Mathematica 11.3 Integration Test Results

Test results for the 932 problems in "4.2.2.1 (a+b cos)^m (c+d cos)^n.m"

Problem 7: Result more than twice size of optimal antiderivative.

$$\int (a + a \operatorname{Cos}[c + d x]) \operatorname{Sec}[c + d x] \, dx$$

Optimal (type 3, 16 leaves, 2 steps):

$$a x + \frac{a \operatorname{ArcTanh}[\operatorname{Sin}[c + d x]]}{d}$$

Result (type 3, 73 leaves):

$$a x - \frac{a \operatorname{Log}\left[\operatorname{Cos}\left[\frac{c}{2} + \frac{d x}{2}\right] - \operatorname{Sin}\left[\frac{c}{2} + \frac{d x}{2}\right]\right]}{d} + \frac{a \operatorname{Log}\left[\operatorname{Cos}\left[\frac{c}{2} + \frac{d x}{2}\right] + \operatorname{Sin}\left[\frac{c}{2} + \frac{d x}{2}\right]\right]}{d}$$

Problem 8: Result more than twice size of optimal antiderivative.

$$\int (a + a \operatorname{Cos}[c + d x]) \operatorname{Sec}[c + d x]^2 \, dx$$

Optimal (type 3, 24 leaves, 4 steps):

$$\frac{a \operatorname{ArcTanh}[\operatorname{Sin}[c + d x]]}{d} + \frac{a \operatorname{Tan}[c + d x]}{d}$$

Result (type 3, 81 leaves):

$$-\frac{a \operatorname{Log}\left[\operatorname{Cos}\left[\frac{c}{2} + \frac{d x}{2}\right] - \operatorname{Sin}\left[\frac{c}{2} + \frac{d x}{2}\right]\right]}{d} + \frac{a \operatorname{Log}\left[\operatorname{Cos}\left[\frac{c}{2} + \frac{d x}{2}\right] + \operatorname{Sin}\left[\frac{c}{2} + \frac{d x}{2}\right]\right]}{d} + \frac{a \operatorname{Tan}[c + d x]}{d}$$

Problem 9: Result more than twice size of optimal antiderivative.

$$\int (a + a \operatorname{Cos}[c + d x]) \operatorname{Sec}[c + d x]^3 \, dx$$

Optimal (type 3, 47 leaves, 5 steps):

$$\frac{a \operatorname{ArcTanh}[\operatorname{Sin}[c + d x]]}{2 d} + \frac{a \operatorname{Tan}[c + d x]}{d} + \frac{a \operatorname{Sec}[c + d x] \operatorname{Tan}[c + d x]}{2 d}$$

Result (type 3, 138 leaves):

$$-\frac{a\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]}{2\,d}+\frac{a\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]}{2\,d}+\frac{a}{4\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^2}-\frac{a}{4\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^2}+\frac{a\,\text{Tan}[c+d\,x]}{d}$$

Problem 10: Result more than twice size of optimal antiderivative.

$$\int (a+a\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]^4\,dx$$

Optimal (type 3, 63 leaves, 5 steps):

$$\frac{a\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{2\,d}+\frac{a\,\text{Tan}[c+d\,x]}{d}+\frac{a\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{2\,d}+\frac{a\,\text{Tan}[c+d\,x]^3}{3\,d}$$

Result (type 3, 163 leaves):

$$-\frac{a\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]}{2\,d}+\frac{a\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]}{2\,d}+\frac{a}{4\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^2}-\frac{a}{4\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^2}+\frac{2\,a\,\text{Tan}[c+d\,x]}{3\,d}+\frac{a\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]}{3\,d}$$

Problem 11: Result more than twice size of optimal antiderivative.

$$\int (a+a\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]^5\,dx$$

Optimal (type 3, 85 leaves, 6 steps):

$$\frac{3\,a\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{8\,d}+\frac{a\,\text{Tan}[c+d\,x]}{d}+\frac{3\,a\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{8\,d}+\frac{a\,\text{Sec}[c+d\,x]^3\,\text{Tan}[c+d\,x]}{4\,d}+\frac{a\,\text{Tan}[c+d\,x]^3}{3\,d}$$

Result (type 3, 227 leaves):

$$-\frac{3\,a\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]}{8\,d}+\frac{3\,a\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]}{8\,d}+\frac{a}{16\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^4}+\frac{3\,a}{16\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^2}-\frac{a}{16\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^4}-\frac{3\,a}{16\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^2}+\frac{2\,a\,\text{Tan}[c+d\,x]}{3\,d}+\frac{a\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]}{3\,d}$$

Problem 12: Result more than twice size of optimal antiderivative.

$$\int (a+a\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]^6\,dx$$

Optimal (type 3, 101 leaves, 6 steps):

$$\frac{3\,a\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{8\,d}+\frac{a\,\text{Tan}[c+d\,x]}{d}+\frac{3\,a\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{8\,d}+\frac{a\,\text{Sec}[c+d\,x]^3\,\text{Tan}[c+d\,x]}{4\,d}+\frac{2\,a\,\text{Tan}[c+d\,x]^3}{3\,d}+\frac{a\,\text{Tan}[c+d\,x]^5}{5\,d}$$

Result (type 3, 249 leaves):

$$-\frac{3\,a\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]}{8\,d}+\frac{3\,a\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]}{8\,d}+\frac{a}{16\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^4}+\frac{3\,a}{16\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^2}-\frac{a}{16\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^4}-\frac{3\,a}{16\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^2}+\frac{8\,a\,\text{Tan}[c+d\,x]}{15\,d}+\frac{4\,a\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]}{15\,d}+\frac{a\,\text{Sec}[c+d\,x]^4\,\text{Tan}[c+d\,x]}{5\,d}$$

Problem 18: Result more than twice size of optimal antiderivative.

$$\int (a+a\,\text{Cos}[c+d\,x])^2\,\text{Sec}[c+d\,x]\,dx$$

Optimal (type 3, 34 leaves, 3 steps):

$$2\,a^2\,x+\frac{a^2\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{d}+\frac{a^2\,\text{Sin}[c+d\,x]}{d}$$

Result (type 3, 106 leaves):

$$2 a^2 x - \frac{a^2 \text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right]}{d} + \frac{a^2 \text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right]}{d} + \frac{a^2 \text{Cos}[d x] \text{Sin}[c]}{d} + \frac{a^2 \text{Cos}[c] \text{Sin}[d x]}{d}$$

Problem 20: Result more than twice size of optimal antiderivative.

$$\int (a + a \text{Cos}[c + d x])^2 \text{Sec}[c + d x]^3 \, dx$$

Optimal (type 3, 54 leaves, 7 steps):

$$\frac{3 a^2 \text{ArcTanh}[\text{Sin}[c + d x]]}{2 d} + \frac{2 a^2 \text{Tan}[c + d x]}{d} + \frac{a^2 \text{Sec}[c + d x] \text{Tan}[c + d x]}{2 d}$$

Result (type 3, 119 leaves):

$$\frac{1}{4 d} a^2 \left(-6 \text{Log}\left[\text{Cos}\left[\frac{1}{2} (c + d x)\right] - \text{Sin}\left[\frac{1}{2} (c + d x)\right]\right] + 6 \text{Log}\left[\text{Cos}\left[\frac{1}{2} (c + d x)\right] + \text{Sin}\left[\frac{1}{2} (c + d x)\right]\right] + \frac{1}{\left(\text{Cos}\left[\frac{1}{2} (c + d x)\right] - \text{Sin}\left[\frac{1}{2} (c + d x)\right]\right)^2} - \frac{1}{\left(\text{Cos}\left[\frac{1}{2} (c + d x)\right] + \text{Sin}\left[\frac{1}{2} (c + d x)\right]\right)^2} + 8 \text{Tan}[c + d x]\right)$$

Problem 21: Result more than twice size of optimal antiderivative.

$$\int (a + a \text{Cos}[c + d x])^2 \text{Sec}[c + d x]^4 \, dx$$

Optimal (type 3, 66 leaves, 8 steps):

$$\frac{a^2 \text{ArcTanh}[\text{Sin}[c + d x]]}{d} + \frac{2 a^2 \text{Tan}[c + d x]}{d} + \frac{a^2 \text{Sec}[c + d x] \text{Tan}[c + d x]}{d} + \frac{a^2 \text{Tan}[c + d x]^3}{3 d}$$

Result (type 3, 669 leaves):

$$-\frac{(a+a\,\mathrm{Cos}[c+d\,x])^2\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\mathrm{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4}{4\,d}+$$
$$\frac{(a+a\,\mathrm{Cos}[c+d\,x])^2\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\mathrm{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4}{4\,d}+$$
$$\frac{(a+a\,\mathrm{Cos}[c+d\,x])^2\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{24\,d\left(\mathrm{Cos}\left[\frac{c}{2}\right]-\mathrm{Sin}\left[\frac{c}{2}\right]\right)\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\mathrm{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3}+$$
$$\frac{(a+a\,\mathrm{Cos}[c+d\,x])^2\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\left(7\,\mathrm{Cos}\left[\frac{c}{2}\right]-5\,\mathrm{Sin}\left[\frac{c}{2}\right]\right)}{48\,d\left(\mathrm{Cos}\left[\frac{c}{2}\right]-\mathrm{Sin}\left[\frac{c}{2}\right]\right)\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\mathrm{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$
$$\frac{5\,(a+a\,\mathrm{Cos}[c+d\,x])^2\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{12\,d\left(\mathrm{Cos}\left[\frac{c}{2}\right]-\mathrm{Sin}\left[\frac{c}{2}\right]\right)\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\mathrm{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}+$$
$$\frac{(a+a\,\mathrm{Cos}[c+d\,x])^2\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{24\,d\left(\mathrm{Cos}\left[\frac{c}{2}\right]+\mathrm{Sin}\left[\frac{c}{2}\right]\right)\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\mathrm{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3}+$$
$$\frac{(a+a\,\mathrm{Cos}[c+d\,x])^2\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\left(-7\,\mathrm{Cos}\left[\frac{c}{2}\right]-5\,\mathrm{Sin}\left[\frac{c}{2}\right]\right)}{48\,d\left(\mathrm{Cos}\left[\frac{c}{2}\right]+\mathrm{Sin}\left[\frac{c}{2}\right]\right)\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\mathrm{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$
$$\frac{5\,(a+a\,\mathrm{Cos}[c+d\,x])^2\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{12\,d\left(\mathrm{Cos}\left[\frac{c}{2}\right]+\mathrm{Sin}\left[\frac{c}{2}\right]\right)\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\mathrm{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}$$

Problem 22: Result more than twice size of optimal antiderivative.

$$\int (a+a\,\mathrm{Cos}[c+d\,x])^2\,\mathrm{Sec}[c+d\,x]^5\,dx$$

Optimal (type 3, 96 leaves, 9 steps):

$$\frac{7\,a^2\,\mathrm{ArcTanh}[\mathrm{Sin}[c+d\,x]]}{8\,d}+\frac{2\,a^2\,\mathrm{Tan}[c+d\,x]}{d}+$$
$$\frac{7\,a^2\,\mathrm{Sec}[c+d\,x]\,\mathrm{Tan}[c+d\,x]}{8\,d}+\frac{a^2\,\mathrm{Sec}[c+d\,x]^3\,\mathrm{Tan}[c+d\,x]}{4\,d}+\frac{2\,a^2\,\mathrm{Tan}[c+d\,x]^3}{3\,d}$$

Result (type 3, 797 leaves):

$$-\frac{1}{32\,d}7\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4+$$

$$\frac{7\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4}{32\,d}+$$

$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4}{64\,d\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^4}+\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\text{Sin}\left[\frac{d\,x}{2}\right]}{12\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3}+$$

$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\left(29\,\text{Cos}\left[\frac{c}{2}\right]-13\,\text{Sin}\left[\frac{c}{2}\right]\right)}{192\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$

$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\text{Sin}\left[\frac{d\,x}{2}\right]}{3\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}-\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4}{64\,d\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^4}+$$

$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\text{Sin}\left[\frac{d\,x}{2}\right]}{12\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3}+$$

$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\left(-29\,\text{Cos}\left[\frac{c}{2}\right]-13\,\text{Sin}\left[\frac{c}{2}\right]\right)}{192\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$

$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\text{Sin}\left[\frac{d\,x}{2}\right]}{3\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}$$

Problem 28: Result more than twice size of optimal antiderivative.

$$\int\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}[c+d\,x]^2\,dx$$

Optimal (type 3, 48 leaves, 6 steps):

$$3\,a^3\,x+\frac{3\,a^3\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{d}+\frac{a^3\,\text{Sin}[c+d\,x]}{d}+\frac{a^3\,\text{Tan}[c+d\,x]}{d}$$

Result (type 3, 211 leaves):

$$\frac{1}{8} a^3 (1+\text{Cos}[c+d x])^3 \text{Sec}\left[\frac{1}{2}(c+d x)\right]^6 \left(3 x-\frac{3 \text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d x)\right]-\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right]}{d}+\frac{3 \text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d x)\right]+\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right]}{d}+\frac{\text{Cos}[d x] \text{Sin}[c]}{d}+\frac{\text{Cos}[c] \text{Sin}[d x]}{d}+\frac{\text{Sin}\left[\frac{d x}{2}\right]}{d \left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right) \left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]-\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)}+\frac{\text{Sin}\left[\frac{d x}{2}\right]}{d \left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right) \left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]+\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)}\right)$$

Problem 29: Result more than twice size of optimal antiderivative.

$$\int (a+a \text{Cos}[c+d x])^3 \text{Sec}[c+d x]^3 \, dx$$

Optimal (type 3, 59 leaves, 7 steps):

$$a^3 x+\frac{7 a^3 \text{ArcTanh}[\text{Sin}[c+d x]]}{2 d}+\frac{3 a^3 \text{Tan}[c+d x]}{d}+\frac{a^3 \text{Sec}[c+d x] \text{Tan}[c+d x]}{2 d}$$

Result (type 3, 144 leaves):

$$a^3 \left(\frac{c}{d}+x-\frac{7 \text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d x)\right]-\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right]}{2 d}+\frac{7 \text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d x)\right]+\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right]}{2 d}+\frac{1}{4 d \left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]-\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^2}-\frac{1}{4 d \left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]+\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^2}+\frac{3 \text{Tan}[c+d x]}{d}\right)$$

Problem 30: Result more than twice size of optimal antiderivative.

$$\int (a+a \text{Cos}[c+d x])^3 \text{Sec}[c+d x]^4 \, dx$$

Optimal (type 3, 72 leaves, 9 steps):

$$\frac{5 a^3 \text{ArcTanh}[\text{Sin}[c+d x]]}{2 d}+\frac{4 a^3 \text{Tan}[c+d x]}{d}+\frac{3 a^3 \text{Sec}[c+d x] \text{Tan}[c+d x]}{2 d}+\frac{a^3 \text{Tan}[c+d x]^3}{3 d}$$

Result (type 3, 669 leaves):

$$-\frac{1}{16\,d}5\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6+$$

$$\frac{5\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6}{16\,d}+$$

$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Sin}\left[\frac{d\,x}{2}\right]}{48\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3}+$$

$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\left(5\,\text{Cos}\left[\frac{c}{2}\right]-4\,\text{Sin}\left[\frac{c}{2}\right]\right)}{48\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$

$$\frac{11\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Sin}\left[\frac{d\,x}{2}\right]}{24\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}+$$

$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Sin}\left[\frac{d\,x}{2}\right]}{48\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3}+$$

$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\left(-5\,\text{Cos}\left[\frac{c}{2}\right]-4\,\text{Sin}\left[\frac{c}{2}\right]\right)}{48\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$

$$\frac{11\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Sin}\left[\frac{d\,x}{2}\right]}{24\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}$$

Problem 31: Result more than twice size of optimal antiderivative.

$$\int\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}[c+d\,x]^5\,dx$$

Optimal (type 3, 93 leaves, 11 steps):

$$\frac{15\,a^3\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{8\,d}+\frac{4\,a^3\,\text{Tan}[c+d\,x]}{d}+$$

$$\frac{15\,a^3\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{8\,d}+\frac{a^3\,\text{Sec}[c+d\,x]^3\,\text{Tan}[c+d\,x]}{4\,d}+\frac{a^3\,\text{Tan}[c+d\,x]^3}{d}$$

Result (type 3, 797 leaves):

$$-\frac{1}{64\,d}15\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6+$$
$$\frac{1}{64\,d}15\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6+$$
$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6}{128\,d\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^4}+\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Sin}\left[\frac{d\,x}{2}\right]}{16\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3}+$$
$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\left(19\,\text{Cos}\left[\frac{c}{2}\right]-11\,\text{Sin}\left[\frac{c}{2}\right]\right)}{128\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$
$$\frac{3\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Sin}\left[\frac{d\,x}{2}\right]}{8\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}-\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6}{128\,d\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^4}+$$
$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Sin}\left[\frac{d\,x}{2}\right]}{16\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3}+$$
$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\left(-19\,\text{Cos}\left[\frac{c}{2}\right]-11\,\text{Sin}\left[\frac{c}{2}\right]\right)}{128\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$
$$\frac{3\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Sin}\left[\frac{d\,x}{2}\right]}{8\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}$$

Problem 32: Result more than twice size of optimal antiderivative.

$$\int\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}[c+d\,x]^6\,dx$$

Optimal (type 3, 114 leaves, 11 steps):

$$\frac{13\,a^3\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{8\,d}+\frac{4\,a^3\,\text{Tan}[c+d\,x]}{d}+\frac{13\,a^3\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{8\,d}+$$
$$\frac{3\,a^3\,\text{Sec}[c+d\,x]^3\,\text{Tan}[c+d\,x]}{4\,d}+\frac{5\,a^3\,\text{Tan}[c+d\,x]^3}{3\,d}+\frac{a^3\,\text{Tan}[c+d\,x]^5}{5\,d}$$

Result (type 3, 487 leaves):

$$-\frac{1}{3840\,d}a^3\,\mathrm{Sec}[c]\,\mathrm{Sec}[c+d\,x]^5\left(975\,\mathrm{Cos}[2\,c+3\,d\,x]\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]+\right.$$
$$975\,\mathrm{Cos}[4\,c+3\,d\,x]\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]+$$
$$195\,\mathrm{Cos}[4\,c+5\,d\,x]\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]+$$
$$195\,\mathrm{Cos}[6\,c+5\,d\,x]\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]+$$
$$1950\,\mathrm{Cos}[d\,x]\left(\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]-\right.$$
$$\left.\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]\right)+1950\,\mathrm{Cos}[2\,c+d\,x]$$
$$\left(\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]-\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]\right)-$$
$$975\,\mathrm{Cos}[2\,c+3\,d\,x]\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]-$$
$$975\,\mathrm{Cos}[4\,c+3\,d\,x]\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]-$$
$$195\,\mathrm{Cos}[4\,c+5\,d\,x]\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]-$$
$$195\,\mathrm{Cos}[6\,c+5\,d\,x]\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]-4640\,\mathrm{Sin}[d\,x]+$$
$$1440\,\mathrm{Sin}[2\,c+d\,x]-1500\,\mathrm{Sin}[c+2\,d\,x]-1500\,\mathrm{Sin}[3\,c+2\,d\,x]-$$
$$\left.3040\,\mathrm{Sin}[2\,c+3\,d\,x]-390\,\mathrm{Sin}[3\,c+4\,d\,x]-390\,\mathrm{Sin}[5\,c+4\,d\,x]-608\,\mathrm{Sin}[4\,c+5\,d\,x]\right)$$

Problem 37: Result more than twice size of optimal antiderivative.

$$\int(a+a\,\mathrm{Cos}[c+d\,x])^4\,\mathrm{Sec}[c+d\,x]^2\,dx$$

Optimal (type 3, 73 leaves, 8 steps):

$$\frac{13\,a^4\,x}{2}+\frac{4\,a^4\,\mathrm{ArcTanh}[\mathrm{Sin}[c+d\,x]]}{d}+$$
$$\frac{4\,a^4\,\mathrm{Sin}[c+d\,x]}{d}+\frac{a^4\,\mathrm{Cos}[c+d\,x]\,\mathrm{Sin}[c+d\,x]}{2\,d}+\frac{a^4\,\mathrm{Tan}[c+d\,x]}{d}$$

Result (type 3, 241 leaves):

$$\frac{1}{64} a^4 (1+\text{Cos}[c+d x])^4 \text{Sec}\left[\frac{1}{2} (c+d x)\right]^8 \left(26 x-\frac{16 \text{Log}\left[\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right]}{d}+\frac{16 \text{Log}\left[\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right]}{d}+\frac{16 \text{Cos}[d x] \text{Sin}[c]}{d}+\frac{\text{Cos}[2 d x] \text{Sin}[2 c]}{d}+\frac{16 \text{Cos}[c] \text{Sin}[d x]}{d}+\frac{\text{Cos}[2 c] \text{Sin}[2 d x]}{d}+\frac{4 \text{Sin}\left[\frac{d x}{2}\right]}{d \left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right) \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)}+\frac{4 \text{Sin}\left[\frac{d x}{2}\right]}{d \left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right) \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)}\right)$$

Problem 38: Result more than twice size of optimal antiderivative.

$$\int (a+a \text{Cos}[c+d x])^4 \text{Sec}[c+d x]^3 \, dx$$

Optimal (type 3, 73 leaves, 8 steps):

$$4 a^4 x+\frac{13 a^4 \text{ArcTanh}[\text{Sin}[c+d x]]}{2 d}+\frac{a^4 \text{Sin}[c+d x]}{d}+\frac{4 a^4 \text{Tan}[c+d x]}{d}+\frac{a^4 \text{Sec}[c+d x] \text{Tan}[c+d x]}{2 d}$$

Result (type 3, 272 leaves):

$$\frac{1}{64} a^4 (1+\text{Cos}[c+d x])^4 \text{Sec}\left[\frac{1}{2} (c+d x)\right]^8 \left(16 x-\frac{26 \text{Log}\left[\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right]}{d}+\frac{26 \text{Log}\left[\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right]}{d}+\frac{4 \text{Cos}[d x] \text{Sin}[c]}{d}+\frac{4 \text{Cos}[c] \text{Sin}[d x]}{d}+\frac{1}{d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)^2}+\frac{16 \text{Sin}\left[\frac{d x}{2}\right]}{d \left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right) \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)}-\frac{1}{d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)^2}+\frac{16 \text{Sin}\left[\frac{d x}{2}\right]}{d \left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right) \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)}\right)$$

Problem 39: Result more than twice size of optimal antiderivative.

$$\int (a+a \text{Cos}[c+d x])^4 \text{Sec}[c+d x]^4 \, dx$$

Optimal (type 3, 73 leaves, 9 steps):

$$a^4 x+\frac{6 a^4 \text{ArcTanh}[\text{Sin}[c+d x]]}{d}+\frac{7 a^4 \text{Tan}[c+d x]}{d}+\frac{2 a^4 \text{Sec}[c+d x] \text{Tan}[c+d x]}{d}+\frac{a^4 \text{Tan}[c+d x]^3}{3 d}$$

Result (type 3, 178 leaves):

$$\frac{1}{12 d} a^4 \text{Sec}[c+d x]^3 \left(9 \text{Cos}[c+d x] \left(c+d x-6 \text{Log}\left[\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right]+6 \text{Log}\left[\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right]\right)+3 \text{Cos}[3 (c+d x)] \left(c+d x-6 \text{Log}\left[\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right]+6 \text{Log}\left[\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right]\right)+4 (6 \text{Sin}[c+d x]+3 \text{Sin}[2 (c+d x)]+5 \text{Sin}[3 (c+d x)])\right)$$

Problem 40: Result more than twice size of optimal antiderivative.

$$\int (a+a \text{Cos}[c+d x])^4 \text{Sec}[c+d x]^5 \, dx$$

Optimal (type 3, 96 leaves, 12 steps):

$$\frac{35 a^4 \text{ArcTanh}[\text{Sin}[c+d x]]}{8 d}+\frac{8 a^4 \text{Tan}[c+d x]}{d}+\frac{27 a^4 \text{Sec}[c+d x] \text{Tan}[c+d x]}{8 d}+\frac{a^4 \text{Sec}[c+d x]^3 \text{Tan}[c+d x]}{4 d}+\frac{4 a^4 \text{Tan}[c+d x]^3}{3 d}$$

Result (type 3, 797 leaves):

$$-\frac{1}{128\,d}35\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8+$$
$$\frac{1}{128\,d}35\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8+$$
$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8}{256\,d\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^4}+\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8\,\text{Sin}\left[\frac{d\,x}{2}\right]}{24\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3}+$$
$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8\,\left(97\,\text{Cos}\left[\frac{c}{2}\right]-65\,\text{Sin}\left[\frac{c}{2}\right]\right)}{768\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$
$$\frac{5\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8\,\text{Sin}\left[\frac{d\,x}{2}\right]}{12\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}-\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8}{256\,d\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^4}+$$
$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8\,\text{Sin}\left[\frac{d\,x}{2}\right]}{24\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3}+$$
$$\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8\,\left(-97\,\text{Cos}\left[\frac{c}{2}\right]-65\,\text{Sin}\left[\frac{c}{2}\right]\right)}{768\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$
$$\frac{5\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8\,\text{Sin}\left[\frac{d\,x}{2}\right]}{12\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}$$

Problem 41: Result more than twice size of optimal antiderivative.

$$\int\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Sec}[c+d\,x]^6\,dx$$

Optimal (type 3, 111 leaves, 13 steps):

$$\frac{7\,a^4\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{2\,d}+\frac{8\,a^4\,\text{Tan}[c+d\,x]}{d}+\frac{7\,a^4\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{2\,d}+$$
$$\frac{a^4\,\text{Sec}[c+d\,x]^3\,\text{Tan}[c+d\,x]}{d}+\frac{8\,a^4\,\text{Tan}[c+d\,x]^3}{3\,d}+\frac{a^4\,\text{Tan}[c+d\,x]^5}{5\,d}$$

Result (type 3, 498 leaves):

$$-\frac{1}{960\,d}a^4\,\text{Sec}[c]\,\text{Sec}[c+d\,x]^5\left(525\,\text{Cos}[2\,c+3\,d\,x]\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]+\right.$$
$$525\,\text{Cos}[4\,c+3\,d\,x]\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]+$$
$$105\,\text{Cos}[4\,c+5\,d\,x]\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]+$$
$$105\,\text{Cos}[6\,c+5\,d\,x]\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]+$$
$$1050\,\text{Cos}[d\,x]\left(\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]-\right.$$
$$\left.\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]\right)+1050\,\text{Cos}[2\,c+d\,x]$$
$$\left(\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]-\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]\right)-$$
$$525\,\text{Cos}[2\,c+3\,d\,x]\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]-$$
$$525\,\text{Cos}[4\,c+3\,d\,x]\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]-$$
$$105\,\text{Cos}[4\,c+5\,d\,x]\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]-$$
$$105\,\text{Cos}[6\,c+5\,d\,x]\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]-2360\,\text{Sin}[d\,x]+$$
$$960\,\text{Sin}[2\,c+d\,x]-660\,\text{Sin}[c+2\,d\,x]-660\,\text{Sin}[3\,c+2\,d\,x]-1600\,\text{Sin}[2\,c+3\,d\,x]+$$
$$\left.60\,\text{Sin}[4\,c+3\,d\,x]-210\,\text{Sin}[3\,c+4\,d\,x]-210\,\text{Sin}[5\,c+4\,d\,x]-332\,\text{Sin}[4\,c+5\,d\,x]\right)$$

Problem 46: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Cos}[c+d\,x]^2}{a+a\,\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 3, 43 leaves, 4 steps):

$$-\frac{x}{a}+\frac{\text{Sin}[c+d\,x]}{a\,d}+\frac{\text{Sin}[c+d\,x]}{a\,d\,(1+\text{Cos}[c+d\,x])}$$

Result (type 3, 89 leaves):

$$\frac{1}{4\,a\,d}\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]$$
$$\left(-2\,d\,x\,\text{Cos}\left[\frac{d\,x}{2}\right]-2\,d\,x\,\text{Cos}\left[c+\frac{d\,x}{2}\right]+5\,\text{Sin}\left[\frac{d\,x}{2}\right]+\text{Sin}\left[c+\frac{d\,x}{2}\right]+\text{Sin}\left[c+\frac{3\,d\,x}{2}\right]+\text{Sin}\left[2\,c+\frac{3\,d\,x}{2}\right]\right)$$

Problem 49: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Sec}[c+d\,x]}{a+a\,\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 3, 38 leaves, 3 steps):

$$\frac{\text{ArcTanh}[\text{Sin}[c+d\,x]]}{a\,d}-\frac{\text{Sin}[c+d\,x]}{d\,(a+a\,\text{Cos}[c+d\,x])}$$

Result (type 3, 103 leaves):

$$-\left(\left(2\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\left(\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]-\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]\right)+\text{Sec}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)\right)\Big/\left(a\,d\,(1+\text{Cos}[c+d\,x])\right)\right)$$

Problem 50: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Sec}[c+d\,x]^2}{a+a\,\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 3, 53 leaves, 5 steps):

$$-\frac{\text{ArcTanh}[\text{Sin}[c+d\,x]]}{a\,d}+\frac{2\,\text{Tan}[c+d\,x]}{a\,d}-\frac{\text{Tan}[c+d\,x]}{d\,(a+a\,\text{Cos}[c+d\,x])}$$

Result (type 3, 188 leaves):

$$\left(2\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\left(\text{Sec}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]+\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\left(\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]-\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]\right)+\text{Sin}[d\,x]\Big/\left(\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)\right)\right)\right)\Big/\left(a\,d\,(1+\text{Cos}[c+d\,x])\right)$$

Problem 51: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Sec}[c+d\,x]^3}{a+a\,\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 3, 83 leaves, 6 steps):

$$\frac{3\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{2\,a\,d}-\frac{2\,\text{Tan}[c+d\,x]}{a\,d}+\frac{3\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{2\,a\,d}-\frac{\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{d\,(a+a\,\text{Cos}[c+d\,x])}$$

Result (type 3, 244 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]\left(-4\,\text{Sec}\left[\frac{c}{2}\right]\text{Sin}\left[\frac{d\,x}{2}\right]+\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]\left(-6\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]+6\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]+\frac{1}{\left(\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right)^2}-\frac{1}{\left(\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right)^2}-\left(4\,\text{Sin}[d\,x]\right)\Big/\left(\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right)\left(\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right)\right)\right)\right)\right)\Big/\left(2\,a\,d\,(1+\text{Cos}[c+d\,x])\right)$$

Problem 52: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Sec}[c+d\,x]^4}{a+a\,\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 3, 103 leaves, 6 steps):

$$-\frac{3\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{2\,a\,d}+\frac{4\,\text{Tan}[c+d\,x]}{a\,d}-\frac{3\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{2\,a\,d}-\frac{\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]}{d\,(a+a\,\text{Cos}[c+d\,x])}+\frac{4\,\text{Tan}[c+d\,x]^3}{3\,a\,d}$$

Result (type 3, 706 leaves):

$$\frac{3\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d\,\left(a+a\,\text{Cos}[c+d\,x]\right)}-\frac{3\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d\,\left(a+a\,\text{Cos}[c+d\,x]\right)}+$$
$$\frac{2\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]}{d\,\left(a+a\,\text{Cos}[c+d\,x]\right)}+\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)\Big/$$
$$\left(3\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3\right)+$$
$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\left(-\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\right)\Big/$$
$$\left(3\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2\right)+$$
$$\left(10\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)\Big/\left(3\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\right.$$
$$\left.\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)\right)+\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)\Big/$$
$$\left(3\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3\right)+$$
$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\left(\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\right)\Big/$$
$$\left(3\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2\right)+$$
$$\left(10\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)\Big/$$
$$\left(3\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)\right)$$

Problem 59: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Sec}[c+d\,x]}{\left(a+a\,\text{Cos}[c+d\,x]\right)^2}\,dx$$

Optimal (type 3, 66 leaves, 4 steps):

$$\frac{\text{ArcTanh}[\text{Sin}[c+d\,x]]}{a^2\,d}-\frac{4\,\text{Sin}[c+d\,x]}{3\,a^2\,d\,\left(1+\text{Cos}[c+d\,x]\right)}-\frac{\text{Sin}[c+d\,x]}{3\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2}$$

Result (type 3, 152 leaves):

$$-\left(\left(2\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\left(6\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^3\right.\right.\right.$$
$$\left(\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]-\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]\right)+$$
$$\text{Sec}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]+8\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]+$$
$$\left.\left.\left.\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\text{Tan}\left[\frac{c}{2}\right]\right)\right)\Big/\left(3\,a^2\,d\,\left(1+\text{Cos}[c+d\,x]\right)^2\right)\right)$$

Problem 60: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Sec}[c+d x]^2}{(a+a \text{Cos}[c+d x])^2} \, dx$$

Optimal (type 3, 81 leaves, 6 steps):

$$-\frac{2 \text{ArcTanh}[\text{Sin}[c+d x]]}{a^2 d}+\frac{10 \text{Tan}[c+d x]}{3 a^2 d}-\frac{2 \text{Tan}[c+d x]}{a^2 d (1+\text{Cos}[c+d x])}-\frac{\text{Tan}[c+d x]}{3 d (a+a \text{Cos}[c+d x])^2}$$

Result (type 3, 239 leaves):

$$\frac{1}{3 a^2 d (1+\text{Cos}[c+d x])^2} 2 \text{Cos}\left[\frac{1}{2} (c+d x)\right] \left(\text{Sec}\left[\frac{c}{2}\right] \text{Sin}\left[\frac{d x}{2}\right]+14 \text{Cos}\left[\frac{1}{2} (c+d x)\right]^2 \text{Sec}\left[\frac{c}{2}\right] \text{Sin}\left[\frac{d x}{2}\right]+6 \text{Cos}\left[\frac{1}{2} (c+d x)\right]^3 \left(2 \text{Log}\left[\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right]-2 \text{Log}\left[\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right]+\text{Sin}[d x]\Big/\left(\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right) \left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right) \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right) \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)\right)\right)+\text{Cos}\left[\frac{1}{2} (c+d x)\right] \text{Tan}\left[\frac{c}{2}\right]\right)$$

Problem 61: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Sec}[c+d x]^3}{(a+a \text{Cos}[c+d x])^2} \, dx$$

Optimal (type 3, 119 leaves, 7 steps):

$$\frac{7 \text{ArcTanh}[\text{Sin}[c+d x]]}{2 a^2 d}-\frac{16 \text{Tan}[c+d x]}{3 a^2 d}+\frac{7 \text{Sec}[c+d x] \text{Tan}[c+d x]}{2 a^2 d}-\frac{8 \text{Sec}[c+d x] \text{Tan}[c+d x]}{3 a^2 d (1+\text{Cos}[c+d x])}-\frac{\text{Sec}[c+d x] \text{Tan}[c+d x]}{3 d (a+a \text{Cos}[c+d x])^2}$$

Result (type 3, 292 leaves):

$$\frac{1}{3\,a^2\,d\,\left(1+\text{Cos}[c+d\,x]\right)^2}$$

$$\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\left(-2\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]-40\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]+\right.$$

$$3\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^3\,\left(-14\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]+\right.$$

$$14\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]+\frac{1}{\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^2}-$$

$$\frac{1}{\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^2}-(8\,\text{Sin}[d\,x])\Big/$$

$$\left(\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)\right.$$

$$\left.\left.\left.\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)\right)\right)-2\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\text{Tan}\left[\frac{c}{2}\right]\right)$$

Problem 62: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Sec}[c+d\,x]^4}{\left(a+a\,\text{Cos}[c+d\,x]\right)^2}\,dx$$

Optimal (type 3, 133 leaves, 7 steps):

$$-\frac{5\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{a^2\,d}+\frac{12\,\text{Tan}[c+d\,x]}{a^2\,d}-\frac{5\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{a^2\,d}-$$

$$\frac{10\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]}{3\,a^2\,d\,\left(1+\text{Cos}[c+d\,x]\right)}-\frac{\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]}{3\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2}+\frac{4\,\text{Tan}[c+d\,x]^3}{a^2\,d}$$

Result (type 3, 403 leaves):

$$\frac{20\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2}-$$
$$\frac{20\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2}+$$
$$\frac{1}{48\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2}\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}[c]\,\text{Sec}[c+d\,x]^3$$
$$\left(-3\,\text{Sin}\left[\frac{d\,x}{2}\right]+155\,\text{Sin}\left[\frac{3\,d\,x}{2}\right]-153\,\text{Sin}\left[c-\frac{d\,x}{2}\right]+21\,\text{Sin}\left[c+\frac{d\,x}{2}\right]-\right.$$
$$135\,\text{Sin}\left[2\,c+\frac{d\,x}{2}\right]+25\,\text{Sin}\left[c+\frac{3\,d\,x}{2}\right]+45\,\text{Sin}\left[2\,c+\frac{3\,d\,x}{2}\right]-85\,\text{Sin}\left[3\,c+\frac{3\,d\,x}{2}\right]+$$
$$99\,\text{Sin}\left[c+\frac{5\,d\,x}{2}\right]+21\,\text{Sin}\left[2\,c+\frac{5\,d\,x}{2}\right]+33\,\text{Sin}\left[3\,c+\frac{5\,d\,x}{2}\right]-45\,\text{Sin}\left[4\,c+\frac{5\,d\,x}{2}\right]+$$
$$57\,\text{Sin}\left[2\,c+\frac{7\,d\,x}{2}\right]+18\,\text{Sin}\left[3\,c+\frac{7\,d\,x}{2}\right]+24\,\text{Sin}\left[4\,c+\frac{7\,d\,x}{2}\right]-$$
$$\left.15\,\text{Sin}\left[5\,c+\frac{7\,d\,x}{2}\right]+24\,\text{Sin}\left[3\,c+\frac{9\,d\,x}{2}\right]+11\,\text{Sin}\left[4\,c+\frac{9\,d\,x}{2}\right]+13\,\text{Sin}\left[5\,c+\frac{9\,d\,x}{2}\right]\right)$$

Problem 69: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Sec}[c+d\,x]}{\left(a+a\,\text{Cos}[c+d\,x]\right)^3}\,dx$$

Optimal (type 3, 97 leaves, 5 steps):

$$\frac{\text{ArcTanh}[\text{Sin}[c+d\,x]]}{a^3\,d}-\frac{\text{Sin}[c+d\,x]}{5\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3}-$$
$$\frac{7\,\text{Sin}[c+d\,x]}{15\,a\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2}-\frac{22\,\text{Sin}[c+d\,x]}{15\,d\,\left(a^3+a^3\,\text{Cos}[c+d\,x]\right)}$$

Result (type 3, 201 leaves):

$$-\frac{1}{15\,a^3\,d\,\left(1+\text{Cos}[c+d\,x]\right)^3}$$
$$2\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\left(60\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^5\,\left(\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]-\right.\right.$$
$$\left.\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]\right)+3\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]+$$
$$14\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]+88\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^4\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]+$$
$$\left.3\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\text{Tan}\left[\frac{c}{2}\right]+14\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^3\,\text{Tan}\left[\frac{c}{2}\right]\right)$$

Problem 70: Result more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{Sec}[c+d\,x]^2}{(a+a\operatorname{Cos}[c+d\,x])^3}\,dx$$

Optimal (type 3, 112 leaves, 7 steps):

$$-\frac{3\operatorname{ArcTanh}[\operatorname{Sin}[c+d\,x]]}{a^3\,d}+\frac{24\operatorname{Tan}[c+d\,x]}{5\,a^3\,d}-\frac{\operatorname{Tan}[c+d\,x]}{5\,d\,(a+a\operatorname{Cos}[c+d\,x])^3}-\frac{3\operatorname{Tan}[c+d\,x]}{5\,a\,d\,(a+a\operatorname{Cos}[c+d\,x])^2}-\frac{3\operatorname{Tan}[c+d\,x]}{d\,(a^3+a^3\operatorname{Cos}[c+d\,x])}$$

Result (type 3, 286 leaves):

$$\frac{1}{5\,a^3\,d\,(1+\operatorname{Cos}[c+d\,x])^3}\,2\operatorname{Cos}\left[\frac{1}{2}(c+d\,x)\right]\left(\operatorname{Sec}\left[\frac{c}{2}\right]\operatorname{Sin}\left[\frac{d\,x}{2}\right]+8\operatorname{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\operatorname{Sec}\left[\frac{c}{2}\right]\operatorname{Sin}\left[\frac{d\,x}{2}\right]+\right.$$
$$76\operatorname{Cos}\left[\frac{1}{2}(c+d\,x)\right]^4\operatorname{Sec}\left[\frac{c}{2}\right]\operatorname{Sin}\left[\frac{d\,x}{2}\right]+20\operatorname{Cos}\left[\frac{1}{2}(c+d\,x)\right]^5$$
$$\left(3\operatorname{Log}\left[\operatorname{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\operatorname{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]-3\operatorname{Log}\left[\operatorname{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\operatorname{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]+\right.$$
$$\operatorname{Sin}[d\,x]\Big/\left(\left(\operatorname{Cos}\left[\frac{c}{2}\right]-\operatorname{Sin}\left[\frac{c}{2}\right]\right)\left(\operatorname{Cos}\left[\frac{c}{2}\right]+\operatorname{Sin}\left[\frac{c}{2}\right]\right)\right.$$
$$\left.\left.\left(\operatorname{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\operatorname{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right)\left(\operatorname{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\operatorname{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right)\right)\right)+$$
$$\left.\operatorname{Cos}\left[\frac{1}{2}(c+d\,x)\right]\operatorname{Tan}\left[\frac{c}{2}\right]+8\operatorname{Cos}\left[\frac{1}{2}(c+d\,x)\right]^3\operatorname{Tan}\left[\frac{c}{2}\right]\right)$$

Problem 71: Result more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{Sec}[c+d\,x]^3}{(a+a\operatorname{Cos}[c+d\,x])^3}\,dx$$

Optimal (type 3, 156 leaves, 8 steps):

$$\frac{13\operatorname{ArcTanh}[\operatorname{Sin}[c+d\,x]]}{2\,a^3\,d}-\frac{152\operatorname{Tan}[c+d\,x]}{15\,a^3\,d}+\frac{13\operatorname{Sec}[c+d\,x]\operatorname{Tan}[c+d\,x]}{2\,a^3\,d}-\frac{\operatorname{Sec}[c+d\,x]\operatorname{Tan}[c+d\,x]}{5\,d\,(a+a\operatorname{Cos}[c+d\,x])^3}-\frac{11\operatorname{Sec}[c+d\,x]\operatorname{Tan}[c+d\,x]}{15\,a\,d\,(a+a\operatorname{Cos}[c+d\,x])^2}-\frac{76\operatorname{Sec}[c+d\,x]\operatorname{Tan}[c+d\,x]}{15\,d\,(a^3+a^3\operatorname{Cos}[c+d\,x])}$$

Result (type 3, 403 leaves):

$$-\frac{52\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3}+$$
$$\frac{52\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3}+$$
$$\frac{1}{480\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}[c]\,\text{Sec}[c+d\,x]^2$$
$$\left(1235\,\text{Sin}\left[\frac{d\,x}{2}\right]-3805\,\text{Sin}\left[\frac{3\,d\,x}{2}\right]+4329\,\text{Sin}\left[c-\frac{d\,x}{2}\right]-1989\,\text{Sin}\left[c+\frac{d\,x}{2}\right]+\right.$$
$$3575\,\text{Sin}\left[2\,c+\frac{d\,x}{2}\right]+475\,\text{Sin}\left[c+\frac{3\,d\,x}{2}\right]-2005\,\text{Sin}\left[2\,c+\frac{3\,d\,x}{2}\right]+2275\,\text{Sin}\left[3\,c+\frac{3\,d\,x}{2}\right]-$$
$$2673\,\text{Sin}\left[c+\frac{5\,d\,x}{2}\right]-105\,\text{Sin}\left[2\,c+\frac{5\,d\,x}{2}\right]-1593\,\text{Sin}\left[3\,c+\frac{5\,d\,x}{2}\right]+975\,\text{Sin}\left[4\,c+\frac{5\,d\,x}{2}\right]-$$
$$1325\,\text{Sin}\left[2\,c+\frac{7\,d\,x}{2}\right]-255\,\text{Sin}\left[3\,c+\frac{7\,d\,x}{2}\right]-875\,\text{Sin}\left[4\,c+\frac{7\,d\,x}{2}\right]+$$
$$\left.195\,\text{Sin}\left[5\,c+\frac{7\,d\,x}{2}\right]-304\,\text{Sin}\left[3\,c+\frac{9\,d\,x}{2}\right]-90\,\text{Sin}\left[4\,c+\frac{9\,d\,x}{2}\right]-214\,\text{Sin}\left[5\,c+\frac{9\,d\,x}{2}\right]\right)$$

Problem 80: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Sec}[c+d\,x]^2}{\left(a+a\,\text{Cos}[c+d\,x]\right)^4}\,dx$$

Optimal (type 3, 135 leaves, 8 steps):

$$-\frac{4\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{a^4\,d}+\frac{664\,\text{Tan}[c+d\,x]}{105\,a^4\,d}-\frac{88\,\text{Tan}[c+d\,x]}{105\,a^4\,d\,\left(1+\text{Cos}[c+d\,x]\right)^2}-$$
$$\frac{4\,\text{Tan}[c+d\,x]}{a^4\,d\,\left(1+\text{Cos}[c+d\,x]\right)}-\frac{\text{Tan}[c+d\,x]}{7\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4}-\frac{12\,\text{Tan}[c+d\,x]}{35\,a\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3}$$

Result (type 3, 401 leaves):

$$\frac{64\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4}-$$
$$\frac{64\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4}+$$
$$\frac{1}{1680\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}[c]\,\text{Sec}[c+d\,x]$$
$$\left(-10\,780\,\text{Sin}\left[\frac{d\,x}{2}\right]+18\,788\,\text{Sin}\left[\frac{3\,d\,x}{2}\right]-20\,524\,\text{Sin}\left[c-\frac{d\,x}{2}\right]+14\,644\,\text{Sin}\left[c+\frac{d\,x}{2}\right]-\right.$$
$$16\,660\,\text{Sin}\left[2\,c+\frac{d\,x}{2}\right]-4690\,\text{Sin}\left[c+\frac{3\,d\,x}{2}\right]+14\,378\,\text{Sin}\left[2\,c+\frac{3\,d\,x}{2}\right]-$$
$$9100\,\text{Sin}\left[3\,c+\frac{3\,d\,x}{2}\right]+11\,668\,\text{Sin}\left[c+\frac{5\,d\,x}{2}\right]-630\,\text{Sin}\left[2\,c+\frac{5\,d\,x}{2}\right]+9358\,\text{Sin}\left[3\,c+\frac{5\,d\,x}{2}\right]-$$
$$2940\,\text{Sin}\left[4\,c+\frac{5\,d\,x}{2}\right]+4228\,\text{Sin}\left[2\,c+\frac{7\,d\,x}{2}\right]+315\,\text{Sin}\left[3\,c+\frac{7\,d\,x}{2}\right]+3493\,\text{Sin}\left[4\,c+\frac{7\,d\,x}{2}\right]-$$
$$\left.420\,\text{Sin}\left[5\,c+\frac{7\,d\,x}{2}\right]+664\,\text{Sin}\left[3\,c+\frac{9\,d\,x}{2}\right]+105\,\text{Sin}\left[4\,c+\frac{9\,d\,x}{2}\right]+559\,\text{Sin}\left[5\,c+\frac{9\,d\,x}{2}\right]\right)$$

Problem 81: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Sec}[c+d\,x]^3}{\left(a+a\,\text{Cos}[c+d\,x]\right)^4}\,dx$$

Optimal (type 3, 185 leaves, 9 steps):

$$\frac{21\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{2\,a^4\,d}-\frac{576\,\text{Tan}[c+d\,x]}{35\,a^4\,d}+$$
$$\frac{21\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{2\,a^4\,d}-\frac{43\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{35\,a^4\,d\,\left(1+\text{Cos}[c+d\,x]\right)^2}-$$
$$\frac{288\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{35\,a^4\,d\,\left(1+\text{Cos}[c+d\,x]\right)}-\frac{\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{7\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4}-\frac{2\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{5\,a\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3}$$

Result (type 3, 455 leaves):

$$-\frac{168\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^8\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right]}{d\,\left(a+a\,\text{Cos}[c+d x]\right)^4}+$$
$$\frac{168\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^8\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right]}{d\,\left(a+a\,\text{Cos}[c+d x]\right)^4}+$$
$$\frac{1}{2240\,d\,\left(a+a\,\text{Cos}[c+d x]\right)^4}\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}[c]\,\text{Sec}[c+d x]^2$$
$$\left(24402\,\text{Sin}\left[\frac{d x}{2}\right]-55556\,\text{Sin}\left[\frac{3 d x}{2}\right]+61054\,\text{Sin}\left[c-\frac{d x}{2}\right]-33614\,\text{Sin}\left[c+\frac{d x}{2}\right]+\right.$$
$$51842\,\text{Sin}\left[2 c+\frac{d x}{2}\right]+12460\,\text{Sin}\left[c+\frac{3 d x}{2}\right]-33716\,\text{Sin}\left[2 c+\frac{3 d x}{2}\right]+34300\,\text{Sin}\left[3 c+\frac{3 d x}{2}\right]-$$
$$39788\,\text{Sin}\left[c+\frac{5 d x}{2}\right]+2940\,\text{Sin}\left[2 c+\frac{5 d x}{2}\right]-26068\,\text{Sin}\left[3 c+\frac{5 d x}{2}\right]+16660\,\text{Sin}\left[4 c+\frac{5 d x}{2}\right]-$$
$$21351\,\text{Sin}\left[2 c+\frac{7 d x}{2}\right]-1295\,\text{Sin}\left[3 c+\frac{7 d x}{2}\right]-14911\,\text{Sin}\left[4 c+\frac{7 d x}{2}\right]+$$
$$5145\,\text{Sin}\left[5 c+\frac{7 d x}{2}\right]-7329\,\text{Sin}\left[3 c+\frac{9 d x}{2}\right]-1225\,\text{Sin}\left[4 c+\frac{9 d x}{2}\right]-5369\,\text{Sin}\left[5 c+\frac{9 d x}{2}\right]+$$
$$\left.735\,\text{Sin}\left[6 c+\frac{9 d x}{2}\right]-1152\,\text{Sin}\left[4 c+\frac{11 d x}{2}\right]-280\,\text{Sin}\left[5 c+\frac{11 d x}{2}\right]-872\,\text{Sin}\left[6 c+\frac{11 d x}{2}\right]\right)$$

Problem 91: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Sec}[c+d x]^2}{\left(a+a\,\text{Cos}[c+d x]\right)^5}\,dx$$

Optimal (type 3, 168 leaves, 9 steps):

$$-\frac{5\,\text{ArcTanh}[\text{Sin}[c+d x]]}{a^5 d}+\frac{496\,\text{Tan}[c+d x]}{63\,a^5 d}-\frac{\text{Tan}[c+d x]}{9\,d\,\left(a+a\,\text{Cos}[c+d x]\right)^5}-\frac{5\,\text{Tan}[c+d x]}{21\,a\,d\,\left(a+a\,\text{Cos}[c+d x]\right)^4}-$$
$$\frac{29\,\text{Tan}[c+d x]}{63\,a^2 d\,\left(a+a\,\text{Cos}[c+d x]\right)^3}-\frac{67\,\text{Tan}[c+d x]}{63\,a^3 d\,\left(a+a\,\text{Cos}[c+d x]\right)^2}-\frac{5\,\text{Tan}[c+d x]}{d\,\left(a^5+a^5\,\text{Cos}[c+d x]\right)}$$

Result (type 3, 453 leaves):

$$\frac{160\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^{10}\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^5}-$$
$$\frac{160\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^{10}\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^5}+$$
$$\frac{1}{2016\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^5}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}[c]\,\text{Sec}[c+d\,x]$$
$$\left(-33978\,\text{Sin}\left[\frac{d\,x}{2}\right]+52002\,\text{Sin}\left[\frac{3\,d\,x}{2}\right]-56952\,\text{Sin}\left[c-\frac{d\,x}{2}\right]+43722\,\text{Sin}\left[c+\frac{d\,x}{2}\right]-\right.$$
$$47208\,\text{Sin}\left[2\,c+\frac{d\,x}{2}\right]-18144\,\text{Sin}\left[c+\frac{3\,d\,x}{2}\right]+41796\,\text{Sin}\left[2\,c+\frac{3\,d\,x}{2}\right]-28350\,\text{Sin}\left[3\,c+\frac{3\,d\,x}{2}\right]+$$
$$34578\,\text{Sin}\left[c+\frac{5\,d\,x}{2}\right]-5691\,\text{Sin}\left[2\,c+\frac{5\,d\,x}{2}\right]+28719\,\text{Sin}\left[3\,c+\frac{5\,d\,x}{2}\right]-11550\,\text{Sin}\left[4\,c+\frac{5\,d\,x}{2}\right]+$$
$$15517\,\text{Sin}\left[2\,c+\frac{7\,d\,x}{2}\right]-504\,\text{Sin}\left[3\,c+\frac{7\,d\,x}{2}\right]+13186\,\text{Sin}\left[4\,c+\frac{7\,d\,x}{2}\right]-$$
$$2835\,\text{Sin}\left[5\,c+\frac{7\,d\,x}{2}\right]+4149\,\text{Sin}\left[3\,c+\frac{9\,d\,x}{2}\right]+252\,\text{Sin}\left[4\,c+\frac{9\,d\,x}{2}\right]+3582\,\text{Sin}\left[5\,c+\frac{9\,d\,x}{2}\right]-$$
$$\left.315\,\text{Sin}\left[6\,c+\frac{9\,d\,x}{2}\right]+496\,\text{Sin}\left[4\,c+\frac{11\,d\,x}{2}\right]+63\,\text{Sin}\left[5\,c+\frac{11\,d\,x}{2}\right]+433\,\text{Sin}\left[6\,c+\frac{11\,d\,x}{2}\right]\right)$$

Problem 92: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Sec}[c+d\,x]^3}{\left(a+a\,\text{Cos}[c+d\,x]\right)^5}\,dx$$

Optimal (type 3, 224 leaves, 10 steps):

$$\frac{31\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{2\,a^5\,d}-\frac{7664\,\text{Tan}[c+d\,x]}{315\,a^5\,d}+\frac{31\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{2\,a^5\,d}-$$
$$\frac{\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{9\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^5}-\frac{17\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{63\,a\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4}-\frac{28\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{45\,a^2\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3}-$$
$$\frac{577\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{315\,a^3\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2}-\frac{3832\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{315\,d\,\left(a^5+a^5\,\text{Cos}[c+d\,x]\right)}$$

Result (type 3, 507 leaves):

$$-\frac{496\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^{10}\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^5}+$$
$$\frac{496\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^{10}\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^5}+$$
$$\frac{1}{40320\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^5}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}[c]\,\text{Sec}[c+d\,x]^2$$
$$\left(1472562\,\text{Sin}\left[\frac{d\,x}{2}\right]-2822886\,\text{Sin}\left[\frac{3\,d\,x}{2}\right]+3057654\,\text{Sin}\left[c-\frac{d\,x}{2}\right]-\right.$$
$$1885854\,\text{Sin}\left[c+\frac{d\,x}{2}\right]+2644362\,\text{Sin}\left[2\,c+\frac{d\,x}{2}\right]+867048\,\text{Sin}\left[c+\frac{3\,d\,x}{2}\right]-$$
$$1868436\,\text{Sin}\left[2\,c+\frac{3\,d\,x}{2}\right]+1821498\,\text{Sin}\left[3\,c+\frac{3\,d\,x}{2}\right]-2083537\,\text{Sin}\left[c+\frac{5\,d\,x}{2}\right]+$$
$$339885\,\text{Sin}\left[2\,c+\frac{5\,d\,x}{2}\right]-1456687\,\text{Sin}\left[3\,c+\frac{5\,d\,x}{2}\right]+966735\,\text{Sin}\left[4\,c+\frac{5\,d\,x}{2}\right]-$$
$$1195641\,\text{Sin}\left[2\,c+\frac{7\,d\,x}{2}\right]+46515\,\text{Sin}\left[3\,c+\frac{7\,d\,x}{2}\right]-874341\,\text{Sin}\left[4\,c+\frac{7\,d\,x}{2}\right]+$$
$$367815\,\text{Sin}\left[5\,c+\frac{7\,d\,x}{2}\right]-494579\,\text{Sin}\left[3\,c+\frac{9\,d\,x}{2}\right]-31815\,\text{Sin}\left[4\,c+\frac{9\,d\,x}{2}\right]-$$
$$374879\,\text{Sin}\left[5\,c+\frac{9\,d\,x}{2}\right]+87885\,\text{Sin}\left[6\,c+\frac{9\,d\,x}{2}\right]-128187\,\text{Sin}\left[4\,c+\frac{11\,d\,x}{2}\right]-$$
$$18585\,\text{Sin}\left[5\,c+\frac{11\,d\,x}{2}\right]-99837\,\text{Sin}\left[6\,c+\frac{11\,d\,x}{2}\right]+9765\,\text{Sin}\left[7\,c+\frac{11\,d\,x}{2}\right]-$$
$$\left.15328\,\text{Sin}\left[5\,c+\frac{13\,d\,x}{2}\right]-3150\,\text{Sin}\left[6\,c+\frac{13\,d\,x}{2}\right]-12178\,\text{Sin}\left[7\,c+\frac{13\,d\,x}{2}\right]\right)$$

Problem 100: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \sqrt{a+a\,\text{Cos}[c+d\,x]}\,\,\text{Sec}[c+d\,x]\,dx$$

Optimal (type 3, 37 leaves, 2 steps):

$$\frac{2\,\sqrt{a}\,\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{d}$$

Result (type 3, 1294 leaves):

$$-\left(\left(\left(\left(\frac{1}{4}-\frac{i}{4}\right)\,\left(1+e^{i\,c}\right)\right.\right.\right.$$
$$\left(\sqrt{2}-(1-i)\,e^{\frac{i\,c}{2}}+(16-16\,i)\,e^{\frac{3\,i\,c}{2}+i\,d\,x}+(20+20\,i)\,\sqrt{2}\,e^{2\,i\,c+\frac{3\,i\,d\,x}{2}}-(34-34\,i)\,e^{\frac{5\,i\,c}{2}+2\,i\,d\,x}-\right.$$
$$(20+20\,i)\,\sqrt{2}\,e^{3\,i\,c+\frac{5\,i\,d\,x}{2}}+(16-16\,i)\,e^{\frac{7\,i\,c}{2}+3\,i\,d\,x}+(4+4\,i)\,\sqrt{2}\,e^{4\,i\,c+\frac{7\,i\,d\,x}{2}}-$$
$$(1-i)\,e^{\frac{9\,i\,c}{2}+4\,i\,d\,x}+8\,i\,e^{\frac{1}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{i\,(c+d\,x)}-40\,i\,e^{\frac{3}{2}\,i\,(c+d\,x)}+34\,\sqrt{2}\,e^{2\,i\,(c+d\,x)}+$$
$$\left.40\,i\,e^{\frac{5}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{3\,i\,(c+d\,x)}-8\,i\,e^{\frac{7}{2}\,i\,(c+d\,x)}+\sqrt{2}\,e^{4\,i\,(c+d\,x)}-(4+4\,i)\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(2\,c+d\,x)}\right)$$

$$x\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}\ \text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\Bigg)\Big/\left(\left(\left((-1-\mathbb{i})+\sqrt{2}\ e^{\frac{\mathbb{i}\,c}{2}}\right)\left(-1+e^{\mathbb{i}\,c}\right)\right.\right.$$

$$\left.\left.\left(\mathbb{i}-2\sqrt{2}\ e^{\frac{1}{2}\mathbb{i}\,(c+d\,x)}-4\,\mathbb{i}\,e^{\mathbb{i}\,(c+d\,x)}+2\sqrt{2}\ e^{\frac{3}{2}\mathbb{i}\,(c+d\,x)}+\mathbb{i}\,e^{2\,\mathbb{i}\,(c+d\,x)}\right)^2\right)\right)-$$

$$\frac{1}{\sqrt{2}\ d}\mathbb{i}\ \text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\ \text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\ \text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]$$

$$\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\frac{1}{\sqrt{2}\ d}$$

$$\mathbb{i}\ \text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\ \text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\ \text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]$$

$$\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-$$

$$\frac{1}{2\sqrt{2}\ d}\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}$$

$$\text{Log}\left[2-\sqrt{2}\ \text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\ \text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\frac{1}{2\sqrt{2}\ d}$$

$$\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}\ \text{Log}\left[2+\sqrt{2}\ \text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\ \text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-$$

$$\left(2\,\mathbb{i}\ \text{ArcTan}\left[\frac{2\,\mathbb{i}\ \text{Cos}\left[\frac{c}{2}\right]-\mathbb{i}\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}\right.$$

$$\left.\text{Cot}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)\Big/\left(d\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}\right)+$$

$$\left(\sqrt{2}\ \sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}\ \text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right.$$

$$\left(-d\,x\,\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Log}\left[\sqrt{2}+2\,\text{Cos}\left[\frac{d\,x}{2}\right]\,\text{Sin}\left[\frac{c}{2}\right]+2\,\text{Cos}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]\right]\,\text{Sin}\left[\frac{c}{2}\right]+\right.$$

$$\left.\left.\frac{4\,i\,\sqrt{2}\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\,\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\,\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Big/\left(d\,\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)$$

Problem 101: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\sqrt{a+a\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^2\,dx$$

Optimal (type 3, 62 leaves, 3 steps):

$$\frac{\sqrt{a}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{d}+\frac{a\,\text{Tan}[c+d\,x]}{d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 1426 leaves):

$$-\left(\left(\left(\left(\frac{1}{8}-\frac{i}{8}\right)\,\left(1+e^{i\,c}\right)\right.\right.\right.$$
$$\left(\sqrt{2}-(1-i)\,e^{\frac{i\,c}{2}}+(16-16\,i)\,e^{\frac{3\,i\,c}{2}+i\,d\,x}+(20+20\,i)\,\sqrt{2}\,e^{2\,i\,c+\frac{3\,i\,d\,x}{2}}-(34-34\,i)\,e^{\frac{5\,i\,c}{2}+2\,i\,d\,x}-\right.$$
$$(20+20\,i)\,\sqrt{2}\,e^{3\,i\,c+\frac{5\,i\,d\,x}{2}}+(16-16\,i)\,e^{\frac{7\,i\,c}{2}+3\,i\,d\,x}+(4+4\,i)\,\sqrt{2}\,e^{4\,i\,c+\frac{7\,i\,d\,x}{2}}-$$
$$(1-i)\,e^{\frac{9\,i\,c}{2}+4\,i\,d\,x}+8\,i\,e^{\frac{1}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{i\,(c+d\,x)}-40\,i\,e^{\frac{3}{2}\,i\,(c+d\,x)}+34\,\sqrt{2}\,e^{2\,i\,(c+d\,x)}+$$
$$\left.40\,i\,e^{\frac{5}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{3\,i\,(c+d\,x)}-8\,i\,e^{\frac{7}{2}\,i\,(c+d\,x)}+\sqrt{2}\,e^{4\,i\,(c+d\,x)}-(4+4\,i)\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(2\,c+d\,x)}\right)$$
$$\left.\times\sqrt{a\,(1+\text{Cos}[c+d\,x])}\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)\Big/\left(\left(\left(-1-i\right)+\sqrt{2}\,e^{\frac{i\,c}{2}}\right)\,\left(-1+e^{i\,c}\right)\right.$$
$$\left.\left.\left(i-2\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(c+d\,x)}-4\,i\,e^{i\,(c+d\,x)}+2\,\sqrt{2}\,e^{\frac{3}{2}\,i\,(c+d\,x)}+i\,e^{2\,i\,(c+d\,x)}\right)^2\right)\right)-$$

$$\frac{1}{2\,\sqrt{2}\,d}\,i\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]$$
$$\sqrt{a\,(1+\text{Cos}[c+d\,x])}$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-$$
$$\frac{1}{2\,\sqrt{2}\,d}$$

$$\dot{\imath}\,\text{ArcTan}\Big[\frac{\text{Cos}\big[\frac{c}{4}+\frac{d\,x}{4}\big]+\text{Sin}\big[\frac{c}{4}+\frac{d\,x}{4}\big]-\sqrt{2}\,\text{Sin}\big[\frac{c}{4}+\frac{d\,x}{4}\big]}{\text{Cos}\big[\frac{c}{4}+\frac{d\,x}{4}\big]+\sqrt{2}\,\text{Cos}\big[\frac{c}{4}+\frac{d\,x}{4}\big]-\text{Sin}\big[\frac{c}{4}+\frac{d\,x}{4}\big]}\Big]$$

$$\sqrt{a\,(1+\text{Cos}[c+d\,x])}\;\text{Sec}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]-$$

$$\frac{1}{4\sqrt{2}\,d}\sqrt{a\,(1+\text{Cos}[c+d\,x])}\;\text{Log}\Big[2-\sqrt{2}\,\text{Cos}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]-\sqrt{2}\,\text{Sin}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]\Big]$$

$$\text{Sec}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]-\frac{1}{4\sqrt{2}\,d}$$

$$\sqrt{a\,(1+\text{Cos}[c+d\,x])}\;\text{Log}\Big[2+\sqrt{2}\,\text{Cos}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]-\sqrt{2}\,\text{Sin}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]\Big]$$

$$\text{Sec}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]-$$

$$\left(\dot{\imath}\,\text{ArcTan}\Big[\frac{2\,\dot{\imath}\,\text{Cos}\big[\frac{c}{2}\big]-\dot{\imath}\,\big(-\sqrt{2}+2\,\text{Sin}\big[\frac{c}{2}\big]\big)\,\text{Tan}\big[\frac{d\,x}{4}\big]}{\sqrt{-2+4\,\text{Cos}\big[\frac{c}{2}\big]^2+4\,\text{Sin}\big[\frac{c}{2}\big]^2}}\Big]\right.$$

$$\left.\sqrt{a\,(1+\text{Cos}[c+d\,x])}\;\text{Cot}\Big[\frac{c}{2}\Big]\,\text{Sec}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]\right)\Big/$$

$$\left(d\sqrt{-2+4\,\text{Cos}\Big[\frac{c}{2}\Big]^2+4\,\text{Sin}\Big[\frac{c}{2}\Big]^2}\right)+\left(\sqrt{a\,(1+\text{Cos}[c+d\,x])}\;\text{Csc}\Big[\frac{c}{2}\Big]\,\text{Sec}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]\right.$$

$$\left(-d\,x\,\text{Cos}\Big[\frac{c}{2}\Big]+2\,\text{Log}\Big[\sqrt{2}+2\,\text{Cos}\Big[\frac{d\,x}{2}\Big]\,\text{Sin}\Big[\frac{c}{2}\Big]+2\,\text{Cos}\Big[\frac{c}{2}\Big]\,\text{Sin}\Big[\frac{d\,x}{2}\Big]\Big]\,\text{Sin}\Big[\frac{c}{2}\Big]+\right.$$

$$\left.\left.\frac{4\,i\,\sqrt{2}\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Bigg/$$

$$\left(\sqrt{2}\,d\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)+\frac{\sqrt{a\,(1+\text{Cos}[c+d\,x])}\;\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{2\,d\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}-$$

$$\frac{\sqrt{a\,(1+\text{Cos}[c+d\,x])}\;\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{2\,d\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}$$

Problem 102: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\sqrt{a+a\,\text{Cos}[c+d\,x]}\;\text{Sec}[c+d\,x]^3\,dx$$

Optimal (type 3, 102 leaves, 4 steps):

$$\frac{3\,\sqrt{a}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{4\,d}+\frac{3\,a\,\text{Tan}[c+d\,x]}{4\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}+\frac{a\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{2\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 1671 leaves):

$$-\left(\left(\left(\left(\frac{3}{32}-\frac{3\,i}{32}\right)\left(1+e^{i\,c}\right)\right.\right.\right.$$

$$\left(\sqrt{2}-(1-i)\,e^{\frac{i\,c}{2}}+(16-16\,i)\,e^{\frac{3\,i\,c}{2}+i\,d\,x}+(20+20\,i)\,\sqrt{2}\,e^{2\,i\,c+\frac{3\,i\,d\,x}{2}}-(34-34\,i)\,e^{\frac{5\,i\,c}{2}+2\,i\,d\,x}-\right.$$

$$(20+20\,i)\,\sqrt{2}\,e^{3\,i\,c+\frac{5\,i\,d\,x}{2}}+(16-16\,i)\,e^{\frac{7\,i\,c}{2}+3\,i\,d\,x}+(4+4\,i)\,\sqrt{2}\,e^{4\,i\,c+\frac{7\,i\,d\,x}{2}}-$$

$$(1-i)\,e^{\frac{9\,i\,c}{2}+4\,i\,d\,x}+8\,i\,e^{\frac{1}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{i\,(c+d\,x)}-40\,i\,e^{\frac{3}{2}\,i\,(c+d\,x)}+34\,\sqrt{2}\,e^{2\,i\,(c+d\,x)}+$$

$$\left.40\,i\,e^{\frac{5}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{3\,i\,(c+d\,x)}-8\,i\,e^{\frac{7}{2}\,i\,(c+d\,x)}+\sqrt{2}\,e^{4\,i\,(c+d\,x)}-(4+4\,i)\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(2\,c+d\,x)}\right)$$

$$\left.x\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}\;\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)\Bigg/\left(\left(\left(-1-i\right)+\sqrt{2}\,e^{\frac{i\,c}{2}}\right)\left(-1+e^{i\,c}\right)\right.$$

$$\left.\left.\left(i-2\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(c+d\,x)}-4\,i\,e^{i\,(c+d\,x)}+2\,\sqrt{2}\,e^{\frac{3}{2}\,i\,(c+d\,x)}+i\,e^{2\,i\,(c+d\,x)}\right)^2\right)\right)-$$

$$\frac{1}{8\,\sqrt{2}\,d}3\,i\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]$$

$$\sqrt{a\,(1+\text{Cos}[c+d\,x])}$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-$$

$$\frac{1}{8\,\sqrt{2}\,d}$$

$$3\,\mathrm{i}\,\text{ArcTan}\Big[\frac{\text{Cos}\big[\frac{c}{4}+\frac{d\,x}{4}\big]+\text{Sin}\big[\frac{c}{4}+\frac{d\,x}{4}\big]-\sqrt{2}\,\text{Sin}\big[\frac{c}{4}+\frac{d\,x}{4}\big]}{\text{Cos}\big[\frac{c}{4}+\frac{d\,x}{4}\big]+\sqrt{2}\,\text{Cos}\big[\frac{c}{4}+\frac{d\,x}{4}\big]-\text{Sin}\big[\frac{c}{4}+\frac{d\,x}{4}\big]}\Big]$$

$$\sqrt{a\,(1+\text{Cos}[c+d\,x])}\;\text{Sec}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]-$$

$$\frac{1}{16\sqrt{2}\,d}3\sqrt{a\,(1+\text{Cos}[c+d\,x])}$$

$$\text{Log}\Big[2-\sqrt{2}\,\text{Cos}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]-\sqrt{2}\,\text{Sin}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]\Big]$$

$$\text{Sec}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]-\frac{1}{16\sqrt{2}\,d}$$

$$3\sqrt{a\,(1+\text{Cos}[c+d\,x])}\;\text{Log}\Big[2+\sqrt{2}\,\text{Cos}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]-\sqrt{2}\,\text{Sin}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]\Big]$$

$$\text{Sec}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]-$$

$$\left(3\,\mathrm{i}\,\text{ArcTan}\Big[\frac{2\,\mathrm{i}\,\text{Cos}\big[\frac{c}{2}\big]-\mathrm{i}\,\big(-\sqrt{2}+2\,\text{Sin}\big[\frac{c}{2}\big]\big)\,\text{Tan}\big[\frac{d\,x}{4}\big]}{\sqrt{-2+4\,\text{Cos}\big[\frac{c}{2}\big]^2+4\,\text{Sin}\big[\frac{c}{2}\big]^2}}\Big]\sqrt{a\,(1+\text{Cos}[c+d\,x])}\right.$$

$$\left.\text{Cot}\Big[\frac{c}{2}\Big]\,\text{Sec}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]\right)\Big/\left(4\,d\sqrt{-2+4\,\text{Cos}\Big[\frac{c}{2}\Big]^2+4\,\text{Sin}\Big[\frac{c}{2}\Big]^2}\right)+$$

$$\left(3\sqrt{a\,(1+\text{Cos}[c+d\,x])}\;\text{Csc}\Big[\frac{c}{2}\Big]\,\text{Sec}\Big[\frac{c}{2}+\frac{d\,x}{2}\Big]\right.$$

$$\left(-d\,x\,\text{Cos}\Big[\frac{c}{2}\Big]+2\,\text{Log}\Big[\sqrt{2}+2\,\text{Cos}\Big[\frac{d\,x}{2}\Big]\,\text{Sin}\Big[\frac{c}{2}\Big]+2\,\text{Cos}\Big[\frac{c}{2}\Big]\,\text{Sin}\Big[\frac{d\,x}{2}\Big]\Big]\,\text{Sin}\Big[\frac{c}{2}\Big]+\right.$$

$$\left.\left.\frac{4\,i\,\sqrt{2}\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Big/$$

$$\left(4\,\sqrt{2}\,d\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)+\frac{\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Sin}\left[\frac{d\,x}{2}\right]}{4\,d\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$

$$\frac{\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\left(3\,\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)}{8\,d\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}+$$

$$\frac{\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Sin}\left[\frac{d\,x}{2}\right]}{4\,d\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$

$$\frac{\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\left(-3\,\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)}{8\,d\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}$$

Problem 103: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\sqrt{a+a\,\text{Cos}[c+d\,x]}\;\text{Sec}[c+d\,x]^4\,dx$$

Optimal (type 3, 138 leaves, 5 steps):

$$\frac{5\,\sqrt{a}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{8\,d}+\frac{5\,a\,\text{Tan}[c+d\,x]}{8\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}+$$

$$\frac{5\,a\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{12\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}+\frac{a\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]}{3\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 1799 leaves):

$$-\left(\left(\left(\left(\frac{5}{64}-\frac{5\,i}{64}\right)\left(1+e^{i\,c}\right)\right.\right.\right.$$

$$\left(\sqrt{2}-(1-i)\,e^{\frac{i\,c}{2}}+(16-16\,i)\,e^{\frac{3\,i\,c}{2}+i\,d\,x}+(20+20\,i)\,\sqrt{2}\,e^{2\,i\,c+\frac{3\,i\,d\,x}{2}}-(34-34\,i)\,e^{\frac{5\,i\,c}{2}+2\,i\,d\,x}-\right.$$

$$(20+20\,i)\,\sqrt{2}\,e^{3\,i\,c+\frac{5\,i\,d\,x}{2}}+(16-16\,i)\,e^{\frac{7\,i\,c}{2}+3\,i\,d\,x}+(4+4\,i)\,\sqrt{2}\,e^{4\,i\,c+\frac{7\,i\,d\,x}{2}}-$$

$$(1-i)\,e^{\frac{9\,i\,c}{2}+4\,i\,d\,x}+8\,i\,e^{\frac{1}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{i\,(c+d\,x)}-40\,i\,e^{\frac{3}{2}\,i\,(c+d\,x)}+34\,\sqrt{2}\,e^{2\,i\,(c+d\,x)}+$$

$$\left.40\,i\,e^{\frac{5}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{3\,i\,(c+d\,x)}-8\,i\,e^{\frac{7}{2}\,i\,(c+d\,x)}+\sqrt{2}\,e^{4\,i\,(c+d\,x)}-(4+4\,i)\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(2\,c+d\,x)}\right)$$

$$\left.\left.x\,\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)\right)\Big/\left(\left(\left((-1-i)+\sqrt{2}\,e^{\frac{i\,c}{2}}\right)\left(-1+e^{i\,c}\right)\right.\right.$$

$$\left(\mathbb{i} - 2\sqrt{2}\, e^{\frac{1}{2}\mathbb{i}(c+d x)} - 4\,\mathbb{i}\, e^{\mathbb{i}(c+d x)} + 2\sqrt{2}\, e^{\frac{3}{2}\mathbb{i}(c+d x)} + \mathbb{i}\, e^{2\mathbb{i}(c+d x)}\right)^2\Bigg)\Bigg) -$$

$$\frac{1}{16\sqrt{2}\, d} 5\,\mathbb{i}\,\text{ArcTan}\Big[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right] - \text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right] - \sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right] + \sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right] - \text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}\Big]$$

$$\sqrt{a\,(1+\text{Cos}[c+d x])}$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] -$$

$$\frac{1}{16\sqrt{2}\, d}$$

$$5$$

$$\mathbb{i}$$

$$\text{ArcTan}\Big[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right] + \text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right] - \sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right] + \sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right] - \text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}\Big]$$

$$\sqrt{a\,(1+\text{Cos}[c+d x])}$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] -$$

$$\frac{1}{32\sqrt{2}\, d} 5\sqrt{a\,(1+\text{Cos}[c+d x])}$$

$$\text{Log}\Big[2 - \sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right] - \sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\Big]$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] - \frac{1}{32\sqrt{2}\, d}$$

$$5\sqrt{a\,(1+\text{Cos}[c+d x])}\;\text{Log}\Big[2 + \sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right] - \sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\Big]$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] -$$

$$\Bigg(5\,\mathbb{i}\,\text{ArcTan}\Big[\frac{2\,\mathbb{i}\,\text{Cos}\left[\frac{c}{2}\right] - \mathbb{i}\left(-\sqrt{2} + 2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d x}{4}\right]}{\sqrt{-2 + 4\,\text{Cos}\left[\frac{c}{2}\right]^2 + 4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\Big]\sqrt{a\,(1+\text{Cos}[c+d x])}$$

$$\text{Cot}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]\Bigg) \Big/ \left(8\, d\sqrt{-2 + 4\,\text{Cos}\left[\frac{c}{2}\right]^2 + 4\,\text{Sin}\left[\frac{c}{2}\right]^2}\right) +$$

$$\Bigg(5\sqrt{a\,(1+\text{Cos}[c+d x])}\;\text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]$$

$$\left(-d\,x\,\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Log}\left[\sqrt{2}+2\,\text{Cos}\left[\frac{d\,x}{2}\right]\,\text{Sin}\left[\frac{c}{2}\right]+2\,\text{Cos}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]\right]\,\text{Sin}\left[\frac{c}{2}\right]+\right.$$

$$\left.\left.\frac{4\,i\,\sqrt{2}\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\,\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\,\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Bigg/$$

$$\left(8\,\sqrt{2}\,d\,\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)+\frac{\sqrt{a\,\left(1+\text{Cos}\left[c+d\,x\right]\right)}\,\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{12\,d\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3}+$$

$$\frac{\sqrt{a\,\left(1+\text{Cos}\left[c+d\,x\right]\right)}\,\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]}{8\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$

$$\frac{\sqrt{a\,\left(1+\text{Cos}\left[c+d\,x\right]\right)}\,\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\left(5\,\text{Cos}\left[\frac{c}{2}\right]-3\,\text{Sin}\left[\frac{c}{2}\right]\right)}{16\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}-$$

$$\frac{\sqrt{a\,\left(1+\text{Cos}\left[c+d\,x\right]\right)}\,\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{12\,d\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3}+$$

$$\frac{\sqrt{a\,\left(1+\text{Cos}\left[c+d\,x\right]\right)}\,\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]}{8\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$

$$\frac{\sqrt{a\,\left(1+\text{Cos}\left[c+d\,x\right]\right)}\,\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\left(-5\,\text{Cos}\left[\frac{c}{2}\right]-3\,\text{Sin}\left[\frac{c}{2}\right]\right)}{16\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}$$

Problem 108: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\left(a+a\,\text{Cos}\left[c+d\,x\right]\right)^{3/2}\,\text{Sec}\left[c+d\,x\right]\,dx$$

Optimal (type 3, 66 leaves, 4 steps):

$$\frac{2\,a^{3/2}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\,\text{Sin}\left[c+d\,x\right]}{\sqrt{a+a\,\text{Cos}\left[c+d\,x\right]}}\right]}{d}+\frac{2\,a^2\,\text{Sin}\left[c+d\,x\right]}{d\,\sqrt{a+a\,\text{Cos}\left[c+d\,x\right]}}$$

Result (type 3, 1404 leaves):

$$-\left(\left(\left(\left(\frac{1}{8}-\frac{i}{8}\right)\left(1+e^{i c}\right)\left(\sqrt{2}-(1-i)\,e^{\frac{i c}{2}}+(16-16 i)\,e^{\frac{3 i c}{2}+i d x}+(20+20 i)\sqrt{2}\,e^{2 i c+\frac{3 i d x}{2}}-(34-34 i)\,e^{\frac{5 i c}{2}+2 i d x}-(20+20 i)\sqrt{2}\,e^{3 i c+\frac{5 i d x}{2}}+(16-16 i)\,e^{\frac{7 i c}{2}+3 i d x}+(4+4 i)\sqrt{2}\,e^{4 i c+\frac{7 i d x}{2}}-(1-i)\,e^{\frac{9 i c}{2}+4 i d x}+8 i\,e^{\frac{1}{2} i (c+d x)}-16\sqrt{2}\,e^{i (c+d x)}-40 i\,e^{\frac{3}{2} i (c+d x)}+34\sqrt{2}\,e^{2 i (c+d x)}+40 i\,e^{\frac{5}{2} i (c+d x)}-16\sqrt{2}\,e^{3 i (c+d x)}-8 i\,e^{\frac{7}{2} i (c+d x)}+\sqrt{2}\,e^{4 i (c+d x)}-(4+4 i)\sqrt{2}\,e^{\frac{1}{2} i (2 c+d x)}\right)x\,(a(1+\text{Cos}[c+d x]))^{3/2}\,\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3\right)\Big/\left(\left(\left((-1-i)+\sqrt{2}\,e^{\frac{i c}{2}}\right)\left(-1+e^{i c}\right)\left(i-2\sqrt{2}\,e^{\frac{1}{2} i (c+d x)}-4 i\,e^{i (c+d x)}+2\sqrt{2}\,e^{\frac{3}{2} i (c+d x)}+i\,e^{2 i (c+d x)}\right)^2\right)\right)-$$

$$\frac{1}{2\sqrt{2}\,d} i\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}\right](a(1+\text{Cos}[c+d x]))^{3/2}\,\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3-$$

$$\frac{1}{2\sqrt{2}\,d} i\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}\right](a(1+\text{Cos}[c+d x]))^{3/2}\,\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3-$$

$$\frac{1}{4\sqrt{2}\,d}(a(1+\text{Cos}[c+d x]))^{3/2}\,\text{Log}\left[2-\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right]\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3-\frac{1}{4\sqrt{2}\,d}$$

$$(a(1+\text{Cos}[c+d x]))^{3/2}\,\text{Log}\left[2+\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right]\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3+$$

$$\frac{\text{Cos}\left[\frac{d x}{2}\right](a(1+\text{Cos}[c+d x]))^{3/2}\,\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3\,\text{Sin}\left[\frac{c}{2}\right]}{d}-$$

$$\left(i\,\text{ArcTan}\left[\frac{2 i\,\text{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\right.$$

$$\left.\left(a\,(1+\text{Cos}[c+d\,x])\right)^{3/2}\text{Cot}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\right)\Bigg/$$

$$\left(d\,\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}\right)+\left(\left(a\,(1+\text{Cos}[c+d\,x])\right)^{3/2}\text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\right.$$

$$\left(-d\,x\,\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Log}\left[\sqrt{2}+2\,\text{Cos}\left[\frac{d\,x}{2}\right]\text{Sin}\left[\frac{c}{2}\right]+2\,\text{Cos}\left[\frac{c}{2}\right]\text{Sin}\left[\frac{d\,x}{2}\right]\right]\text{Sin}\left[\frac{c}{2}\right]+\right.$$

$$\left.\left.\frac{4\,i\,\sqrt{2}\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Bigg/$$

$$\left(\sqrt{2}\,d\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)+\frac{\text{Cos}\left[\frac{c}{2}\right]\left(a\,(1+\text{Cos}[c+d\,x])\right)^{3/2}\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\text{Sin}\left[\frac{d\,x}{2}\right]}{d}$$

Problem 109: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int (a+a\,\text{Cos}[c+d\,x])^{3/2}\,\text{Sec}[c+d\,x]^2\,dx$$

Optimal (type 3, 65 leaves, 4 steps):

$$\frac{3\,a^{3/2}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{d}+\frac{a^2\,\text{Tan}[c+d\,x]}{d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 1449 leaves):

$$-\left(\left(\left(\left(\frac{3}{16}-\frac{3\,i}{16}\right)\left(1+e^{i\,c}\right)\right.\right.\right.$$

$$\left(\sqrt{2}-(1-i)\,e^{\frac{i\,c}{2}}+(16-16\,i)\,e^{\frac{3\,i\,c}{2}+i\,d\,x}+(20+20\,i)\,\sqrt{2}\,e^{2\,i\,c+\frac{3\,i\,d\,x}{2}}-(34-34\,i)\,e^{\frac{5\,i\,c}{2}+2\,i\,d\,x}-\right.$$

$$(20+20\,i)\,\sqrt{2}\,e^{3\,i\,c+\frac{5\,i\,d\,x}{2}}+(16-16\,i)\,e^{\frac{7\,i\,c}{2}+3\,i\,d\,x}+(4+4\,i)\,\sqrt{2}\,e^{4\,i\,c+\frac{7\,i\,d\,x}{2}}-$$

$$(1-i)\,e^{\frac{9\,i\,c}{2}+4\,i\,d\,x}+8\,i\,e^{\frac{1}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{i\,(c+d\,x)}-40\,i\,e^{\frac{3}{2}\,i\,(c+d\,x)}+34\,\sqrt{2}\,e^{2\,i\,(c+d\,x)}+$$

$$40\,i\,e^{\frac{5}{2}i(c+dx)}-16\sqrt{2}\,e^{3i(c+dx)}-8\,i\,e^{\frac{7}{2}i(c+dx)}+\sqrt{2}\,e^{4i(c+dx)}-(4+4\,i)\sqrt{2}\,e^{\frac{1}{2}i(2c+dx)}\Big)$$

$$\times\left(a\,(1+\mathrm{Cos}[c+d\,x])\right)^{3/2}\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\Big)\Big/\left(\left(\left(-1-i\right)+\sqrt{2}\,e^{\frac{i c}{2}}\right)\left(-1+e^{i c}\right)\right.$$

$$\left.\left(i-2\sqrt{2}\,e^{\frac{1}{2}i(c+dx)}-4\,i\,e^{i(c+dx)}+2\sqrt{2}\,e^{\frac{3}{2}i(c+dx)}+i\,e^{2i(c+dx)}\right)^2\right)\Big)-$$

$$\frac{1}{4\sqrt{2}\,d}3\,i\,\mathrm{ArcTan}\left[\frac{\mathrm{Cos}\left[\frac{c}{4}+\frac{dx}{4}\right]-\mathrm{Sin}\left[\frac{c}{4}+\frac{dx}{4}\right]-\sqrt{2}\,\mathrm{Sin}\left[\frac{c}{4}+\frac{dx}{4}\right]}{-\mathrm{Cos}\left[\frac{c}{4}+\frac{dx}{4}\right]+\sqrt{2}\,\mathrm{Cos}\left[\frac{c}{4}+\frac{dx}{4}\right]-\mathrm{Sin}\left[\frac{c}{4}+\frac{dx}{4}\right]}\right]$$

$$\left(a\,(1+\mathrm{Cos}[c+d\,x])\right)^{3/2}$$

$$\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3-$$

$$\frac{1}{4\sqrt{2}\,d}$$

$$3$$

$$i$$

$$\mathrm{ArcTan}\left[\frac{\mathrm{Cos}\left[\frac{c}{4}+\frac{dx}{4}\right]+\mathrm{Sin}\left[\frac{c}{4}+\frac{dx}{4}\right]-\sqrt{2}\,\mathrm{Sin}\left[\frac{c}{4}+\frac{dx}{4}\right]}{\mathrm{Cos}\left[\frac{c}{4}+\frac{dx}{4}\right]+\sqrt{2}\,\mathrm{Cos}\left[\frac{c}{4}+\frac{dx}{4}\right]-\mathrm{Sin}\left[\frac{c}{4}+\frac{dx}{4}\right]}\right]$$

$$\left(a\,(1+\mathrm{Cos}[c+d\,x])\right)^{3/2}$$

$$\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3-$$

$$\frac{1}{8\sqrt{2}\,d}3\left(a\,(1+\mathrm{Cos}[c+d\,x])\right)^{3/2}$$

$$\mathrm{Log}\left[2-\sqrt{2}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\mathrm{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]$$

$$\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3-$$

$$\frac{1}{8\sqrt{2}\,d}3\left(a\,(1+\mathrm{Cos}[c+d\,x])\right)^{3/2}$$

$$\mathrm{Log}\left[2+\sqrt{2}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\mathrm{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]$$

$$\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3-$$

$$\left(3\,i\,\mathrm{ArcTan}\left[\frac{2\,i\,\mathrm{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\mathrm{Sin}\left[\frac{c}{2}\right]\right)\mathrm{Tan}\left[\frac{dx}{4}\right]}{\sqrt{-2+4\,\mathrm{Cos}\left[\frac{c}{2}\right]^2+4\,\mathrm{Sin}\left[\frac{c}{2}\right]^2}}\right]\left(a\,(1+\mathrm{Cos}[c+d\,x])\right)^{3/2}\right.$$

$$\left.\mathrm{Cot}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\right)\Big/\left(2\,d\,\sqrt{-2+4\,\mathrm{Cos}\left[\frac{c}{2}\right]^2+4\,\mathrm{Sin}\left[\frac{c}{2}\right]^2}\right)+$$

$$\left(3\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{3/2}\text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3\right.$$

$$\left(-d x\,\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Log}\left[\sqrt{2}+2\,\text{Cos}\left[\frac{d x}{2}\right]\text{Sin}\left[\frac{c}{2}\right]+2\,\text{Cos}\left[\frac{c}{2}\right]\text{Sin}\left[\frac{d x}{2}\right]\right]\text{Sin}\left[\frac{c}{2}\right]+\right.$$

$$\left.\left.\frac{4\,i\sqrt{2}\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Big/$$

$$\left(2\sqrt{2}\,d\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)+\frac{\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{3/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3}{4\,d\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right)}-$$

$$\frac{\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{3/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3}{4\,d\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right)}$$

Problem 110: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\left(a+a\,\text{Cos}[c+d x]\right)^{3/2}\text{Sec}[c+d x]^3\,dx$$

Optimal (type 3, 106 leaves, 5 steps):

$$\frac{7\,a^{3/2}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{a+a\,\text{Cos}[c+d x]}}\right]}{4\,d}+\frac{7\,a^2\,\text{Tan}[c+d x]}{4\,d\sqrt{a+a\,\text{Cos}[c+d x]}}+\frac{a^2\,\text{Sec}[c+d x]\,\text{Tan}[c+d x]}{2\,d\sqrt{a+a\,\text{Cos}[c+d x]}}$$

Result (type 3, 1693 leaves):

$$-\left(\left(\left(\left(\frac{7}{64}-\frac{7\,i}{64}\right)\left(1+e^{i c}\right)\right.\right.\right.$$

$$\left(\sqrt{2}-(1-i)\,e^{\frac{i c}{2}}+(16-16\,i)\,e^{\frac{3 i c}{2}+i d x}+(20+20\,i)\sqrt{2}\,e^{2 i c+\frac{3 i d x}{2}}-(34-34\,i)\,e^{\frac{5 i c}{2}+2 i d x}-\right.$$

$$(20+20\,i)\sqrt{2}\,e^{3 i c+\frac{5 i d x}{2}}+(16-16\,i)\,e^{\frac{7 i c}{2}+3 i d x}+(4+4\,i)\sqrt{2}\,e^{4 i c+\frac{7 i d x}{2}}-$$

$$(1-i)\,e^{\frac{9 i c}{2}+4 i d x}+8\,i\,e^{\frac{1}{2} i (c+d x)}-16\sqrt{2}\,e^{i (c+d x)}-40\,i\,e^{\frac{3}{2} i (c+d x)}+34\sqrt{2}\,e^{2 i (c+d x)}+$$

$$\left.40\,i\,e^{\frac{5}{2} i (c+d x)}-16\sqrt{2}\,e^{3 i (c+d x)}-8\,i\,e^{\frac{7}{2} i (c+d x)}+\sqrt{2}\,e^{4 i (c+d x)}-(4+4\,i)\sqrt{2}\,e^{\frac{1}{2} i (2 c+d x)}\right)$$

$$x\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{3/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3\bigg/\left(\left(\left(-1-\mathbb{i}\right)+\sqrt{2}\,e^{\frac{\mathbb{i} c}{2}}\right)\left(-1+e^{\mathbb{i} c}\right)\left(\mathbb{i}-2\sqrt{2}\,e^{\frac{1}{2}\mathbb{i}(c+d x)}-4\,\mathbb{i}\,e^{\mathbb{i}(c+d x)}+2\sqrt{2}\,e^{\frac{3}{2}\mathbb{i}(c+d x)}+\mathbb{i}\,e^{2\mathbb{i}(c+d x)}\right)^2\right)\right)-$$

$$\frac{1}{16\sqrt{2}\,d}7\,\mathbb{i}\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}\right]\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{3/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3-$$

$$\frac{1}{16\sqrt{2}\,d}7\,\mathbb{i}\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}\right]\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{3/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3-$$

$$\frac{1}{32\sqrt{2}\,d}7\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{3/2}\text{Log}\left[2-\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right]\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3-$$

$$\frac{1}{32\sqrt{2}\,d}7\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{3/2}\text{Log}\left[2+\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right]\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3-$$

$$\left(7\,\mathbb{i}\,\text{ArcTan}\left[\frac{2\,\mathbb{i}\,\text{Cos}\left[\frac{c}{2}\right]-\mathbb{i}\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{3/2}\text{Cot}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3\right)\bigg/\left(8\,d\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}\right)+$$

$$\left(7\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{3/2}\text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3\right.$$

$$\left(-d x\,\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Log}\left[\sqrt{2}+2\,\text{Cos}\left[\frac{d x}{2}\right]\text{Sin}\left[\frac{c}{2}\right]+2\,\text{Cos}\left[\frac{c}{2}\right]\text{Sin}\left[\frac{d x}{2}\right]\right]\text{Sin}\left[\frac{c}{2}\right]+\right.$$

$$\left.\left.\frac{4\,i\sqrt{2}\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Bigg/$$

$$\left(8\sqrt{2}\,d\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)+\frac{\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{3/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3\text{Sin}\left[\frac{d x}{2}\right]}{8\,d\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right)^2}+$$

$$\frac{\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{3/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3\left(7\,\text{Cos}\left[\frac{c}{2}\right]-5\,\text{Sin}\left[\frac{c}{2}\right]\right)}{16\,d\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right)}+$$

$$\frac{\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{3/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3\text{Sin}\left[\frac{d x}{2}\right]}{8\,d\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right)^2}+$$

$$\frac{\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{3/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3\left(-7\,\text{Cos}\left[\frac{c}{2}\right]-5\,\text{Sin}\left[\frac{c}{2}\right]\right)}{16\,d\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right)}$$

Problem 111: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\left(a+a\,\text{Cos}[c+d x]\right)^{3/2}\text{Sec}[c+d x]^4\,dx$$

Optimal (type 3, 144 leaves, 6 steps):

$$\frac{11\,a^{3/2}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{a+a\,\text{Cos}[c+d x]}}\right]}{8\,d}+\frac{11\,a^2\,\text{Tan}[c+d x]}{8\,d\sqrt{a+a\,\text{Cos}[c+d x]}}+$$

$$\frac{11\,a^2\,\text{Sec}[c+d x]\,\text{Tan}[c+d x]}{12\,d\sqrt{a+a\,\text{Cos}[c+d x]}}+\frac{a^2\,\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]}{3\,d\sqrt{a+a\,\text{Cos}[c+d x]}}$$

Result (type 3, 1825 leaves) :

$$-\Bigg(\Bigg(\Bigg(\left(\frac{11}{128}-\frac{11\,\mathrm{i}}{128}\right)\left(1+e^{\mathrm{i}\,c}\right)\Big(\sqrt{2}-(1-\mathrm{i})\,e^{\frac{\mathrm{i}\,c}{2}}+(16-16\,\mathrm{i})\,e^{\frac{3\,\mathrm{i}\,c}{2}+\mathrm{i}\,d\,x}+(20+20\,\mathrm{i})\sqrt{2}\,e^{2\,\mathrm{i}\,c+\frac{3\,\mathrm{i}\,d\,x}{2}}-(34-34\,\mathrm{i})\,e^{\frac{5\,\mathrm{i}\,c}{2}+2\,\mathrm{i}\,d\,x}-(20+20\,\mathrm{i})\sqrt{2}\,e^{3\,\mathrm{i}\,c+\frac{5\,\mathrm{i}\,d\,x}{2}}+(16-16\,\mathrm{i})\,e^{\frac{7\,\mathrm{i}\,c}{2}+3\,\mathrm{i}\,d\,x}+(4+4\,\mathrm{i})\sqrt{2}\,e^{4\,\mathrm{i}\,c+\frac{7\,\mathrm{i}\,d\,x}{2}}-(1-\mathrm{i})\,e^{\frac{9\,\mathrm{i}\,c}{2}+4\,\mathrm{i}\,d\,x}+8\,\mathrm{i}\,e^{\frac{1}{2}\,\mathrm{i}\,(c+d\,x)}-16\sqrt{2}\,e^{\mathrm{i}\,(c+d\,x)}-40\,\mathrm{i}\,e^{\frac{3}{2}\,\mathrm{i}\,(c+d\,x)}+34\sqrt{2}\,e^{2\,\mathrm{i}\,(c+d\,x)}+40\,\mathrm{i}\,e^{\frac{5}{2}\,\mathrm{i}\,(c+d\,x)}-16\sqrt{2}\,e^{3\,\mathrm{i}\,(c+d\,x)}-8\,\mathrm{i}\,e^{\frac{7}{2}\,\mathrm{i}\,(c+d\,x)}+\sqrt{2}\,e^{4\,\mathrm{i}\,(c+d\,x)}-(4+4\,\mathrm{i})\sqrt{2}\,e^{\frac{1}{2}\,\mathrm{i}\,(2\,c+d\,x)}\Big)\,x\,(a\,(1+\mathrm{Cos}[c+d\,x]))^{3/2}\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\Bigg)\Bigg/\Bigg(\left(\left(-1-\mathrm{i}\right)+\sqrt{2}\,e^{\frac{\mathrm{i}\,c}{2}}\right)\left(-1+e^{\mathrm{i}\,c}\right)\left(\mathrm{i}-2\sqrt{2}\,e^{\frac{1}{2}\,\mathrm{i}\,(c+d\,x)}-4\,\mathrm{i}\,e^{\mathrm{i}\,(c+d\,x)}+2\sqrt{2}\,e^{\frac{3}{2}\,\mathrm{i}\,(c+d\,x)}+\mathrm{i}\,e^{2\,\mathrm{i}\,(c+d\,x)}\right)^2\Bigg)\Bigg)-$$

$$\frac{1}{32\sqrt{2}\,d}11\,\mathrm{i}\,\mathrm{ArcTan}\left[\frac{\mathrm{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\mathrm{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\mathrm{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{-\mathrm{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\mathrm{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\mathrm{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right](a\,(1+\mathrm{Cos}[c+d\,x]))^{3/2}\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3-$$

$$\frac{1}{32\sqrt{2}\,d}11\,\mathrm{i}\,\mathrm{ArcTan}\left[\frac{\mathrm{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\mathrm{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\mathrm{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{\mathrm{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\mathrm{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\mathrm{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right](a\,(1+\mathrm{Cos}[c+d\,x]))^{3/2}\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3-$$

$$\frac{1}{64\sqrt{2}\,d}11\,(a\,(1+\mathrm{Cos}[c+d\,x]))^{3/2}\,\mathrm{Log}\left[2-\sqrt{2}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\mathrm{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3-$$

$$\frac{1}{64\sqrt{2}\,d}11\,(a\,(1+\mathrm{Cos}[c+d\,x]))^{3/2}\,\mathrm{Log}\left[2+\sqrt{2}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\mathrm{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3-$$

$$\left(11\, i\, \text{ArcTan}\left[\frac{2\, i \cos\left[\frac{c}{2}\right] - i\left(-\sqrt{2} + 2 \sin\left[\frac{c}{2}\right]\right) \tan\left[\frac{d x}{4}\right]}{\sqrt{-2 + 4 \cos\left[\frac{c}{2}\right]^2 + 4 \sin\left[\frac{c}{2}\right]^2}}\right] \left(a\left(1 + \cos[c + d x]\right)\right)^{3/2} \cot\left[\frac{c}{2}\right] \sec\left[\frac{c}{2} + \frac{d x}{2}\right]^3\right) \Big/ \left(16\, d \sqrt{-2 + 4 \cos\left[\frac{c}{2}\right]^2 + 4 \sin\left[\frac{c}{2}\right]^2}\right) +$$

$$\left(11\left(a\left(1 + \cos[c + d x]\right)\right)^{3/2} \csc\left[\frac{c}{2}\right] \sec\left[\frac{c}{2} + \frac{d x}{2}\right]^3 \left(-d x \cos\left[\frac{c}{2}\right] + 2 \log\left[\sqrt{2} + 2 \cos\left[\frac{d x}{2}\right] \sin\left[\frac{c}{2}\right] + 2 \cos\left[\frac{c}{2}\right] \sin\left[\frac{d x}{2}\right]\right] \sin\left[\frac{c}{2}\right] + \frac{4\, i \sqrt{2}\, \text{ArcTan}\left[\frac{2\, i \cos\left[\frac{c}{2}\right] - i\left(-\sqrt{2} + 2 \sin\left[\frac{c}{2}\right]\right) \tan\left[\frac{d x}{4}\right]}{\sqrt{-2+4 \cos\left[\frac{c}{2}\right]^2 + 4 \sin\left[\frac{c}{2}\right]^2}}\right] \cos\left[\frac{c}{2}\right]}{\sqrt{-2 + 4 \cos\left[\frac{c}{2}\right]^2 + 4 \sin\left[\frac{c}{2}\right]^2}}\right)\right) \Big/$$

$$\left(16 \sqrt{2}\, d\left(4 \cos\left[\frac{c}{2}\right]^2 + 4 \sin\left[\frac{c}{2}\right]^2\right)\right) + \frac{\left(a\left(1 + \cos[c + d x]\right)\right)^{3/2} \sec\left[\frac{c}{2} + \frac{d x}{2}\right]^3}{24\, d\left(\cos\left[\frac{c}{2} + \frac{d x}{2}\right] - \sin\left[\frac{c}{2} + \frac{d x}{2}\right]\right)^3} +$$

$$\frac{3\left(a\left(1 + \cos[c + d x]\right)\right)^{3/2} \sec\left[\frac{c}{2} + \frac{d x}{2}\right]^3 \sin\left[\frac{d x}{2}\right]}{16\, d\left(\cos\left[\frac{c}{2}\right] - \sin\left[\frac{c}{2}\right]\right)\left(\cos\left[\frac{c}{2} + \frac{d x}{2}\right] - \sin\left[\frac{c}{2} + \frac{d x}{2}\right]\right)^2} +$$

$$\frac{\left(a\left(1 + \cos[c + d x]\right)\right)^{3/2} \sec\left[\frac{c}{2} + \frac{d x}{2}\right]^3 \left(11 \cos\left[\frac{c}{2}\right] - 5 \sin\left[\frac{c}{2}\right]\right)}{32\, d\left(\cos\left[\frac{c}{2}\right] - \sin\left[\frac{c}{2}\right]\right)\left(\cos\left[\frac{c}{2} + \frac{d x}{2}\right] - \sin\left[\frac{c}{2} + \frac{d x}{2}\right]\right)} -$$

$$\frac{\left(a\left(1 + \cos[c + d x]\right)\right)^{3/2} \sec\left[\frac{c}{2} + \frac{d x}{2}\right]^3}{24\, d\left(\cos\left[\frac{c}{2} + \frac{d x}{2}\right] + \sin\left[\frac{c}{2} + \frac{d x}{2}\right]\right)^3} +$$

$$\frac{3\left(a\left(1 + \cos[c + d x]\right)\right)^{3/2} \sec\left[\frac{c}{2} + \frac{d x}{2}\right]^3 \sin\left[\frac{d x}{2}\right]}{16\, d\left(\cos\left[\frac{c}{2}\right] + \sin\left[\frac{c}{2}\right]\right)\left(\cos\left[\frac{c}{2} + \frac{d x}{2}\right] + \sin\left[\frac{c}{2} + \frac{d x}{2}\right]\right)^2} +$$

$$\frac{\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{3/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3\left(-11\,\text{Cos}\left[\frac{c}{2}\right]-5\,\text{Sin}\left[\frac{c}{2}\right]\right)}{32\,d\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right)}$$

Problem 116: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \left(a+a\,\text{Cos}[c+d x]\right)^{5/2}\text{Sec}[c+d x]\,dx$$

Optimal (type 3, 98 leaves, 4 steps):

$$\frac{2\,a^{5/2}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{a+a\,\text{Cos}[c+d x]}}\right]}{d}+\frac{14\,a^3\,\text{Sin}[c+d x]}{3\,d\sqrt{a+a\,\text{Cos}[c+d x]}}+\frac{2\,a^2\sqrt{a+a\,\text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{3\,d}$$

Result (type 3, 1513 leaves):

$$-\left(\left(\left(\left(\frac{1}{16}-\frac{i}{16}\right)\left(1+e^{i c}\right)\right.\right.\right.$$
$$\left(\sqrt{2}-(1-i)\,e^{\frac{i c}{2}}+(16-16\,i)\,e^{\frac{3 i c}{2}+i d x}+(20+20\,i)\sqrt{2}\,e^{2 i c+\frac{3 i d x}{2}}-(34-34\,i)\,e^{\frac{5 i c}{2}+2 i d x}-\right.$$
$$(20+20\,i)\sqrt{2}\,e^{3 i c+\frac{5 i d x}{2}}+(16-16\,i)\,e^{\frac{7 i c}{2}+3 i d x}+(4+4\,i)\sqrt{2}\,e^{4 i c+\frac{7 i d x}{2}}-$$
$$(1-i)\,e^{\frac{9 i c}{2}+4 i d x}+8\,i\,e^{\frac{1}{2} i (c+d x)}-16\sqrt{2}\,e^{i (c+d x)}-40\,i\,e^{\frac{3}{2} i (c+d x)}+34\sqrt{2}\,e^{2 i (c+d x)}+$$
$$\left.40\,i\,e^{\frac{5}{2} i (c+d x)}-16\sqrt{2}\,e^{3 i (c+d x)}-8\,i\,e^{\frac{7}{2} i (c+d x)}+\sqrt{2}\,e^{4 i (c+d x)}-(4+4\,i)\sqrt{2}\,e^{\frac{1}{2} i (2 c+d x)}\right)$$
$$\left.x\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\right)\Big/\left(\left(\left((-1-i)+\sqrt{2}\,e^{\frac{i c}{2}}\right)\left(-1+e^{i c}\right)\right.\right.$$
$$\left.\left.\left.\left(i-2\sqrt{2}\,e^{\frac{1}{2} i (c+d x)}-4\,i\,e^{i (c+d x)}+2\sqrt{2}\,e^{\frac{3}{2} i (c+d x)}+i\,e^{2 i (c+d x)}\right)^2\right)\right)-$$
$$\frac{1}{4\sqrt{2}\,d}i\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}\right]$$
$$\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5-$$
$$\frac{1}{4\sqrt{2}\,d}$$
$$i$$
$$\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}\right]$$
$$\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5-$$
$$\frac{1}{8\sqrt{2}\,d}\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}$$

$$\text{Log}\left[2-\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5-\frac{1}{8\sqrt{2}\,d}$$

$$\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\text{Log}\left[2+\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5+$$

$$\frac{5\,\text{Cos}\left[\frac{d\,x}{2}\right]\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\text{Sin}\left[\frac{c}{2}\right]}{4\,d}-$$

$$\left(\text{i}\,\text{ArcTan}\left[\frac{2\,\text{i}\,\text{Cos}\left[\frac{c}{2}\right]-\text{i}\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\right.$$

$$\left.\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\text{Cot}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\right)\Big/$$

$$\left(2\,d\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}\right)+\left(\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\right.$$

$$\left(-d\,x\,\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Log}\left[\sqrt{2}+2\,\text{Cos}\left[\frac{d\,x}{2}\right]\text{Sin}\left[\frac{c}{2}\right]+2\,\text{Cos}\left[\frac{c}{2}\right]\text{Sin}\left[\frac{d\,x}{2}\right]\right]\text{Sin}\left[\frac{c}{2}\right]+\right.$$

$$\left.\left.\frac{4\,\text{i}\sqrt{2}\,\text{ArcTan}\left[\frac{2\,\text{i}\,\text{Cos}\left[\frac{c}{2}\right]-\text{i}\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Big/$$

$$\left(2\sqrt{2}\,d\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)+\frac{\text{Cos}\left[\frac{3\,d\,x}{2}\right]\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\text{Sin}\left[\frac{3\,c}{2}\right]}{12\,d}+$$

$$\frac{5\,\text{Cos}\left[\frac{c}{2}\right]\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\text{Sin}\left[\frac{d\,x}{2}\right]}{4\,d}+$$

$$\frac{\text{Cos}\left[\frac{3c}{2}\right]\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\text{Sin}\left[\frac{3\,d\,x}{2}\right]}{12\,d}$$

Problem 117: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}\,\text{Sec}[c+d\,x]^2\,dx$$

Optimal (type 3, 92 leaves, 4 steps):

$$\frac{5\,a^{5/2}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{d}+\frac{a^3\,\text{Sin}[c+d\,x]}{d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}+\frac{a^2\,\sqrt{a+a\,\text{Cos}[c+d\,x]}\,\text{Tan}[c+d\,x]}{d}$$

Result (type 3, 1547 leaves):

$$-\left(\left(\left(\left(\frac{5}{32}-\frac{5\,i}{32}\right)\left(1+e^{i\,c}\right)\right.\right.\right.$$
$$\left(\sqrt{2}-(1-i)\,e^{\frac{i\,c}{2}}+(16-16\,i)\,e^{\frac{3\,i\,c}{2}+i\,d\,x}+(20+20\,i)\,\sqrt{2}\,e^{2\,i\,c+\frac{3\,i\,d\,x}{2}}-(34-34\,i)\,e^{\frac{5\,i\,c}{2}+2\,i\,d\,x}-\right.$$
$$(20+20\,i)\,\sqrt{2}\,e^{3\,i\,c+\frac{5\,i\,d\,x}{2}}+(16-16\,i)\,e^{\frac{7\,i\,c}{2}+3\,i\,d\,x}+(4+4\,i)\,\sqrt{2}\,e^{4\,i\,c+\frac{7\,i\,d\,x}{2}}-$$
$$(1-i)\,e^{\frac{9\,i\,c}{2}+4\,i\,d\,x}+8\,i\,e^{\frac{1}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{i\,(c+d\,x)}-40\,i\,e^{\frac{3}{2}\,i\,(c+d\,x)}+34\,\sqrt{2}\,e^{2\,i\,(c+d\,x)}+$$
$$\left.40\,i\,e^{\frac{5}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{3\,i\,(c+d\,x)}-8\,i\,e^{\frac{7}{2}\,i\,(c+d\,x)}+\sqrt{2}\,e^{4\,i\,(c+d\,x)}-(4+4\,i)\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(2\,c+d\,x)}\right)$$
$$\left.x\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\right)\Big/\left(\left(\left((-1-i)+\sqrt{2}\,e^{\frac{i\,c}{2}}\right)\left(-1+e^{i\,c}\right)\right.\right.$$
$$\left.\left.\left.\left(i-2\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(c+d\,x)}-4\,i\,e^{i\,(c+d\,x)}+2\,\sqrt{2}\,e^{\frac{3}{2}\,i\,(c+d\,x)}+i\,e^{2\,i\,(c+d\,x)}\right)^2\right)\right)-$$

$$\frac{1}{8\,\sqrt{2}\,d}5\,i\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]$$
$$\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5-$$
$$\frac{1}{8\,\sqrt{2}\,d}$$
$$5$$
$$i$$
$$\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]$$
$$\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5-$$
$$\frac{1}{16\,\sqrt{2}\,d}5\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}$$

$$\text{Log}\left[2-\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5-$$

$$\frac{1}{16\sqrt{2}\,d}5\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}$$

$$\text{Log}\left[2+\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5+$$

$$\frac{\text{Cos}\left[\frac{d\,x}{2}\right]\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\text{Sin}\left[\frac{c}{2}\right]}{2\,d}-$$

$$\left(5\,i\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\right.$$

$$\left.\text{Cot}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\right)\Big/\left(4\,d\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}\right)+$$

$$\left(5\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\right.$$

$$\left(-d\,x\,\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Log}\left[\sqrt{2}+2\,\text{Cos}\left[\frac{d\,x}{2}\right]\text{Sin}\left[\frac{c}{2}\right]+2\,\text{Cos}\left[\frac{c}{2}\right]\text{Sin}\left[\frac{d\,x}{2}\right]\right]\text{Sin}\left[\frac{c}{2}\right]+\right.$$

$$\left.\left.\frac{4\,i\sqrt{2}\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Big/$$

$$\left(4\sqrt{2}\,d\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)+\frac{\text{Cos}\left[\frac{c}{2}\right]\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\text{Sin}\left[\frac{d\,x}{2}\right]}{2\,d}+$$

$$\frac{\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5}{8 d\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right)}-\frac{\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5}{8 d\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right)}$$

Problem 118: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\left(a+a\,\text{Cos}[c+d x]\right)^{5/2}\text{Sec}[c+d x]^3\,dx$$

Optimal (type 3, 106 leaves, 4 steps):

$$\frac{19 a^{5/2}\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{a+a\,\text{Cos}[c+d x]}}\right]}{4 d}+\frac{9 a^3\,\text{Tan}[c+d x]}{4 d\sqrt{a+a\,\text{Cos}[c+d x]}}+\frac{a^2\sqrt{a+a\,\text{Cos}[c+d x]}\,\text{Sec}[c+d x]\,\text{Tan}[c+d x]}{2 d}$$

Result (type 3, 1693 leaves):

$$-\left(\left(\left(\left(\frac{19}{128}-\frac{19\,i}{128}\right)\left(1+e^{i c}\right)\left(\sqrt{2}-(1-i)\,e^{\frac{i c}{2}}+(16-16 i)\,e^{\frac{3 i c}{2}+i d x}+(20+20 i)\sqrt{2}\,e^{2 i c+\frac{3 i d x}{2}}-(34-34 i)\,e^{\frac{5 i c}{2}+2 i d x}-(20+20 i)\sqrt{2}\,e^{3 i c+\frac{5 i d x}{2}}+(16-16 i)\,e^{\frac{7 i c}{2}+3 i d x}+(4+4 i)\sqrt{2}\,e^{4 i c+\frac{7 i d x}{2}}-(1-i)\,e^{\frac{9 i c}{2}+4 i d x}+8 i\,e^{\frac{1}{2} i (c+d x)}-16\sqrt{2}\,e^{i (c+d x)}-40 i\,e^{\frac{3}{2} i (c+d x)}+34\sqrt{2}\,e^{2 i (c+d x)}+40 i\,e^{\frac{5}{2} i (c+d x)}-16\sqrt{2}\,e^{3 i (c+d x)}-8 i\,e^{\frac{7}{2} i (c+d x)}+\sqrt{2}\,e^{4 i (c+d x)}-(4+4 i)\sqrt{2}\,e^{\frac{1}{2} i (2 c+d x)}\right)\times\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\right)\Big/\left(\left(\left(-1-i\right)+\sqrt{2}\,e^{\frac{i c}{2}}\right)\left(-1+e^{i c}\right)\left(i-2\sqrt{2}\,e^{\frac{1}{2} i (c+d x)}-4 i\,e^{i (c+d x)}+2\sqrt{2}\,e^{\frac{3}{2} i (c+d x)}+i\,e^{2 i (c+d x)}\right)^2\right)\right)-$$

$$\frac{1}{32\sqrt{2}\,d}19\,i\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}\right]\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5-$$

$$\frac{1}{32\sqrt{2}\,d}$$

19

i

$$\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}\right]$$
$$\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5-$$
$$\frac{1}{64\sqrt{2}\,d}19\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}$$
$$\text{Log}\left[2-\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right]$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5-$$
$$\frac{1}{64\sqrt{2}\,d}19\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}$$
$$\text{Log}\left[2+\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right]$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5-$$
$$\left(19\,i\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\right.$$
$$\left.\text{Cot}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\right)\Big/\left(16\,d\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}\right)+$$
$$\left(19\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\right.$$
$$\left(-d\,x\,\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Log}\left[\sqrt{2}+2\,\text{Cos}\left[\frac{d x}{2}\right]\text{Sin}\left[\frac{c}{2}\right]+2\,\text{Cos}\left[\frac{c}{2}\right]\text{Sin}\left[\frac{d x}{2}\right]\right]\text{Sin}\left[\frac{c}{2}\right]+\right.$$

$$\left.\left.\frac{4\,i\,\sqrt{2}\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\,\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\,\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Big/$$

$$\left(16\,\sqrt{2}\,d\,\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)+\frac{\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\text{Sin}\left[\frac{d\,x}{2}\right]}{16\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$

$$\frac{\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\left(11\,\text{Cos}\left[\frac{c}{2}\right]-9\,\text{Sin}\left[\frac{c}{2}\right]\right)}{32\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}+$$

$$\frac{\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\text{Sin}\left[\frac{d\,x}{2}\right]}{16\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$

$$\frac{\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\left(-11\,\text{Cos}\left[\frac{c}{2}\right]-9\,\text{Sin}\left[\frac{c}{2}\right]\right)}{32\,d\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}$$

Problem 119: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}\,\text{Sec}[c+d\,x]^4\,dx$$

Optimal (type 3, 144 leaves, 5 steps):

$$\frac{25\,a^{5/2}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{8\,d}+\frac{25\,a^3\,\text{Tan}[c+d\,x]}{8\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}+$$

$$\frac{13\,a^3\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{12\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}+\frac{a^2\,\sqrt{a+a\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]}{3\,d}$$

Result (type 3, 1825 leaves):

$$-\left(\left(\left(\left(\frac{25}{256}-\frac{25\,i}{256}\right)\,\left(1+e^{i\,c}\right)\right.\right.\right.$$

$$\left(\sqrt{2}-(1-i)\,e^{\frac{i\,c}{2}}+(16-16\,i)\,e^{\frac{3\,i\,c}{2}+i\,d\,x}+(20+20\,i)\,\sqrt{2}\,e^{2\,i\,c+\frac{3\,i\,d\,x}{2}}-(34-34\,i)\,e^{\frac{5\,i\,c}{2}+2\,i\,d\,x}-\right.$$

$$(20+20\,i)\,\sqrt{2}\,e^{3\,i\,c+\frac{5\,i\,d\,x}{2}}+(16-16\,i)\,e^{\frac{7\,i\,c}{2}+3\,i\,d\,x}+(4+4\,i)\,\sqrt{2}\,e^{4\,i\,c+\frac{7\,i\,d\,x}{2}}-$$

$$(1-i)\,e^{\frac{9\,i\,c}{2}+4\,i\,d\,x}+8\,i\,e^{\frac{1}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{i\,(c+d\,x)}-40\,i\,e^{\frac{3}{2}\,i\,(c+d\,x)}+34\,\sqrt{2}\,e^{2\,i\,(c+d\,x)}+$$

$$\left.40\,i\,e^{\frac{5}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{3\,i\,(c+d\,x)}-8\,i\,e^{\frac{7}{2}\,i\,(c+d\,x)}+\sqrt{2}\,e^{4\,i\,(c+d\,x)}-(4+4\,i)\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(2\,c+d\,x)}\right)$$

$$\left.x\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\right)\Big/\left(\left(\left((-1-i)+\sqrt{2}\,e^{\frac{i\,c}{2}}\right)\,\left(-1+e^{i\,c}\right)\right.\right.$$

$$\left(\mathrm{i}-2\sqrt{2}\ e^{\frac{1}{2}\mathrm{i}\ (c+d\,x)}-4\,\mathrm{i}\ e^{\mathrm{i}\ (c+d\,x)}+2\sqrt{2}\ e^{\frac{3}{2}\mathrm{i}\ (c+d\,x)}+\mathrm{i}\ e^{2\,\mathrm{i}\ (c+d\,x)}\right)^2\Big)\Big)-$$

$$\frac{1}{64\sqrt{2}\ d}25\,\mathrm{i}\ \mathrm{ArcTan}\Big[\frac{\mathrm{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\mathrm{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\ \mathrm{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{-\mathrm{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\ \mathrm{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\mathrm{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\Big]$$

$$\left(a\ \left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{5/2}$$

$$\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5-$$

$$\frac{1}{64\sqrt{2}\ d}$$

$$25$$

$$\mathrm{i}$$

$$\mathrm{ArcTan}\Big[\frac{\mathrm{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\mathrm{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\ \mathrm{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{\mathrm{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\ \mathrm{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\mathrm{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\Big]$$

$$\left(a\ \left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{5/2}$$

$$\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5-$$

$$\frac{1}{128\sqrt{2}\ d}25\ \left(a\ \left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{5/2}$$

$$\mathrm{Log}\left[2-\sqrt{2}\ \mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\ \mathrm{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]$$

$$\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5-$$

$$\frac{1}{128\sqrt{2}\ d}25\ \left(a\ \left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{5/2}$$

$$\mathrm{Log}\left[2+\sqrt{2}\ \mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\ \mathrm{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]$$

$$\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5-$$

$$\Bigg(25\,\mathrm{i}\ \mathrm{ArcTan}\Big[\frac{2\,\mathrm{i}\ \mathrm{Cos}\left[\frac{c}{2}\right]-\mathrm{i}\ \left(-\sqrt{2}+2\,\mathrm{Sin}\left[\frac{c}{2}\right]\right)\ \mathrm{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\mathrm{Cos}\left[\frac{c}{2}\right]^2+4\,\mathrm{Sin}\left[\frac{c}{2}\right]^2}}\Big]\ \left(a\ \left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{5/2}$$

$$\mathrm{Cot}\left[\frac{c}{2}\right]\ \mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\Bigg)\Big/\left(32\,d\ \sqrt{-2+4\,\mathrm{Cos}\left[\frac{c}{2}\right]^2+4\,\mathrm{Sin}\left[\frac{c}{2}\right]^2}\right)+$$

$$\left(25\,\left(a\,\left(1+\operatorname{Cos}[c+d\,x]\right)\right)^{5/2}\operatorname{Csc}\left[\frac{c}{2}\right]\operatorname{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\right.$$

$$\left(-d\,x\operatorname{Cos}\left[\frac{c}{2}\right]+2\operatorname{Log}\left[\sqrt{2}+2\operatorname{Cos}\left[\frac{d\,x}{2}\right]\operatorname{Sin}\left[\frac{c}{2}\right]+2\operatorname{Cos}\left[\frac{c}{2}\right]\operatorname{Sin}\left[\frac{d\,x}{2}\right]\right]\operatorname{Sin}\left[\frac{c}{2}\right]+\right.$$

$$\left.\left.\frac{4\,i\,\sqrt{2}\operatorname{ArcTan}\left[\frac{2\,i\operatorname{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\operatorname{Sin}\left[\frac{c}{2}\right]\right)\operatorname{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\operatorname{Cos}\left[\frac{c}{2}\right]^2+4\operatorname{Sin}\left[\frac{c}{2}\right]^2}}\right]\operatorname{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\operatorname{Cos}\left[\frac{c}{2}\right]^2+4\operatorname{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Bigg/$$

$$\left(32\sqrt{2}\,d\left(4\operatorname{Cos}\left[\frac{c}{2}\right]^2+4\operatorname{Sin}\left[\frac{c}{2}\right]^2\right)\right)+\frac{\left(a\,\left(1+\operatorname{Cos}[c+d\,x]\right)\right)^{5/2}\operatorname{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{48\,d\left(\operatorname{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\operatorname{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3}+$$

$$\frac{5\,\left(a\,\left(1+\operatorname{Cos}[c+d\,x]\right)\right)^{5/2}\operatorname{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\operatorname{Sin}\left[\frac{d\,x}{2}\right]}{32\,d\left(\operatorname{Cos}\left[\frac{c}{2}\right]-\operatorname{Sin}\left[\frac{c}{2}\right]\right)\left(\operatorname{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\operatorname{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$

$$\frac{5\,\left(a\,\left(1+\operatorname{Cos}[c+d\,x]\right)\right)^{5/2}\operatorname{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\left(5\operatorname{Cos}\left[\frac{c}{2}\right]-3\operatorname{Sin}\left[\frac{c}{2}\right]\right)}{64\,d\left(\operatorname{Cos}\left[\frac{c}{2}\right]-\operatorname{Sin}\left[\frac{c}{2}\right]\right)\left(\operatorname{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\operatorname{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}-$$

$$\frac{\left(a\,\left(1+\operatorname{Cos}[c+d\,x]\right)\right)^{5/2}\operatorname{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{48\,d\left(\operatorname{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\operatorname{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3}+$$

$$\frac{5\,\left(a\,\left(1+\operatorname{Cos}[c+d\,x]\right)\right)^{5/2}\operatorname{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\operatorname{Sin}\left[\frac{d\,x}{2}\right]}{32\,d\left(\operatorname{Cos}\left[\frac{c}{2}\right]+\operatorname{Sin}\left[\frac{c}{2}\right]\right)\left(\operatorname{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\operatorname{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}-$$

$$\frac{5\,\left(a\,\left(1+\operatorname{Cos}[c+d\,x]\right)\right)^{5/2}\operatorname{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\left(5\operatorname{Cos}\left[\frac{c}{2}\right]+3\operatorname{Sin}\left[\frac{c}{2}\right]\right)}{64\,d\left(\operatorname{Cos}\left[\frac{c}{2}\right]+\operatorname{Sin}\left[\frac{c}{2}\right]\right)\left(\operatorname{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\operatorname{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}$$

Problem 120: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\left(a+a\operatorname{Cos}[c+d\,x]\right)^{5/2}\operatorname{Sec}[c+d\,x]^5\,dx$$

Optimal (type 3, 182 leaves, 6 steps):

$$\frac{163\,a^{5/2}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{64\,d}+\frac{163\,a^3\,\text{Tan}[c+d\,x]}{64\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}+\frac{163\,a^3\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{96\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}+\frac{17\,a^3\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]}{24\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}+\frac{a^2\,\sqrt{a+a\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^3\,\text{Tan}[c+d\,x]}{4\,d}$$

Result (type 3, 2069 leaves):

$$-\left(\left(\left(\left(\frac{163}{2048}-\frac{163\,i}{2048}\right)\left(1+e^{i\,c}\right)\left(\sqrt{2}-(1-i)\,e^{\frac{i\,c}{2}}+(16-16\,i)\,e^{\frac{3\,i\,c}{2}+i\,d\,x}+(20+20\,i)\,\sqrt{2}\,e^{2\,i\,c+\frac{3\,i\,d\,x}{2}}-(34-34\,i)\,e^{\frac{5\,i\,c}{2}+2\,i\,d\,x}-(20+20\,i)\,\sqrt{2}\,e^{3\,i\,c+\frac{5\,i\,d\,x}{2}}+(16-16\,i)\,e^{\frac{7\,i\,c}{2}+3\,i\,d\,x}+(4+4\,i)\,\sqrt{2}\,e^{4\,i\,c+\frac{7\,i\,d\,x}{2}}-(1-i)\,e^{\frac{9\,i\,c}{2}+4\,i\,d\,x}+8\,i\,e^{\frac{1}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{i\,(c+d\,x)}-40\,i\,e^{\frac{3}{2}\,i\,(c+d\,x)}+34\,\sqrt{2}\,e^{2\,i\,(c+d\,x)}+40\,i\,e^{\frac{5}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{3\,i\,(c+d\,x)}-8\,i\,e^{\frac{7}{2}\,i\,(c+d\,x)}+\sqrt{2}\,e^{4\,i\,(c+d\,x)}-(4+4\,i)\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(2\,c+d\,x)}\right)\,x\,\left(a\,(1+\text{Cos}[c+d\,x])\right)^{5/2}\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\right)\Big/\left(\left(\left(-1-i\right)+\sqrt{2}\,e^{\frac{i\,c}{2}}\right)\left(-1+e^{i\,c}\right)\left(i-2\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(c+d\,x)}-4\,i\,e^{i\,(c+d\,x)}+2\,\sqrt{2}\,e^{\frac{3}{2}\,i\,(c+d\,x)}+i\,e^{2\,i\,(c+d\,x)}\right)^2\right)\right)-$$

$$\frac{1}{512\,\sqrt{2}\,d}163\,i\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]\left(a\,(1+\text{Cos}[c+d\,x])\right)^{5/2}\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5-$$

$$\frac{1}{512\,\sqrt{2}\,d}163\,i\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]\left(a\,(1+\text{Cos}[c+d\,x])\right)^{5/2}\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5-$$

$$\frac{1}{1024\,\sqrt{2}\,d}163\,\left(a\,(1+\text{Cos}[c+d\,x])\right)^{5/2}\,\text{Log}\left[2-\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5-$$

$$\frac{1}{1024\,\sqrt{2}\,d}163\,\left(a\,(1+\text{Cos}[c+d\,x])\right)^{5/2}$$

$$\text{Log}\left[2+\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5-$$

$$\left(163\,\mathrm{i}\,\text{ArcTan}\left[\frac{2\,\mathrm{i}\,\text{Cos}\left[\frac{c}{2}\right]-\mathrm{i}\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\right.$$

$$\left.\text{Cot}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\right)\Big/\left(256\,d\,\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}\right)+$$

$$\left(163\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\right.$$

$$\left(-d\,x\,\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Log}\left[\sqrt{2}+2\,\text{Cos}\left[\frac{d\,x}{2}\right]\text{Sin}\left[\frac{c}{2}\right]+2\,\text{Cos}\left[\frac{c}{2}\right]\text{Sin}\left[\frac{d\,x}{2}\right]\right]\text{Sin}\left[\frac{c}{2}\right]+\right.$$

$$\left.\left.\frac{4\,\mathrm{i}\,\sqrt{2}\,\text{ArcTan}\left[\frac{2\,\mathrm{i}\,\text{Cos}\left[\frac{c}{2}\right]-\mathrm{i}\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Big/$$

$$\left(256\,\sqrt{2}\,d\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)+\frac{\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\text{Sin}\left[\frac{d\,x}{2}\right]}{64\,d\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^4}+$$

$$\frac{\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\left(23\,\text{Cos}\left[\frac{c}{2}\right]-17\,\text{Sin}\left[\frac{c}{2}\right]\right)}{384\,d\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3}+$$

$$\frac{43\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\text{Sin}\left[\frac{d\,x}{2}\right]}{256\,d\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2}+$$

$$\frac{\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\left(163\,\text{Cos}\left[\frac{c}{2}\right]-77\,\text{Sin}\left[\frac{c}{2}\right]\right)}{512\,d\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right)}+$$

$$\frac{\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\text{Sin}\left[\frac{d x}{2}\right]}{64\,d\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right)^4}+$$

$$\frac{\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\left(-23\,\text{Cos}\left[\frac{c}{2}\right]-17\,\text{Sin}\left[\frac{c}{2}\right]\right)}{384\,d\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right)^3}+$$

$$\frac{43\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\text{Sin}\left[\frac{d x}{2}\right]}{256\,d\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right)^2}+$$

$$\frac{\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\left(-163\,\text{Cos}\left[\frac{c}{2}\right]-77\,\text{Sin}\left[\frac{c}{2}\right]\right)}{512\,d\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right)}$$

Problem 127: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\text{Sec}[c+d x]}{\sqrt{a+a\,\text{Cos}[c+d x]}}\,dx$$

Optimal (type 3, 85 leaves, 5 steps):

$$\frac{2\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{a+a\,\text{Cos}[c+d x]}}\right]}{\sqrt{a}\,d}-\frac{\sqrt{2}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{2}\,\sqrt{a+a\,\text{Cos}[c+d x]}}\right]}{\sqrt{a}\,d}$$

Result (type 3, 1413 leaves):

$$-\Bigg(\Bigg(\Bigg(\left(\frac{1}{2}-\frac{i}{2}\right)\left(1+e^{i c}\right)$$
$$\Big(\sqrt{2}-(1-i)\,e^{\frac{i c}{2}}+(16-16 i)\,e^{\frac{3 i c}{2}+i d x}+(20+20 i)\sqrt{2}\,e^{2 i c+\frac{3 i d x}{2}}-(34-34 i)\,e^{\frac{5 i c}{2}+2 i d x}-$$
$$(20+20 i)\sqrt{2}\,e^{3 i c+\frac{5 i d x}{2}}+(16-16 i)\,e^{\frac{7 i c}{2}+3 i d x}+(4+4 i)\sqrt{2}\,e^{4 i c+\frac{7 i d x}{2}}-$$
$$(1-i)\,e^{\frac{9 i c}{2}+4 i d x}+8 i\,e^{\frac{1}{2} i (c+d x)}-16\sqrt{2}\,e^{i (c+d x)}-40 i\,e^{\frac{3}{2} i (c+d x)}+34\sqrt{2}\,e^{2 i (c+d x)}+$$
$$40 i\,e^{\frac{5}{2} i (c+d x)}-16\sqrt{2}\,e^{3 i (c+d x)}-8 i\,e^{\frac{7}{2} i (c+d x)}+\sqrt{2}\,e^{4 i (c+d x)}-(4+4 i)\sqrt{2}\,e^{\frac{1}{2} i (2 c+d x)}\Big)$$
$$x\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]\Bigg)\Bigg/\Bigg(\Bigg(\left((-1-i)+\sqrt{2}\,e^{\frac{i c}{2}}\right)\left(-1+e^{i c}\right)$$
$$\left(i-2\sqrt{2}\,e^{\frac{1}{2} i (c+d x)}-4 i\,e^{i (c+d x)}+2\sqrt{2}\,e^{\frac{3}{2} i (c+d x)}+i\,e^{2 i (c+d x)}\right)^2\sqrt{a\left(1+\text{Cos}[c+d x]\right)}\Bigg)\Bigg)-$$

$$\frac{i\sqrt{2}\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}\right]\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]}{d\sqrt{a\left(1+\text{Cos}[c+d x]\right)}}-$$

$$\frac{i\sqrt{2}\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{d\sqrt{a\,(1+\text{Cos}[c+d\,x])}}+$$

$$\frac{2\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right]}{d\sqrt{a\,(1+\text{Cos}[c+d\,x])}}-$$

$$\frac{2\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right]}{d\sqrt{a\,(1+\text{Cos}[c+d\,x])}}-$$

$$\frac{\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Log}\left[2-\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{\sqrt{2}\,d\sqrt{a\,(1+\text{Cos}[c+d\,x])}}-$$

$$\frac{\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Log}\left[2+\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{\sqrt{2}\,d\sqrt{a\,(1+\text{Cos}[c+d\,x])}}-$$

$$\frac{4\,i\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Cot}\left[\frac{c}{2}\right]}{d\sqrt{a\,(1+\text{Cos}[c+d\,x])}\,\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}+$$

$$\left(2\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Csc}\left[\frac{c}{2}\right]\right.$$

$$\left(-d\,x\,\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Log}\left[\sqrt{2}+2\,\text{Cos}\left[\frac{d\,x}{2}\right]\text{Sin}\left[\frac{c}{2}\right]+2\,\text{Cos}\left[\frac{c}{2}\right]\text{Sin}\left[\frac{d\,x}{2}\right]\right]\text{Sin}\left[\frac{c}{2}\right]+\right.$$

$$\left.\left.\frac{4\,i\sqrt{2}\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Big/$$

$$\left(d\sqrt{a\,(1+\text{Cos}[c+d\,x])}\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)$$

Problem 128: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{Sec}[c+d x]^2}{\sqrt{a+a \text{Cos}[c+d x]}} \, dx$$

Optimal (type 3, 108 leaves, 6 steps):

$$-\frac{\text{ArcTanh}\left[\frac{\sqrt{a} \text{Sin}[c+d x]}{\sqrt{a+a \text{Cos}[c+d x]}}\right]}{\sqrt{a} d}+\frac{\sqrt{2} \text{ArcTanh}\left[\frac{\sqrt{a} \text{Sin}[c+d x]}{\sqrt{2} \sqrt{a+a \text{Cos}[c+d x]}}\right]}{\sqrt{a} d}+\frac{\text{Tan}[c+d x]}{d \sqrt{a+a \text{Cos}[c+d x]}}$$

Result (type 3, 1540 leaves):

$$\left(\left(\frac{1}{4}-\frac{i}{4}\right) \left(1+e^{i c}\right) \left(\sqrt{2}-(1-i) e^{\frac{i c}{2}}+(16-16 i) e^{\frac{3 i c}{2}+i d x}+(20+20 i) \sqrt{2} e^{2 i c+\frac{3 i d x}{2}}-(34-34 i) e^{\frac{5 i c}{2}+2 i d x}-(20+20 i) \sqrt{2} e^{3 i c+\frac{5 i d x}{2}}+(16-16 i) e^{\frac{7 i c}{2}+3 i d x}+(4+4 i) \sqrt{2} e^{4 i c+\frac{7 i d x}{2}}-(1-i) e^{\frac{9 i c}{2}+4 i d x}+8 i e^{\frac{1}{2} i (c+d x)}-16 \sqrt{2} e^{i (c+d x)}-40 i e^{\frac{3}{2} i (c+d x)}+34 \sqrt{2} e^{2 i (c+d x)}+40 i e^{\frac{5}{2} i (c+d x)}-16 \sqrt{2} e^{3 i (c+d x)}-8 i e^{\frac{7}{2} i (c+d x)}+\sqrt{2} e^{4 i (c+d x)}-(4+4 i) \sqrt{2} e^{\frac{1}{2} i (2 c+d x)}\right) \text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]\right) \Big/ \left(\left((-1-i)+\sqrt{2} e^{\frac{i c}{2}}\right) \left(-1+e^{i c}\right) \left(i-2 \sqrt{2} e^{\frac{1}{2} i (c+d x)}-4 i e^{i (c+d x)}+2 \sqrt{2} e^{\frac{3}{2} i (c+d x)}+i e^{2 i (c+d x)}\right)^2 \sqrt{a (1+\text{Cos}[c+d x])}\right)+$$

$$\frac{i \text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]-\sqrt{2} \text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\sqrt{2} \text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}\right] \text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]}{\sqrt{2} d \sqrt{a (1+\text{Cos}[c+d x])}}+$$

$$\frac{i \text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]-\sqrt{2} \text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\sqrt{2} \text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}\right] \text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]}{\sqrt{2} d \sqrt{a (1+\text{Cos}[c+d x])}}-$$

$$\frac{2 \text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right] \text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]\right]}{d \sqrt{a (1+\text{Cos}[c+d x])}}+$$

$$\frac{2 \text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right] \text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]\right]}{d \sqrt{a (1+\text{Cos}[c+d x])}}+$$

$$\frac{\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right] \text{Log}\left[2-\sqrt{2} \text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\sqrt{2} \text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right]}{2 \sqrt{2} d \sqrt{a (1+\text{Cos}[c+d x])}}+$$

$$\frac{\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right] \text{Log}\left[2+\sqrt{2} \text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\sqrt{2} \text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right]}{2 \sqrt{2} d \sqrt{a (1+\text{Cos}[c+d x])}}+$$

$$\frac{2\,\mathrm{i}\,\text{ArcTan}\left[\frac{2\,\mathrm{i}\,\text{Cos}\left[\frac{c}{2}\right]-\mathrm{i}\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Cot}\left[\frac{c}{2}\right]}{d\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}\,\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}-$$

$$\left(\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Csc}\left[\frac{c}{2}\right]\left(-d\,x\,\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Log}\left[\sqrt{2}+2\,\text{Cos}\left[\frac{d\,x}{2}\right]\text{Sin}\left[\frac{c}{2}\right]+2\,\text{Cos}\left[\frac{c}{2}\right]\text{Sin}\left[\frac{d\,x}{2}\right]\right]\right.\right.$$

$$\left.\left.\text{Sin}\left[\frac{c}{2}\right]+\frac{4\,\mathrm{i}\,\sqrt{2}\,\text{ArcTan}\left[\frac{2\,\mathrm{i}\,\text{Cos}\left[\frac{c}{2}\right]-\mathrm{i}\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Bigg/$$

$$\left(d\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)+$$

$$\frac{\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{d\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}-$$

$$\frac{\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{d\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}$$

Problem 129: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{Sec}[c+d\,x]^3}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 147 leaves, 7 steps):

$$\frac{7\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{4\,\sqrt{a}\,d}-\frac{\sqrt{2}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{\sqrt{a}\,d}-$$

$$\frac{\text{Tan}[c+d\,x]}{4\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}+\frac{\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{2\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 1791 leaves):

$$-\left(\left(\left(\left(\frac{7}{16}-\frac{7\,\mathrm{i}}{16}\right)\left(1+e^{\mathrm{i}\,c}\right)\right.\right.\right.$$

$$\left(\sqrt{2}-(1-\mathrm{i})\,e^{\frac{\mathrm{i}\,c}{2}}+(16-16\,\mathrm{i})\,e^{\frac{3\,\mathrm{i}\,c}{2}+\mathrm{i}\,d\,x}+(20+20\,\mathrm{i})\,\sqrt{2}\,e^{2\,\mathrm{i}\,c+\frac{3\,\mathrm{i}\,d\,x}{2}}-(34-34\,\mathrm{i})\,e^{\frac{5\,\mathrm{i}\,c}{2}+2\,\mathrm{i}\,d\,x}-\right.$$

$$\left(20+20\,i\right)\sqrt{2}\,e^{3\,i\,c+\frac{5\,i\,d\,x}{2}}+\left(16-16\,i\right)e^{\frac{7\,i\,c}{2}+3\,i\,d\,x}+\left(4+4\,i\right)\sqrt{2}\,e^{4\,i\,c+\frac{7\,i\,d\,x}{2}}-$$
$$\left(1-i\right)e^{\frac{9\,i\,c}{2}+4\,i\,d\,x}+8\,i\,e^{\frac{1}{2}\,i\,(c+d\,x)}-16\sqrt{2}\,e^{i\,(c+d\,x)}-40\,i\,e^{\frac{3}{2}\,i\,(c+d\,x)}+34\sqrt{2}\,e^{2\,i\,(c+d\,x)}+$$
$$40\,i\,e^{\frac{5}{2}\,i\,(c+d\,x)}-16\sqrt{2}\,e^{3\,i\,(c+d\,x)}-8\,i\,e^{\frac{7}{2}\,i\,(c+d\,x)}+\sqrt{2}\,e^{4\,i\,(c+d\,x)}-\left(4+4\,i\right)\sqrt{2}\,e^{\frac{1}{2}\,i\,(2\,c+d\,x)}\Big)$$
$$x\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\Bigg)\Bigg/\left(\left(\left(\left(-1-i\right)+\sqrt{2}\,e^{\frac{i\,c}{2}}\right)\left(-1+e^{i\,c}\right)\right.\right.$$
$$\left.\left.\left(i-2\sqrt{2}\,e^{\frac{1}{2}\,i\,(c+d\,x)}-4\,i\,e^{i\,(c+d\,x)}+2\sqrt{2}\,e^{\frac{3}{2}\,i\,(c+d\,x)}+i\,e^{2\,i\,(c+d\,x)}\right)^2\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}\right)\right)-$$

$$\frac{7\,i\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{4\sqrt{2}\,d\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}}-$$

$$\frac{7\,i\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{4\sqrt{2}\,d\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}}+$$

$$\frac{2\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right]}{d\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}}-$$

$$\frac{2\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right]}{d\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}}-$$

$$\frac{7\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Log}\left[2-\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{8\sqrt{2}\,d\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}}-$$

$$\frac{7\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Log}\left[2+\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{8\sqrt{2}\,d\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}}-$$

$$\frac{7\,i\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Cot}\left[\frac{c}{2}\right]}{2\,d\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}+$$

$$\Bigg(7\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Csc}\left[\frac{c}{2}\right]$$

$$\left(-d\,x\,\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Log}\left[\sqrt{2}+2\,\text{Cos}\left[\frac{d\,x}{2}\right]\,\text{Sin}\left[\frac{c}{2}\right]+2\,\text{Cos}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]\right]\,\text{Sin}\left[\frac{c}{2}\right]+\right.$$

$$\left.\left.\frac{4\,i\,\sqrt{2}\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\,\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Big/$$

$$\left(2\,\sqrt{2}\,d\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}\,\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)+$$

$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)\Big/$$

$$\left(2\,d\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2\right)+$$

$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\left(-\text{Cos}\left[\frac{c}{2}\right]+3\,\text{Sin}\left[\frac{c}{2}\right]\right)\right)\Big/$$

$$\left(4\,d\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)\right)+$$

$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)\Big/$$

$$\left(2\,d\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2\right)+$$

$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\left(\text{Cos}\left[\frac{c}{2}\right]+3\,\text{Sin}\left[\frac{c}{2}\right]\right)\right)\Big/$$

$$\left(4\,d\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)\right)$$

Problem 130: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\text{Sec}[c+d\,x]^4}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 181 leaves, 8 steps):

$$-\frac{9\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{8\,\sqrt{a}\,d}+\frac{\sqrt{2}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{\sqrt{a}\,d}+$$

$$\frac{7\,\text{Tan}[c+d\,x]}{8\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}-\frac{\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{12\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}+\frac{\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]}{3\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 1921 leaves):

$$\Bigg(\left(\frac{9}{32}-\frac{9\,i}{32}\right)\left(1+e^{i\,c}\right)\Big(\sqrt{2}-(1-i)\,e^{\frac{i\,c}{2}}+(16-16\,i)\,e^{\frac{3\,i\,c}{2}+i\,d\,x}+(20+20\,i)\,\sqrt{2}\,e^{2\,i\,c+\frac{3\,i\,d\,x}{2}}-(34-34\,i)\,e^{\frac{5\,i\,c}{2}+2\,i\,d\,x}-(20+20\,i)\,\sqrt{2}\,e^{3\,i\,c+\frac{5\,i\,d\,x}{2}}+(16-16\,i)\,e^{\frac{7\,i\,c}{2}+3\,i\,d\,x}+(4+4\,i)\,\sqrt{2}\,e^{4\,i\,c+\frac{7\,i\,d\,x}{2}}-(1-i)\,e^{\frac{9\,i\,c}{2}+4\,i\,d\,x}+8\,i\,e^{\frac{1}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{i\,(c+d\,x)}-40\,i\,e^{\frac{3}{2}\,i\,(c+d\,x)}+34\,\sqrt{2}\,e^{2\,i\,(c+d\,x)}+40\,i\,e^{\frac{5}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{3\,i\,(c+d\,x)}-8\,i\,e^{\frac{7}{2}\,i\,(c+d\,x)}+\sqrt{2}\,e^{4\,i\,(c+d\,x)}-(4+4\,i)\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(2\,c+d\,x)}\Big)\,x\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\Bigg)\Bigg/\Bigg(\left(\left((-1-i)+\sqrt{2}\,e^{\frac{i\,c}{2}}\right)\left(-1+e^{i\,c}\right)\left(i-2\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(c+d\,x)}-4\,i\,e^{i\,(c+d\,x)}+2\,\sqrt{2}\,e^{\frac{3}{2}\,i\,(c+d\,x)}+i\,e^{2\,i\,(c+d\,x)}\right)^2\sqrt{a\,(1+\text{Cos}[c+d\,x])}\right)\Bigg)+$$

$$\frac{9\,i\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{8\,\sqrt{2}\,d\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}}+$$

$$\frac{9\,i\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{8\,\sqrt{2}\,d\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}}-$$

$$\frac{2\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right]}{d\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}}+$$

$$\frac{2\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right]}{d\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}}+$$

$$\frac{9\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Log}\left[2-\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{16\,\sqrt{2}\,d\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}}+$$

$$\frac{9\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Log}\left[2+\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{16\,\sqrt{2}\,d\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}}+$$

$$\frac{9\,i\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\,\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Cot}\left[\frac{c}{2}\right]}{4\,d\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}\,\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}-$$

$$\left(9\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Csc}\left[\frac{c}{2}\right]\left(-d\,x\,\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Log}\left[\sqrt{2}+2\,\text{Cos}\left[\frac{d\,x}{2}\right]\,\text{Sin}\left[\frac{c}{2}\right]+2\,\text{Cos}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]\right]\right.\right.$$

$$\left.\left.\text{Sin}\left[\frac{c}{2}\right]+\frac{4\,\mathrm{i}\,\sqrt{2}\,\text{ArcTan}\left[\frac{2\,\mathrm{i}\,\text{Cos}\left[\frac{c}{2}\right]-\mathrm{i}\,\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\,\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Big/$$

$$\left(4\,\sqrt{2}\,d\,\sqrt{a\,\left(1+\text{Cos}[c+d\,x]\right)}\,\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)+$$

$$\frac{\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{6\,d\,\sqrt{a\,\left(1+\text{Cos}[c+d\,x]\right)}\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3}-$$

$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)\Big/$$

$$\left(4\,d\,\sqrt{a\,\left(1+\text{Cos}[c+d\,x]\right)}\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2\right)+$$

$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\left(7\,\text{Cos}\left[\frac{c}{2}\right]-9\,\text{Sin}\left[\frac{c}{2}\right]\right)\right)\Big/$$

$$\left(8\,d\,\sqrt{a\,\left(1+\text{Cos}[c+d\,x]\right)}\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)\right)-$$

$$\frac{\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{6\,d\,\sqrt{a\,\left(1+\text{Cos}[c+d\,x]\right)}\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^3}-$$

$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)\Big/$$

$$\left(4\,d\,\sqrt{a\,\left(1+\text{Cos}[c+d\,x]\right)}\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2\right)+$$

$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\left(-7\,\text{Cos}\left[\frac{c}{2}\right]-9\,\text{Sin}\left[\frac{c}{2}\right]\right)\right)\Big/$$

$$\left(8\,d\,\sqrt{a\,\left(1+\text{Cos}[c+d\,x]\right)}\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)\right)$$

Problem 136: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\text{Sec}[c+d\,x]}{\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}}\,dx$$

Optimal (type 3, 114 leaves, 6 steps):

$$\frac{2\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{a^{3/2}\,d}-\frac{5\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{2\,\sqrt{2}\,a^{3/2}\,d}-\frac{\text{Sin}[c+d\,x]}{2\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}}$$

Result (type 3, 1787 leaves):

$$-\left(\left(\left(1-i\right)\left(1+e^{i\,c}\right)\left(\sqrt{2}-\left(1-i\right)e^{\frac{i\,c}{2}}+\left(16-16\,i\right)e^{\frac{3\,i\,c}{2}+i\,d\,x}+\left(20+20\,i\right)\sqrt{2}\,e^{2\,i\,c+\frac{3\,i\,d\,x}{2}}-\right.\right.\right.$$
$$\left(34-34\,i\right)e^{\frac{5\,i\,c}{2}+2\,i\,d\,x}-\left(20+20\,i\right)\sqrt{2}\,e^{3\,i\,c+\frac{5\,i\,d\,x}{2}}+\left(16-16\,i\right)e^{\frac{7\,i\,c}{2}+3\,i\,d\,x}+$$
$$\left(4+4\,i\right)\sqrt{2}\,e^{4\,i\,c+\frac{7\,i\,d\,x}{2}}-\left(1-i\right)e^{\frac{9\,i\,c}{2}+4\,i\,d\,x}+8\,i\,e^{\frac{1}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{i\,(c+d\,x)}-$$
$$40\,i\,e^{\frac{3}{2}\,i\,(c+d\,x)}+34\,\sqrt{2}\,e^{2\,i\,(c+d\,x)}+40\,i\,e^{\frac{5}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{3\,i\,(c+d\,x)}-8\,i\,e^{\frac{7}{2}\,i\,(c+d\,x)}+$$
$$\left.\left.\sqrt{2}\,e^{4\,i\,(c+d\,x)}-\left(4+4\,i\right)\sqrt{2}\,e^{\frac{1}{2}\,i\,(2\,c+d\,x)}\right)x\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^{3}\right)\Big/\left(\left(\left(-1-i\right)+\sqrt{2}\,e^{\frac{i\,c}{2}}\right)\right.$$
$$\left(-1+e^{i\,c}\right)\left(i-2\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(c+d\,x)}-4\,i\,e^{i\,(c+d\,x)}+2\,\sqrt{2}\,e^{\frac{3}{2}\,i\,(c+d\,x)}+i\,e^{2\,i\,(c+d\,x)}\right)^{2}$$
$$\left.\left.\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}\right)\right)-$$

$$\frac{2\,i\,\sqrt{2}\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^{3}}{d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}}+$$

$$\frac{5\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^{3}\,\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right]}{d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}}-$$

$$\frac{5\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^{3}\,\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right]}{d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}}-$$

$$\frac{\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^{3}\,\text{Log}\left[2-\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}}+$$

$$\left(\left(1-i\right)\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]\right.$$
$$\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^{3}\left(\left(1+i\right)\text{Cos}\left[\frac{c}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}\right]-\left(1-i\right)\text{Sin}\left[\frac{c}{4}\right]-i\,\sqrt{2}\,\text{Sin}\left[\frac{c}{4}\right]\right)$$
$$\left.\left(\left(-1-i\right)\text{Cos}\left[\frac{c}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}\right]+\left(1-i\right)\text{Sin}\left[\frac{c}{4}\right]-i\,\sqrt{2}\,\text{Sin}\left[\frac{c}{4}\right]\right)\right)\Big/$$
$$\left(\sqrt{2}\,d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\right)-$$
$$\left(\left(\frac{1}{2}+\frac{i}{2}\right)\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^{3}\,\text{Log}\left[2+\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]\right.$$
$$\left(\left(1+i\right)\text{Cos}\left[\frac{c}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}\right]-\left(1-i\right)\text{Sin}\left[\frac{c}{4}\right]-i\,\sqrt{2}\,\text{Sin}\left[\frac{c}{4}\right]\right)$$
$$\left.\left(\left(-1-i\right)\text{Cos}\left[\frac{c}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}\right]+\left(1-i\right)\text{Sin}\left[\frac{c}{4}\right]-i\,\sqrt{2}\,\text{Sin}\left[\frac{c}{4}\right]\right)\right)\Big/$$

$$\left(\sqrt{2}\, d \left(a \left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{3/2} \left(\mathrm{Cos}\left[\frac{c}{2}\right]+\mathrm{Sin}\left[\frac{c}{2}\right]\right)\right) - \frac{8\, i\, \mathrm{ArcTan}\left[\frac{2\, i\, \mathrm{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\mathrm{Sin}\left[\frac{c}{2}\right]\right)\mathrm{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\mathrm{Cos}\left[\frac{c}{2}\right]^2+4\,\mathrm{Sin}\left[\frac{c}{2}\right]^2}}\right]\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\mathrm{Cot}\left[\frac{c}{2}\right]}{d\left(a\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{3/2}\sqrt{-2+4\,\mathrm{Cos}\left[\frac{c}{2}\right]^2+4\,\mathrm{Sin}\left[\frac{c}{2}\right]^2}} +$$

$$\left(4\sqrt{2}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\mathrm{Csc}\left[\frac{c}{2}\right]\right.$$

$$\left(-d\,x\,\mathrm{Cos}\left[\frac{c}{2}\right]+2\,\mathrm{Log}\left[\sqrt{2}+2\,\mathrm{Cos}\left[\frac{d\,x}{2}\right]\mathrm{Sin}\left[\frac{c}{2}\right]+2\,\mathrm{Cos}\left[\frac{c}{2}\right]\mathrm{Sin}\left[\frac{d\,x}{2}\right]\right]\mathrm{Sin}\left[\frac{c}{2}\right]+\right.$$

$$\left.\left.\frac{4\, i\sqrt{2}\,\mathrm{ArcTan}\left[\frac{2\, i\,\mathrm{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\mathrm{Sin}\left[\frac{c}{2}\right]\right)\mathrm{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\mathrm{Cos}\left[\frac{c}{2}\right]^2+4\,\mathrm{Sin}\left[\frac{c}{2}\right]^2}}\right]\mathrm{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\mathrm{Cos}\left[\frac{c}{2}\right]^2+4\,\mathrm{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Big/$$

$$\left(d\left(a\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{3/2}\left(4\,\mathrm{Cos}\left[\frac{c}{2}\right]^2+4\,\mathrm{Sin}\left[\frac{c}{2}\right]^2\right)\right) - \frac{\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3}{2\,d\left(a\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{3/2}\left(\mathrm{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\mathrm{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^2} + \frac{\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3}{2\,d\left(a\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{3/2}\left(\mathrm{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\mathrm{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^2}$$

Problem 137: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\mathrm{Sec}[c+d\,x]^2}{\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{3/2}}\, dx$$

Optimal (type 3, 144 leaves, 7 steps):

$$-\frac{3\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{a^{3/2}\,d}+\frac{9\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{2\,\sqrt{2}\,a^{3/2}\,d}-\frac{\text{Tan}[c+d\,x]}{2\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}}+\frac{3\,\text{Tan}[c+d\,x]}{2\,a\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 1691 leaves):

$$\Bigg(\left(\frac{3}{2}-\frac{3\,i}{2}\right)\left(1+e^{i\,c}\right)\Big(\sqrt{2}-(1-i)\,e^{\frac{i\,c}{2}}+(16-16\,i)\,e^{\frac{3\,i\,c}{2}+i\,d\,x}+(20+20\,i)\,\sqrt{2}\,e^{2\,i\,c+\frac{3\,i\,d\,x}{2}}-(34-34\,i)\,e^{\frac{5\,i\,c}{2}+2\,i\,d\,x}-$$

$$(20+20\,i)\,\sqrt{2}\,e^{3\,i\,c+\frac{5\,i\,d\,x}{2}}+(16-16\,i)\,e^{\frac{7\,i\,c}{2}+3\,i\,d\,x}+(4+4\,i)\,\sqrt{2}\,e^{4\,i\,c+\frac{7\,i\,d\,x}{2}}-$$

$$(1-i)\,e^{\frac{9\,i\,c}{2}+4\,i\,d\,x}+8\,i\,e^{\frac{1}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{i\,(c+d\,x)}-40\,i\,e^{\frac{3}{2}\,i\,(c+d\,x)}+34\,\sqrt{2}\,e^{2\,i\,(c+d\,x)}+$$

$$40\,i\,e^{\frac{5}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{3\,i\,(c+d\,x)}-8\,i\,e^{\frac{7}{2}\,i\,(c+d\,x)}+\sqrt{2}\,e^{4\,i\,(c+d\,x)}-(4+4\,i)\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(2\,c+d\,x)}\Big)$$

$$\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\Bigg)\Big/\Bigg(\left(\left(-1-i\right)+\sqrt{2}\,e^{\frac{i\,c}{2}}\right)\left(-1+e^{i\,c}\right)$$

$$\left(i-2\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(c+d\,x)}-4\,i\,e^{i\,(c+d\,x)}+2\,\sqrt{2}\,e^{\frac{3}{2}\,i\,(c+d\,x)}+i\,e^{2\,i\,(c+d\,x)}\right)^2\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}\Bigg)+$$

$$\frac{3\,i\,\sqrt{2}\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3}{d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}}+$$

$$\frac{3\,i\,\sqrt{2}\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3}{d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}}-$$

$$\frac{9\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right]}{d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}}+$$

$$\frac{9\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right]}{d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}}+$$

$$\frac{3\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\text{Log}\left[2-\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{\sqrt{2}\,d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}}+$$

$$\frac{3\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\text{Log}\left[2+\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{\sqrt{2}\,d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}}+$$

$$\frac{12\,i\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\text{Cot}\left[\frac{c}{2}\right]}{d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}-$$

$$\left(6\sqrt{2}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\mathrm{Csc}\left[\frac{c}{2}\right]\left(-d\,x\,\mathrm{Cos}\left[\frac{c}{2}\right]+2\,\mathrm{Log}\left[\sqrt{2}+2\,\mathrm{Cos}\left[\frac{d\,x}{2}\right]\mathrm{Sin}\left[\frac{c}{2}\right]+2\,\mathrm{Cos}\left[\frac{c}{2}\right]\mathrm{Sin}\left[\frac{d\,x}{2}\right]\right]\right.\right.$$

$$\left.\left.\mathrm{Sin}\left[\frac{c}{2}\right]+\frac{4\,i\,\sqrt{2}\,\mathrm{ArcTan}\left[\frac{2\,i\,\mathrm{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\mathrm{Sin}\left[\frac{c}{2}\right]\right)\mathrm{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\mathrm{Cos}\left[\frac{c}{2}\right]^2+4\,\mathrm{Sin}\left[\frac{c}{2}\right]^2}}\right]\mathrm{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\mathrm{Cos}\left[\frac{c}{2}\right]^2+4\,\mathrm{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Bigg/$$

$$\left(d\left(a\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{3/2}\left(4\,\mathrm{Cos}\left[\frac{c}{2}\right]^2+4\,\mathrm{Sin}\left[\frac{c}{2}\right]^2\right)\right)+$$

$$\frac{\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3}{2\,d\left(a\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{3/2}\left(\mathrm{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\mathrm{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^2}-$$

$$\frac{\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3}{2\,d\left(a\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{3/2}\left(\mathrm{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\mathrm{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^2}+$$

$$\frac{2\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3}{d\left(a\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{3/2}\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\mathrm{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}-$$

$$\frac{2\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3}{d\left(a\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{3/2}\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\mathrm{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}$$

Problem 138: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\mathrm{Sec}[c+d\,x]^3}{\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{3/2}}\,dx$$

Optimal (type 3, 185 leaves, 8 steps):

$$\frac{19\,\mathrm{ArcTanh}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+d\,x]}{\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}\right]}{4\,a^{3/2}\,d}-\frac{13\,\mathrm{ArcTanh}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}\right]}{2\,\sqrt{2}\,a^{3/2}\,d}-$$

$$\frac{7\,\mathrm{Tan}[c+d\,x]}{4\,a\,d\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}-\frac{\mathrm{Sec}[c+d\,x]\,\mathrm{Tan}[c+d\,x]}{2\,d\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{3/2}}+\frac{\mathrm{Sec}[c+d\,x]\,\mathrm{Tan}[c+d\,x]}{a\,d\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}$$

Result (type 3, 1941 leaves):

$$-\left(\left(\left(\left(\frac{19}{8}-\frac{19\,i}{8}\right)\left(1+e^{i\,c}\right)\right.\right.\right.$$

$$\left(\sqrt{2} - (1-i)\, e^{\frac{i c}{2}} + (16-16 i)\, e^{\frac{3 i c}{2}+i d x} + (20+20 i)\sqrt{2}\, e^{2 i c+\frac{3 i d x}{2}} - (34-34 i)\, e^{\frac{5 i c}{2}+2 i d x} - (20+20 i)\sqrt{2}\, e^{3 i c+\frac{5 i d x}{2}} + (16-16 i)\, e^{\frac{7 i c}{2}+3 i d x} + (4+4 i)\sqrt{2}\, e^{4 i c+\frac{7 i d x}{2}} - (1-i)\, e^{\frac{9 i c}{2}+4 i d x} + 8 i\, e^{\frac{1}{2} i (c+d x)} - 16\sqrt{2}\, e^{i (c+d x)} - 40 i\, e^{\frac{3}{2} i (c+d x)} + 34\sqrt{2}\, e^{2 i (c+d x)} + 40 i\, e^{\frac{5}{2} i (c+d x)} - 16\sqrt{2}\, e^{3 i (c+d x)} - 8 i\, e^{\frac{7}{2} i (c+d x)} + \sqrt{2}\, e^{4 i (c+d x)} - (4+4 i)\sqrt{2}\, e^{\frac{1}{2} i (2 c+d x)}\right)$$

$$\times \mathrm{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3\Bigg) \Bigg/ \left(\left(\left((-1-i)+\sqrt{2}\, e^{\frac{i c}{2}}\right)\left(-1+e^{i c}\right)\right.\right.$$

$$\left(i - 2\sqrt{2}\, e^{\frac{1}{2} i (c+d x)} - 4 i\, e^{i (c+d x)} + 2\sqrt{2}\, e^{\frac{3}{2} i (c+d x)} + i\, e^{2 i (c+d x)}\right)^2$$

$$\left.\left.(a (1+\mathrm{Cos}[c+d x]))^{3/2}\right)\right) -$$

$$\frac{19\, i\, \mathrm{ArcTan}\left[\frac{\mathrm{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\mathrm{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]-\sqrt{2}\, \mathrm{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}{-\mathrm{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\sqrt{2}\, \mathrm{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\mathrm{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}\right] \mathrm{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3}{2\sqrt{2}\, d\, (a (1+\mathrm{Cos}[c+d x]))^{3/2}} -$$

$$\frac{19\, i\, \mathrm{ArcTan}\left[\frac{\mathrm{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\mathrm{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]-\sqrt{2}\, \mathrm{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}{\mathrm{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\sqrt{2}\, \mathrm{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\mathrm{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}\right] \mathrm{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3}{2\sqrt{2}\, d\, (a (1+\mathrm{Cos}[c+d x]))^{3/2}} +$$

$$\frac{13\, \mathrm{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \mathrm{Log}\left[\mathrm{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\mathrm{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]\right]}{d\, (a (1+\mathrm{Cos}[c+d x]))^{3/2}} -$$

$$\frac{13\, \mathrm{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \mathrm{Log}\left[\mathrm{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\mathrm{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]\right]}{d\, (a (1+\mathrm{Cos}[c+d x]))^{3/2}} -$$

$$\frac{19\, \mathrm{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \mathrm{Log}\left[2-\sqrt{2}\, \mathrm{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\sqrt{2}\, \mathrm{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right]}{4\sqrt{2}\, d\, (a (1+\mathrm{Cos}[c+d x]))^{3/2}} -$$

$$\frac{19\, \mathrm{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \mathrm{Log}\left[2+\sqrt{2}\, \mathrm{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\sqrt{2}\, \mathrm{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right]}{4\sqrt{2}\, d\, (a (1+\mathrm{Cos}[c+d x]))^{3/2}} -$$

$$\frac{19\, i\, \mathrm{ArcTan}\left[\frac{2 i\, \mathrm{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\, \mathrm{Sin}\left[\frac{c}{2}\right]\right) \mathrm{Tan}\left[\frac{d x}{4}\right]}{\sqrt{-2+4\, \mathrm{Cos}\left[\frac{c}{2}\right]^2+4\, \mathrm{Sin}\left[\frac{c}{2}\right]^2}}\right] \mathrm{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \mathrm{Cot}\left[\frac{c}{2}\right]}{d\, (a (1+\mathrm{Cos}[c+d x]))^{3/2} \sqrt{-2+4\, \mathrm{Cos}\left[\frac{c}{2}\right]^2+4\, \mathrm{Sin}\left[\frac{c}{2}\right]^2}} +$$

$$\left(19\, \mathrm{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \mathrm{Csc}\left[\frac{c}{2}\right]\right.$$

$$\left(-d\,x\,\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Log}\left[\sqrt{2}+2\,\text{Cos}\left[\frac{d\,x}{2}\right]\,\text{Sin}\left[\frac{c}{2}\right]+2\,\text{Cos}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]\right]\,\text{Sin}\left[\frac{c}{2}\right]+\right.$$

$$\left.\left.\frac{4\,\text{i}\,\sqrt{2}\,\text{ArcTan}\left[\frac{2\,\text{i}\,\text{Cos}\left[\frac{c}{2}\right]-\text{i}\,\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\,\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Big/$$

$$\left(\sqrt{2}\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}\,\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)-$$

$$\frac{\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3}{2\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^2}+$$

$$\frac{\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3}{2\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^2}+$$

$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)\Big/$$

$$\left(d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2\right)+$$

$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\,\left(-5\,\text{Cos}\left[\frac{c}{2}\right]+7\,\text{Sin}\left[\frac{c}{2}\right]\right)\right)\Big/$$

$$\left(2\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}\,\left(\text{Cos}\left[\frac{c}{2}\right]-\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)\right)+$$

$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)\Big/$$

$$\left(d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)^2\right)+$$

$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\,\left(5\,\text{Cos}\left[\frac{c}{2}\right]+7\,\text{Sin}\left[\frac{c}{2}\right]\right)\right)\Big/$$

$$\left(2\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}\,\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)\right)$$

Problem 139: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Cos}[c+d\,x]^4}{\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}}\,\text{d}x$$

Optimal (type 3, 183 leaves, 7 steps):

$$\frac{163\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{16\,\sqrt{2}\,a^{5/2}\,d}-\frac{\text{Cos}[c+d\,x]^3\,\text{Sin}[c+d\,x]}{4\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}}-\frac{17\,\text{Cos}[c+d\,x]^2\,\text{Sin}[c+d\,x]}{16\,a\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}}-\frac{197\,\text{Sin}[c+d\,x]}{24\,a^2\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}+\frac{95\,\sqrt{a+a\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{48\,a^3\,d}$$

Result (type 3, 587 leaves):

$$-\frac{163\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right]}{4\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}}+\frac{163\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right]}{4\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}}-\frac{40\,\text{Cos}\left[\frac{d\,x}{2}\right]\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\text{Sin}\left[\frac{c}{2}\right]}{d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}}+\frac{8\,\text{Cos}\left[\frac{3\,d\,x}{2}\right]\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\text{Sin}\left[\frac{3\,c}{2}\right]}{3\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}}-\frac{40\,\text{Cos}\left[\frac{c}{2}\right]\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\text{Sin}\left[\frac{d\,x}{2}\right]}{d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}}+\frac{8\,\text{Cos}\left[\frac{3\,c}{2}\right]\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\text{Sin}\left[\frac{3\,d\,x}{2}\right]}{3\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}}+\frac{\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{8\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^4}-\frac{29\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{8\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^2}-\frac{\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{8\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^4}+\frac{29\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{8\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^2}$$

Problem 140: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Cos}[c+d\,x]^3}{\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}}\,dx$$

Optimal (type 3, 145 leaves, 6 steps):

$$-\frac{75\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{16\,\sqrt{2}\,a^{5/2}\,d}-\frac{\text{Cos}[c+d\,x]^2\,\text{Sin}[c+d\,x]}{4\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}}+\frac{13\,\text{Sin}[c+d\,x]}{16\,a\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}}+\frac{9\,\text{Sin}[c+d\,x]}{4\,a^2\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 489 leaves):

$$\frac{75\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right]}{4\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}}-$$
$$\frac{75\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right]}{4\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}}+\frac{16\,\text{Cos}\left[\frac{d\,x}{2}\right]\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\text{Sin}\left[\frac{c}{2}\right]}{d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}}+$$
$$\frac{16\,\text{Cos}\left[\frac{c}{2}\right]\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\text{Sin}\left[\frac{d\,x}{2}\right]}{d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}}-\frac{\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{8\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^4}+$$
$$\frac{21\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{8\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^2}+$$
$$\frac{\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{8\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^4}-$$
$$\frac{21\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{8\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^2}$$

Problem 144: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{Sec}[c+d\,x]}{\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}}\,dx$$

Optimal (type 3, 144 leaves, 7 steps):

$$\frac{2\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{a^{5/2}\,d}-\frac{43\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{16\,\sqrt{2}\,a^{5/2}\,d}-$$
$$\frac{\text{Sin}[c+d\,x]}{4\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}}-\frac{11\,\text{Sin}[c+d\,x]}{16\,a\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}}$$

Result (type 3, 1919 leaves):

$$-\Bigg(\Bigg(\Big((2-2\,i)\,\left(1+e^{i\,c}\right)$$
$$\Big(\sqrt{2}-(1-i)\,e^{\frac{i\,c}{2}}+(16-16\,i)\,e^{\frac{3\,i\,c}{2}+i\,d\,x}+(20+20\,i)\,\sqrt{2}\,e^{2\,i\,c+\frac{3\,i\,d\,x}{2}}-(34-34\,i)\,e^{\frac{5\,i\,c}{2}+2\,i\,d\,x}-$$
$$(20+20\,i)\,\sqrt{2}\,e^{3\,i\,c+\frac{5\,i\,d\,x}{2}}+(16-16\,i)\,e^{\frac{7\,i\,c}{2}+3\,i\,d\,x}+(4+4\,i)\,\sqrt{2}\,e^{4\,i\,c+\frac{7\,i\,d\,x}{2}}-$$
$$(1-i)\,e^{\frac{9\,i\,c}{2}+4\,i\,d\,x}+8\,i\,e^{\frac{1}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{i\,(c+d\,x)}-40\,i\,e^{\frac{3}{2}\,i\,(c+d\,x)}+34\,\sqrt{2}\,e^{2\,i\,(c+d\,x)}+$$
$$40\,i\,e^{\frac{5}{2}\,i\,(c+d\,x)}-16\,\sqrt{2}\,e^{3\,i\,(c+d\,x)}-8\,i\,e^{\frac{7}{2}\,i\,(c+d\,x)}+\sqrt{2}\,e^{4\,i\,(c+d\,x)}-(4+4\,i)\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(2\,c+d\,x)}\Big)$$
$$x\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\Big)\Big/\left(\left(\left(-1-i\right)+\sqrt{2}\,e^{\frac{i\,c}{2}}\right)\,\left(-1+e^{i\,c}\right)\right.$$
$$\left(i-2\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(c+d\,x)}-4\,i\,e^{i\,(c+d\,x)}+2\,\sqrt{2}\,e^{\frac{3}{2}\,i\,(c+d\,x)}+i\,e^{2\,i\,(c+d\,x)}\right)^2$$

$$\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\Big)\Big)-$$

$$\frac{4\,\text{i}\,\sqrt{2}\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}\right]\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5}{d\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}}+$$

$$\frac{43\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]\right]}{4\,d\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}}-$$

$$\frac{43\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]\right]}{4\,d\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}}-$$

$$\frac{2\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\text{Log}\left[2-\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right]}{d\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}}+$$

$$\Bigg((1-\text{i})\sqrt{2}\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}{\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d x}{4}\right]}\right]$$

$$\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\left((1+\text{i})\,\text{Cos}\left[\frac{c}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}\right]-(1-\text{i})\,\text{Sin}\left[\frac{c}{4}\right]-\text{i}\sqrt{2}\,\text{Sin}\left[\frac{c}{4}\right]\right)$$

$$\left((-1-\text{i})\,\text{Cos}\left[\frac{c}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}\right]+(1-\text{i})\,\text{Sin}\left[\frac{c}{4}\right]-\text{i}\sqrt{2}\,\text{Sin}\left[\frac{c}{4}\right]\right)\Bigg)\Big/$$

$$\left(d\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\right)-$$

$$\Bigg((1+\text{i})\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\text{Log}\left[2+\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]\right]$$

$$\left((1+\text{i})\,\text{Cos}\left[\frac{c}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}\right]-(1-\text{i})\,\text{Sin}\left[\frac{c}{4}\right]-\text{i}\sqrt{2}\,\text{Sin}\left[\frac{c}{4}\right]\right)$$

$$\left((-1-\text{i})\,\text{Cos}\left[\frac{c}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}\right]+(1-\text{i})\,\text{Sin}\left[\frac{c}{4}\right]-\text{i}\sqrt{2}\,\text{Sin}\left[\frac{c}{4}\right]\right)\Bigg)\Big/$$

$$\left(\sqrt{2}\,d\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\right)-$$

$$\frac{16\,\text{i}\,\text{ArcTan}\left[\frac{2\,\text{i}\,\text{Cos}\left[\frac{c}{2}\right]-\text{i}\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\text{Cot}\left[\frac{c}{2}\right]}{d\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}+$$

$$\Bigg(8\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\text{Csc}\left[\frac{c}{2}\right]$$

$$\left(-d\,x\,\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Log}\left[\sqrt{2}+2\,\text{Cos}\left[\frac{d\,x}{2}\right]\,\text{Sin}\left[\frac{c}{2}\right]+2\,\text{Cos}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]\right]\,\text{Sin}\left[\frac{c}{2}\right]+\right.$$

$$\left.\left.\frac{4\,i\,\sqrt{2}\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\,\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\,\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Big/$$

$$\left(d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)-$$

$$\frac{\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{8\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^4}-$$

$$\frac{11\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{8\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^2}+$$

$$\frac{\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{8\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^4}+$$

$$\frac{11\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{8\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^2}$$

Problem 145: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\text{Sec}[c+d\,x]^2}{\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}}\,dx$$

Optimal (type 3, 174 leaves, 8 steps):

$$-\frac{5\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{a^{5/2}\,d}+\frac{115\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{16\,\sqrt{2}\,a^{5/2}\,d}-$$

$$\frac{\text{Tan}[c+d\,x]}{4\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}}-\frac{15\,\text{Tan}[c+d\,x]}{16\,a\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}}+\frac{35\,\text{Tan}[c+d\,x]}{16\,a^2\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 2051 leaves):

$$\left(\left(5-5\,i\right)\,\left(1+e^{i\,c}\right)\right.$$

$$\left(\sqrt{2}-\left(1-i\right)\,e^{\frac{i\,c}{2}}+\left(16-16\,i\right)\,e^{\frac{3\,i\,c}{2}+i\,d\,x}+\left(20+20\,i\right)\,\sqrt{2}\,e^{2\,i\,c+\frac{3\,i\,d\,x}{2}}-\left(34-34\,i\right)\,e^{\frac{5\,i\,c}{2}+2\,i\,d\,x}-\right.$$

$$\left(20+20\,i\right)\sqrt{2}\,e^{3\,i\,c+\frac{5\,i\,d\,x}{2}}+\left(16-16\,i\right)e^{\frac{7\,i\,c}{2}+3\,i\,d\,x}+\left(4+4\,i\right)\sqrt{2}\,e^{4\,i\,c+\frac{7\,i\,d\,x}{2}}-$$
$$\left(1-i\right)e^{\frac{9\,i\,c}{2}+4\,i\,d\,x}+8\,i\,e^{\frac{1}{2}\,i\,(c+d\,x)}-16\sqrt{2}\,e^{i\,(c+d\,x)}-40\,i\,e^{\frac{3}{2}\,i\,(c+d\,x)}+34\sqrt{2}\,e^{2\,i\,(c+d\,x)}+$$
$$40\,i\,e^{\frac{5}{2}\,i\,(c+d\,x)}-16\sqrt{2}\,e^{3\,i\,(c+d\,x)}-8\,i\,e^{\frac{7}{2}\,i\,(c+d\,x)}+\sqrt{2}\,e^{4\,i\,(c+d\,x)}-\left(4+4\,i\right)\sqrt{2}\,e^{\frac{1}{2}\,i\,(2\,c+d\,x)}\Big)$$
$$\left.x\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\right)\Big/\left(\left(\left(\left(-1-i\right)+\sqrt{2}\,e^{\frac{i\,c}{2}}\right)\left(-1+e^{i\,c}\right)\right.\right.$$
$$\left.\left(i-2\sqrt{2}\,e^{\frac{1}{2}\,i\,(c+d\,x)}-4\,i\,e^{i\,(c+d\,x)}+2\sqrt{2}\,e^{\frac{3}{2}\,i\,(c+d\,x)}+i\,e^{2\,i\,(c+d\,x)}\right)^2\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\right)+$$

$$\frac{10\,i\sqrt{2}\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{-\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}}-$$

$$\frac{115\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right]}{4\,d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}}+$$

$$\frac{115\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\text{Log}\left[\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right]}{4\,d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}}+$$

$$\frac{5\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\text{Log}\left[2-\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}}-$$

$$\left(\left(5-5\,i\right)\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}{\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]}\right]\right.$$
$$\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\left(\left(1+i\right)\text{Cos}\left[\frac{c}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}\right]-\left(1-i\right)\text{Sin}\left[\frac{c}{4}\right]-i\sqrt{2}\,\text{Sin}\left[\frac{c}{4}\right]\right)$$
$$\left.\left(\left(-1-i\right)\text{Cos}\left[\frac{c}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}\right]+\left(1-i\right)\text{Sin}\left[\frac{c}{4}\right]-i\sqrt{2}\,\text{Sin}\left[\frac{c}{4}\right]\right)\right)\Big/$$
$$\left(\sqrt{2}\,d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\right)+$$
$$\left(\left(\frac{5}{2}+\frac{5\,i}{2}\right)\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\text{Log}\left[2+\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\sqrt{2}\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]\right.$$
$$\left(\left(1+i\right)\text{Cos}\left[\frac{c}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}\right]-\left(1-i\right)\text{Sin}\left[\frac{c}{4}\right]-i\sqrt{2}\,\text{Sin}\left[\frac{c}{4}\right]\right)$$
$$\left.\left(\left(-1-i\right)\text{Cos}\left[\frac{c}{4}\right]+\sqrt{2}\,\text{Cos}\left[\frac{c}{4}\right]+\left(1-i\right)\text{Sin}\left[\frac{c}{4}\right]-i\sqrt{2}\,\text{Sin}\left[\frac{c}{4}\right]\right)\right)\Big/$$
$$\left(\sqrt{2}\,d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\left(\text{Cos}\left[\frac{c}{2}\right]+\text{Sin}\left[\frac{c}{2}\right]\right)\right)+$$

$$\frac{40\,i\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\text{Cot}\left[\frac{c}{2}\right]}{d\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}-$$

$$\left(20\sqrt{2}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\text{Csc}\left[\frac{c}{2}\right]\right.$$

$$\left(-d\,x\,\text{Cos}\left[\frac{c}{2}\right]+2\,\text{Log}\left[\sqrt{2}+2\,\text{Cos}\left[\frac{d\,x}{2}\right]\,\text{Sin}\left[\frac{c}{2}\right]+2\,\text{Cos}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]\right]\,\text{Sin}\left[\frac{c}{2}\right]+\right.$$

$$\left.\left.\frac{4\,i\,\sqrt{2}\,\text{ArcTan}\left[\frac{2\,i\,\text{Cos}\left[\frac{c}{2}\right]-i\left(-\sqrt{2}+2\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\text{Tan}\left[\frac{d\,x}{4}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right]\,\text{Cos}\left[\frac{c}{2}\right]}{\sqrt{-2+4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2}}\right)\right)\Big/$$

$$\left(d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(4\,\text{Cos}\left[\frac{c}{2}\right]^2+4\,\text{Sin}\left[\frac{c}{2}\right]^2\right)\right)+$$

$$\frac{\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{8\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^4}+$$

$$\frac{19\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{8\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]-\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^2}-$$

$$\frac{\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{8\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^4}-$$

$$\frac{19\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{8\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{4}+\frac{d\,x}{4}\right]+\text{Sin}\left[\frac{c}{4}+\frac{d\,x}{4}\right]\right)^2}+$$

$$\frac{4\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}-$$

$$\frac{4\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5}{d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right)}$$

Problem 146: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \text{Cos}[c+d\,x]^{5/2}\,(a+a\,\text{Cos}[c+d\,x])\,dx$$

Optimal (type 4, 111 leaves, 6 steps):

$$\frac{6\,a\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{5\,d}+\frac{10\,a\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{21\,d}+\frac{10\,a\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{21\,d}+\frac{2\,a\,\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{5\,d}+\frac{2\,a\,\text{Cos}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{7\,d}$$

Result (type 5, 490 leaves):

$$a\left(\sqrt{\text{Cos}[c+d\,x]}\,\left(1+\text{Cos}[c+d\,x]\right)\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\right.$$

$$\left(-\frac{3\,\text{Cot}[c]}{5\,d}+\frac{23\,\text{Cos}[d\,x]\,\text{Sin}[c]}{84\,d}+\frac{\text{Cos}[2\,d\,x]\,\text{Sin}[2\,c]}{10\,d}+\frac{\text{Cos}[3\,d\,x]\,\text{Sin}[3\,c]}{28\,d}+\frac{23\,\text{Cos}[c]\,\text{Sin}[d\,x]}{84\,d}+\frac{\text{Cos}[2\,c]\,\text{Sin}[2\,d\,x]}{10\,d}+\frac{\text{Cos}[3\,c]\,\text{Sin}[3\,d\,x]}{28\,d}\right)-$$

$$\left(5\,\left(1+\text{Cos}[c+d\,x]\right)\text{Csc}[c]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]\right.$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$

$$\left.\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\right)\Big/$$

$$\left(21\,d\,\sqrt{1+\text{Cot}[c]^2}\right)-\frac{1}{10\,d}3\,\left(1+\text{Cos}[c+d\,x]\right)\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2$$

$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\right.\right.$$

$$\left.\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]\right)\Big/$$

$$\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$

$$\left.\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\,\sqrt{1+\text{Tan}[c]^2}\right)-$$

$$\left.\left.\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)\right)$$

Problem 147: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \text{Cos}[c+d\,x]^{3/2}\,\left(a+a\,\text{Cos}[c+d\,x]\right)\,dx$$

Optimal (type 4, 87 leaves, 5 steps):

$$\frac{6\,a\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{5\,d}+\frac{2\,a\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{3\,d}+\frac{2\,a\,\sqrt{\text{Cos}[c+d\,x]}\;\text{Sin}[c+d\,x]}{3\,d}+\frac{2\,a\,\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{5\,d}$$

Result (type 5, 458 leaves):

$$a\left(\sqrt{\text{Cos}[c+d\,x]}\;(1+\text{Cos}[c+d\,x])\;\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\left(-\frac{3\,\text{Cot}[c]}{5\,d}+\frac{\text{Cos}[d\,x]\;\text{Sin}[c]}{3\,d}+\frac{\text{Cos}[2\,d\,x]\;\text{Sin}[2\,c]}{10\,d}+\frac{\text{Cos}[c]\;\text{Sin}[d\,x]}{3\,d}+\frac{\text{Cos}[2\,c]\;\text{Sin}[2\,d\,x]}{10\,d}\right)-\right.$$

$$\left((1+\text{Cos}[c+d\,x])\;\text{Csc}[c]\;\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]\right.$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\;\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$

$$\left.\sqrt{-\sqrt{1+\text{Cot}[c]^2}\;\text{Sin}[c]\;\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\;\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\right)\Big/$$

$$\left(3\,d\,\sqrt{1+\text{Cot}[c]^2}\right)-\frac{1}{10\,d}3\,(1+\text{Cos}[c+d\,x])\;\text{Csc}[c]\;\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2$$

$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\right.\right.$$

$$\left.\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\;\text{Tan}[c]\right)\Big/$$

$$\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\;\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$

$$\left.\sqrt{\text{Cos}[c]\;\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\;\sqrt{1+\text{Tan}[c]^2}}\;\sqrt{1+\text{Tan}[c]^2}\right)-$$

$$\left.\left.\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\;\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\;\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\;\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\;\sqrt{1+\text{Tan}[c]^2}}}\right)\right)$$

Problem 148: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \sqrt{\text{Cos}[c+d\,x]}\,\left(a+a\,\text{Cos}[c+d\,x]\right)\,dx$$

Optimal (type 4, 61 leaves, 4 steps):

$$\frac{2\,a\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{d}+\frac{2\,a\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{3\,d}+\frac{2\,a\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{3\,d}$$

Result (type 5, 424 leaves):

$$a\left(\sqrt{\text{Cos}[c+d\,x]}\,\left(1+\text{Cos}[c+d\,x]\right)\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\left(-\frac{\text{Cot}[c]}{d}+\frac{\text{Cos}[d\,x]\,\text{Sin}[c]}{3\,d}+\frac{\text{Cos}[c]\,\text{Sin}[d\,x]}{3\,d}\right)-\right.$$

$$\left(\left(1+\text{Cos}[c+d\,x]\right)\,\text{Csc}[c]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]\right.$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$

$$\left.\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\right)\Big/$$

$$\left(3\,d\,\sqrt{1+\text{Cot}[c]^2}\right)-\frac{1}{2\,d}\left(1+\text{Cos}[c+d\,x]\right)\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2$$

$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\right.\right.$$

$$\left.\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]\right)\Big/$$

$$\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$

$$\left.\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\,\sqrt{1+\text{Tan}[c]^2}\right)-$$

$$\left.\left.\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)\right)$$

Problem 149: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{a + a \operatorname{Cos}[c + d x]}{\sqrt{\operatorname{Cos}[c + d x]}} \, dx$$

Optimal (type 4, 35 leaves, 3 steps):

$$\frac{2 a \operatorname{EllipticE}\left[\frac{1}{2} (c + d x), 2\right]}{d} + \frac{2 a \operatorname{EllipticF}\left[\frac{1}{2} (c + d x), 2\right]}{d}$$

Result (type 5, 155 leaves):

$$\frac{1}{2 d} a \sqrt{\operatorname{Cos}[c + d x]} \, (1 + \operatorname{Cos}[c + d x]) \operatorname{Sec}\left[\frac{1}{2} (c + d x)\right]^2 \left(-2 \sqrt{\operatorname{Cos}[d x - \operatorname{ArcTan}[\operatorname{Cot}[c]]]^2} \sqrt{\operatorname{Csc}[c]^2} \right.$$
$$\operatorname{HypergeometricPFQ}\left[\left\{\frac{1}{4}, \frac{1}{2}\right\}, \left\{\frac{5}{4}\right\}, \operatorname{Sin}[d x - \operatorname{ArcTan}[\operatorname{Cot}[c]]]^2\right]$$
$$\operatorname{Sec}[d x - \operatorname{ArcTan}[\operatorname{Cot}[c]]] \operatorname{Sin}[c] + \operatorname{Tan}[d x + \operatorname{ArcTan}[\operatorname{Tan}[c]]] -$$
$$\left(\operatorname{HypergeometricPFQ}\left[\left\{-\frac{1}{2}, -\frac{1}{4}\right\}, \left\{\frac{3}{4}\right\}, \operatorname{Cos}[d x + \operatorname{ArcTan}[\operatorname{Tan}[c]]]^2\right]\right.$$
$$\left.\left.\operatorname{Tan}[d x + \operatorname{ArcTan}[\operatorname{Tan}[c]]]\right) \Big/ \left(\sqrt{\operatorname{Sin}[d x + \operatorname{ArcTan}[\operatorname{Tan}[c]]]^2}\right)\right)$$

Problem 150: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{a + a \operatorname{Cos}[c + d x]}{\operatorname{Cos}[c + d x]^{3/2}} \, dx$$

Optimal (type 4, 57 leaves, 4 steps):

$$-\frac{2 a \operatorname{EllipticE}\left[\frac{1}{2} (c + d x), 2\right]}{d} + \frac{2 a \operatorname{EllipticF}\left[\frac{1}{2} (c + d x), 2\right]}{d} + \frac{2 a \operatorname{Sin}[c + d x]}{d \sqrt{\operatorname{Cos}[c + d x]}}$$

Result (type 5, 413 leaves):

$$a\left(\sqrt{\text{Cos}[c+d\,x]}\,\left(1+\text{Cos}[c+d\,x]\right)\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\right.$$

$$\left(\frac{\text{Csc}[c]\,\text{Sec}[c]}{d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]\,\text{Sin}[d\,x]}{d}\right)-\frac{1}{d\,\sqrt{1+\text{Cot}[c]^2}}$$

$$\left(1+\text{Cos}[c+d\,x]\right)\,\text{Csc}[c]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$

$$\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,+$$

$$\frac{1}{2\,d}\left(1+\text{Cos}[c+d\,x]\right)\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2$$

$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\right.\right.$$

$$\left.\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]\right)\Big/\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$

$$\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}$$

$$\left.\left.\left.\sqrt{1+\text{Tan}[c]^2}\right)-\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)\right)$$

Problem 151: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{a+a\,\text{Cos}[c+d\,x]}{\text{Cos}[c+d\,x]^{5/2}}\,dx$$

Optimal (type 4, 83 leaves, 5 steps):

$$-\frac{2\,a\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),2\right]}{d}+\frac{2\,a\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]}{3\,d}+\frac{2\,a\,\text{Sin}[c+d\,x]}{3\,d\,\text{Cos}[c+d\,x]^{3/2}}+\frac{2\,a\,\text{Sin}[c+d\,x]}{d\,\sqrt{\text{Cos}[c+d\,x]}}$$

Result (type 5, 444 leaves):

$$
\begin{aligned}
&a\left(\sqrt{\text{Cos}[c+d\,x]}\,\left(1+\text{Cos}[c+d\,x]\right)\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\right.\\
&\quad\left(\frac{\text{Csc}[c]\,\text{Sec}[c]}{d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]^2\,\text{Sin}[d\,x]}{3\,d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]\,\left(\text{Sin}[c]+3\,\text{Sin}[d\,x]\right)}{3\,d}\right)-\\
&\quad\left(\left(1+\text{Cos}[c+d\,x]\right)\,\text{Csc}[c]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]\right.\\
&\qquad\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\\
&\qquad\left.\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\right)\Big/\\
&\quad\left(3\,d\,\sqrt{1+\text{Cot}[c]^2}\right)+\frac{1}{2\,d}\left(1+\text{Cos}[c+d\,x]\right)\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\\
&\quad\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\right.\right.\\
&\qquad\left.\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]\right)\Big/\\
&\qquad\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\right.\\
&\qquad\left.\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\,\sqrt{1+\text{Tan}[c]^2}\right)-\\
&\qquad\left.\left.\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)\right)
\end{aligned}
$$

Problem 152: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{a+a\,\text{Cos}[c+d\,x]}{\text{Cos}[c+d\,x]^{7/2}}\,dx$$

Optimal (type 4, 111 leaves, 6 steps):

$$-\frac{6\,a\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{5\,d}+\frac{2\,a\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{3\,d}+\frac{2\,a\,\text{Sin}[c+d\,x]}{5\,d\,\text{Cos}[c+d\,x]^{5/2}}+\frac{2\,a\,\text{Sin}[c+d\,x]}{3\,d\,\text{Cos}[c+d\,x]^{3/2}}+\frac{6\,a\,\text{Sin}[c+d\,x]}{5\,d\,\sqrt{\text{Cos}[c+d\,x]}}$$

Result (type 5, 477 leaves):

$$a\left(\sqrt{\text{Cos}[c+d\,x]}\,\left(1+\text{Cos}[c+d\,x]\right)\right.$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\left(\frac{3\,\text{Csc}[c]\,\text{Sec}[c]}{5\,d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]^3\,\text{Sin}[d\,x]}{5\,d}+\right.$$

$$\left.\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]^2\,\left(3\,\text{Sin}[c]+5\,\text{Sin}[d\,x]\right)}{15\,d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]\,\left(5\,\text{Sin}[c]+9\,\text{Sin}[d\,x]\right)}{15\,d}\right)-$$

$$\left(\left(1+\text{Cos}[c+d\,x]\right)\,\text{Csc}[c]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\,\frac{1}{2}\right\},\,\left\{\frac{5}{4}\right\},\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]\right.$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$

$$\left.\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\right)\Big/$$

$$\left(3\,d\,\sqrt{1+\text{Cot}[c]^2}\right)+\frac{1}{10\,d}3\,\left(1+\text{Cos}[c+d\,x]\right)\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2$$

$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},\,-\frac{1}{4}\right\},\,\left\{\frac{3}{4}\right\},\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\right.\right.$$

$$\left.\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]\right)\Big/$$

$$\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$

$$\left.\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\,\sqrt{1+\text{Tan}[c]^2}\right)-$$

$$\left.\left.\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)\right)$$

Problem 153: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \text{Cos}[c+d\,x]^{5/2}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,dx$$

Optimal (type 4, 147 leaves, 10 steps):

$$\frac{32\,a^2\,\text{EllipticE}\left[\frac{1}{2}\,\left(c+d\,x\right),\,2\right]}{15\,d}+\frac{20\,a^2\,\text{EllipticF}\left[\frac{1}{2}\,\left(c+d\,x\right),\,2\right]}{21\,d}+\frac{20\,a^2\,\sqrt{\text{Cos}[c+d\,x]}\,\,\text{Sin}[c+d\,x]}{21\,d}+\frac{32\,a^2\,\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{45\,d}+\frac{4\,a^2\,\text{Cos}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{7\,d}+\frac{2\,a^2\,\text{Cos}[c+d\,x]^{7/2}\,\text{Sin}[c+d\,x]}{9\,d}$$

Result (type 5, 532 leaves):

$$\sqrt{\text{Cos}[c+d\,x]}\;(a+a\,\text{Cos}[c+d\,x])^2\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4$$
$$\left(-\frac{8\,\text{Cot}[c]}{15\,d}+\frac{23\,\text{Cos}[d\,x]\,\text{Sin}[c]}{84\,d}+\frac{37\,\text{Cos}[2\,d\,x]\,\text{Sin}[2\,c]}{360\,d}+\frac{\text{Cos}[3\,d\,x]\,\text{Sin}[3\,c]}{28\,d}+\frac{\text{Cos}[4\,d\,x]\,\text{Sin}[4\,c]}{144\,d}+\frac{23\,\text{Cos}[c]\,\text{Sin}[d\,x]}{84\,d}+\frac{37\,\text{Cos}[2\,c]\,\text{Sin}[2\,d\,x]}{360\,d}+\frac{\text{Cos}[3\,c]\,\text{Sin}[3\,d\,x]}{28\,d}+\frac{\text{Cos}[4\,c]\,\text{Sin}[4\,d\,x]}{144\,d}\right)-$$
$$\left(5\,(a+a\,\text{Cos}[c+d\,x])^2\,\text{Csc}[c]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]\right.$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$
$$\left.\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\;\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\right)\Big/$$
$$\left(21\,d\,\sqrt{1+\text{Cot}[c]^2}\right)-\frac{1}{15\,d}4\,(a+a\,\text{Cos}[c+d\,x])^2\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4$$
$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\,\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\right.\right.$$
$$\left.\text{Tan}[c]\right)\Big/\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\;\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$
$$\left.\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\;\sqrt{1+\text{Tan}[c]^2}\right)-$$
$$\left.\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 154: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \text{Cos}[c+d\,x]^{3/2}\,(a+a\,\text{Cos}[c+d\,x])^2\,dx$$

Optimal (type 4, 121 leaves, 9 steps):

$$\frac{12\,a^2\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{5\,d}+\frac{8\,a^2\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{7\,d}+$$
$$\frac{8\,a^2\,\sqrt{\text{Cos}[c+d\,x]}\,\,\text{Sin}[c+d\,x]}{7\,d}+\frac{4\,a^2\,\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{5\,d}+\frac{2\,a^2\,\text{Cos}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{7\,d}$$

Result (type 5, 500 leaves):

$$\sqrt{\text{Cos}[c+d\,x]}\,\,(a+a\,\text{Cos}[c+d\,x])^2\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4$$
$$\left(-\frac{3\,\text{Cot}[c]}{5\,d}+\frac{17\,\text{Cos}[d\,x]\,\text{Sin}[c]}{56\,d}+\frac{\text{Cos}[2\,d\,x]\,\text{Sin}[2\,c]}{10\,d}+\frac{\text{Cos}[3\,d\,x]\,\text{Sin}[3\,c]}{56\,d}+\right.$$
$$\left.\frac{17\,\text{Cos}[c]\,\text{Sin}[d\,x]}{56\,d}+\frac{\text{Cos}[2\,c]\,\text{Sin}[2\,d\,x]}{10\,d}+\frac{\text{Cos}[3\,c]\,\text{Sin}[3\,d\,x]}{56\,d}\right)-\frac{1}{7\,d\,\sqrt{1+\text{Cot}[c]^2}}$$
$$2\,(a+a\,\text{Cos}[c+d\,x])^2\,\text{Csc}[c]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\,\frac{1}{2}\right\},\,\left\{\frac{5}{4}\right\},\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$
$$\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\,\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\,\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,-$$
$$\frac{1}{10\,d}3\,(a+a\,\text{Cos}[c+d\,x])^2\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4$$
$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},\,-\frac{1}{4}\right\},\,\left\{\frac{3}{4}\right\},\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\,\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\right.\right.$$
$$\left.\text{Tan}[c]\right)\Big/\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\,\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$
$$\left.\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\,\,\sqrt{1+\text{Tan}[c]^2}\right)-$$
$$\left.\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 155: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\sqrt{\text{Cos}[c+d\,x]}\,\,(a+a\,\text{Cos}[c+d\,x])^2\,dx$$

Optimal (type 4, 95 leaves, 7 steps):

$$\frac{16\,a^2\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{5\,d}+\frac{4\,a^2\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{3\,d}+\frac{4\,a^2\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{3\,d}+\frac{2\,a^2\,\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{5\,d}$$

Result (type 5, 468 leaves):

$$\sqrt{\text{Cos}[c+d\,x]}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\left(-\frac{4\,\text{Cot}[c]}{5\,d}+\frac{\text{Cos}[d\,x]\,\text{Sin}[c]}{3\,d}+\frac{\text{Cos}[2\,d\,x]\,\text{Sin}[2\,c]}{20\,d}+\frac{\text{Cos}[c]\,\text{Sin}[d\,x]}{3\,d}+\frac{\text{Cos}[2\,c]\,\text{Sin}[2\,d\,x]}{20\,d}\right)-$$
$$\frac{1}{3\,d\,\sqrt{1+\text{Cot}[c]^2}}\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Csc}[c]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$
$$\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}-$$
$$\frac{1}{5\,d}2\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4$$
$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\,\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\right.\right.$$
$$\left.\text{Tan}[c]\right)\Big/\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$
$$\left.\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\,\sqrt{1+\text{Tan}[c]^2}\right)-$$
$$\left.\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 156: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^2}{\sqrt{\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 67 leaves, 6 steps):

$$\frac{4\,a^2\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{d}+\frac{8\,a^2\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{3\,d}+\frac{2\,a^2\,\sqrt{\text{Cos}[c+d\,x]}\,\,\text{Sin}[c+d\,x]}{3\,d}$$

Result (type 5, 434 leaves):

$$\sqrt{\text{Cos}[c+d\,x]}\,\,(a+a\,\text{Cos}[c+d\,x])^2\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\left(-\frac{\text{Cot}[c]}{d}+\frac{\text{Cos}[d\,x]\,\text{Sin}[c]}{6\,d}+\frac{\text{Cos}[c]\,\text{Sin}[d\,x]}{6\,d}\right)-\frac{1}{3\,d\,\sqrt{1+\text{Cot}[c]^2}}$$
$$2\,(a+a\,\text{Cos}[c+d\,x])^2\,\text{Csc}[c]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$
$$\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\,\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\,\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,-$$
$$\frac{1}{2\,d}(a+a\,\text{Cos}[c+d\,x])^2\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4$$
$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\,\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\right.\right.$$
$$\left.\text{Tan}[c]\right)\Big/\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\,\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$
$$\left.\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\,\,\sqrt{1+\text{Tan}[c]^2}\right)-$$
$$\left.\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 158: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{(a+a\,\text{Cos}[c+d\,x])^2}{\text{Cos}[c+d\,x]^{5/2}}\,dx$$

Optimal (type 4, 91 leaves, 7 steps):

$$-\frac{4\,a^2\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{d}+\frac{8\,a^2\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{3\,d}+\frac{2\,a^2\,\text{Sin}[c+d\,x]}{3\,d\,\text{Cos}[c+d\,x]^{3/2}}+\frac{4\,a^2\,\text{Sin}[c+d\,x]}{d\,\sqrt{\text{Cos}[c+d\,x]}}$$

Result (type 5, 454 leaves):

$$\sqrt{\text{Cos}[c+d\,x]}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\left(\frac{\text{Csc}[c]\,\text{Sec}[c]}{d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]^2\,\text{Sin}[d\,x]}{6\,d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]\,\left(\text{Sin}[c]+6\,\text{Sin}[d\,x]\right)}{6\,d}\right)-$$
$$\frac{1}{3\,d\,\sqrt{1+\text{Cot}[c]^2}}2\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Csc}[c]$$
$$\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$
$$\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}+$$
$$\frac{1}{2\,d}\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4$$
$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\,\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\right.\right.$$
$$\left.\text{Tan}[c]\right)\Big/\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$
$$\left.\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\,\sqrt{1+\text{Tan}[c]^2}\right)-$$
$$\left.\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 159: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^2}{\text{Cos}[c+d\,x]^{7/2}}\,dx$$

Optimal (type 4, 121 leaves, 9 steps):

$$-\frac{16\,a^2\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{5\,d}+\frac{4\,a^2\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{3\,d}+\frac{2\,a^2\,\text{Sin}[c+d\,x]}{5\,d\,\text{Cos}[c+d\,x]^{5/2}}+\frac{4\,a^2\,\text{Sin}[c+d\,x]}{3\,d\,\text{Cos}[c+d\,x]^{3/2}}+\frac{16\,a^2\,\text{Sin}[c+d\,x]}{5\,d\,\sqrt{\text{Cos}[c+d\,x]}}$$

Result (type 5, 487 leaves):

$$\sqrt{\text{Cos}[c+d\,x]}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\left(\frac{4\,\text{Csc}[c]\,\text{Sec}[c]}{5\,d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]^3\,\text{Sin}[d\,x]}{10\,d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]^2\,(3\,\text{Sin}[c]+10\,\text{Sin}[d\,x])}{30\,d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]\,(5\,\text{Sin}[c]+12\,\text{Sin}[d\,x])}{15\,d}\right)-$$

$$\frac{1}{3\,d\,\sqrt{1+\text{Cot}[c]^2}}\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Csc}[c]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}+\frac{1}{5\,d}2\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4$$

$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\,\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]\right)\Big/\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\,\sqrt{1+\text{Tan}[c]^2}\right)-\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 160: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \text{Cos}[c+d\,x]^{3/2}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,dx$$

Optimal (type 4, 147 leaves, 12 steps):

$$\frac{68 a^3 \text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]}{15 d}+\frac{44 a^3 \text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]}{21 d}+\frac{44 a^3 \sqrt{\text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{21 d}+\frac{68 a^3 \text{Cos}[c+d x]^{3/2}\,\text{Sin}[c+d x]}{45 d}+\frac{6 a^3 \text{Cos}[c+d x]^{5/2}\,\text{Sin}[c+d x]}{7 d}+\frac{2 a^3 \text{Cos}[c+d x]^{7/2}\,\text{Sin}[c+d x]}{9 d}$$

Result (type 5, 532 leaves):

$$\sqrt{\text{Cos}[c+d x]}\,(a+a\,\text{Cos}[c+d x])^3\,\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^6\left(-\frac{17\,\text{Cot}[c]}{30 d}+\frac{97\,\text{Cos}[d x]\,\text{Sin}[c]}{336 d}+\frac{73\,\text{Cos}[2 d x]\,\text{Sin}[2 c]}{720 d}+\frac{3\,\text{Cos}[3 d x]\,\text{Sin}[3 c]}{112 d}+\frac{\text{Cos}[4 d x]\,\text{Sin}[4 c]}{288 d}+\frac{97\,\text{Cos}[c]\,\text{Sin}[d x]}{336 d}+\frac{73\,\text{Cos}[2 c]\,\text{Sin}[2 d x]}{720 d}+\frac{3\,\text{Cos}[3 c]\,\text{Sin}[3 d x]}{112 d}+\frac{\text{Cos}[4 c]\,\text{Sin}[4 d x]}{288 d}\right)-$$

$$\left(11\,(a+a\,\text{Cos}[c+d x])^3\,\text{Csc}[c]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d x-\text{ArcTan}[\text{Cot}[c]]]^2\right]\right.$$

$$\left.\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^6\,\text{Sec}[d x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\text{Sin}[c]\,\text{Sin}[d x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{1+\text{Sin}[d x-\text{ArcTan}[\text{Cot}[c]]]}\right)\Big/$$

$$\left(42 d\sqrt{1+\text{Cot}[c]^2}\right)-\frac{1}{60 d}17\,(a+a\,\text{Cos}[c+d x])^3\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^6$$

$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\text{Sin}[d x+\text{ArcTan}[\text{Tan}[c]]]\right.\right.$$

$$\left.\text{Tan}[c]\right)\Big/\left(\sqrt{1-\text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]}\,\sqrt{1+\text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$

$$\left.\sqrt{\text{Cos}[c]\,\text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\,\sqrt{1+\text{Tan}[c]^2}\right)-$$

$$\left.\frac{\frac{\text{Sin}[d x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 161: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \sqrt{\text{Cos}[c+d\,x]}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,dx$$

Optimal (type 4, 121 leaves, 10 steps):

$$\frac{28\,a^3\,\text{EllipticE}\left[\frac{1}{2}\left(c+d\,x\right),2\right]}{5\,d}+\frac{52\,a^3\,\text{EllipticF}\left[\frac{1}{2}\left(c+d\,x\right),2\right]}{21\,d}+$$
$$\frac{52\,a^3\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{21\,d}+\frac{6\,a^3\,\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{5\,d}+\frac{2\,a^3\,\text{Cos}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{7\,d}$$

Result (type 5, 500 leaves):

$$\sqrt{\text{Cos}[c+d\,x]}\;(a+a\,\text{Cos}[c+d\,x])^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6 \left(-\frac{7\,\text{Cot}[c]}{10\,d}+\frac{107\,\text{Cos}[d\,x]\,\text{Sin}[c]}{336\,d}+\frac{3\,\text{Cos}[2\,d\,x]\,\text{Sin}[2\,c]}{40\,d}+\frac{\text{Cos}[3\,d\,x]\,\text{Sin}[3\,c]}{112\,d}+\frac{107\,\text{Cos}[c]\,\text{Sin}[d\,x]}{336\,d}+\frac{3\,\text{Cos}[2\,c]\,\text{Sin}[2\,d\,x]}{40\,d}+\frac{\text{Cos}[3\,c]\,\text{Sin}[3\,d\,x]}{112\,d}\right)-$$

$$\left(13\,(a+a\,\text{Cos}[c+d\,x])^3\,\text{Csc}[c]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]\right.$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$
$$\left.\sqrt{-\sqrt{1+\text{Cot}[c]^2}\;\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\;\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\right)\Big/$$
$$\left(42\,d\,\sqrt{1+\text{Cot}[c]^2}\right)-\frac{1}{20\,d}7\,(a+a\,\text{Cos}[c+d\,x])^3\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6$$
$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\,\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\right.\right.$$
$$\left.\text{Tan}[c]\right)\Big/\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\;\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$
$$\left.\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\;\sqrt{1+\text{Tan}[c]^2}\right)-$$
$$\left.\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 162: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{(a+a\,\text{Cos}[c+d\,x])^3}{\sqrt{\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 91 leaves, 8 steps):

$$\frac{36\,a^3\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),2\right]}{5\,d}+\frac{4\,a^3\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]}{d}+\frac{2\,a^3\,\sqrt{\text{Cos}[c+d\,x]}\;\text{Sin}[c+d\,x]}{d}+\frac{2\,a^3\,\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{5\,d}$$

Result (type 5, 468 leaves):

$$\sqrt{\text{Cos}[c+d\,x]}\;(a+a\,\text{Cos}[c+d\,x])^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\left(-\frac{9\,\text{Cot}[c]}{10\,d}+\frac{\text{Cos}[d\,x]\,\text{Sin}[c]}{4\,d}+\frac{\text{Cos}[2\,d\,x]\,\text{Sin}[2\,c]}{40\,d}+\frac{\text{Cos}[c]\,\text{Sin}[d\,x]}{4\,d}+\frac{\text{Cos}[2\,c]\,\text{Sin}[2\,d\,x]}{40\,d}\right)-$$

$$\frac{1}{2\,d\,\sqrt{1+\text{Cot}[c]^2}}(a+a\,\text{Cos}[c+d\,x])^3\,\text{Csc}[c]$$

$$\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$

$$\sqrt{-\sqrt{1+\text{Cot}[c]^2}\;\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\;\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\;-$$

$$\frac{1}{20\,d}9\,(a+a\,\text{Cos}[c+d\,x])^3\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6$$

$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\right.\right.$$

$$\left.\text{Tan}[c]\right)\Big/\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\;\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$

$$\left.\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\;\sqrt{1+\text{Tan}[c]^2}\right)-$$

$$\left.\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 163: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{(a+a\,\text{Cos}[c+d\,x])^3}{\text{Cos}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 4, 91 leaves, 8 steps):

$$\frac{4 a^3 \text{EllipticE}\left[\frac{1}{2}(c+d x), 2\right]}{d}+\frac{20 a^3 \text{EllipticF}\left[\frac{1}{2}(c+d x), 2\right]}{3 d}+\frac{2 a^3 \text{Sin}[c+d x]}{d \sqrt{\text{Cos}[c+d x]}}+\frac{2 a^3 \sqrt{\text{Cos}[c+d x]}\, \text{Sin}[c+d x]}{3 d}$$

Result (type 5, 465 leaves):

$$\sqrt{\text{Cos}[c+d x]}\, (a+a \text{Cos}[c+d x])^3\, \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^6 \left(-\frac{(1+3 \text{Cos}[2 c])\, \text{Csc}[c]\, \text{Sec}[c]}{8 d}+\frac{\text{Cos}[d x]\, \text{Sin}[c]}{12 d}+\frac{\text{Cos}[c]\, \text{Sin}[d x]}{12 d}+\frac{\text{Sec}[c]\, \text{Sec}[c+d x]\, \text{Sin}[d x]}{4 d}\right)-\frac{1}{6 d \sqrt{1+\text{Cot}[c]^2}}$$

$$5\, (a+a \text{Cos}[c+d x])^3\, \text{Csc}[c]\, \text{HypergeometricPFQ}\left[\left\{\frac{1}{4}, \frac{1}{2}\right\}, \left\{\frac{5}{4}\right\}, \text{Sin}[d x-\text{ArcTan}[\text{Cot}[c]]]^2\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^6 \text{Sec}[d x-\text{ArcTan}[\text{Cot}[c]]]\, \sqrt{1-\text{Sin}[d x-\text{ArcTan}[\text{Cot}[c]]]}\, \sqrt{-\sqrt{1+\text{Cot}[c]^2}\, \text{Sin}[c]\, \text{Sin}[d x-\text{ArcTan}[\text{Cot}[c]]]}\, \sqrt{1+\text{Sin}[d x-\text{ArcTan}[\text{Cot}[c]]]}-$$

$$\frac{1}{4 d} (a+a \text{Cos}[c+d x])^3\, \text{Csc}[c]\, \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^6 \left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2}, -\frac{1}{4}\right\}, \left\{\frac{3}{4}\right\}, \text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]^2\right] \text{Sin}[d x+\text{ArcTan}[\text{Tan}[c]]]\, \text{Tan}[c]\right) \Big/ \left(\sqrt{1-\text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]}\, \sqrt{1+\text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]}\, \sqrt{\text{Cos}[c]\, \text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]\, \sqrt{1+\text{Tan}[c]^2}}\, \sqrt{1+\text{Tan}[c]^2}\right)-\frac{\frac{\text{Sin}[d x+\text{ArcTan}[\text{Tan}[c]]]\, \text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2 \text{Cos}[c]^2 \text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]\, \sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\, \text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]\, \sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 164: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{(a+a \text{Cos}[c+d x])^3}{\text{Cos}[c+d x]^{5/2}}\, dx$$

Optimal (type 4, 91 leaves, 8 steps):

$$-\frac{4\,a^3\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{d}+\frac{20\,a^3\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{3\,d}+\frac{2\,a^3\,\text{Sin}[c+d\,x]}{3\,d\,\text{Cos}[c+d\,x]^{3/2}}+\frac{6\,a^3\,\text{Sin}[c+d\,x]}{d\,\sqrt{\text{Cos}[c+d\,x]}}$$

Result (type 5, 463 leaves):

$$\sqrt{\text{Cos}[c+d\,x]}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\left(-\frac{(-5+\text{Cos}[2\,c])\,\text{Csc}[c]\,\text{Sec}[c]}{8\,d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]^2\,\text{Sin}[d\,x]}{12\,d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]\,(\text{Sin}[c]+9\,\text{Sin}[d\,x])}{12\,d}\right)-\frac{1}{6\,d\,\sqrt{1+\text{Cot}[c]^2}}$$

$$5\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Csc}[c]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\,\frac{1}{2}\right\},\,\left\{\frac{5}{4}\right\},\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$
$$\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}+$$
$$\frac{1}{4\,d}\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6$$
$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},\,-\frac{1}{4}\right\},\,\left\{\frac{3}{4}\right\},\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\,\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\right.\right.$$
$$\left.\text{Tan}[c]\right)\Big/\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$
$$\left.\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\,\sqrt{1+\text{Tan}[c]^2}\right)-$$
$$\left.\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 165: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^3}{\text{Cos}[c+d\,x]^{7/2}}\,dx$$

Optimal (type 4, 117 leaves, 10 steps):

$$-\frac{36 a^3 \text{EllipticE}\left[\frac{1}{2} (c+d x),2\right]}{5 d}+\frac{4 a^3 \text{EllipticF}\left[\frac{1}{2} (c+d x),2\right]}{d}+\frac{2 a^3 \text{Sin}[c+d x]}{5 d \text{Cos}[c+d x]^{5/2}}+\frac{2 a^3 \text{Sin}[c+d x]}{d \text{Cos}[c+d x]^{3/2}}+\frac{36 a^3 \text{Sin}[c+d x]}{5 d \sqrt{\text{Cos}[c+d x]}}$$

Result (type 5, 485 leaves):

$$\sqrt{\text{Cos}[c+d x]} \left(a+a \text{Cos}[c+d x]\right)^3 \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^6 \left(\frac{9 \text{Csc}[c] \text{Sec}[c]}{10 d}+\frac{\text{Sec}[c] \text{Sec}[c+d x]^3 \text{Sin}[d x]}{20 d}+\frac{\text{Sec}[c] \text{Sec}[c+d x]^2 \left(\text{Sin}[c]+5 \text{Sin}[d x]\right)}{20 d}+\frac{\text{Sec}[c] \text{Sec}[c+d x] \left(5 \text{Sin}[c]+18 \text{Sin}[d x]\right)}{20 d}\right)-\frac{1}{2 d \sqrt{1+\text{Cot}[c]^2}}$$

$$\left(a+a \text{Cos}[c+d x]\right)^3 \text{Csc}[c] \text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d x-\text{ArcTan}[\text{Cot}[c]]]^2\right]$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^6 \text{Sec}[d x-\text{ArcTan}[\text{Cot}[c]]] \sqrt{1-\text{Sin}[d x-\text{ArcTan}[\text{Cot}[c]]]}$$

$$\sqrt{-\sqrt{1+\text{Cot}[c]^2} \text{Sin}[c] \text{Sin}[d x-\text{ArcTan}[\text{Cot}[c]]]} \sqrt{1+\text{Sin}[d x-\text{ArcTan}[\text{Cot}[c]]]}+$$

$$\frac{1}{20 d}9 \left(a+a \text{Cos}[c+d x]\right)^3 \text{Csc}[c] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^6$$

$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]^2\right] \text{Sin}[d x+\text{ArcTan}[\text{Tan}[c]]]\right.\right.$$

$$\left.\text{Tan}[c]\right) \Big/ \left(\sqrt{1-\text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]} \sqrt{1+\text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$

$$\left.\sqrt{\text{Cos}[c] \text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]] \sqrt{1+\text{Tan}[c]^2}} \sqrt{1+\text{Tan}[c]^2}\right)-$$

$$\left.\frac{\frac{\text{Sin}[d x+\text{ArcTan}[\text{Tan}[c]]] \text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2 \text{Cos}[c]^2 \text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]] \sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c] \text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]] \sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 166: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{(a + a \operatorname{Cos}[c + d x])^3}{\operatorname{Cos}[c + d x]^{9/2}} \, dx$$

Optimal (type 4, 147 leaves, 12 steps):

$$-\frac{28 a^3 \operatorname{EllipticE}\left[\frac{1}{2} (c + d x), 2\right]}{5 d} + \frac{52 a^3 \operatorname{EllipticF}\left[\frac{1}{2} (c + d x), 2\right]}{21 d} + \frac{2 a^3 \operatorname{Sin}[c + d x]}{7 d \operatorname{Cos}[c + d x]^{7/2}} + \frac{6 a^3 \operatorname{Sin}[c + d x]}{5 d \operatorname{Cos}[c + d x]^{5/2}} + \frac{52 a^3 \operatorname{Sin}[c + d x]}{21 d \operatorname{Cos}[c + d x]^{3/2}} + \frac{28 a^3 \operatorname{Sin}[c + d x]}{5 d \sqrt{\operatorname{Cos}[c + d x]}}$$

Result (type 5, 515 leaves):

$$\sqrt{\text{Cos}[c+d\,x]}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\left(\frac{7\,\text{Csc}[c]\,\text{Sec}[c]}{10\,d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]^4\,\text{Sin}[d\,x]}{28\,d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]^3\,\left(5\,\text{Sin}[c]+21\,\text{Sin}[d\,x]\right)}{140\,d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]^2\,\left(63\,\text{Sin}[c]+130\,\text{Sin}[d\,x]\right)}{420\,d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]\,\left(65\,\text{Sin}[c]+147\,\text{Sin}[d\,x]\right)}{210\,d}\right)-$$

$$\left(13\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Csc}[c]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\right)\Big/\left(42\,d\,\sqrt{1+\text{Cot}[c]^2}\right)+\frac{1}{20\,d}7\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6$$

$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\,\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]\right)\Big/\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\,\sqrt{1+\text{Tan}[c]^2}\right)-\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 167: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \text{Cos}[c+d\,x]^{3/2}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,dx$$

Optimal (type 4, 173 leaves, 16 steps):

$$\frac{128\,a^4\,\text{EllipticE}\left[\frac{1}{2}\left(c+d\,x\right),2\right]}{15\,d}+\frac{904\,a^4\,\text{EllipticF}\left[\frac{1}{2}\left(c+d\,x\right),2\right]}{231\,d}+\frac{904\,a^4\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{231\,d}+\frac{128\,a^4\,\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{45\,d}+\frac{150\,a^4\,\text{Cos}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{77\,d}+\frac{8\,a^4\,\text{Cos}[c+d\,x]^{7/2}\,\text{Sin}[c+d\,x]}{9\,d}+\frac{2\,a^4\,\text{Cos}[c+d\,x]^{9/2}\,\text{Sin}[c+d\,x]}{11\,d}$$

Result (type 5, 564 leaves):

$$\sqrt{\text{Cos}[c+d\,x]}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8\left(-\frac{8\,\text{Cot}[c]}{15\,d}+\frac{4087\,\text{Cos}[d\,x]\,\text{Sin}[c]}{14784\,d}+\frac{37\,\text{Cos}[2\,d\,x]\,\text{Sin}[2\,c]}{360\,d}+\frac{321\,\text{Cos}[3\,d\,x]\,\text{Sin}[3\,c]}{9856\,d}+\frac{\text{Cos}[4\,d\,x]\,\text{Sin}[4\,c]}{144\,d}+\frac{\text{Cos}[5\,d\,x]\,\text{Sin}[5\,c]}{1408\,d}+\frac{4087\,\text{Cos}[c]\,\text{Sin}[d\,x]}{14784\,d}+\frac{37\,\text{Cos}[2\,c]\,\text{Sin}[2\,d\,x]}{360\,d}+\frac{321\,\text{Cos}[3\,c]\,\text{Sin}[3\,d\,x]}{9856\,d}+\frac{\text{Cos}[4\,c]\,\text{Sin}[4\,d\,x]}{144\,d}+\frac{\text{Cos}[5\,c]\,\text{Sin}[5\,d\,x]}{1408\,d}\right)-$$

$$\left(113\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Csc}[c]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\right)\Big/\left(462\,d\,\sqrt{1+\text{Cot}[c]^2}\right)-\frac{1}{15\,d}4\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8$$

$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\,\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]\right)\Big/\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\,\sqrt{1+\text{Tan}[c]^2}\right)-\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 168: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \sqrt{\text{Cos}[c+d\,x]}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,dx$$

Optimal (type 4, 147 leaves, 13 steps):

$$\frac{152\,a^4\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{15\,d}+\frac{32\,a^4\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{7\,d}+\frac{32\,a^4\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{7\,d}+\frac{122\,a^4\,\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{45\,d}+\frac{8\,a^4\,\text{Cos}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{7\,d}+\frac{2\,a^4\,\text{Cos}[c+d\,x]^{7/2}\,\text{Sin}[c+d\,x]}{9\,d}$$

Result (type 5, 532 leaves):

$$\sqrt{\text{Cos}[c+d\,x]}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8$$
$$\left(-\frac{19\,\text{Cot}[c]}{30\,d}+\frac{17\,\text{Cos}[d\,x]\,\text{Sin}[c]}{56\,d}+\frac{127\,\text{Cos}[2\,d\,x]\,\text{Sin}[2\,c]}{1440\,d}+\frac{\text{Cos}[3\,d\,x]\,\text{Sin}[3\,c]}{56\,d}+\right.$$
$$\frac{\text{Cos}[4\,d\,x]\,\text{Sin}[4\,c]}{576\,d}+\frac{17\,\text{Cos}[c]\,\text{Sin}[d\,x]}{56\,d}+\frac{127\,\text{Cos}[2\,c]\,\text{Sin}[2\,d\,x]}{1440\,d}+$$
$$\left.\frac{\text{Cos}[3\,c]\,\text{Sin}[3\,d\,x]}{56\,d}+\frac{\text{Cos}[4\,c]\,\text{Sin}[4\,d\,x]}{576\,d}\right)-\frac{1}{7\,d\,\sqrt{1+\text{Cot}[c]^2}}$$
$$2\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Csc}[c]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$
$$\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,-$$
$$\frac{1}{60\,d}19\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8$$
$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\,\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\right.\right.$$
$$\left.\text{Tan}[c]\right)\Big/\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$
$$\left.\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\,\sqrt{1+\text{Tan}[c]^2}\right)-$$
$$\left.\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 169: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^4}{\sqrt{\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 121 leaves, 11 steps):

$$\frac{64 a^4 \text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]}{5 d}+\frac{136 a^4 \text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]}{21 d}+\frac{94 a^4 \sqrt{\text{Cos}[c+d x]}\, \text{Sin}[c+d x]}{21 d}+\frac{8 a^4 \text{Cos}[c+d x]^{3/2} \text{Sin}[c+d x]}{5 d}+\frac{2 a^4 \text{Cos}[c+d x]^{5/2} \text{Sin}[c+d x]}{7 d}$$

Result (type 5, 500 leaves):

$$\sqrt{\text{Cos}[c+d x]}\, (a+a \text{Cos}[c+d x])^4 \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^8 \left(-\frac{4 \text{Cot}[c]}{5 d}+\frac{191 \text{Cos}[d x] \text{Sin}[c]}{672 d}+\frac{\text{Cos}[2 d x] \text{Sin}[2 c]}{20 d}+\frac{\text{Cos}[3 d x] \text{Sin}[3 c]}{224 d}+\frac{191 \text{Cos}[c] \text{Sin}[d x]}{672 d}+\frac{\text{Cos}[2 c] \text{Sin}[2 d x]}{20 d}+\frac{\text{Cos}[3 c] \text{Sin}[3 d x]}{224 d}\right)-$$

$$\left(17 (a+a \text{Cos}[c+d x])^4 \text{Csc}[c] \text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d x-\text{ArcTan}[\text{Cot}[c]]]^2\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^8 \text{Sec}[d x-\text{ArcTan}[\text{Cot}[c]]] \sqrt{1-\text{Sin}[d x-\text{ArcTan}[\text{Cot}[c]]]} \sqrt{-\sqrt{1+\text{Cot}[c]^2}\, \text{Sin}[c] \text{Sin}[d x-\text{ArcTan}[\text{Cot}[c]]]} \sqrt{1+\text{Sin}[d x-\text{ArcTan}[\text{Cot}[c]]]}\right) \Big/ \left(42 d \sqrt{1+\text{Cot}[c]^2}\right)-\frac{1}{5 d} 2 (a+a \text{Cos}[c+d x])^4 \text{Csc}[c] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^8$$

$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]^2\right] \text{Sin}[d x+\text{ArcTan}[\text{Tan}[c]]] \text{Tan}[c]\right) \Big/ \left(\sqrt{1-\text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]} \sqrt{1+\text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]]} \sqrt{\text{Cos}[c] \text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]] \sqrt{1+\text{Tan}[c]^2}} \sqrt{1+\text{Tan}[c]^2}\right)-\frac{\frac{\text{Sin}[d x+\text{ArcTan}[\text{Tan}[c]]] \text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2 \text{Cos}[c]^2 \text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]] \sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c] \text{Cos}[d x+\text{ArcTan}[\text{Tan}[c]]] \sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 170: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{(a+a \text{Cos}[c+d x])^4}{\text{Cos}[c+d x]^{3/2}} \, dx$$

Optimal (type 4, 119 leaves, 10 steps):

$$\frac{56\,a^4\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{5\,d}+\frac{32\,a^4\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{3\,d}+\frac{2\,a^4\,\text{Sin}[c+d\,x]}{d\,\sqrt{\text{Cos}[c+d\,x]}}+\frac{8\,a^4\,\sqrt{\text{Cos}[c+d\,x]}\,\,\text{Sin}[c+d\,x]}{3\,d}+\frac{2\,a^4\,\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{5\,d}$$

Result (type 5, 497 leaves):

$$\sqrt{\text{Cos}[c+d\,x]}\,\,(a+a\,\text{Cos}[c+d\,x])^4\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8\left(-\frac{(23+33\,\text{Cos}[2\,c])\,\,\text{Csc}[c]\,\,\text{Sec}[c]}{80\,d}+\frac{\text{Cos}[d\,x]\,\,\text{Sin}[c]}{6\,d}+\frac{\text{Cos}[2\,d\,x]\,\,\text{Sin}[2\,c]}{80\,d}+\frac{\text{Cos}[c]\,\,\text{Sin}[d\,x]}{6\,d}+\frac{\text{Sec}[c]\,\,\text{Sec}[c+d\,x]\,\,\text{Sin}[d\,x]}{8\,d}+\frac{\text{Cos}[2\,c]\,\,\text{Sin}[2\,d\,x]}{80\,d}\right)-\frac{1}{3\,d\,\sqrt{1+\text{Cot}[c]^2}}$$
$$2\,(a+a\,\text{Cos}[c+d\,x])^4\,\text{Csc}[c]\,\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\,\frac{1}{2}\right\},\,\left\{\frac{5}{4}\right\},\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$
$$\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\,\text{Sin}[c]\,\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\,\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,-$$
$$\frac{1}{20\,d}7\,(a+a\,\text{Cos}[c+d\,x])^4\,\text{Csc}[c]\,\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8$$
$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},\,-\frac{1}{4}\right\},\,\left\{\frac{3}{4}\right\},\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\,\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\right.\right.$$
$$\left.\text{Tan}[c]\right)\Big/\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\,\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$
$$\left.\sqrt{\text{Cos}[c]\,\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\,\sqrt{1+\text{Tan}[c]^2}}\,\,\sqrt{1+\text{Tan}[c]^2}\right)-$$
$$\left.\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\,\sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 172: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{(a + a \operatorname{Cos}[c + d x])^4}{\operatorname{Cos}[c + d x]^{7/2}} \, dx$$

Optimal (type 4, 121 leaves, 11 steps):

$$-\frac{56 a^4 \operatorname{EllipticE}\left[\frac{1}{2} (c + d x), 2\right]}{5 d} + \frac{32 a^4 \operatorname{EllipticF}\left[\frac{1}{2} (c + d x), 2\right]}{3 d} + \frac{2 a^4 \operatorname{Sin}[c + d x]}{5 d \operatorname{Cos}[c + d x]^{5/2}} + \frac{8 a^4 \operatorname{Sin}[c + d x]}{3 d \operatorname{Cos}[c + d x]^{3/2}} + \frac{66 a^4 \operatorname{Sin}[c + d x]}{5 d \sqrt{\operatorname{Cos}[c + d x]}}$$

Result (type 5, 495 leaves):

$$\sqrt{\text{Cos}[c+d\,x]}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8\,\left(-\frac{\left(-61+5\,\text{Cos}[2\,c]\right)\,\text{Csc}[c]\,\text{Sec}[c]}{80\,d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]^3\,\text{Sin}[d\,x]}{40\,d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]^2\,\left(3\,\text{Sin}[c]+20\,\text{Sin}[d\,x]\right)}{120\,d}+\frac{\text{Sec}[c]\,\text{Sec}[c+d\,x]\,\left(20\,\text{Sin}[c]+99\,\text{Sin}[d\,x]\right)}{120\,d}\right)-\frac{1}{3\,d\,\sqrt{1+\text{Cot}[c]^2}}$$

$$2\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Csc}[c]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]\,\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$

$$\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\,\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}+$$

$$\frac{1}{20\,d}7\,\left(a+a\,\text{Cos}[c+d\,x]\right)^4\,\text{Csc}[c]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8$$

$$\left(\left(\text{HypergeometricPFQ}\left[\left\{-\frac{1}{2},-\frac{1}{4}\right\},\left\{\frac{3}{4}\right\},\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]^2\right]\,\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\right.\right.$$

$$\left.\text{Tan}[c]\right)\Big/\left(\sqrt{1-\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\,\sqrt{1+\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]}\right.$$

$$\left.\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}\,\sqrt{1+\text{Tan}[c]^2}\right)-$$

$$\left.\frac{\frac{\text{Sin}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\text{Tan}[c]}{\sqrt{1+\text{Tan}[c]^2}}+\frac{2\,\text{Cos}[c]^2\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}{\text{Cos}[c]^2+\text{Sin}[c]^2}}{\sqrt{\text{Cos}[c]\,\text{Cos}[d\,x+\text{ArcTan}[\text{Tan}[c]]]\,\sqrt{1+\text{Tan}[c]^2}}}\right)$$

Problem 173: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^4}{\text{Cos}[c+d\,x]^{9/2}}\,dx$$

Optimal (type 4, 147 leaves, 13 steps):

$$-\frac{64\,a^4\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),2\right]}{5\,d}+\frac{136\,a^4\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]}{21\,d}+\frac{2\,a^4\,\text{Sin}[c+d\,x]}{7\,d\,\text{Cos}[c+d\,x]^{7/2}}+\frac{8\,a^4\,\text{Sin}[c+d\,x]}{5\,d\,\text{Cos}[c+d\,x]^{5/2}}+\frac{94\,a^4\,\text{Sin}[c+d\,x]}{21\,d\,\text{Cos}[c+d\,x]^{3/2}}+\frac{64\,a^4\,\text{Sin}[c+d\,x]}{5\,d\,\sqrt{\text{Cos}[c+d\,x]}}$$

Result (type 5, 515 leaves) :

$$\sqrt{\operatorname{Cos}[c+d x]}\ (a+a \operatorname{Cos}[c+d x])^4 \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^8 \left(\frac{4 \operatorname{Csc}[c] \operatorname{Sec}[c]}{5 d}+\frac{\operatorname{Sec}[c] \operatorname{Sec}[c+d x]^4 \operatorname{Sin}[d x]}{56 d}+\frac{\operatorname{Sec}[c] \operatorname{Sec}[c+d x]^3 (5 \operatorname{Sin}[c]+28 \operatorname{Sin}[d x])}{280 d}+\frac{\operatorname{Sec}[c] \operatorname{Sec}[c+d x]^2 (84 \operatorname{Sin}[c]+235 \operatorname{Sin}[d x])}{840 d}+\frac{\operatorname{Sec}[c] \operatorname{Sec}[c+d x] (235 \operatorname{Sin}[c]+672 \operatorname{Sin}[d x])}{840 d}\right)-$$

$$\left(17 (a+a \operatorname{Cos}[c+d x])^4 \operatorname{Csc}[c] \operatorname{HypergeometricPFQ}\left[\left\{\frac{1}{4}, \frac{1}{2}\right\}, \left\{\frac{5}{4}\right\}, \operatorname{Sin}[d x-\operatorname{ArcTan}[\operatorname{Cot}[c]]]^2\right] \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^8 \operatorname{Sec}[d x-\operatorname{ArcTan}[\operatorname{Cot}[c]]] \sqrt{1-\operatorname{Sin}[d x-\operatorname{ArcTan}[\operatorname{Cot}[c]]]} \sqrt{-\sqrt{1+\operatorname{Cot}[c]^2} \operatorname{Sin}[c] \operatorname{Sin}[d x-\operatorname{ArcTan}[\operatorname{Cot}[c]]]} \sqrt{1+\operatorname{Sin}[d x-\operatorname{ArcTan}[\operatorname{Cot}[c]]]}\right) \Big/ \left(42 d \sqrt{1+\operatorname{Cot}[c]^2}\right)+\frac{1}{5 d} 2 (a+a \operatorname{Cos}[c+d x])^4 \operatorname{Csc}[c] \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^8$$

$$\left(\left(\operatorname{HypergeometricPFQ}\left[\left\{-\frac{1}{2}, -\frac{1}{4}\right\}, \left\{\frac{3}{4}\right\}, \operatorname{Cos}[d x+\operatorname{ArcTan}[\operatorname{Tan}[c]]]^2\right] \operatorname{Sin}[d x+\operatorname{ArcTan}[\operatorname{Tan}[c]]] \operatorname{Tan}[c]\right) \Big/ \left(\sqrt{1-\operatorname{Cos}[d x+\operatorname{ArcTan}[\operatorname{Tan}[c]]]} \sqrt{1+\operatorname{Cos}[d x+\operatorname{ArcTan}[\operatorname{Tan}[c]]]} \sqrt{\operatorname{Cos}[c] \operatorname{Cos}[d x+\operatorname{ArcTan}[\operatorname{Tan}[c]]] \sqrt{1+\operatorname{Tan}[c]^2}} \sqrt{1+\operatorname{Tan}[c]^2}\right)-\frac{\frac{\operatorname{Sin}[d x+\operatorname{ArcTan}[\operatorname{Tan}[c]]] \operatorname{Tan}[c]}{\sqrt{1+\operatorname{Tan}[c]^2}}+\frac{2 \operatorname{Cos}[c]^2 \operatorname{Cos}[d x+\operatorname{ArcTan}[\operatorname{Tan}[c]]] \sqrt{1+\operatorname{Tan}[c]^2}}{\operatorname{Cos}[c]^2+\operatorname{Sin}[c]^2}}{\sqrt{\operatorname{Cos}[c] \operatorname{Cos}[d x+\operatorname{ArcTan}[\operatorname{Tan}[c]]] \sqrt{1+\operatorname{Tan}[c]^2}}}\right)$$

Problem 174: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{Cos}[c+d x]^{7/2}}{a+a \operatorname{Cos}[c+d x]} \, dx$$

Optimal (type 4, 128 leaves, 6 steps) :

$$\frac{21\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{5\,a\,d}-\frac{5\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{3\,a\,d}-\frac{5\,\sqrt{\text{Cos}[c+d\,x]}\,\,\text{Sin}[c+d\,x]}{3\,a\,d}+\frac{7\,\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{5\,a\,d}-\frac{\text{Cos}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{d\,(a+a\,\text{Cos}[c+d\,x])}$$

Result (type 5, 315 leaves):

$$\frac{1}{15\,a\,(1+\text{Cos}[c+d\,x])}\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\left(\left(2\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\left(63\,\left(1+e^{2\,i\,(c+d\,x)}\right)+63\,\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\,\frac{1}{2},\,\frac{3}{4},\,-e^{2\,i\,(c+d\,x)}\right]+25\,e^{i\,(c+d\,x)}\,\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{5}{4},\,-e^{2\,i\,(c+d\,x)}\right]\right)\right)\Big/\left(d\,\left(-1+e^{2\,i\,c}\right)\sqrt{e^{-i\,(c+d\,x)}\,\left(1+e^{2\,i\,(c+d\,x)}\right)}\right)-\frac{1}{d}2\,\sqrt{\text{Cos}[c+d\,x]}\,\,\text{Csc}[c]\left(15+10\,\text{Cos}[d\,x]\,\text{Sin}[c]^2-6\,\text{Cos}[c]\,\left(-8+\text{Cos}[2\,d\,x]\,\text{Sin}[c]^2\right)+30\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]\,\text{Sin}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]+5\,\text{Sin}[2\,c]\,\text{Sin}[d\,x]-3\,\text{Cos}[2\,c]\,\text{Sin}[c]\,\text{Sin}[2\,d\,x]\right)\right)$$

Problem 175: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\text{Cos}[c+d\,x]^{5/2}}{a+a\,\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 4, 100 leaves, 5 steps):

$$-\frac{3\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{a\,d}+\frac{5\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]}{3\,a\,d}+\frac{5\,\sqrt{\text{Cos}[c+d\,x]}\,\,\text{Sin}[c+d\,x]}{3\,a\,d}-\frac{\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{d\,(a+a\,\text{Cos}[c+d\,x])}$$

Result (type 5, 289 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\left(-\left(\left(2\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\left(9\left(1+e^{2\,i\,(c+d\,x)}\right)+9\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+5\,e^{i\,(c+d\,x)}\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)\right)\Big/\left(d\left(-1+e^{2\,i\,c}\right)\sqrt{e^{-i\,(c+d\,x)}\left(1+e^{2\,i\,(c+d\,x)}\right)}\right)\right)+\frac{1}{d}2\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c]\left(3+6\,\text{Cos}[c]+2\,\text{Cos}[d\,x]\,\text{Sin}[c]^2+6\,\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]\text{Sin}\left[\frac{c}{2}\right]\text{Sin}\left[\frac{d\,x}{2}\right]+\text{Sin}[2\,c]\,\text{Sin}[d\,x]\right)\right)\right)\Big/\left(3\,a\left(1+\text{Cos}[c+d\,x]\right)\right)$$

Problem 176: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{\text{Cos}[c+d\,x]^{3/2}}{a+a\,\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 4, 72 leaves, 4 steps):

$$\frac{3\,\text{EllipticE}\left[\frac{1}{2}(c+d\,x),2\right]}{a\,d}-\frac{\text{EllipticF}\left[\frac{1}{2}(c+d\,x),2\right]}{a\,d}-\frac{\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d\left(a+a\,\text{Cos}[c+d\,x]\right)}$$

Result (type 5, 264 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\left(\left(2\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\left(3\left(1+e^{2\,i\,(c+d\,x)}\right)+3\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+e^{i\,(c+d\,x)}\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)\right)\Big/\left(d\left(-1+e^{2\,i\,c}\right)\sqrt{e^{-i\,(c+d\,x)}\left(1+e^{2\,i\,(c+d\,x)}\right)}\right)-\frac{1}{d}2\sqrt{\text{Cos}[c+d\,x]}\left(2\,\text{Cot}[c]+\text{Csc}[c]+\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]\text{Sin}\left[\frac{d\,x}{2}\right]\right)\right)\right)\Big/\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)$$

Problem 177: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{\text{Cos}[c+d\,x]}}{a+a\,\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 4, 70 leaves, 4 steps):

$$-\frac{\text{EllipticE}\left[\frac{1}{2}(c+d\,x),2\right]}{a\,d}+\frac{\text{EllipticF}\left[\frac{1}{2}(c+d\,x),2\right]}{a\,d}+\frac{\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d\left(a+a\,\text{Cos}[c+d\,x]\right)}$$

Result (type 5, 256 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\left(-\left(\left(2\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\left(1+e^{2\,i\,(c+d\,x)}+\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+e^{i\,(c+d\,x)}\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)\right)\Big/\left(d\left(-1+e^{2\,i\,c}\right)\sqrt{e^{-i\,(c+d\,x)}\left(1+e^{2\,i\,(c+d\,x)}\right)}\right)\right)+\frac{2\sqrt{\text{Cos}[c+d\,x]}\left(\text{Csc}[c]+\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]\text{Sin}\left[\frac{d\,x}{2}\right]\right)}{d}\right)\right)\Big/\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)$$

Problem 178: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{\text{Cos}[c+d\,x]}\,\left(a+a\,\text{Cos}[c+d\,x]\right)}\,dx$$

Optimal (type 4, 70 leaves, 4 steps):

$$\frac{\text{EllipticE}\left[\frac{1}{2}(c+d\,x),2\right]}{a\,d}+\frac{\text{EllipticF}\left[\frac{1}{2}(c+d\,x),2\right]}{a\,d}-\frac{\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d\left(a+a\,\text{Cos}[c+d\,x]\right)}$$

Result (type 5, 257 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\left(\left(2\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\left(1+e^{2\,i\,(c+d\,x)}+\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]-e^{i\,(c+d\,x)}\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)\right)\Big/\left(d\left(-1+e^{2\,i\,c}\right)\sqrt{e^{-i\,(c+d\,x)}\left(1+e^{2\,i\,(c+d\,x)}\right)}\right)-\frac{2\sqrt{\text{Cos}[c+d\,x]}\left(\text{Csc}[c]+\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]\text{Sin}\left[\frac{d\,x}{2}\right]\right)}{d}\right)\right)\Big/\left(a\left(1+\text{Cos}[c+d\,x]\right)\right)$$

Problem 179: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{1}{\operatorname{Cos}[c+d x]^{3/2}\,(a+a\operatorname{Cos}[c+d x])}\,dx$$

Optimal (type 4, 96 leaves, 5 steps):

$$-\frac{3\,\text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]}{a d}-\frac{\text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]}{a d}+\frac{3\,\operatorname{Sin}[c+d x]}{a d\sqrt{\operatorname{Cos}[c+d x]}}-\frac{\operatorname{Sin}[c+d x]}{d\sqrt{\operatorname{Cos}[c+d x]}\,(a+a\operatorname{Cos}[c+d x])}$$

Result (type 5, 297 leaves):

$$\left(\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]^2\left(-\left(\left(2\,i\sqrt{2}\,e^{-i(c+d x)}\left(3\left(1+e^{2 i(c+d x)}\right)+3\left(-1+e^{2 i c}\right)\sqrt{1+e^{2 i(c+d x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2 i(c+d x)}\right]-e^{i(c+d x)}\left(-1+e^{2 i c}\right)\sqrt{1+e^{2 i(c+d x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2 i(c+d x)}\right]\right)\right)\Big/\left(d\left(-1+e^{2 i c}\right)\sqrt{e^{-i(c+d x)}\left(1+e^{2 i(c+d x)}\right)}\right)\right)+\left(\left(2\operatorname{Cos}\left[\frac{1}{2}(c-d x)\right]+\operatorname{Cos}\left[\frac{1}{2}(3 c+d x)\right]+3\operatorname{Cos}\left[\frac{1}{2}(c+3 d x)\right]\right)\operatorname{Csc}\left[\frac{c}{2}\right]\operatorname{Sec}\left[\frac{c}{2}\right]\operatorname{Sec}\left[\frac{1}{2}(c+d x)\right]\right)\Big/\left(2 d\sqrt{\operatorname{Cos}[c+d x]}\right)\right)\right)\Big/\left(a\left(1+\operatorname{Cos}[c+d x]\right)\right)$$

Problem 180: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{1}{\operatorname{Cos}[c+d x]^{5/2}\,(a+a\operatorname{Cos}[c+d x])}\,dx$$

Optimal (type 4, 124 leaves, 6 steps):

$$\frac{3\,\text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]}{a d}+\frac{5\,\text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]}{3 a d}+\frac{5\,\operatorname{Sin}[c+d x]}{3 a d\operatorname{Cos}[c+d x]^{3/2}}-\frac{3\,\operatorname{Sin}[c+d x]}{a d\sqrt{\operatorname{Cos}[c+d x]}}-\frac{\operatorname{Sin}[c+d x]}{d\operatorname{Cos}[c+d x]^{3/2}\,(a+a\operatorname{Cos}[c+d x])}$$

Result (type 5, 332 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]^2\left(\left(2 i \sqrt{2}\, e^{-i (c+d x)}\left(9\left(1+e^{2 i (c+d x)}\right)+9\left(-1+e^{2 i c}\right) \sqrt{1+e^{2 i (c+d x)}}\, \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2 i (c+d x)}\right]-5\, e^{i (c+d x)}\left(-1+e^{2 i c}\right) \sqrt{1+e^{2 i (c+d x)}}\, \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2 i (c+d x)}\right]\right)\right)\Big/\left(d\left(-1+e^{2 i c}\right) \sqrt{e^{-i (c+d x)}\left(1+e^{2 i (c+d x)}\right)}\right)-\left(\left(10\, \text{Cos}\left[\frac{1}{2}(c-d x)\right]+8\, \text{Cos}\left[\frac{1}{2}(3 c+d x)\right]+4\, \text{Cos}\left[\frac{1}{2}(c+3 d x)\right]+5\, \text{Cos}\left[\frac{1}{2}(5 c+3 d x)\right]+9\, \text{Cos}\left[\frac{1}{2}(3 c+5 d x)\right]\right) \text{Csc}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{1}{2}(c+d x)\right]\right)\Big/\left(4\, d\, \text{Cos}[c+d x]^{3/2}\right)\right)\right)\Big/\left(3\, a\left(1+\text{Cos}[c+d x]\right)\right)$$

Problem 181: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\text{Cos}[c+d x]^{9/2}}{\left(a+a\, \text{Cos}[c+d x]\right)^2}\, dx$$

Optimal (type 4, 160 leaves, 7 steps):

$$\frac{56\, \text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]}{5 a^2 d}-\frac{5\, \text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]}{a^2 d}-\frac{5 \sqrt{\text{Cos}[c+d x]}\, \text{Sin}[c+d x]}{a^2 d}+\frac{56\, \text{Cos}[c+d x]^{3/2}\, \text{Sin}[c+d x]}{15 a^2 d}-\frac{3\, \text{Cos}[c+d x]^{5/2}\, \text{Sin}[c+d x]}{a^2 d\left(1+\text{Cos}[c+d x]\right)}-\frac{\text{Cos}[c+d x]^{7/2}\, \text{Sin}[c+d x]}{3 d\left(a+a\, \text{Cos}[c+d x]\right)^2}$$

Result (type 5, 367 leaves):

$$\frac{1}{5 a^2\left(1+\text{Cos}[c+d x]\right)^2}\text{Cos}\left[\frac{1}{2}(c+d x)\right]^4\left(\left(4 i \sqrt{2}\, e^{-i (c+d x)}\left(56\left(1+e^{2 i (c+d x)}\right)+56\left(-1+e^{2 i c}\right) \sqrt{1+e^{2 i (c+d x)}}\, \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2 i (c+d x)}\right]+25\, e^{i (c+d x)}\left(-1+e^{2 i c}\right) \sqrt{1+e^{2 i (c+d x)}}\, \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2 i (c+d x)}\right]\right)\right)\Big/\left(d\left(-1+e^{2 i c}\right) \sqrt{e^{-i (c+d x)}\left(1+e^{2 i (c+d x)}\right)}\right)-\frac{1}{3 d}2 \sqrt{\text{Cos}[c+d x]}\, \text{Csc}[c]\left(120+40\, \text{Cos}[d x]\, \text{Sin}[c]^2-6\, \text{Cos}[2 d x]\, \text{Sin}[c]\, \text{Sin}[2 c]+240\, \text{Sec}\left[\frac{1}{2}(c+d x)\right] \text{Sin}\left[\frac{c}{2}\right] \text{Sin}\left[\frac{d x}{2}\right]-10\, \text{Sec}\left[\frac{1}{2}(c+d x)\right]^3 \text{Sin}\left[\frac{c}{2}\right] \text{Sin}\left[\frac{d x}{2}\right]+8\, \text{Cos}[c]\left(27+5\, \text{Sin}[c]\, \text{Sin}[d x]\right)-6\, \text{Cos}[2 c]\, \text{Sin}[c]\, \text{Sin}[2 d x]-5\, \text{Sec}\left[\frac{1}{2}(c+d x)\right]^2 \text{Sin}[c]\, \text{Tan}\left[\frac{c}{2}\right]\right)\right)$$

Problem 182: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\text{Cos}[c+d x]^{7/2}}{(a+a\,\text{Cos}[c+d x])^2}\,dx$$

Optimal (type 4, 138 leaves, 6 steps):

$$-\frac{7\,\text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]}{a^2 d}+\frac{10\,\text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]}{3 a^2 d}+\frac{10\sqrt{\text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{3 a^2 d}-\frac{7\,\text{Cos}[c+d x]^{3/2}\,\text{Sin}[c+d x]}{3 a^2 d\,(1+\text{Cos}[c+d x])}-\frac{\text{Cos}[c+d x]^{5/2}\,\text{Sin}[c+d x]}{3 d\,(a+a\,\text{Cos}[c+d x])^2}$$

Result (type 5, 337 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]^4\left(-\left(\left(4\,i\sqrt{2}\,e^{-i(c+d x)}\left(21\left(1+e^{2 i (c+d x)}\right)+21\left(-1+e^{2 i c}\right)\sqrt{1+e^{2 i (c+d x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2 i (c+d x)}\right]+10\,e^{i (c+d x)}\left(-1+e^{2 i c}\right)\sqrt{1+e^{2 i (c+d x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2 i (c+d x)}\right]\right)\right)\Big/\left(d\left(-1+e^{2 i c}\right)\sqrt{e^{-i (c+d x)}\left(1+e^{2 i (c+d x)}\right)}\right)\right)+\frac{1}{2 d}\sqrt{\text{Cos}[c+d x]}\left(72\,\text{Cos}\left[\frac{1}{2}(c-d x)\right]+54\,\text{Cos}\left[\frac{1}{2}(3 c+d x)\right]+33\,\text{Cos}\left[\frac{1}{2}(c+3 d x)\right]+9\,\text{Cos}\left[\frac{1}{2}(5 c+3 d x)\right]+\text{Cos}\left[\frac{1}{2}(3 c+5 d x)\right]-\text{Cos}\left[\frac{1}{2}(7 c+5 d x)\right]\right)\text{Csc}[c]\,\text{Sec}\left[\frac{1}{2}(c+d x)\right]^3\right)\right)\Big/\left(3 a^2\left(1+\text{Cos}[c+d x]\right)^2\right)$$

Problem 183: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\text{Cos}[c+d x]^{5/2}}{(a+a\,\text{Cos}[c+d x])^2}\,dx$$

Optimal (type 4, 112 leaves, 5 steps):

$$\frac{4\,\text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]}{a^2 d}-\frac{5\,\text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]}{3 a^2 d}-\frac{5\sqrt{\text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{3 a^2 d\,(1+\text{Cos}[c+d x])}-\frac{\text{Cos}[c+d x]^{3/2}\,\text{Sin}[c+d x]}{3 d\,(a+a\,\text{Cos}[c+d x])^2}$$

Result (type 5, 319 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}\left(c+d\,x\right)\right]^4\right.$$
$$\left(\left(4\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\left(12\left(1+e^{2\,i\,(c+d\,x)}\right)+12\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\right.\right.\right.\right.$$
$$\left.-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+5\,e^{i\,(c+d\,x)}\left(-1+e^{2\,i\,c}\right)$$
$$\left.\left.\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)\right)\Big/$$
$$\left(d\left(-1+e^{2\,i\,c}\right)\sqrt{e^{-i\,(c+d\,x)}\left(1+e^{2\,i\,(c+d\,x)}\right)}\right)-\frac{1}{2\,d}\sqrt{\text{Cos}[c+d\,x]}$$
$$\left(20\,\text{Cos}\left[\frac{1}{2}\left(c-d\,x\right)\right]+16\,\text{Cos}\left[\frac{1}{2}\left(3\,c+d\,x\right)\right]+9\,\text{Cos}\left[\frac{1}{2}\left(c+3\,d\,x\right)\right]+3\,\text{Cos}\left[\frac{1}{2}\left(5\,c+3\,d\,x\right)\right]\right)$$
$$\left.\left.\text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^3\right)\right)\Big/\left(3\,a^2\left(1+\text{Cos}[c+d\,x]\right)^2\right)$$

Problem 184: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{\text{Cos}[c+d\,x]^{3/2}}{\left(a+a\,\text{Cos}[c+d\,x]\right)^2}\,dx$$

Optimal (type 4, 109 leaves, 5 steps):

$$-\frac{\text{EllipticE}\left[\frac{1}{2}\left(c+d\,x\right),2\right]}{a^2\,d}+\frac{2\,\text{EllipticF}\left[\frac{1}{2}\left(c+d\,x\right),2\right]}{3\,a^2\,d}+\frac{\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{a^2\,d\left(1+\text{Cos}[c+d\,x]\right)}-\frac{\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{3\,d\left(a+a\,\text{Cos}[c+d\,x]\right)^2}$$

Result (type 5, 640 leaves):

$$-\left(\left(\left(\mathrm{i}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\mathrm{Csc}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}\right]\right.\right.\right.$$

$$\left(\left(2\,e^{2\,\mathrm{i}\,d\,x}\,\mathrm{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},-e^{2\,\mathrm{i}\,d\,x}\left(\mathrm{Cos}[c]+\mathrm{i}\,\mathrm{Sin}[c]\right)^2\right]\right.\right.$$

$$\sqrt{e^{-\mathrm{i}\,d\,x}\left(2\left(1+e^{2\,\mathrm{i}\,d\,x}\right)\mathrm{Cos}[c]+2\,\mathrm{i}\left(-1+e^{2\,\mathrm{i}\,d\,x}\right)\mathrm{Sin}[c]\right)}$$

$$\left.\sqrt{1+e^{2\,\mathrm{i}\,d\,x}\,\mathrm{Cos}[2\,c]+\mathrm{i}\,e^{2\,\mathrm{i}\,d\,x}\,\mathrm{Sin}[2\,c]}\right)\Big/$$

$$\left(3\,\mathrm{i}\,d\left(1+e^{2\,\mathrm{i}\,d\,x}\right)\mathrm{Cos}[c]-3\,d\left(-1+e^{2\,\mathrm{i}\,d\,x}\right)\mathrm{Sin}[c]\right)-$$

$$\left(2\,\mathrm{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,\mathrm{i}\,d\,x}\left(\mathrm{Cos}[c]+\mathrm{i}\,\mathrm{Sin}[c]\right)^2\right]\right.$$

$$\sqrt{e^{-\mathrm{i}\,d\,x}\left(2\left(1+e^{2\,\mathrm{i}\,d\,x}\right)\mathrm{Cos}[c]+2\,\mathrm{i}\left(-1+e^{2\,\mathrm{i}\,d\,x}\right)\mathrm{Sin}[c]\right)}$$

$$\left.\sqrt{1+e^{2\,\mathrm{i}\,d\,x}\,\mathrm{Cos}[2\,c]+\mathrm{i}\,e^{2\,\mathrm{i}\,d\,x}\,\mathrm{Sin}[2\,c]}\right)\Big/$$

$$\left.\left.\left.\left(-\mathrm{i}\,d\left(1+e^{2\,\mathrm{i}\,d\,x}\right)\mathrm{Cos}[c]+d\left(-1+e^{2\,\mathrm{i}\,d\,x}\right)\mathrm{Sin}[c]\right)\right)\right)\Big/\left(2\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^2\right)\right)-$$

$$\left(4\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\mathrm{Csc}\left[\frac{c}{2}\right]\mathrm{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\right.\right.$$

$$\left.\mathrm{Sin}[d\,x-\mathrm{ArcTan}[\mathrm{Cot}[c]]]^2\right]$$

$$\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}[d\,x-\mathrm{ArcTan}[\mathrm{Cot}[c]]]$$

$$\sqrt{1-\mathrm{Sin}[d\,x-\mathrm{ArcTan}[\mathrm{Cot}[c]]]}$$

$$\sqrt{-\sqrt{1+\mathrm{Cot}[c]^2}\,\mathrm{Sin}[c]\,\mathrm{Sin}[d\,x-\mathrm{ArcTan}[\mathrm{Cot}[c]]]}$$

$$\left.\sqrt{1+\mathrm{Sin}[d\,x-\mathrm{ArcTan}[\mathrm{Cot}[c]]]}\right)\Big/$$

$$\left(3\,d\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^2\sqrt{1+\mathrm{Cot}[c]^2}\right)+$$

$$\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\sqrt{\mathrm{Cos}[c+d\,x]}\right.$$

$$\left(\frac{4\,\mathrm{Csc}[c]}{d}+\frac{4\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{d}-\frac{2\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{3\,d}-\right.$$

$$\left.\left.\frac{2\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\mathrm{Tan}\left[\frac{c}{2}\right]}{3\,d}\right)\right)\Big/\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^2$$

Problem 186: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{\mathrm{Cos}[c+d\,x]}\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^2}\,dx$$

Optimal (type 4, 109 leaves, 5 steps):

$$\frac{\text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]}{a^2 d}+\frac{2\,\text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]}{3 a^2 d}-\frac{\sqrt{\text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{a^2 d\,(1+\text{Cos}[c+d x])}-\frac{\sqrt{\text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{3 d\,(a+a\,\text{Cos}[c+d x])^2}$$

Result (type 5, 304 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]^4\left(\left(4 i \sqrt{2}\, e^{-i(c+d x)}\left(3\left(1+e^{2 i (c+d x)}\right)+3\left(-1+e^{2 i c}\right)\sqrt{1+e^{2 i (c+d x)}}\ \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2 i (c+d x)}\right]-2 e^{i (c+d x)}\left(-1+e^{2 i c}\right)\sqrt{1+e^{2 i (c+d x)}}\ \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2 i (c+d x)}\right]\right)\right)\Big/\left(d\left(-1+e^{2 i c}\right)\sqrt{e^{-i (c+d x)}\left(1+e^{2 i (c+d x)}\right)}\right)-\frac{1}{2 d}\sqrt{\text{Cos}[c+d x]}\left(7\,\text{Cos}\left[\frac{1}{2}(c-d x)\right]+2\,\text{Cos}\left[\frac{1}{2}(3 c+d x)\right]+3\,\text{Cos}\left[\frac{1}{2}(c+3 d x)\right]\right)\text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{1}{2}(c+d x)\right]^3\right)\right)\Big/\left(3 a^2\,(1+\text{Cos}[c+d x])^2\right)$$

Problem 187: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{1}{\text{Cos}[c+d x]^{3/2}\,(a+a\,\text{Cos}[c+d x])^2}\,dx$$

Optimal (type 4, 136 leaves, 6 steps):

$$-\frac{4\,\text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]}{a^2 d}-\frac{5\,\text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]}{3 a^2 d}+\frac{4\,\text{Sin}[c+d x]}{a^2 d\sqrt{\text{Cos}[c+d x]}}-\frac{5\,\text{Sin}[c+d x]}{3 a^2 d\sqrt{\text{Cos}[c+d x]}\,(1+\text{Cos}[c+d x])}-\frac{\text{Sin}[c+d x]}{3 d\sqrt{\text{Cos}[c+d x]}\,(a+a\,\text{Cos}[c+d x])^2}$$

Result (type 5, 334 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]^4\left(-\left(\left(4 i \sqrt{2}\, e^{-i(c+d x)}\left(12\left(1+e^{2 i(c+d x)}\right)+12\left(-1+e^{2 i c}\right)\sqrt{1+e^{2 i(c+d x)}}\ \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2 i(c+d x)}\right]-5 e^{i(c+d x)}\left(-1+e^{2 i c}\right)\sqrt{1+e^{2 i(c+d x)}}\ \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2 i(c+d x)}\right]\right)\right)\Big/\left(d\left(-1+e^{2 i c}\right)\sqrt{e^{-i(c+d x)}\left(1+e^{2 i(c+d x)}\right)}\right)\right)+\left(\left(29\,\text{Cos}\left[\frac{1}{2}(c-d x)\right]+19\,\text{Cos}\left[\frac{1}{2}(3 c+d x)\right]+31\,\text{Cos}\left[\frac{1}{2}(c+3 d x)\right]+5\,\text{Cos}\left[\frac{1}{2}(5 c+3 d x)\right]+12\,\text{Cos}\left[\frac{1}{2}(3 c+5 d x)\right]\right)\text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{1}{2}(c+d x)\right]^3\right)\Big/\left(4 d\sqrt{\text{Cos}[c+d x]}\right)\right)\Big/\left(3 a^2\left(1+\text{Cos}[c+d x]\right)^2\right)$$

Problem 188: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{1}{\text{Cos}[c+d x]^{5/2}\left(a+a\,\text{Cos}[c+d x]\right)^2}\,dx$$

Optimal (type 4, 162 leaves, 7 steps):

$$\frac{7\,\text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]}{a^2 d}+\frac{10\,\text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]}{3 a^2 d}+\frac{10\,\text{Sin}[c+d x]}{3 a^2 d\,\text{Cos}[c+d x]^{3/2}}-\frac{7\,\text{Sin}[c+d x]}{a^2 d\sqrt{\text{Cos}[c+d x]}}-\frac{7\,\text{Sin}[c+d x]}{3 a^2 d\,\text{Cos}[c+d x]^{3/2}\left(1+\text{Cos}[c+d x]\right)}-\frac{\text{Sin}[c+d x]}{3 d\,\text{Cos}[c+d x]^{3/2}\left(a+a\,\text{Cos}[c+d x]\right)^2}$$

Result (type 5, 425 leaves):

$$\left(4\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\left(21\,\left(1+e^{2\,i\,(c+d\,x)}\right)+\right.\right.$$
$$21\,\left(-1+e^{2\,i\,c}\right)\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\mathrm{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]-$$
$$\left.\left.10\,e^{i\,(c+d\,x)}\,\left(-1+e^{2\,i\,c}\right)\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\mathrm{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)\right)\Big/$$
$$\left(3\,d\,\left(-1+e^{2\,i\,c}\right)\,\sqrt{e^{-i\,(c+d\,x)}\,\left(1+e^{2\,i\,(c+d\,x)}\right)}\,\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^2\right)+$$
$$\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\sqrt{\mathrm{Cos}[c+d\,x]}\right.$$
$$\left(-\frac{2\,\left(4+3\,\mathrm{Cos}[c]\right)\,\mathrm{Csc}\left[\frac{c}{2}\right]\,\mathrm{Sec}\left[\frac{c}{2}\right]\,\mathrm{Sec}[c]}{d}-\frac{12\,\mathrm{Sec}\left[\frac{c}{2}\right]\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{d}-\right.$$
$$\frac{2\,\mathrm{Sec}\left[\frac{c}{2}\right]\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{3\,d}+\frac{8\,\mathrm{Sec}[c]\,\mathrm{Sec}[c+d\,x]\,\left(\mathrm{Sin}[c]-6\,\mathrm{Sin}[d\,x]\right)}{3\,d}+$$
$$\left.\left.\frac{8\,\mathrm{Sec}[c]\,\mathrm{Sec}[c+d\,x]^2\,\mathrm{Sin}[d\,x]}{3\,d}-\frac{2\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\mathrm{Tan}\left[\frac{c}{2}\right]}{3\,d}\right)\right)\Big/\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^2$$

Problem 189: Result unnecessarily involves higher level functions.

$$\int\frac{\mathrm{Cos}[c+d\,x]^{11/2}}{\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^3}\,dx$$

Optimal (type 4, 207 leaves, 8 steps):

$$\frac{231\,\mathrm{EllipticE}\left[\frac{1}{2}\,(c+d\,x),2\right]}{10\,a^3\,d}-\frac{21\,\mathrm{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]}{2\,a^3\,d}-$$
$$\frac{21\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{2\,a^3\,d}+\frac{77\,\mathrm{Cos}[c+d\,x]^{3/2}\,\mathrm{Sin}[c+d\,x]}{10\,a^3\,d}-$$
$$\frac{\mathrm{Cos}[c+d\,x]^{9/2}\,\mathrm{Sin}[c+d\,x]}{5\,d\,\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^3}-\frac{4\,\mathrm{Cos}[c+d\,x]^{7/2}\,\mathrm{Sin}[c+d\,x]}{5\,a\,d\,\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^2}-\frac{63\,\mathrm{Cos}[c+d\,x]^{5/2}\,\mathrm{Sin}[c+d\,x]}{10\,d\,\left(a^3+a^3\,\mathrm{Cos}[c+d\,x]\right)}$$

Result (type 5, 388 leaves):

$$\frac{1}{5 a^3 d \left(1+\text{Cos}[c+d x]\right)^3} 2 \,\text{Cos}\left[\frac{1}{2}\left(c+d x\right)\right]^6 \left(\left(42 \,i \sqrt{2}\, e^{-i (c+d x)} \left(11 \left(1+e^{2 i (c+d x)}\right)+11 \left(-1+e^{2 i c}\right) \sqrt{1+e^{2 i (c+d x)}}\right.\right.\right.$$
$$\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2 i (c+d x)}\right]+$$
$$\left.\left.5\, e^{i (c+d x)} \left(-1+e^{2 i c}\right) \sqrt{1+e^{2 i (c+d x)}}\ \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2 i (c+d x)}\right]\right)\right) \Big/$$
$$\left(\left(-1+e^{2 i c}\right) \sqrt{e^{-i (c+d x)} \left(1+e^{2 i (c+d x)}\right)}\right)-\sqrt{\text{Cos}[c+d x]}$$
$$\left(264 \,\text{Cot}[c]+198 \,\text{Csc}[c]+\frac{1}{16} \text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{1}{2}\left(c+d x\right)\right]^5 \left(1210 \,\text{Sin}\left[\frac{d x}{2}\right]-770 \,\text{Sin}\left[c+\frac{d x}{2}\right]+\right.\right.$$
$$840 \,\text{Sin}\left[c+\frac{3 d x}{2}\right]-150 \,\text{Sin}\left[2 c+\frac{3 d x}{2}\right]+238 \,\text{Sin}\left[2 c+\frac{5 d x}{2}\right]+40 \,\text{Sin}\left[3 c+\frac{5 d x}{2}\right]+$$
$$\left.\left.\left.5 \,\text{Sin}\left[3 c+\frac{7 d x}{2}\right]+5 \,\text{Sin}\left[4 c+\frac{7 d x}{2}\right]-\text{Sin}\left[4 c+\frac{9 d x}{2}\right]-\text{Sin}\left[5 c+\frac{9 d x}{2}\right]\right)\right)\right)$$

Problem 190: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\text{Cos}[c+d x]^{9/2}}{\left(a+a \,\text{Cos}[c+d x]\right)^3} \, dx$$

Optimal (type 4, 181 leaves, 7 steps):

$$-\frac{119 \,\text{EllipticE}\left[\frac{1}{2}\left(c+d x\right),2\right]}{10 a^3 d}+\frac{11 \,\text{EllipticF}\left[\frac{1}{2}\left(c+d x\right),2\right]}{2 a^3 d}+\frac{11 \sqrt{\text{Cos}[c+d x]}\ \text{Sin}[c+d x]}{2 a^3 d}-$$
$$\frac{\text{Cos}[c+d x]^{7/2} \,\text{Sin}[c+d x]}{5 d \left(a+a \,\text{Cos}[c+d x]\right)^3}-\frac{2 \,\text{Cos}[c+d x]^{5/2} \,\text{Sin}[c+d x]}{3 a d \left(a+a \,\text{Cos}[c+d x]\right)^2}-\frac{119 \,\text{Cos}[c+d x]^{3/2} \,\text{Sin}[c+d x]}{30 d \left(a^3+a^3 \,\text{Cos}[c+d x]\right)}$$

Result (type 5, 369 leaves):

$$\frac{1}{5\,a^3\,\left(1+\text{Cos}[c+d\,x]\right)^3}\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^6\left(-\left(\left(4\,\mathrm{i}\,\sqrt{2}\,e^{-\mathrm{i}\,(c+d\,x)}\,\left(119\,\left(1+e^{2\,\mathrm{i}\,(c+d\,x)}\right)+119\,\left(-1+e^{2\,\mathrm{i}\,c}\right)\right.\right.\right.\right.$$

$$\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\;\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,\mathrm{i}\,(c+d\,x)}\right]+$$

$$\left.\left.55\,e^{\mathrm{i}\,(c+d\,x)}\,\left(-1+e^{2\,\mathrm{i}\,c}\right)\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\;\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,\mathrm{i}\,(c+d\,x)}\right]\right)\right)\Big/$$

$$\left.\left(d\,\left(-1+e^{2\,\mathrm{i}\,c}\right)\sqrt{e^{-\mathrm{i}\,(c+d\,x)}\,\left(1+e^{2\,\mathrm{i}\,(c+d\,x)}\right)}\right)\right)+\frac{1}{12\,d}\sqrt{\text{Cos}[c+d\,x]}$$

$$\left(1961\,\text{Cos}\left[\frac{1}{2}\,(c-d\,x)\right]+1609\,\text{Cos}\left[\frac{1}{2}\,(3\,c+d\,x)\right]+1165\,\text{Cos}\left[\frac{1}{2}\,(c+3\,d\,x)\right]+\right.$$

$$620\,\text{Cos}\left[\frac{1}{2}\,(5\,c+3\,d\,x)\right]+292\,\text{Cos}\left[\frac{1}{2}\,(3\,c+5\,d\,x)\right]+65\,\text{Cos}\left[\frac{1}{2}\,(7\,c+5\,d\,x)\right]+$$

$$\left.\left.5\,\text{Cos}\left[\frac{1}{2}\,(5\,c+7\,d\,x)\right]-5\,\text{Cos}\left[\frac{1}{2}\,(9\,c+7\,d\,x)\right]\right)\text{Csc}[c]\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^5\right)$$

Problem 191: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{\text{Cos}[c+d\,x]^{7/2}}{\left(a+a\,\text{Cos}[c+d\,x]\right)^3}\,dx$$

Optimal (type 4, 155 leaves, 6 steps):

$$\frac{49\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),2\right]}{10\,a^3\,d}-\frac{13\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]}{6\,a^3\,d}-$$

$$\frac{\text{Cos}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{5\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3}-\frac{8\,\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{15\,a\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2}-\frac{13\,\sqrt{\text{Cos}[c+d\,x]}\;\text{Sin}[c+d\,x]}{6\,d\,\left(a^3+a^3\,\text{Cos}[c+d\,x]\right)}$$

Result (type 5, 435 leaves):

$$\left(4\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\left(147\,\left(1+e^{2\,i\,(c+d\,x)}\right)+147\,\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+65\,e^{i\,(c+d\,x)}\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)\right)\Big/\left(15\,d\left(-1+e^{2\,i\,c}\right)\sqrt{e^{-i\,(c+d\,x)}\left(1+e^{2\,i\,(c+d\,x)}\right)}\left(a+a\,\text{Cos}[c+d\,x]\right)^3\right)+$$

$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\sqrt{\text{Cos}[c+d\,x]}\left(-\frac{4\,(29+20\,\text{Cos}[c])\,\text{Csc}[c]}{5\,d}-\frac{116\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Sin}\left[\frac{d\,x}{2}\right]}{5\,d}+\frac{56\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\text{Sin}\left[\frac{d\,x}{2}\right]}{15\,d}-\frac{2\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\text{Sin}\left[\frac{d\,x}{2}\right]}{5\,d}+\frac{56\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\text{Tan}\left[\frac{c}{2}\right]}{15\,d}-\frac{2\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\text{Tan}\left[\frac{c}{2}\right]}{5\,d}\right)\right)\Big/\left(a+a\,\text{Cos}[c+d\,x]\right)^3$$

Problem 192: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{\text{Cos}[c+d\,x]^{5/2}}{\left(a+a\,\text{Cos}[c+d\,x]\right)^3}\,dx$$

Optimal (type 4, 155 leaves, 6 steps):

$$-\frac{9\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),2\right]}{10\,a^3\,d}+\frac{\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]}{2\,a^3\,d}-\frac{\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{5\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3}-\frac{2\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{5\,a\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^2}+\frac{9\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{10\,d\,\left(a^3+a^3\,\text{Cos}[c+d\,x]\right)}$$

Result (type 5, 705 leaves):

$$- \Bigg(\Bigg(9\,i\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6 \mathrm{Csc}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}\right]$$

$$\Bigg(\Bigg(2\,e^{2\,i\,d\,x}\,\mathrm{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},-e^{2\,i\,d\,x}\left(\mathrm{Cos}[c]+i\,\mathrm{Sin}[c]\right)^2\right]$$

$$\sqrt{e^{-i\,d\,x}\left(2\left(1+e^{2\,i\,d\,x}\right)\mathrm{Cos}[c]+2\,i\left(-1+e^{2\,i\,d\,x}\right)\mathrm{Sin}[c]\right)}$$

$$\sqrt{1+e^{2\,i\,d\,x}\,\mathrm{Cos}[2\,c]+i\,e^{2\,i\,d\,x}\,\mathrm{Sin}[2\,c]}\Bigg)\Big/$$

$$\left(3\,i\,d\left(1+e^{2\,i\,d\,x}\right)\mathrm{Cos}[c]-3\,d\left(-1+e^{2\,i\,d\,x}\right)\mathrm{Sin}[c]\right)-$$

$$\Bigg(2\,\mathrm{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,d\,x}\left(\mathrm{Cos}[c]+i\,\mathrm{Sin}[c]\right)^2\right]$$

$$\sqrt{e^{-i\,d\,x}\left(2\left(1+e^{2\,i\,d\,x}\right)\mathrm{Cos}[c]+2\,i\left(-1+e^{2\,i\,d\,x}\right)\mathrm{Sin}[c]\right)}$$

$$\sqrt{1+e^{2\,i\,d\,x}\,\mathrm{Cos}[2\,c]+i\,e^{2\,i\,d\,x}\,\mathrm{Sin}[2\,c]}\Bigg)\Big/$$

$$\left(-i\,d\left(1+e^{2\,i\,d\,x}\right)\mathrm{Cos}[c]+d\left(-1+e^{2\,i\,d\,x}\right)\mathrm{Sin}[c]\right)\Bigg)\Bigg)\Big/\left(10\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^3\right)\Bigg)-$$

$$\Bigg(2\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\mathrm{Csc}\left[\frac{c}{2}\right]\mathrm{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\right.$$

$$\left.\mathrm{Sin}[d\,x-\mathrm{ArcTan}[\mathrm{Cot}[c]]]^2\right]$$

$$\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}[d\,x-\mathrm{ArcTan}[\mathrm{Cot}[c]]]$$

$$\sqrt{1-\mathrm{Sin}[d\,x-\mathrm{ArcTan}[\mathrm{Cot}[c]]]}$$

$$\sqrt{-\sqrt{1+\mathrm{Cot}[c]^2}\;\mathrm{Sin}[c]\,\mathrm{Sin}[d\,x-\mathrm{ArcTan}[\mathrm{Cot}[c]]]}$$

$$\sqrt{1+\mathrm{Sin}[d\,x-\mathrm{ArcTan}[\mathrm{Cot}[c]]]}\Bigg)\Big/$$

$$\left(d\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^3\sqrt{1+\mathrm{Cot}[c]^2}\right)+$$

$$\Bigg(\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\sqrt{\mathrm{Cos}[c+d\,x]}$$

$$\Bigg(\frac{36\,\mathrm{Csc}[c]}{5\,d}+\frac{36\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{5\,d}-$$

$$\frac{12\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{5\,d}+\frac{2\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{5\,d}-$$

$$\frac{12\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\mathrm{Tan}\left[\frac{c}{2}\right]}{5\,d}+\frac{2\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\mathrm{Tan}\left[\frac{c}{2}\right]}{5\,d}\Bigg)\Bigg)\Big/\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^3$$

Problem 193: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\text{Cos}[c+d x]^{3/2}}{(a+a \text{Cos}[c+d x])^3} \, dx$$

Optimal (type 4, 155 leaves, 6 steps):

$$-\frac{\text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]}{10 a^3 d}+\frac{\text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]}{6 a^3 d}-\frac{\sqrt{\text{Cos}[c+d x]}\ \text{Sin}[c+d x]}{5 d (a+a \text{Cos}[c+d x])^3}+\frac{4 \sqrt{\text{Cos}[c+d x]}\ \text{Sin}[c+d x]}{15 a d (a+a \text{Cos}[c+d x])^2}+\frac{\sqrt{\text{Cos}[c+d x]}\ \text{Sin}[c+d x]}{10 d \left(a^3+a^3 \text{Cos}[c+d x]\right)}$$

Result (type 5, 334 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]^6 \left(-\left(\left(4 i \sqrt{2}\, e^{-i (c+d x)} \left(3 \left(1+e^{2 i (c+d x)}\right)+3 \left(-1+e^{2 i c}\right) \sqrt{1+e^{2 i (c+d x)}}\ \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2 i (c+d x)}\right]+5 e^{i (c+d x)} \left(-1+e^{2 i c}\right) \sqrt{1+e^{2 i (c+d x)}}\ \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2 i (c+d x)}\right]\right)\right)\Big/\left(d \left(-1+e^{2 i c}\right) \sqrt{e^{-i (c+d x)} \left(1+e^{2 i (c+d x)}\right)}\right)\right)+\frac{1}{8 d}\sqrt{\text{Cos}[c+d x]} \left(14 \text{Cos}\left[\frac{1}{2}(c-d x)\right]+16 \text{Cos}\left[\frac{1}{2}(3 c+d x)\right]+20 \text{Cos}\left[\frac{1}{2}(c+3 d x)\right]-5 \text{Cos}\left[\frac{1}{2}(5 c+3 d x)\right]+3 \text{Cos}\left[\frac{1}{2}(3 c+5 d x)\right]\right) \text{Csc}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{1}{2}(c+d x)\right]^5\right)\right)\Big/\left(15 a^3 (1+\text{Cos}[c+d x])^3\right)$$

Problem 194: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{\text{Cos}[c+d x]}}{(a+a \text{Cos}[c+d x])^3} \, dx$$

Optimal (type 4, 155 leaves, 6 steps):

$$\frac{\text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]}{10 a^3 d}+\frac{\text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]}{6 a^3 d}+\frac{\sqrt{\text{Cos}[c+d x]}\ \text{Sin}[c+d x]}{5 d (a+a \text{Cos}[c+d x])^3}+\frac{\sqrt{\text{Cos}[c+d x]}\ \text{Sin}[c+d x]}{15 a d (a+a \text{Cos}[c+d x])^2}-\frac{\sqrt{\text{Cos}[c+d x]}\ \text{Sin}[c+d x]}{10 d \left(a^3+a^3 \text{Cos}[c+d x]\right)}$$

Result (type 5, 334 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}\left(c+d\,x\right)\right]^6 \left(\left(4\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\left(3\left(1+e^{2\,i\,(c+d\,x)}\right)+3\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]-5\,e^{i\,(c+d\,x)}\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)\right)\Big/\left(d\left(-1+e^{2\,i\,c}\right)\sqrt{e^{-i\,(c+d\,x)}\left(1+e^{2\,i\,(c+d\,x)}\right)}\right)-\frac{1}{8\,d}\sqrt{\text{Cos}[c+d\,x]}\left(4\,\text{Cos}\left[\frac{1}{2}\left(c-d\,x\right)\right]+26\,\text{Cos}\left[\frac{1}{2}\left(3\,c+d\,x\right)\right]+10\,\text{Cos}\left[\frac{1}{2}\left(c+3\,d\,x\right)\right]+5\,\text{Cos}\left[\frac{1}{2}\left(5\,c+3\,d\,x\right)\right]+3\,\text{Cos}\left[\frac{1}{2}\left(3\,c+5\,d\,x\right)\right]\right)\text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^5\right)\right)\Big/\left(15\,a^3\left(1+\text{Cos}[c+d\,x]\right)^3\right)$$

Problem 195: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{\text{Cos}[c+d\,x]}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^3}\,dx$$

Optimal (type 4, 155 leaves, 6 steps):

$$\frac{9\,\text{EllipticE}\left[\frac{1}{2}\left(c+d\,x\right),2\right]}{10\,a^3\,d}+\frac{\text{EllipticF}\left[\frac{1}{2}\left(c+d\,x\right),2\right]}{2\,a^3\,d}-\frac{\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{5\,d\left(a+a\,\text{Cos}[c+d\,x]\right)^3}-\frac{2\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{5\,a\,d\left(a+a\,\text{Cos}[c+d\,x]\right)^2}-\frac{9\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{10\,d\left(a^3+a^3\,\text{Cos}[c+d\,x]\right)}$$

Result (type 5, 705 leaves):

$$\left(9\,i\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Csc}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}\right]\right.$$
$$\left(\left(\left(2\,e^{2\,i\,d\,x}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},-e^{2\,i\,d\,x}\left(\text{Cos}[c]+i\,\text{Sin}[c]\right)^2\right]\right.\right.\right.$$
$$\sqrt{e^{-i\,d\,x}\left(2\left(1+e^{2\,i\,d\,x}\right)\text{Cos}[c]+2\,i\left(-1+e^{2\,i\,d\,x}\right)\text{Sin}[c]\right)}$$
$$\left.\sqrt{1+e^{2\,i\,d\,x}\,\text{Cos}[2\,c]+i\,e^{2\,i\,d\,x}\,\text{Sin}[2\,c]}\right)\Big/$$
$$\left(3\,i\,d\left(1+e^{2\,i\,d\,x}\right)\text{Cos}[c]-3\,d\left(-1+e^{2\,i\,d\,x}\right)\text{Sin}[c]\right)-$$
$$\left(2\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,d\,x}\left(\text{Cos}[c]+i\,\text{Sin}[c]\right)^2\right]\right.$$
$$\sqrt{e^{-i\,d\,x}\left(2\left(1+e^{2\,i\,d\,x}\right)\text{Cos}[c]+2\,i\left(-1+e^{2\,i\,d\,x}\right)\text{Sin}[c]\right)}$$
$$\left.\sqrt{1+e^{2\,i\,d\,x}\,\text{Cos}[2\,c]+i\,e^{2\,i\,d\,x}\,\text{Sin}[2\,c]}\right)\Big/$$
$$\left.\left.\left(-i\,d\left(1+e^{2\,i\,d\,x}\right)\text{Cos}[c]+d\left(-1+e^{2\,i\,d\,x}\right)\text{Sin}[c]\right)\right)\right)\Big/\left(10\left(a+a\,\text{Cos}[c+d\,x]\right)^3\right)-$$
$$\left(2\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Csc}\left[\frac{c}{2}\right]\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{2}\right\},\left\{\frac{5}{4}\right\},\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]^2\right]\right.$$
$$\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}[d\,x-\text{ArcTan}[\text{Cot}[c]]]$$
$$\sqrt{1-\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$
$$\sqrt{-\sqrt{1+\text{Cot}[c]^2}\,\text{Sin}[c]\,\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}$$
$$\left.\sqrt{1+\text{Sin}[d\,x-\text{ArcTan}[\text{Cot}[c]]]}\right)\Big/$$
$$\left(d\left(a+a\,\text{Cos}[c+d\,x]\right)^3\sqrt{1+\text{Cot}[c]^2}\right)+$$
$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\sqrt{\text{Cos}[c+d\,x]}\left(-\frac{36\,\text{Csc}[c]}{5\,d}-\frac{36\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]}{5\,d}-\right.\right.$$
$$\frac{8\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\,\text{Sin}\left[\frac{d\,x}{2}\right]}{5\,d}-\frac{2\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\text{Sin}\left[\frac{d\,x}{2}\right]}{5\,d}-$$
$$\left.\left.\frac{8\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Tan}\left[\frac{c}{2}\right]}{5\,d}-\frac{2\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\text{Tan}\left[\frac{c}{2}\right]}{5\,d}\right)\right)\Big/\left(a+a\,\text{Cos}[c+d\,x]\right)^3$$

Problem 196: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{1}{\text{Cos}[c+d\,x]^{3/2}\left(a+a\,\text{Cos}[c+d\,x]\right)^3}\,dx$$

Optimal (type 4, 181 leaves, 7 steps):

$$-\frac{49\,\text{EllipticE}\left[\frac{1}{2}(c+d\,x),2\right]}{10\,a^3\,d}-\frac{13\,\text{EllipticF}\left[\frac{1}{2}(c+d\,x),2\right]}{6\,a^3\,d}+\frac{49\,\text{Sin}[c+d\,x]}{10\,a^3\,d\,\sqrt{\text{Cos}[c+d\,x]}}-\frac{\text{Sin}[c+d\,x]}{5\,d\,\sqrt{\text{Cos}[c+d\,x]}\,(a+a\,\text{Cos}[c+d\,x])^3}-\frac{8\,\text{Sin}[c+d\,x]}{15\,a\,d\,\sqrt{\text{Cos}[c+d\,x]}\,(a+a\,\text{Cos}[c+d\,x])^2}-\frac{13\,\text{Sin}[c+d\,x]}{6\,d\,\sqrt{\text{Cos}[c+d\,x]}\,(a^3+a^3\,\text{Cos}[c+d\,x])}$$

Result (type 5, 364 leaves):

$$\frac{1}{15\,a^3\,(1+\text{Cos}[c+d\,x])^3}\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]^6\left(-\left(\left(4\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\left(147\left(1+e^{2\,i\,(c+d\,x)}\right)+147\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]-65\,e^{i\,(c+d\,x)}\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)\right)\Big/\left(d\left(-1+e^{2\,i\,c}\right)\sqrt{e^{-i\,(c+d\,x)}\left(1+e^{2\,i\,(c+d\,x)}\right)}\right)\right)+\left(\left(1284\,\text{Cos}\left[\frac{1}{2}(c-d\,x)\right]+921\,\text{Cos}\left[\frac{1}{2}(3\,c+d\,x)\right]+1243\,\text{Cos}\left[\frac{1}{2}(c+3\,d\,x)\right]+374\,\text{Cos}\left[\frac{1}{2}(5\,c+3\,d\,x)\right]+670\,\text{Cos}\left[\frac{1}{2}(3\,c+5\,d\,x)\right]+65\,\text{Cos}\left[\frac{1}{2}(7\,c+5\,d\,x)\right]+147\,\text{Cos}\left[\frac{1}{2}(5\,c+7\,d\,x)\right]\right)\text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^5\right)\Big/\left(16\,d\,\sqrt{\text{Cos}[c+d\,x]}\right)\right)$$

Problem 197: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\text{Cos}[c+d\,x]^{5/2}\,(a+a\,\text{Cos}[c+d\,x])^3}\,dx$$

Optimal (type 4, 207 leaves, 8 steps):

$$\frac{119\,\text{EllipticE}\left[\frac{1}{2}(c+d\,x),2\right]}{10\,a^3\,d}+\frac{11\,\text{EllipticF}\left[\frac{1}{2}(c+d\,x),2\right]}{2\,a^3\,d}+\frac{11\,\text{Sin}[c+d\,x]}{2\,a^3\,d\,\text{Cos}[c+d\,x]^{3/2}}-\frac{119\,\text{Sin}[c+d\,x]}{10\,a^3\,d\,\sqrt{\text{Cos}[c+d\,x]}}-\frac{\text{Sin}[c+d\,x]}{5\,d\,\text{Cos}[c+d\,x]^{3/2}\,(a+a\,\text{Cos}[c+d\,x])^3}-\frac{2\,\text{Sin}[c+d\,x]}{3\,a\,d\,\text{Cos}[c+d\,x]^{3/2}\,(a+a\,\text{Cos}[c+d\,x])^2}-\frac{119\,\text{Sin}[c+d\,x]}{30\,d\,\text{Cos}[c+d\,x]^{3/2}\,(a^3+a^3\,\text{Cos}[c+d\,x])}$$

Result (type 5, 394 leaves):

$$\frac{1}{5\,a^3\,(1+\text{Cos}[c+d\,x])^3}\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^6\left(\left(4\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\left(119\,\left(1+e^{2\,i\,(c+d\,x)}\right)+119\,\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\right.\right.\right.$$
$$\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]-$$
$$\left.\left.55\,e^{i\,(c+d\,x)}\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)\right)\Big/$$
$$\left(d\left(-1+e^{2\,i\,c}\right)\sqrt{e^{-i\,(c+d\,x)}\left(1+e^{2\,i\,(c+d\,x)}\right)}\right)-$$
$$\left(\left(5134\,\text{Cos}\left[\frac{1}{2}\,(c-d\,x)\right]+4148\,\text{Cos}\left[\frac{1}{2}\,(3\,c+d\,x)\right]+4664\,\text{Cos}\left[\frac{1}{2}\,(c+3\,d\,x)\right]+\right.\right.$$
$$2476\,\text{Cos}\left[\frac{1}{2}\,(5\,c+3\,d\,x)\right]+3340\,\text{Cos}\left[\frac{1}{2}\,(3\,c+5\,d\,x)\right]+944\,\text{Cos}\left[\frac{1}{2}\,(7\,c+5\,d\,x)\right]+$$
$$\left.1620\,\text{Cos}\left[\frac{1}{2}\,(5\,c+7\,d\,x)\right]+165\,\text{Cos}\left[\frac{1}{2}\,(9\,c+7\,d\,x)\right]+357\,\text{Cos}\left[\frac{1}{2}\,(7\,c+9\,d\,x)\right]\right)$$
$$\left.\left.\text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^5\right)\Big/\left(96\,d\,\text{Cos}[c+d\,x]^{3/2}\right)\right)$$

Problem 198: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \text{Cos}[c+d\,x]^{5/2}\sqrt{a+a\,\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 3, 154 leaves, 5 steps):

$$\frac{5\,\sqrt{a}\,\text{ArcSin}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{8\,d}+\frac{5\,a\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{8\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}+$$
$$\frac{5\,a\,\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{12\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}+\frac{a\,\text{Cos}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{3\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 437 leaves):

$$\frac{1}{48\,d\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}}$$
$$\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a\,\left(1+\mathrm{Cos}[c+d\,x]\right)}\,\mathrm{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\left(-15\,i\,\mathrm{Cos}\left[\frac{d\,x}{2}\right]\right.$$
$$\mathrm{Log}\left[2\,\left(e^{i\,d\,x}\,\mathrm{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\mathrm{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}\right)\right]+$$
$$15\,i\,\mathrm{ArcTanh}\left[\left(\mathrm{Cos}\left[\frac{c}{2}\right]+i\,\mathrm{Sin}\left[\frac{c}{2}\right]\right)\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}\right]$$
$$\left(\mathrm{Cos}\left[\frac{d\,x}{2}\right]+i\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]\right)+$$
$$15\,\mathrm{Log}\left[2\,\left(e^{i\,d\,x}\,\mathrm{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\mathrm{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}\right)\right]$$
$$\mathrm{Sin}\left[\frac{d\,x}{2}\right]+28\,\sqrt{2}\,\sqrt{\mathrm{Cos}[c+d\,x]\,\left(\mathrm{Cos}[d\,x]+i\,\mathrm{Sin}[d\,x]\right)}\,\mathrm{Sin}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]+$$
$$6\,\sqrt{2}\,\sqrt{\mathrm{Cos}[c+d\,x]\,\left(\mathrm{Cos}[d\,x]+i\,\mathrm{Sin}[d\,x]\right)}\,\mathrm{Sin}\left[\frac{3}{2}\,\left(c+d\,x\right)\right]+$$
$$\left.4\,\sqrt{2}\,\sqrt{\mathrm{Cos}[c+d\,x]\,\left(\mathrm{Cos}[d\,x]+i\,\mathrm{Sin}[d\,x]\right)}\,\mathrm{Sin}\left[\frac{5}{2}\,\left(c+d\,x\right)\right]\right)$$

Problem 199: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \mathrm{Cos}[c+d\,x]^{3/2}\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}\,dx$$

Optimal (type 3, 116 leaves, 4 steps):

$$\frac{3\,\sqrt{a}\,\mathrm{ArcSin}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+d\,x]}{\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}\right]}{4\,d}+\frac{3\,a\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{4\,d\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}+\frac{a\,\mathrm{Cos}[c+d\,x]^{3/2}\,\mathrm{Sin}[c+d\,x]}{2\,d\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}$$

Result (type 3, 396 leaves):

$$\frac{1}{8\,d\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}}\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a\,\left(1+\text{Cos}[c+d\,x]\right)}\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\left(-3\,i\,\text{Cos}\left[\frac{d\,x}{2}\right]\right.$$
$$\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]+$$
$$3\,i\,\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+i\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\,\right]$$
$$\left(\text{Cos}\left[\frac{d\,x}{2}\right]+i\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)+$$
$$3\,\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]$$
$$\text{Sin}\left[\frac{d\,x}{2}\right]+4\,\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]\,\left(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x]\right)}\,\text{Sin}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]+$$
$$\left.2\,\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]\,\left(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x]\right)}\,\text{Sin}\left[\frac{3}{2}\,\left(c+d\,x\right)\right]\right)$$

Problem 200: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 3, 72 leaves, 3 steps):

$$\frac{\sqrt{a}\,\text{ArcSin}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{d}+\frac{a\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 354 leaves):

$$\frac{1}{2\,d\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}}\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a\,\left(1+\text{Cos}[c+d\,x]\right)}\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\left(-i\,\text{Cos}\left[\frac{d\,x}{2}\right]\right.$$
$$\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]+$$
$$i\,\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+i\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\,\right]$$
$$\left(\text{Cos}\left[\frac{d\,x}{2}\right]+i\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)+$$
$$\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]$$
$$\left.\text{Sin}\left[\frac{d\,x}{2}\right]+2\,\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]\,\left(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x]\right)}\,\text{Sin}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right)$$

Problem 201: Result unnecessarily involves complex numbers and more than

twice size of optimal antiderivative.

$$\int \frac{\sqrt{a + a \operatorname{Cos}[c + d x]}}{\sqrt{\operatorname{Cos}[c + d x]}} \, dx$$

Optimal (type 3, 37 leaves, 2 steps):

$$\frac{2 \sqrt{a} \operatorname{ArcSin}\left[\frac{\sqrt{a} \operatorname{Sin}[c+d x]}{\sqrt{a+a \operatorname{Cos}[c+d x]}}\right]}{d}$$

Result (type 3, 246 leaves):

$$\left(i e^{\frac{i d x}{2}} \sqrt{a \left(1 + \operatorname{Cos}[c + d x]\right)} \left(\operatorname{ArcTanh}\left[\left(\operatorname{Cos}\left[\frac{c}{2}\right] + i \operatorname{Sin}\left[\frac{c}{2}\right]\right) \sqrt{\left(1 + e^{2 i d x}\right) \operatorname{Cos}[c] + i \left(-1 + e^{2 i d x}\right) \operatorname{Sin}[c]}\right] - \operatorname{Log}\left[2 \left(e^{i d x} \operatorname{Cos}\left[\frac{c}{2}\right] + i e^{i d x} \operatorname{Sin}\left[\frac{c}{2}\right]\right) + \sqrt{\left(1 + e^{2 i d x}\right) \operatorname{Cos}[c] + i \left(-1 + e^{2 i d x}\right) \operatorname{Sin}[c]}\right]\right) \operatorname{Sec}\left[\frac{1}{2} (c + d x)\right] \sqrt{e^{-i d x} \left(\left(1 + e^{2 i d x}\right) \operatorname{Cos}[c] + i \left(-1 + e^{2 i d x}\right) \operatorname{Sin}[c]\right)}\right) \Big/ \left(d \sqrt{2 \left(1 + e^{2 i d x}\right) \operatorname{Cos}[c] + 2 i \left(-1 + e^{2 i d x}\right) \operatorname{Sin}[c]}\right)$$

Problem 206: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \operatorname{Cos}[c + d x]^{3/2} \left(a + a \operatorname{Cos}[c + d x]\right)^{3/2} \, dx$$

Optimal (type 3, 160 leaves, 6 steps):

$$\frac{11 a^{3/2} \operatorname{ArcSin}\left[\frac{\sqrt{a} \operatorname{Sin}[c+d x]}{\sqrt{a+a \operatorname{Cos}[c+d x]}}\right]}{8 d} + \frac{11 a^2 \sqrt{\operatorname{Cos}[c + d x]} \operatorname{Sin}[c + d x]}{8 d \sqrt{a + a \operatorname{Cos}[c + d x]}} + \frac{11 a^2 \operatorname{Cos}[c + d x]^{3/2} \operatorname{Sin}[c + d x]}{12 d \sqrt{a + a \operatorname{Cos}[c + d x]}} + \frac{a^2 \operatorname{Cos}[c + d x]^{5/2} \operatorname{Sin}[c + d x]}{3 d \sqrt{a + a \operatorname{Cos}[c + d x]}}$$

Result (type 3, 438 leaves):

$$\frac{1}{48\, d\, \sqrt{\left(1+e^{2\, i\, d\, x}\right) \operatorname{Cos}[c]+i \left(-1+e^{2\, i\, d\, x}\right) \operatorname{Sin}[c]}}$$
$$a \sqrt{\operatorname{Cos}[c+d\, x]} \sqrt{a\,(1+\operatorname{Cos}[c+d\, x])} \operatorname{Sec}\left[\frac{1}{2} (c+d\, x)\right] \left(-33\, i \operatorname{Cos}\left[\frac{d\, x}{2}\right]\right.$$
$$\operatorname{Log}\left[2 \left(e^{i\, d\, x} \operatorname{Cos}\left[\frac{c}{2}\right]+i\, e^{i\, d\, x} \operatorname{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\, i\, d\, x}\right) \operatorname{Cos}[c]+i \left(-1+e^{2\, i\, d\, x}\right) \operatorname{Sin}[c]}\right)\right]+$$
$$33\, i \operatorname{ArcTanh}\left[\left(\operatorname{Cos}\left[\frac{c}{2}\right]+i \operatorname{Sin}\left[\frac{c}{2}\right]\right) \sqrt{\left(1+e^{2\, i\, d\, x}\right) \operatorname{Cos}[c]+i \left(-1+e^{2\, i\, d\, x}\right) \operatorname{Sin}[c]}\right]$$
$$\left(\operatorname{Cos}\left[\frac{d\, x}{2}\right]+i \operatorname{Sin}\left[\frac{d\, x}{2}\right]\right)+$$
$$33 \operatorname{Log}\left[2 \left(e^{i\, d\, x} \operatorname{Cos}\left[\frac{c}{2}\right]+i\, e^{i\, d\, x} \operatorname{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\, i\, d\, x}\right) \operatorname{Cos}[c]+i \left(-1+e^{2\, i\, d\, x}\right) \operatorname{Sin}[c]}\right)\right]$$
$$\operatorname{Sin}\left[\frac{d\, x}{2}\right]+52 \sqrt{2} \sqrt{\operatorname{Cos}[c+d\, x]\, (\operatorname{Cos}[d\, x]+i \operatorname{Sin}[d\, x])} \operatorname{Sin}\left[\frac{1}{2} (c+d\, x)\right]+$$
$$18 \sqrt{2} \sqrt{\operatorname{Cos}[c+d\, x]\, (\operatorname{Cos}[d\, x]+i \operatorname{Sin}[d\, x])} \operatorname{Sin}\left[\frac{3}{2} (c+d\, x)\right]+$$
$$\left.4 \sqrt{2} \sqrt{\operatorname{Cos}[c+d\, x]\, (\operatorname{Cos}[d\, x]+i \operatorname{Sin}[d\, x])} \operatorname{Sin}\left[\frac{5}{2} (c+d\, x)\right]\right)$$

Problem 207: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \sqrt{\operatorname{Cos}[c+d\, x]}\, (a+a \operatorname{Cos}[c+d\, x])^{3/2}\, dx$$

Optimal (type 3, 120 leaves, 5 steps):

$$\frac{7\, a^{3/2} \operatorname{ArcSin}\left[\frac{\sqrt{a} \operatorname{Sin}[c+d\, x]}{\sqrt{a+a \operatorname{Cos}[c+d\, x]}}\right]}{4\, d}+\frac{7\, a^2 \sqrt{\operatorname{Cos}[c+d\, x]} \operatorname{Sin}[c+d\, x]}{4\, d \sqrt{a+a \operatorname{Cos}[c+d\, x]}}+\frac{a^2 \operatorname{Cos}[c+d\, x]^{3/2} \operatorname{Sin}[c+d\, x]}{2\, d \sqrt{a+a \operatorname{Cos}[c+d\, x]}}$$

Result (type 3, 397 leaves):

$$\begin{aligned}
&\frac{1}{8\,d\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}}\\
&\quad a\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a\,\left(1+\text{Cos}[c+d\,x]\right)}\,\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]\,\left(-7\,i\,\text{Cos}\left[\frac{d\,x}{2}\right]\right.\\
&\qquad \text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]+\\
&\qquad 7\,i\,\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+i\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\,\right]\\
&\qquad \left(\text{Cos}\left[\frac{d\,x}{2}\right]+i\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)+\\
&\qquad 7\,\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]\\
&\qquad \text{Sin}\left[\frac{d\,x}{2}\right]+12\,\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]\,\left(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x]\right)}\,\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]+\\
&\qquad \left.2\,\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]\,\left(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x]\right)}\,\,\text{Sin}\left[\frac{3}{2}\,(c+d\,x)\right]\right)
\end{aligned}$$

Problem 208: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}}{\sqrt{\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 75 leaves, 4 steps):

$$\frac{3\,a^{3/2}\,\text{ArcSin}\left[\frac{\sqrt{a}\,\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{d}+\frac{a^2\,\sqrt{\text{Cos}[c+d\,x]}\,\,\text{Sin}[c+d\,x]}{d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 356 leaves):

$$\begin{aligned}
&\frac{1}{2\,d\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}}\\
&\quad a\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a\,\left(1+\text{Cos}[c+d\,x]\right)}\,\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]\,\left(-3\,i\,\text{Cos}\left[\frac{d\,x}{2}\right]\right.\\
&\qquad \text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]+\\
&\qquad 3\,i\,\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+i\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\,\right]\\
&\qquad \left(\text{Cos}\left[\frac{d\,x}{2}\right]+i\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)+\\
&\qquad 3\,\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]\\
&\qquad \left.\text{Sin}\left[\frac{d\,x}{2}\right]+2\,\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]\,\left(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x]\right)}\,\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)
\end{aligned}$$

Problem 209: Result unnecessarily involves complex numbers and more than

twice size of optimal antiderivative.

$$\int \frac{(a + a \operatorname{Cos}[c + d x])^{3/2}}{\operatorname{Cos}[c + d x]^{3/2}} \, dx$$

Optimal (type 3, 76 leaves, 4 steps):

$$\frac{2 a^{3/2} \operatorname{ArcSin}\left[\frac{\sqrt{a} \operatorname{Sin}[c+d x]}{\sqrt{a+a \operatorname{Cos}[c+d x]}}\right]}{d} + \frac{2 a^2 \operatorname{Sin}[c + d x]}{d \sqrt{\operatorname{Cos}[c + d x]} \sqrt{a + a \operatorname{Cos}[c + d x]}}$$

Result (type 3, 292 leaves):

$$\frac{1}{\sqrt{2} d \sqrt{\operatorname{Cos}[c + d x]} \sqrt{\operatorname{Cos}[c + d x] (\operatorname{Cos}[d x] + i \operatorname{Sin}[d x])}} a \sqrt{a (1 + \operatorname{Cos}[c + d x])} \operatorname{Sec}\left[\frac{1}{2} (c + d x)\right] \left(\operatorname{Cos}\left[\frac{d x}{2}\right] + i \operatorname{Sin}\left[\frac{d x}{2}\right]\right)$$
$$\left(i \operatorname{ArcTanh}\left[\left(\operatorname{Cos}\left[\frac{c}{2}\right] + i \operatorname{Sin}\left[\frac{c}{2}\right]\right) \sqrt{(1 + e^{2 i d x}) \operatorname{Cos}[c] + i (-1 + e^{2 i d x}) \operatorname{Sin}[c]}\right] \operatorname{Cos}[c + d x] - i \operatorname{Cos}[c + d x] \operatorname{Log}\left[2 \left(e^{i d x} \operatorname{Cos}\left[\frac{c}{2}\right] + i e^{i d x} \operatorname{Sin}\left[\frac{c}{2}\right] + \sqrt{(1 + e^{2 i d x}) \operatorname{Cos}[c] + i (-1 + e^{2 i d x}) \operatorname{Sin}[c]}\right)\right] + 2 \sqrt{2} \left(\operatorname{Cos}\left[\frac{d x}{2}\right] - i \operatorname{Sin}\left[\frac{d x}{2}\right]\right) \sqrt{\operatorname{Cos}[c + d x] (\operatorname{Cos}[d x] + i \operatorname{Sin}[d x])} \operatorname{Sin}\left[\frac{1}{2} (c + d x)\right]\right)$$

Problem 213: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \operatorname{Cos}[c + d x]^{3/2} (a + a \operatorname{Cos}[c + d x])^{5/2} \, dx$$

Optimal (type 3, 200 leaves, 6 steps):

$$\frac{163 a^{5/2} \operatorname{ArcSin}\left[\frac{\sqrt{a} \operatorname{Sin}[c+d x]}{\sqrt{a+a \operatorname{Cos}[c+d x]}}\right]}{64 d} + \frac{163 a^3 \sqrt{\operatorname{Cos}[c + d x]} \operatorname{Sin}[c + d x]}{64 d \sqrt{a + a \operatorname{Cos}[c + d x]}} + \frac{163 a^3 \operatorname{Cos}[c + d x]^{3/2} \operatorname{Sin}[c + d x]}{96 d \sqrt{a + a \operatorname{Cos}[c + d x]}} + \frac{17 a^3 \operatorname{Cos}[c + d x]^{5/2} \operatorname{Sin}[c + d x]}{24 d \sqrt{a + a \operatorname{Cos}[c + d x]}} + \frac{a^2 \operatorname{Cos}[c + d x]^{5/2} \sqrt{a + a \operatorname{Cos}[c + d x]} \operatorname{Sin}[c + d x]}{4 d}$$

Result (type 3, 481 leaves):

$$\frac{1}{384\, d \sqrt{\left(1+e^{2 i d x}\right) \text{Cos}[c]+i \left(-1+e^{2 i d x}\right) \text{Sin}[c]}}$$
$$a^2 \sqrt{\text{Cos}[c+d x]} \sqrt{a \left(1+\text{Cos}[c+d x]\right)} \text{Sec}\left[\frac{1}{2} (c+d x)\right] \left(-489\, i\, \text{Cos}\left[\frac{d x}{2}\right]\right.$$
$$\text{Log}\left[2 \left(e^{i d x} \text{Cos}\left[\frac{c}{2}\right]+i e^{i d x} \text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2 i d x}\right) \text{Cos}[c]+i \left(-1+e^{2 i d x}\right) \text{Sin}[c]}\right)\right]+$$
$$489\, i\, \text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+i \text{Sin}\left[\frac{c}{2}\right]\right) \sqrt{\left(1+e^{2 i d x}\right) \text{Cos}[c]+i \left(-1+e^{2 i d x}\right) \text{Sin}[c]}\right]$$
$$\left(\text{Cos}\left[\frac{d x}{2}\right]+i \text{Sin}\left[\frac{d x}{2}\right]\right)+$$
$$489\, \text{Log}\left[2 \left(e^{i d x} \text{Cos}\left[\frac{c}{2}\right]+i e^{i d x} \text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2 i d x}\right) \text{Cos}[c]+i \left(-1+e^{2 i d x}\right) \text{Sin}[c]}\right)\right]$$
$$\text{Sin}\left[\frac{d x}{2}\right]+800 \sqrt{2} \sqrt{\text{Cos}[c+d x]} \left(\text{Cos}[d x]+i \text{Sin}[d x]\right) \text{Sin}\left[\frac{1}{2} (c+d x)\right]+$$
$$270 \sqrt{2} \sqrt{\text{Cos}[c+d x]} \left(\text{Cos}[d x]+i \text{Sin}[d x]\right) \text{Sin}\left[\frac{3}{2} (c+d x)\right]+$$
$$80 \sqrt{2} \sqrt{\text{Cos}[c+d x]} \left(\text{Cos}[d x]+i \text{Sin}[d x]\right) \text{Sin}\left[\frac{5}{2} (c+d x)\right]+$$
$$\left.12 \sqrt{2} \sqrt{\text{Cos}[c+d x]} \left(\text{Cos}[d x]+i \text{Sin}[d x]\right) \text{Sin}\left[\frac{7}{2} (c+d x)\right]\right)$$

Problem 214: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \sqrt{\text{Cos}[c+d x]} \left(a+a \text{Cos}[c+d x]\right)^{5/2} dx$$

Optimal (type 3, 160 leaves, 5 steps):

$$\frac{25 a^{5/2} \text{ArcSin}\left[\frac{\sqrt{a} \text{Sin}[c+d x]}{\sqrt{a+a \text{Cos}[c+d x]}}\right]}{8 d}+\frac{25 a^3 \sqrt{\text{Cos}[c+d x]} \text{Sin}[c+d x]}{8 d \sqrt{a+a \text{Cos}[c+d x]}}+$$
$$\frac{13 a^3 \text{Cos}[c+d x]^{3/2} \text{Sin}[c+d x]}{12 d \sqrt{a+a \text{Cos}[c+d x]}}+\frac{a^2 \text{Cos}[c+d x]^{3/2} \sqrt{a+a \text{Cos}[c+d x]} \text{Sin}[c+d x]}{3 d}$$

Result (type 3, 440 leaves):

$$\frac{1}{48\,d\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}}$$
$$a^2\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a\,\left(1+\mathrm{Cos}[c+d\,x]\right)}\,\mathrm{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\left(-75\,i\,\mathrm{Cos}\left[\frac{d\,x}{2}\right]\right.$$
$$\mathrm{Log}\left[2\,\left(e^{i\,d\,x}\,\mathrm{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\mathrm{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}\right)\right]+$$
$$75\,i\,\mathrm{ArcTanh}\left[\left(\mathrm{Cos}\left[\frac{c}{2}\right]+i\,\mathrm{Sin}\left[\frac{c}{2}\right]\right)\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}\,\right]$$
$$\left(\mathrm{Cos}\left[\frac{d\,x}{2}\right]+i\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]\right)+$$
$$75\,\mathrm{Log}\left[2\,\left(e^{i\,d\,x}\,\mathrm{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\mathrm{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}\right)\right]$$
$$\mathrm{Sin}\left[\frac{d\,x}{2}\right]+124\,\sqrt{2}\,\sqrt{\mathrm{Cos}[c+d\,x]\,\left(\mathrm{Cos}[d\,x]+i\,\mathrm{Sin}[d\,x]\right)}\,\mathrm{Sin}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]+$$
$$30\,\sqrt{2}\,\sqrt{\mathrm{Cos}[c+d\,x]\,\left(\mathrm{Cos}[d\,x]+i\,\mathrm{Sin}[d\,x]\right)}\,\mathrm{Sin}\left[\frac{3}{2}\,\left(c+d\,x\right)\right]+$$
$$\left.4\,\sqrt{2}\,\sqrt{\mathrm{Cos}[c+d\,x]\,\left(\mathrm{Cos}[d\,x]+i\,\mathrm{Sin}[d\,x]\right)}\,\mathrm{Sin}\left[\frac{5}{2}\,\left(c+d\,x\right)\right]\right)$$

Problem 215: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{5/2}}{\sqrt{\mathrm{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 120 leaves, 4 steps):

$$\frac{19\,a^{5/2}\,\mathrm{ArcSin}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+d\,x]}{\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}\right]}{4\,d}+\frac{9\,a^3\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{4\,d\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}+$$
$$\frac{a^2\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{2\,d}$$

Result (type 3, 399 leaves):

$$\frac{1}{8\,d\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}}\,a^2\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a\,\left(1+\mathrm{Cos}[c+d\,x]\right)}\,\mathrm{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\left(-19\,i\,\mathrm{Cos}\left[\frac{d\,x}{2}\right]\right.$$

$$\mathrm{Log}\left[2\,\left(e^{i\,d\,x}\,\mathrm{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\mathrm{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}\right)\right]+$$

$$19\,i\,\mathrm{ArcTanh}\left[\left(\mathrm{Cos}\left[\frac{c}{2}\right]+i\,\mathrm{Sin}\left[\frac{c}{2}\right]\right)\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}\right]$$

$$\left(\mathrm{Cos}\left[\frac{d\,x}{2}\right]+i\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]\right)+$$

$$19\,\mathrm{Log}\left[2\,\left(e^{i\,d\,x}\,\mathrm{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\mathrm{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}\right)\right]$$

$$\mathrm{Sin}\left[\frac{d\,x}{2}\right]+20\,\sqrt{2}\,\sqrt{\mathrm{Cos}[c+d\,x]\,\left(\mathrm{Cos}[d\,x]+i\,\mathrm{Sin}[d\,x]\right)}\,\mathrm{Sin}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]+$$

$$\left.2\,\sqrt{2}\,\sqrt{\mathrm{Cos}[c+d\,x]\,\left(\mathrm{Cos}[d\,x]+i\,\mathrm{Sin}[d\,x]\right)}\,\mathrm{Sin}\left[\frac{3}{2}\,\left(c+d\,x\right)\right]\right)$$

Problem 216: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{5/2}}{\mathrm{Cos}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 3, 114 leaves, 4 steps):

$$\frac{5\,a^{5/2}\,\mathrm{ArcSin}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+d\,x]}{\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}\right]}{d}-\frac{a^3\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{d\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}+\frac{2\,a^2\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{d\,\sqrt{\mathrm{Cos}[c+d\,x]}}$$

Result (type 3, 570 leaves):

$$\frac{1}{4\sqrt{2}\,d\sqrt{\text{Cos}[c+d x]}\,\sqrt{\text{Cos}[c+d x]\,(\text{Cos}[d x]+i\,\text{Sin}[d x])}}$$

$$a^2\sqrt{a\,(1+\text{Cos}[c+d x])}\,\text{Sec}\left[\frac{1}{2}(c+d x)\right]\Bigg(-5\,i\,\text{Cos}\left[c+\frac{d x}{2}\right]$$
$$\text{Log}\left[2\left(e^{i d x}\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i d x}\text{Sin}\left[\frac{c}{2}\right]+\sqrt{(1+e^{2 i d x})\,\text{Cos}[c]+i\,(-1+e^{2 i d x})\,\text{Sin}[c]}\right)\right]-5$$
$$i\,\text{Cos}\left[c+\frac{3 d x}{2}\right]$$
$$\text{Log}\left[2\left(e^{i d x}\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i d x}\text{Sin}\left[\frac{c}{2}\right]+\sqrt{(1+e^{2 i d x})\,\text{Cos}[c]+i\,(-1+e^{2 i d x})\,\text{Sin}[c]}\right)\right]+$$
$$10\,i\,\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+i\,\text{Sin}\left[\frac{c}{2}\right]\right)\sqrt{(1+e^{2 i d x})\,\text{Cos}[c]+i\,(-1+e^{2 i d x})\,\text{Sin}[c]}\right]$$
$$\text{Cos}[c+d x]\left(\text{Cos}\left[\frac{d x}{2}\right]+i\,\text{Sin}\left[\frac{d x}{2}\right]\right)-$$
$$5\,\text{Log}\left[2\left(e^{i d x}\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i d x}\text{Sin}\left[\frac{c}{2}\right]+\sqrt{(1+e^{2 i d x})\,\text{Cos}[c]+i\,(-1+e^{2 i d x})\,\text{Sin}[c]}\right)\right]$$
$$\text{Sin}\left[c+\frac{d x}{2}\right]+6\sqrt{2}\,\sqrt{\text{Cos}[c+d x]\,(\text{Cos}[d x]+i\,\text{Sin}[d x])}\,\text{Sin}\left[\frac{1}{2}(c+d x)\right]+$$
$$2\sqrt{2}\,\sqrt{\text{Cos}[c+d x]\,(\text{Cos}[d x]+i\,\text{Sin}[d x])}\,\text{Sin}\left[\frac{3}{2}(c+d x)\right]+$$
$$5\,\text{Log}\left[2\left(e^{i d x}\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i d x}\text{Sin}\left[\frac{c}{2}\right]+\sqrt{(1+e^{2 i d x})\,\text{Cos}[c]+i\,(-1+e^{2 i d x})\,\text{Sin}[c]}\right)\right]$$
$$\text{Sin}\left[c+\frac{3 d x}{2}\right]\Bigg)$$

Problem 217: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{(a+a\,\text{Cos}[c+d x])^{5/2}}{\text{Cos}[c+d x]^{5/2}}\,dx$$

Optimal (type 3, 118 leaves, 4 steps):

$$\frac{2\,a^{5/2}\,\text{ArcSin}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{a+a\,\text{Cos}[c+d x]}}\right]}{d}+$$
$$\frac{14\,a^3\,\text{Sin}[c+d x]}{3\,d\sqrt{\text{Cos}[c+d x]}\,\sqrt{a+a\,\text{Cos}[c+d x]}}+\frac{2\,a^2\sqrt{a+a\,\text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{3\,d\,\text{Cos}[c+d x]^{3/2}}$$

Result (type 3, 850 leaves):

$$\frac{1}{4} \left(a \left(1+\text{Cos}[c+d x]\right)\right)^{5/2} \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5$$
$$\left(\frac{1}{2} \mathbb{i} \,\text{Sin}\left[\frac{c}{2}\right] \left(-\left(\left(2 \mathbb{i} \,e^{\frac{\mathbb{i} d x}{2}} \text{Log}\left[2 \left(e^{\mathbb{i} d x} \text{Cos}\left[\frac{c}{2}\right]+\mathbb{i} \,e^{\mathbb{i} d x} \text{Sin}\left[\frac{c}{2}\right]+\right.\right.\right.\right.\right.$$
$$\left.\left.\sqrt{\left(1+e^{2 \mathbb{i} d x}\right) \text{Cos}[c]+\mathbb{i} \left(-1+e^{2 \mathbb{i} d x}\right) \text{Sin}[c]}\right)\right]$$
$$\left(\text{Cos}\left[\frac{c}{2}\right]-\mathbb{i} \,\text{Sin}\left[\frac{c}{2}\right]\right) \sqrt{e^{-\mathbb{i} d x} \left(\left(1+e^{2 \mathbb{i} d x}\right) \text{Cos}[c]+\mathbb{i} \left(-1+e^{2 \mathbb{i} d x}\right) \text{Sin}[c]\right)}\Bigg/$$
$$\left.\left(d \sqrt{2 \left(1+e^{2 \mathbb{i} d x}\right) \text{Cos}[c]+2 \mathbb{i} \left(-1+e^{2 \mathbb{i} d x}\right) \text{Sin}[c]}\right)\right)-$$
$$\left(2 \mathbb{i} \,e^{\frac{\mathbb{i} d x}{2}} \text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+\mathbb{i} \,\text{Sin}\left[\frac{c}{2}\right]\right) \sqrt{\left(1+e^{2 \mathbb{i} d x}\right) \text{Cos}[c]+\mathbb{i} \left(-1+e^{2 \mathbb{i} d x}\right) \text{Sin}[c]}\right]\right.$$
$$\left(\text{Cos}\left[\frac{c}{2}\right]+\mathbb{i} \,\text{Sin}\left[\frac{c}{2}\right]\right) \sqrt{e^{-\mathbb{i} d x} \left(\left(1+e^{2 \mathbb{i} d x}\right) \text{Cos}[c]+\mathbb{i} \left(-1+e^{2 \mathbb{i} d x}\right) \text{Sin}[c]\right)}\Bigg/$$
$$\left.\left.\left(d \sqrt{2 \left(1+e^{2 \mathbb{i} d x}\right) \text{Cos}[c]+2 \mathbb{i} \left(-1+e^{2 \mathbb{i} d x}\right) \text{Sin}[c]}\right)\right)+$$
$$\frac{1}{2} \text{Cos}\left[\frac{c}{2}\right] \left(-\left(\left(2 \mathbb{i} \,e^{\frac{\mathbb{i} d x}{2}} \text{Log}\left[2 \left(e^{\mathbb{i} d x} \text{Cos}\left[\frac{c}{2}\right]+\mathbb{i} \,e^{\mathbb{i} d x} \text{Sin}\left[\frac{c}{2}\right]+\right.\right.\right.\right.$$
$$\left.\left.\sqrt{\left(1+e^{2 \mathbb{i} d x}\right) \text{Cos}[c]+\mathbb{i} \left(-1+e^{2 \mathbb{i} d x}\right) \text{Sin}[c]}\right)\right]$$
$$\left(\text{Cos}\left[\frac{c}{2}\right]-\mathbb{i} \,\text{Sin}\left[\frac{c}{2}\right]\right) \sqrt{e^{-\mathbb{i} d x} \left(\left(1+e^{2 \mathbb{i} d x}\right) \text{Cos}[c]+\mathbb{i} \left(-1+e^{2 \mathbb{i} d x}\right) \text{Sin}[c]\right)}\Bigg/$$
$$\left.\left(d \sqrt{2 \left(1+e^{2 \mathbb{i} d x}\right) \text{Cos}[c]+2 \mathbb{i} \left(-1+e^{2 \mathbb{i} d x}\right) \text{Sin}[c]}\right)\right)+$$
$$\left(2 \mathbb{i} \,e^{\frac{\mathbb{i} d x}{2}} \text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+\mathbb{i} \,\text{Sin}\left[\frac{c}{2}\right]\right) \sqrt{\left(1+e^{2 \mathbb{i} d x}\right) \text{Cos}[c]+\mathbb{i} \left(-1+e^{2 \mathbb{i} d x}\right) \text{Sin}[c]}\right]\right.$$
$$\left(\text{Cos}\left[\frac{c}{2}\right]+\mathbb{i} \,\text{Sin}\left[\frac{c}{2}\right]\right) \sqrt{e^{-\mathbb{i} d x} \left(\left(1+e^{2 \mathbb{i} d x}\right) \text{Cos}[c]+\mathbb{i} \left(-1+e^{2 \mathbb{i} d x}\right) \text{Sin}[c]\right)}\Bigg/$$
$$\left.\left.\left.\left(d \sqrt{2 \left(1+e^{2 \mathbb{i} d x}\right) \text{Cos}[c]+2 \mathbb{i} \left(-1+e^{2 \mathbb{i} d x}\right) \text{Sin}[c]}\right)\right)\right)+$$
$$\sqrt{\text{Cos}[c+d x]} \left(a \left(1+\text{Cos}[c+d x]\right)\right)^{5/2}$$
$$\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5$$
$$\left(\frac{4 \,\text{Sec}[c+d x] \,\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]}{3 d}+\frac{\text{Sec}[c+d x]^2 \,\text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]}{6 d}\right)$$

Problem 222: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{a+a \,\text{Cos}[e+f x]}}{\sqrt{\text{Cos}[e+f x]}} \, dx$$

Optimal (type 3, 37 leaves, 2 steps):

$$\frac{2\sqrt{a}\ \text{ArcSin}\left[\frac{\sqrt{a}\ \text{Sin}[e+f x]}{\sqrt{a+a\,\text{Cos}[e+f x]}}\right]}{f}$$

Result (type 3, 246 leaves):

$$\left(\mathrm{i}\ e^{\frac{\mathrm{i} f x}{2}} \sqrt{a\,(1+\text{Cos}[e+f x])}\right.$$
$$\left(\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{e}{2}\right]+\mathrm{i}\ \text{Sin}\left[\frac{e}{2}\right]\right)\sqrt{\left(1+e^{2\mathrm{i} f x}\right)\text{Cos}[e]+\mathrm{i}\left(-1+e^{2\mathrm{i} f x}\right)\text{Sin}[e]}\ \right]-\right.$$
$$\left.\text{Log}\left[2\left(e^{\mathrm{i} f x}\,\text{Cos}\left[\frac{e}{2}\right]+\mathrm{i}\ e^{\mathrm{i} f x}\,\text{Sin}\left[\frac{e}{2}\right]+\sqrt{\left(1+e^{2\mathrm{i} f x}\right)\text{Cos}[e]+\mathrm{i}\left(-1+e^{2\mathrm{i} f x}\right)\text{Sin}[e]}\right)\right]\right)$$
$$\left.\text{Sec}\left[\frac{1}{2}(e+f x)\right]\sqrt{e^{-\mathrm{i} f x}\left(\left(1+e^{2\mathrm{i} f x}\right)\text{Cos}[e]+\mathrm{i}\left(-1+e^{2\mathrm{i} f x}\right)\text{Sin}[e]\right)}\right)\Big/$$
$$\left(f\sqrt{2\left(1+e^{2\mathrm{i} f x}\right)\text{Cos}[e]+2\,\mathrm{i}\left(-1+e^{2\mathrm{i} f x}\right)\text{Sin}[e]}\right)$$

Problem 223: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{a-a\,\text{Cos}[e+f x]}}{\sqrt{-\text{Cos}[e+f x]}}\,dx$$

Optimal (type 3, 38 leaves, 2 steps):

$$-\frac{2\sqrt{a}\ \text{ArcSin}\left[\frac{\sqrt{a}\ \text{Sin}[e+f x]}{\sqrt{a-a\,\text{Cos}[e+f x]}}\right]}{f}$$

Result (type 3, 214 leaves):

$$\left(\sqrt{-\text{Cos}[e+f x]}\ \sqrt{a-a\,\text{Cos}[e+f x]}\ \text{Csc}\left[\frac{1}{2}(e+f x)\right]\right.$$
$$\left(\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{e}{2}\right]+\mathrm{i}\ \text{Sin}\left[\frac{e}{2}\right]\right)\sqrt{\left(1+e^{2\mathrm{i} f x}\right)\text{Cos}[e]+\mathrm{i}\left(-1+e^{2\mathrm{i} f x}\right)\text{Sin}[e]}\ \right]+\right.$$
$$\left.\text{Log}\left[2\left(e^{\mathrm{i} f x}\,\text{Cos}\left[\frac{e}{2}\right]+\mathrm{i}\ e^{\mathrm{i} f x}\,\text{Sin}\left[\frac{e}{2}\right]+\sqrt{\left(1+e^{2\mathrm{i} f x}\right)\text{Cos}[e]+\mathrm{i}\left(-1+e^{2\mathrm{i} f x}\right)\text{Sin}[e]}\right)\right]\right)$$
$$\left.\left(\text{Cos}\left[\frac{f x}{2}\right]+\mathrm{i}\ \text{Sin}\left[\frac{f x}{2}\right]\right)\right)\Big/\left(\sqrt{2}\ f\sqrt{\text{Cos}[e+f x]\ (\text{Cos}[f x]+\mathrm{i}\ \text{Sin}[f x])}\right)$$

Problem 224: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Cos}[c+d x]^{5/2}}{\sqrt{a+a\,\text{Cos}[c+d x]}}\,dx$$

Optimal (type 3, 171 leaves, 7 steps):

$$\frac{7\,\text{ArcSin}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{4\,\sqrt{a}\,d}-\frac{\sqrt{2}\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{\sqrt{a}\,d}-\frac{\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{4\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}+\frac{\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{2\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 251 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\left(\left(\sqrt{2}\,e^{\frac{1}{2}\,i\,(c+d\,x)}\,\sqrt{e^{-i\,(c+d\,x)}\,\left(1+e^{2\,i\,(c+d\,x)}\right)}\right.\right.\right.$$
$$\left(7\,d\,x-7\,i\,\text{ArcSinh}\left[e^{i\,(c+d\,x)}\right]+8\,i\,\sqrt{2}\,\text{Log}\left[1+e^{i\,(c+d\,x)}\right]+7\,i\,\text{Log}\left[1+\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]-\right.$$
$$\left.\left.8\,i\,\sqrt{2}\,\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/\left(d\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right)+$$
$$\left.\left.\frac{4\,\sqrt{\text{Cos}[c+d\,x]}\,\left(-2\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{3}{2}\,(c+d\,x)\right]\right)}{d}\right)\right)\Big/\left(8\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}\right)$$

Problem 225: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Cos}[c+d\,x]^{3/2}}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 128 leaves, 6 steps):

$$-\frac{\text{ArcSin}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{\sqrt{a}\,d}+\frac{\sqrt{2}\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{\sqrt{a}\,d}+\frac{\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 233 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\left(-\left(\left(i\,\sqrt{2}\,e^{\frac{1}{2}\,i\,(c+d\,x)}\,\sqrt{e^{-i\,(c+d\,x)}\,\left(1+e^{2\,i\,(c+d\,x)}\right)}\right.\right.\right.\right.$$
$$\left(-i\,d\,x-\text{ArcSinh}\left[e^{i\,(c+d\,x)}\right]+2\,\sqrt{2}\,\text{Log}\left[1+e^{i\,(c+d\,x)}\right]+\text{Log}\left[1+\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]-\right.$$
$$\left.\left.\left.2\,\sqrt{2}\,\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/\left(d\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right)\right)+$$
$$\left.\left.\frac{4\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]}{d}\right)\right)\Big/\left(2\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}\right)$$

Problem 226: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{\text{Cos}[c+d\,x]}}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 95 leaves, 5 steps):

$$\frac{2\,\text{ArcSin}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{\sqrt{a}\,d}-\frac{\sqrt{2}\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{\sqrt{a}\,d}$$

Result (type 3, 197 leaves):

$$\left(\left(1+e^{i\,(c+d\,x)}\right)\sqrt{e^{-i\,(c+d\,x)}\left(1+e^{2\,i\,(c+d\,x)}\right)}\,\left(d\,x-i\,\text{ArcSinh}\left[e^{i\,(c+d\,x)}\right]+i\,\sqrt{2}\,\text{Log}\left[1+e^{i\,(c+d\,x)}\right]+i\,\text{Log}\left[1+\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]-i\,\sqrt{2}\,\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/\left(\sqrt{2}\,d\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\sqrt{a\,\left(1+\text{Cos}[c+d\,x]\right)}\right)$$

Problem 227: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 56 leaves, 2 steps):

$$\frac{\sqrt{2}\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{\sqrt{a}\,d}$$

Result (type 3, 136 leaves):

$$-\left(\left(i\,\left(1+e^{i\,(c+d\,x)}\right)\sqrt{e^{-i\,(c+d\,x)}\left(1+e^{2\,i\,(c+d\,x)}\right)}\,\left(\text{Log}\left[1+e^{i\,(c+d\,x)}\right]-\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/\left(d\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\sqrt{a\,\left(1+\text{Cos}[c+d\,x]\right)}\right)\right)$$

Problem 228: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\text{Cos}[c+d\,x]^{3/2}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 93 leaves, 4 steps):

$$-\frac{\sqrt{2}\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{\sqrt{a}\,d}+\frac{2\,\text{Sin}[c+d\,x]}{d\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 146 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]\left(i\sqrt{2}\, e^{-\frac{1}{2} i (c+d x)}\sqrt{1+e^{2 i (c+d x)}}\left(\text{Log}\left[1+e^{i (c+d x)}\right]-\text{Log}\left[1-e^{i (c+d x)}+\sqrt{2}\sqrt{1+e^{2 i (c+d x)}}\right]\right)+4\,\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)\right)\Big/\left(d\sqrt{\text{Cos}[c+d x]}\sqrt{a(1+\text{Cos}[c+d x])}\right)$$

Problem 229: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\text{Cos}[c+d x]^{5/2}\sqrt{a+a\,\text{Cos}[c+d x]}}\, dx$$

Optimal (type 3, 131 leaves, 5 steps):

$$\frac{\sqrt{2}\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{2}\sqrt{\text{Cos}[c+d x]}\sqrt{a+a\,\text{Cos}[c+d x]}}\right]}{\sqrt{a}\, d}+\frac{2\,\text{Sin}[c+d x]}{3 d\,\text{Cos}[c+d x]^{3/2}\sqrt{a+a\,\text{Cos}[c+d x]}}-\frac{2\,\text{Sin}[c+d x]}{3 d\sqrt{\text{Cos}[c+d x]}\sqrt{a+a\,\text{Cos}[c+d x]}}$$

Result (type 3, 177 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]\left(-\left(\left(2 i\, e^{\frac{1}{2} i (c+d x)}\sqrt{e^{-i (c+d x)}\left(1+e^{2 i (c+d x)}\right)}\left(\text{Log}\left[1+e^{i (c+d x)}\right]-\text{Log}\left[1-e^{i (c+d x)}+\sqrt{2}\sqrt{1+e^{2 i (c+d x)}}\right]\right)\right)\Big/\left(d\sqrt{1+e^{2 i (c+d x)}}\right)\right)+\frac{8\,\text{Sin}\left[\frac{1}{2}(c+d x)\right]^3}{3 d\,\text{Cos}[c+d x]^{3/2}}\right)\right)\Big/\left(\sqrt{a(1+\text{Cos}[c+d x])}\right)$$

Problem 230: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\text{Cos}[c+d x]^{7/2}\sqrt{a+a\,\text{Cos}[c+d x]}}\, dx$$

Optimal (type 3, 169 leaves, 6 steps):

$$-\frac{\sqrt{2}\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{2}\sqrt{\text{Cos}[c+d x]}\sqrt{a+a\,\text{Cos}[c+d x]}}\right]}{\sqrt{a}\, d}+\frac{2\,\text{Sin}[c+d x]}{5 d\,\text{Cos}[c+d x]^{5/2}\sqrt{a+a\,\text{Cos}[c+d x]}}-\frac{2\,\text{Sin}[c+d x]}{15 d\,\text{Cos}[c+d x]^{3/2}\sqrt{a+a\,\text{Cos}[c+d x]}}+\frac{26\,\text{Sin}[c+d x]}{15 d\sqrt{\text{Cos}[c+d x]}\sqrt{a+a\,\text{Cos}[c+d x]}}$$

Result (type 3, 195 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}\left(c+d\,x\right)\right]\left(\left(2\,i\,e^{\frac{1}{2}i\,(c+d\,x)}\sqrt{e^{-i\,(c+d\,x)}\left(1+e^{2\,i\,(c+d\,x)}\right)}\left(\text{Log}\left[1+e^{i\,(c+d\,x)}\right]-\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/\left(d\sqrt{1+e^{2\,i\,(c+d\,x)}}\right)+\frac{4\left(3-\text{Cos}[c+d\,x]+13\,\text{Cos}[c+d\,x]^2\right)\text{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]}{15\,d\,\text{Cos}[c+d\,x]^{5/2}}\right)\right)\Big/\left(\sqrt{a\left(1+\text{Cos}[c+d\,x]\right)}\right)$$

Problem 231: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Cos}[c+d\,x]^{5/2}}{\sqrt{1+\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 126 leaves, 7 steps):

$$-\frac{\sqrt{2}\,\text{ArcSin}\left[\frac{\text{Sin}[c+d\,x]}{1+\text{Cos}[c+d\,x]}\right]}{d}+\frac{7\,\text{ArcSin}\left[\frac{\text{Sin}[c+d\,x]}{\sqrt{1+\text{Cos}[c+d\,x]}}\right]}{4\,d}-\frac{\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{4\,d\sqrt{1+\text{Cos}[c+d\,x]}}+\frac{\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{2\,d\sqrt{1+\text{Cos}[c+d\,x]}}$$

Result (type 3, 249 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}\left(c+d\,x\right)\right]\left(\left(\sqrt{2}\,e^{\frac{1}{2}i\,(c+d\,x)}\sqrt{e^{-i\,(c+d\,x)}\left(1+e^{2\,i\,(c+d\,x)}\right)}\left(7\,d\,x-7\,i\,\text{ArcSinh}\left[e^{i\,(c+d\,x)}\right]+8\,i\sqrt{2}\,\text{Log}\left[1+e^{i\,(c+d\,x)}\right]+7\,i\,\text{Log}\left[1+\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]-8\,i\sqrt{2}\,\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/\left(d\sqrt{1+e^{2\,i\,(c+d\,x)}}\right)+\frac{4\sqrt{\text{Cos}[c+d\,x]}\left(-2\,\text{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]+\text{Sin}\left[\frac{3}{2}\left(c+d\,x\right)\right]\right)}{d}\right)\right)\Big/\left(8\sqrt{1+\text{Cos}[c+d\,x]}\right)$$

Problem 232: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\text{Cos}[c+d\,x]^{3/2}}{\sqrt{1+\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 85 leaves, 6 steps):

$$\frac{\sqrt{2}\,\text{ArcSin}\left[\frac{\text{Sin}[c+d\,x]}{1+\text{Cos}[c+d\,x]}\right]}{d}-\frac{\text{ArcSin}\left[\frac{\text{Sin}[c+d\,x]}{\sqrt{1+\text{Cos}[c+d\,x]}}\right]}{d}+\frac{\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d\sqrt{1+\text{Cos}[c+d\,x]}}$$

Result (type 3, 231 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]\left(-\left(\left(\left(i\sqrt{2}\, e^{\frac{1}{2} i (c+d x)}\sqrt{e^{-i (c+d x)}\left(1+e^{2 i (c+d x)}\right)}\right.\right.\right.\right.\right.$$
$$\left(-i d x-\text{ArcSinh}\left[e^{i (c+d x)}\right]+2\sqrt{2}\,\text{Log}\left[1+e^{i (c+d x)}\right]+\text{Log}\left[1+\sqrt{1+e^{2 i (c+d x)}}\right]-\right.$$
$$\left.\left.\left.2\sqrt{2}\,\text{Log}\left[1-e^{i (c+d x)}+\sqrt{2}\sqrt{1+e^{2 i (c+d x)}}\right]\right)\right)\Big/\left(d\sqrt{1+e^{2 i (c+d x)}}\right)\right)+$$
$$\left.\left.\frac{4\sqrt{\text{Cos}[c+d x]}\,\text{Sin}\left[\frac{1}{2}(c+d x)\right]}{d}\right)\right)\Big/\left(2\sqrt{1+\text{Cos}[c+d x]}\right)$$

Problem 233: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{\text{Cos}[c+d x]}}{\sqrt{1+\text{Cos}[c+d x]}}\,dx$$

Optimal (type 3, 54 leaves, 5 steps):

$$-\frac{\sqrt{2}\,\text{ArcSin}\left[\frac{\text{Sin}[c+d x]}{1+\text{Cos}[c+d x]}\right]}{d}+\frac{2\,\text{ArcSin}\left[\frac{\text{Sin}[c+d x]}{\sqrt{1+\text{Cos}[c+d x]}}\right]}{d}$$

Result (type 3, 170 leaves):

$$\frac{1}{d\sqrt{1+e^{2 i (c+d x)}}}$$
$$\left(1+e^{i (c+d x)}\right)\sqrt{\frac{\text{Cos}[c+d x]}{1+\text{Cos}[c+d x]}}\left(d x-i\,\text{ArcSinh}\left[e^{i (c+d x)}\right]+i\sqrt{2}\,\text{Log}\left[1+e^{i (c+d x)}\right]+\right.$$
$$\left.i\,\text{Log}\left[1+\sqrt{1+e^{2 i (c+d x)}}\right]-i\sqrt{2}\,\text{Log}\left[1-e^{i (c+d x)}+\sqrt{2}\sqrt{1+e^{2 i (c+d x)}}\right]\right)$$

Problem 234: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{\text{Cos}[c+d x]}\sqrt{1+\text{Cos}[c+d x]}}\,dx$$

Optimal (type 3, 27 leaves, 2 steps):

$$\frac{\sqrt{2}\,\text{ArcSin}\left[\frac{\text{Sin}[c+d x]}{1+\text{Cos}[c+d x]}\right]}{d}$$

Result (type 3, 134 leaves):

$$-\left(\left(i\left(1+e^{i(c+dx)}\right)\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}\left(\text{Log}\left[1+e^{i(c+dx)}\right]-\text{Log}\left[1-e^{i(c+dx)}+\sqrt{2}\sqrt{1+e^{2i(c+dx)}}\right]\right)\right)\Big/\left(d\sqrt{1+e^{2i(c+dx)}}\sqrt{1+\text{Cos}[c+dx]}\right)\right)$$

Problem 235: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{\text{Cos}[c+dx]^{3/2}\sqrt{1+\text{Cos}[c+dx]}}\,dx$$

Optimal (type 3, 62 leaves, 3 steps):

$$-\frac{\sqrt{2}\,\text{ArcSin}\left[\frac{\text{Sin}[c+dx]}{1+\text{Cos}[c+dx]}\right]}{d}+\frac{2\,\text{Sin}[c+dx]}{d\sqrt{\text{Cos}[c+dx]}\sqrt{1+\text{Cos}[c+dx]}}$$

Result (type 3, 144 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}(c+dx)\right]\left(i\sqrt{2}\,e^{-\frac{1}{2}i(c+dx)}\sqrt{1+e^{2i(c+dx)}}\left(\text{Log}\left[1+e^{i(c+dx)}\right]-\text{Log}\left[1-e^{i(c+dx)}+\sqrt{2}\sqrt{1+e^{2i(c+dx)}}\right]\right)+4\,\text{Sin}\left[\frac{1}{2}(c+dx)\right]\right)\right)\Big/\left(d\sqrt{\text{Cos}[c+dx]}\sqrt{1+\text{Cos}[c+dx]}\right)$$

Problem 236: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\text{Cos}[c+dx]^{5/2}\sqrt{1+\text{Cos}[c+dx]}}\,dx$$

Optimal (type 3, 98 leaves, 5 steps):

$$\frac{\sqrt{2}\,\text{ArcSin}\left[\frac{\text{Sin}[c+dx]}{1+\text{Cos}[c+dx]}\right]}{d}+\frac{2\,\text{Sin}[c+dx]}{3\,d\,\text{Cos}[c+dx]^{3/2}\sqrt{1+\text{Cos}[c+dx]}}-\frac{2\,\text{Sin}[c+dx]}{3\,d\sqrt{\text{Cos}[c+dx]}\sqrt{1+\text{Cos}[c+dx]}}$$

Result (type 3, 175 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}(c+dx)\right]\left(-\left(\left(2\,i\,e^{\frac{1}{2}i(c+dx)}\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}\left(\text{Log}\left[1+e^{i(c+dx)}\right]-\text{Log}\left[1-e^{i(c+dx)}+\sqrt{2}\sqrt{1+e^{2i(c+dx)}}\right]\right)\right)\Big/\left(d\sqrt{1+e^{2i(c+dx)}}\right)\right)+\frac{8\,\text{Sin}\left[\frac{1}{2}(c+dx)\right]^3}{3\,d\,\text{Cos}[c+dx]^{3/2}}\right)\right)\Big/\left(\sqrt{1+\text{Cos}[c+dx]}\right)$$

Problem 237: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\text{Cos}[c+d x]^{7/2} \sqrt{1+\text{Cos}[c+d x]}} \, dx$$

Optimal (type 3, 134 leaves, 6 steps):

$$-\frac{\sqrt{2} \,\text{ArcSin}\left[\frac{\text{Sin}[c+d x]}{1+\text{Cos}[c+d x]}\right]}{d}+\frac{2 \,\text{Sin}[c+d x]}{5 d \,\text{Cos}[c+d x]^{5/2} \sqrt{1+\text{Cos}[c+d x]}}-\frac{2 \,\text{Sin}[c+d x]}{15 d \,\text{Cos}[c+d x]^{3/2} \sqrt{1+\text{Cos}[c+d x]}}+\frac{26 \,\text{Sin}[c+d x]}{15 d \sqrt{\text{Cos}[c+d x]} \sqrt{1+\text{Cos}[c+d x]}}$$

Result (type 3, 193 leaves):

$$\left(\text{Cos}\left[\frac{1}{2} (c+d x)\right] \left(\left(2 i e^{\frac{1}{2} i (c+d x)} \sqrt{e^{-i (c+d x)} \left(1+e^{2 i (c+d x)}\right)} \left(\text{Log}\left[1+e^{i (c+d x)}\right]-\text{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \Big/ \left(d \sqrt{1+e^{2 i (c+d x)}}\right)+\frac{4 \left(3-\text{Cos}[c+d x]+13 \,\text{Cos}[c+d x]^2\right) \text{Sin}\left[\frac{1}{2} (c+d x)\right]}{15 d \,\text{Cos}[c+d x]^{5/2}}\right)\right) \Big/ \left(\sqrt{1+\text{Cos}[c+d x]}\right)$$

Problem 238: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Cos}[c+d x]^{5/2}}{(a+a \,\text{Cos}[c+d x])^{3/2}} \, dx$$

Optimal (type 3, 174 leaves, 7 steps):

$$-\frac{3 \,\text{ArcSin}\left[\frac{\sqrt{a} \,\text{Sin}[c+d x]}{\sqrt{a+a \,\text{Cos}[c+d x]}}\right]}{a^{3/2} d}+\frac{9 \,\text{ArcTan}\left[\frac{\sqrt{a} \,\text{Sin}[c+d x]}{\sqrt{2} \sqrt{\text{Cos}[c+d x]} \sqrt{a+a \,\text{Cos}[c+d x]}}\right]}{2 \sqrt{2} a^{3/2} d}-\frac{\text{Cos}[c+d x]^{3/2} \text{Sin}[c+d x]}{2 d (a+a \,\text{Cos}[c+d x])^{3/2}}+\frac{3 \sqrt{\text{Cos}[c+d x]} \,\text{Sin}[c+d x]}{2 a d \sqrt{a+a \,\text{Cos}[c+d x]}}$$

Result (type 3, 262 leaves):

$$\left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]^3 \left(-\left(\left(3 i \sqrt{2} e^{\frac{1}{2} i (c+d x)} \sqrt{e^{-i (c+d x)} \left(1+e^{2 i (c+d x)}\right)} \left(-2 i d x-2 \,\text{ArcSinh}\left[e^{i (c+d x)}\right]+3 \sqrt{2} \,\text{Log}\left[1+e^{i (c+d x)}\right]+2 \,\text{Log}\left[1+\sqrt{1+e^{2 i (c+d x)}}\right]-3 \sqrt{2} \,\text{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \Big/ \left(d \sqrt{1+e^{2 i (c+d x)}}\right)\right)+\frac{1}{d} 2 \sqrt{\text{Cos}[c+d x]} \,\text{Sec}\left[\frac{1}{2} (c+d x)\right]^2 \left(2 \,\text{Sin}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{3}{2} (c+d x)\right]\right)\right)\right) \Big/ \left(2 (a (1+\text{Cos}[c+d x]))^{3/2}\right)$$

Problem 239: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{Cos}[c+d x]^{3/2}}{(a+a \operatorname{Cos}[c+d x])^{3/2}}\, dx$$

Optimal (type 3, 134 leaves, 6 steps):

$$\frac{2 \operatorname{ArcSin}\left[\frac{\sqrt{a} \operatorname{Sin}[c+d x]}{\sqrt{a+a \operatorname{Cos}[c+d x]}}\right]}{a^{3/2} d}-\frac{5 \operatorname{ArcTan}\left[\frac{\sqrt{a} \operatorname{Sin}[c+d x]}{\sqrt{2} \sqrt{\operatorname{Cos}[c+d x]} \sqrt{a+a \operatorname{Cos}[c+d x]}}\right]}{2 \sqrt{2} a^{3/2} d}-\frac{\sqrt{\operatorname{Cos}[c+d x]} \operatorname{Sin}[c+d x]}{2 d (a+a \operatorname{Cos}[c+d x])^{3/2}}$$

Result (type 3, 312 leaves):

$$\left(e^{\frac{1}{2} i (c+d x)} \sqrt{e^{-i (c+d x)} \left(1+e^{2 i (c+d x)}\right)} \operatorname{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \left(4 d x-4 i \operatorname{ArcSinh}\left[e^{i (c+d x)}\right]+5 i \sqrt{2} \operatorname{Log}\left[1+e^{i (c+d x)}\right]+4 i \operatorname{Log}\left[1+\sqrt{1+e^{2 i (c+d x)}}\right]-5 i \sqrt{2} \operatorname{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \Big/ \left(\sqrt{2} d \sqrt{1+e^{2 i (c+d x)}} (a (1+\operatorname{Cos}[c+d x]))^{3/2}\right)+\left(\operatorname{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \sqrt{\operatorname{Cos}[c+d x]} \left(-\frac{\operatorname{Sec}\left[\frac{c}{2}\right] \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2 \operatorname{Sin}\left[\frac{d x}{2}\right]}{d}-\frac{\operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] \operatorname{Tan}\left[\frac{c}{2}\right]}{d}\right)\right) \Big/ (a (1+\operatorname{Cos}[c+d x]))^{3/2}$$

Problem 240: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{\operatorname{Cos}[c+d x]}}{(a+a \operatorname{Cos}[c+d x])^{3/2}}\, dx$$

Optimal (type 3, 97 leaves, 4 steps):

$$\frac{\operatorname{ArcTan}\left[\frac{\sqrt{a} \operatorname{Sin}[c+d x]}{\sqrt{2} \sqrt{\operatorname{Cos}[c+d x]} \sqrt{a+a \operatorname{Cos}[c+d x]}}\right]}{2 \sqrt{2} a^{3/2} d}+\frac{\sqrt{\operatorname{Cos}[c+d x]} \operatorname{Sin}[c+d x]}{2 d (a+a \operatorname{Cos}[c+d x])^{3/2}}$$

Result (type 3, 248 leaves):

$$-\left(\left(i\, e^{\frac{1}{2} i (c+d x)} \sqrt{e^{-i (c+d x)} \left(1+e^{2 i (c+d x)}\right)} \operatorname{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \left(\operatorname{Log}\left[1+e^{i (c+d x)}\right]-\operatorname{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \Big/ \left(d \sqrt{1+e^{2 i (c+d x)}} \left(a \left(1+\operatorname{Cos}[c+d x]\right)\right)^{3/2}\right)\right)+\left(\operatorname{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \sqrt{\operatorname{Cos}[c+d x]} \left(\frac{\operatorname{Sec}\left[\frac{c}{2}\right] \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2 \operatorname{Sin}\left[\frac{d x}{2}\right]}{d}+\frac{\operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] \operatorname{Tan}\left[\frac{c}{2}\right]}{d}\right)\right) \Big/ \left(a \left(1+\operatorname{Cos}[c+d x]\right)\right)^{3/2}$$

Problem 241: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{\operatorname{Cos}[c+d x]} \left(a+a \operatorname{Cos}[c+d x]\right)^{3/2}} \, dx$$

Optimal (type 3, 97 leaves, 4 steps):

$$\frac{3 \operatorname{ArcTan}\left[\frac{\sqrt{a} \operatorname{Sin}[c+d x]}{\sqrt{2} \sqrt{\operatorname{Cos}[c+d x]} \sqrt{a+a \operatorname{Cos}[c+d x]}}\right]}{2 \sqrt{2} a^{3/2} d}-\frac{\sqrt{\operatorname{Cos}[c+d x]} \operatorname{Sin}[c+d x]}{2 d \left(a+a \operatorname{Cos}[c+d x]\right)^{3/2}}$$

Result (type 3, 250 leaves):

$$-\left(\left(3 i\, e^{\frac{1}{2} i (c+d x)} \sqrt{e^{-i (c+d x)} \left(1+e^{2 i (c+d x)}\right)} \operatorname{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \left(\operatorname{Log}\left[1+e^{i (c+d x)}\right]-\operatorname{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \Big/ \left(d \sqrt{1+e^{2 i (c+d x)}} \left(a \left(1+\operatorname{Cos}[c+d x]\right)\right)^{3/2}\right)\right)+\left(\operatorname{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \sqrt{\operatorname{Cos}[c+d x]} \left(-\frac{\operatorname{Sec}\left[\frac{c}{2}\right] \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2 \operatorname{Sin}\left[\frac{d x}{2}\right]}{d}-\frac{\operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] \operatorname{Tan}\left[\frac{c}{2}\right]}{d}\right)\right) \Big/ \left(a \left(1+\operatorname{Cos}[c+d x]\right)\right)^{3/2}$$

Problem 242: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\operatorname{Cos}[c+d x]^{3/2} \left(a+a \operatorname{Cos}[c+d x]\right)^{3/2}} \, dx$$

Optimal (type 3, 137 leaves, 5 steps):

$$-\frac{7\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{2\,\sqrt{2}\,a^{3/2}\,d}-\frac{\text{Sin}[c+d\,x]}{2\,d\,\sqrt{\text{Cos}[c+d\,x]}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}}+\frac{5\,\text{Sin}[c+d\,x]}{2\,a\,d\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 272 leaves):

$$\left(7\,i\,e^{\frac{1}{2}i\,(c+d\,x)}\,\sqrt{e^{-i\,(c+d\,x)}\,\left(1+e^{2\,i\,(c+d\,x)}\right)}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\left(\text{Log}\left[1+e^{i\,(c+d\,x)}\right]-\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/\left(d\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}\right)+\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\sqrt{\text{Cos}[c+d\,x]}\left(\frac{\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Sin}\left[\frac{d\,x}{2}\right]}{d}+\frac{8\,\text{Sec}[c+d\,x]\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{d}+\frac{\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Tan}\left[\frac{c}{2}\right]}{d}\right)\right)\Big/\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}$$

Problem 243: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\text{Cos}[c+d\,x]^{5/2}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}}\,dx$$

Optimal (type 3, 177 leaves, 6 steps):

$$\frac{11\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{2\,\sqrt{2}\,a^{3/2}\,d}-\frac{\text{Sin}[c+d\,x]}{2\,d\,\text{Cos}[c+d\,x]^{3/2}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}}+\frac{7\,\text{Sin}[c+d\,x]}{6\,a\,d\,\text{Cos}[c+d\,x]^{3/2}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}-\frac{19\,\text{Sin}[c+d\,x]}{6\,a\,d\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 304 leaves):

$$-\left(\left(11\,i\,e^{\frac{1}{2}i\,(c+d\,x)}\,\sqrt{e^{-i\,(c+d\,x)}\,\left(1+e^{2\,i\,(c+d\,x)}\right)}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\left(\text{Log}\left[1+e^{i\,(c+d\,x)}\right]-\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/\left(d\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}\right)\right)+\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\sqrt{\text{Cos}[c+d\,x]}\left(-\frac{\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Sin}\left[\frac{d\,x}{2}\right]}{d}-\frac{32\,\text{Sec}[c+d\,x]\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{3\,d}+\frac{8\,\text{Sec}[c+d\,x]^2\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{3\,d}-\frac{\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Tan}\left[\frac{c}{2}\right]}{d}\right)\right)\Big/\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{3/2}$$

Problem 244: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Cos}[c+d x]^{7/2}}{(a+a\,\text{Cos}[c+d x])^{5/2}}\,dx$$

Optimal (type 3, 214 leaves, 8 steps):

$$-\frac{5\,\text{ArcSin}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{a+a\,\text{Cos}[c+d x]}}\right]}{a^{5/2}\,d}+\frac{115\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d x]}\,\sqrt{a+a\,\text{Cos}[c+d x]}}\right]}{16\,\sqrt{2}\,a^{5/2}\,d}-\frac{\text{Cos}[c+d x]^{5/2}\,\text{Sin}[c+d x]}{4\,d\,(a+a\,\text{Cos}[c+d x])^{5/2}}-\frac{15\,\text{Cos}[c+d x]^{3/2}\,\text{Sin}[c+d x]}{16\,a\,d\,(a+a\,\text{Cos}[c+d x])^{3/2}}+\frac{35\,\sqrt{\text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{16\,a^2\,d\,\sqrt{a+a\,\text{Cos}[c+d x]}}$$

Result (type 3, 414 leaves):

$$-\left(\left(5\,i\,e^{\frac{1}{2} i (c+d x)}\,\sqrt{e^{-i (c+d x)}\left(1+e^{2 i (c+d x)}\right)}\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\left(-16\,i\,d\,x-16\,\text{ArcSinh}\left[e^{i (c+d x)}\right]+23\,\sqrt{2}\,\text{Log}\left[1+e^{i (c+d x)}\right]+16\,\text{Log}\left[1+\sqrt{1+e^{2 i (c+d x)}}\right]-23\,\sqrt{2}\,\text{Log}\left[1-e^{i (c+d x)}+\sqrt{2}\,\sqrt{1+e^{2 i (c+d x)}}\right]\right)\right)\Big/\left(4\,\sqrt{2}\,d\,\sqrt{1+e^{2 i (c+d x)}}\,\left(a\,(1+\text{Cos}[c+d x])\right)^{5/2}\right)\right)+\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\sqrt{\text{Cos}[c+d x]}\left(\frac{8\,\text{Cos}\left[\frac{d x}{2}\right]\,\text{Sin}\left[\frac{c}{2}\right]}{d}+\frac{8\,\text{Cos}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d x}{2}\right]}{d}+\frac{23\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2\,\text{Sin}\left[\frac{d x}{2}\right]}{4\,d}-\frac{\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^4\,\text{Sin}\left[\frac{d x}{2}\right]}{2\,d}+\frac{23\,\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]\,\text{Tan}\left[\frac{c}{2}\right]}{4\,d}-\frac{\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3\,\text{Tan}\left[\frac{c}{2}\right]}{2\,d}\right)\right)\Big/\left(a\,(1+\text{Cos}[c+d x])\right)^{5/2}$$

Problem 245: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{Cos}[c+d x]^{5/2}}{(a+a\,\text{Cos}[c+d x])^{5/2}}\,dx$$

Optimal (type 3, 174 leaves, 7 steps):

$$\frac{2\,\text{ArcSin}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{a+a\,\text{Cos}[c+d x]}}\right]}{a^{5/2}\,d}-\frac{43\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d x]}\,\sqrt{a+a\,\text{Cos}[c+d x]}}\right]}{16\,\sqrt{2}\,a^{5/2}\,d}-\frac{\text{Cos}[c+d x]^{3/2}\,\text{Sin}[c+d x]}{4\,d\,(a+a\,\text{Cos}[c+d x])^{5/2}}-\frac{11\,\sqrt{\text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{16\,a\,d\,(a+a\,\text{Cos}[c+d x])^{3/2}}$$

Result (type 3, 382 leaves):

$$\left(e^{\frac{1}{2} i (c+d x)} \sqrt{e^{-i (c+d x)} \left(1+e^{2 i (c+d x)}\right)} \, \text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5 \left(32 d x-32 i \, \text{ArcSinh}\left[e^{i (c+d x)}\right]+43 i \sqrt{2} \, \text{Log}\left[1+e^{i (c+d x)}\right]+32 i \, \text{Log}\left[1+\sqrt{1+e^{2 i (c+d x)}}\right]-43 i \sqrt{2} \, \text{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \Big/ \left(4 \sqrt{2} d \sqrt{1+e^{2 i (c+d x)}} \left(a \left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\right)+\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5 \sqrt{\text{Cos}[c+d x]} \left(-\frac{15 \, \text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2 \text{Sin}\left[\frac{d x}{2}\right]}{4 d}+\frac{\text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^4 \text{Sin}\left[\frac{d x}{2}\right]}{2 d}-\frac{15 \, \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] \text{Tan}\left[\frac{c}{2}\right]}{4 d}+\frac{\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \text{Tan}\left[\frac{c}{2}\right]}{2 d}\right)\right) \Big/ \left(a \left(1+\text{Cos}[c+d x]\right)\right)^{5/2}$$

Problem 246: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{Cos}[c+d x]^{3/2}}{\left(a+a \, \text{Cos}[c+d x]\right)^{5/2}} \, dx$$

Optimal (type 3, 137 leaves, 5 steps):

$$\frac{3 \, \text{ArcTan}\left[\frac{\sqrt{a} \, \text{Sin}[c+d x]}{\sqrt{2} \sqrt{\text{Cos}[c+d x]} \sqrt{a+a \, \text{Cos}[c+d x]}}\right]}{16 \sqrt{2} \, a^{5/2} d}-\frac{\sqrt{\text{Cos}[c+d x]} \, \text{Sin}[c+d x]}{4 d \left(a+a \, \text{Cos}[c+d x]\right)^{5/2}}+\frac{7 \sqrt{\text{Cos}[c+d x]} \, \text{Sin}[c+d x]}{16 a d \left(a+a \, \text{Cos}[c+d x]\right)^{3/2}}$$

Result (type 3, 319 leaves):

$$-\left(\left(3 i e^{\frac{1}{2} i (c+d x)} \sqrt{e^{-i (c+d x)} \left(1+e^{2 i (c+d x)}\right)} \, \text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5 \left(\text{Log}\left[1+e^{i (c+d x)}\right]-\text{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \Big/ \left(4 d \sqrt{1+e^{2 i (c+d x)}} \left(a \left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\right)\right)+\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5 \sqrt{\text{Cos}[c+d x]} \left(\frac{7 \, \text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2 \text{Sin}\left[\frac{d x}{2}\right]}{4 d}-\frac{\text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^4 \text{Sin}\left[\frac{d x}{2}\right]}{2 d}+\frac{7 \, \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] \text{Tan}\left[\frac{c}{2}\right]}{4 d}-\frac{\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \text{Tan}\left[\frac{c}{2}\right]}{2 d}\right)\right) \Big/ \left(a \left(1+\text{Cos}[c+d x]\right)\right)^{5/2}$$

Problem 247: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{\text{Cos}[c+d x]}}{(a+a \,\text{Cos}[c+d x])^{5/2}} \, dx$$

Optimal (type 3, 137 leaves, 5 steps):

$$\frac{5 \,\text{ArcTan}\left[\frac{\sqrt{a} \,\text{Sin}[c+d x]}{\sqrt{2} \sqrt{\text{Cos}[c+d x]} \sqrt{a+a \,\text{Cos}[c+d x]}}\right]}{16 \sqrt{2} \, a^{5/2} d}+\frac{\sqrt{\text{Cos}[c+d x]} \,\text{Sin}[c+d x]}{4 d (a+a \,\text{Cos}[c+d x])^{5/2}}+\frac{\sqrt{\text{Cos}[c+d x]} \,\text{Sin}[c+d x]}{16 a d (a+a \,\text{Cos}[c+d x])^{3/2}}$$

Result (type 3, 319 leaves):

$$-\left(\left(5 \, i \, e^{\frac{1}{2} i (c+d x)} \sqrt{e^{-i (c+d x)} \left(1+e^{2 i (c+d x)}\right)} \,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5 \left(\text{Log}\left[1+e^{i (c+d x)}\right]-\text{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \Big/ \left(4 d \sqrt{1+e^{2 i (c+d x)}} \left(a (1+\text{Cos}[c+d x])\right)^{5/2}\right)\right)+$$
$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5 \sqrt{\text{Cos}[c+d x]} \left(\frac{\text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2 \text{Sin}\left[\frac{d x}{2}\right]}{4 d}+\frac{\text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^4 \text{Sin}\left[\frac{d x}{2}\right]}{2 d}+\frac{\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] \text{Tan}\left[\frac{c}{2}\right]}{4 d}+\frac{\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \text{Tan}\left[\frac{c}{2}\right]}{2 d}\right)\right) \Big/ \left(a (1+\text{Cos}[c+d x])\right)^{5/2}$$

Problem 248: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{\text{Cos}[c+d x]} \,(a+a \,\text{Cos}[c+d x])^{5/2}} \, dx$$

Optimal (type 3, 137 leaves, 5 steps):

$$\frac{19 \,\text{ArcTan}\left[\frac{\sqrt{a} \,\text{Sin}[c+d x]}{\sqrt{2} \sqrt{\text{Cos}[c+d x]} \sqrt{a+a \,\text{Cos}[c+d x]}}\right]}{16 \sqrt{2} \, a^{5/2} d}-\frac{\sqrt{\text{Cos}[c+d x]} \,\text{Sin}[c+d x]}{4 d (a+a \,\text{Cos}[c+d x])^{5/2}}-\frac{9 \sqrt{\text{Cos}[c+d x]} \,\text{Sin}[c+d x]}{16 a d (a+a \,\text{Cos}[c+d x])^{3/2}}$$

Result (type 3, 319 leaves):

$$-\left(\left(19\, i\, e^{\frac{1}{2} i (c+d x)} \sqrt{e^{-i (c+d x)} \left(1+e^{2 i (c+d x)}\right)} \cos\left[\frac{c}{2}+\frac{d x}{2}\right]^5 \left(\text{Log}\left[1+e^{i (c+d x)}\right]-\text{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \Big/ \left(4 d \sqrt{1+e^{2 i (c+d x)}} \left(a \left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\right)\right)+$$
$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5 \sqrt{\text{Cos}[c+d x]} \left(-\frac{9 \text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2 \text{Sin}\left[\frac{d x}{2}\right]}{4 d}-\frac{\text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^4 \text{Sin}\left[\frac{d x}{2}\right]}{2 d}-\frac{9 \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] \text{Tan}\left[\frac{c}{2}\right]}{4 d}-\frac{\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \text{Tan}\left[\frac{c}{2}\right]}{2 d}\right)\right) \Big/ \left(a \left(1+\text{Cos}[c+d x]\right)\right)^{5/2}$$

Problem 249: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\text{Cos}[c+d x]^{3/2} \left(a+a \text{Cos}[c+d x]\right)^{5/2}} \, dx$$

Optimal (type 3, 177 leaves, 6 steps):

$$-\frac{75 \text{ArcTan}\left[\frac{\sqrt{a} \text{Sin}[c+d x]}{\sqrt{2} \sqrt{\text{Cos}[c+d x]} \sqrt{a+a \text{Cos}[c+d x]}}\right]}{16 \sqrt{2}\, a^{5/2} d}-\frac{\text{Sin}[c+d x]}{4 d \sqrt{\text{Cos}[c+d x]} \left(a+a \text{Cos}[c+d x]\right)^{5/2}}-\frac{13 \text{Sin}[c+d x]}{16 a d \sqrt{\text{Cos}[c+d x]} \left(a+a \text{Cos}[c+d x]\right)^{3/2}}+\frac{49 \text{Sin}[c+d x]}{16 a^2 d \sqrt{\text{Cos}[c+d x]} \sqrt{a+a \text{Cos}[c+d x]}}$$

Result (type 3, 343 leaves):

$$\left(75\, i\, e^{\frac{1}{2} i (c+d x)} \sqrt{e^{-i (c+d x)} \left(1+e^{2 i (c+d x)}\right)} \cos\left[\frac{c}{2}+\frac{d x}{2}\right]^5 \left(\text{Log}\left[1+e^{i (c+d x)}\right]-\text{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \Big/ \left(4 d \sqrt{1+e^{2 i (c+d x)}} \left(a \left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\right)+$$
$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5 \sqrt{\text{Cos}[c+d x]} \left(\frac{17 \text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2 \text{Sin}\left[\frac{d x}{2}\right]}{4 d}+\frac{\text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^4 \text{Sin}\left[\frac{d x}{2}\right]}{2 d}+\frac{16 \text{Sec}[c+d x] \text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]}{d}+\frac{17 \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] \text{Tan}\left[\frac{c}{2}\right]}{4 d}+\frac{\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \text{Tan}\left[\frac{c}{2}\right]}{2 d}\right)\right) \Big/ \left(a \left(1+\text{Cos}[c+d x]\right)\right)^{5/2}$$

Problem 250: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\text{Cos}[c+d\,x]^{5/2}\,(a+a\,\text{Cos}[c+d\,x])^{5/2}}\,dx$$

Optimal (type 3, 217 leaves, 7 steps):

$$\frac{163\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{16\,\sqrt{2}\,a^{5/2}\,d}-\frac{\text{Sin}[c+d\,x]}{4\,d\,\text{Cos}[c+d\,x]^{3/2}\,(a+a\,\text{Cos}[c+d\,x])^{5/2}}-\frac{17\,\text{Sin}[c+d\,x]}{16\,a\,d\,\text{Cos}[c+d\,x]^{3/2}\,(a+a\,\text{Cos}[c+d\,x])^{3/2}}+\frac{95\,\text{Sin}[c+d\,x]}{48\,a^2\,d\,\text{Cos}[c+d\,x]^{3/2}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}-\frac{299\,\text{Sin}[c+d\,x]}{48\,a^2\,d\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 373 leaves):

$$-\left(\left(163\,i\,e^{\frac{1}{2}i\,(c+d\,x)}\,\sqrt{e^{-i\,(c+d\,x)}\,\left(1+e^{2\,i\,(c+d\,x)}\right)}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\left(\text{Log}\left[1+e^{i\,(c+d\,x)}\right]-\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/\left(4\,d\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\left(a\,(1+\text{Cos}[c+d\,x])\right)^{5/2}\right)\right)+\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\sqrt{\text{Cos}[c+d\,x]}\left(-\frac{25\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Sin}\left[\frac{d\,x}{2}\right]}{4\,d}-\frac{\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\text{Sin}\left[\frac{d\,x}{2}\right]}{2\,d}-\frac{112\,\text{Sec}[c+d\,x]\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{3\,d}+\frac{16\,\text{Sec}[c+d\,x]^2\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{3\,d}-\frac{25\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Tan}\left[\frac{c}{2}\right]}{4\,d}-\frac{\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\,\text{Tan}\left[\frac{c}{2}\right]}{2\,d}\right)\right)\Big/\left(a\,(1+\text{Cos}[c+d\,x])\right)^{5/2}$$

Problem 251: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Cos}[c+d\,x]^{9/2}}{(a+a\,\text{Cos}[c+d\,x])^{7/2}}\,dx$$

Optimal (type 3, 254 leaves, 9 steps):

$$-\frac{7\,\text{ArcSin}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{a^{7/2}\,d}+\frac{637\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{64\,\sqrt{2}\,a^{7/2}\,d}-\frac{\text{Cos}[c+d\,x]^{7/2}\,\text{Sin}[c+d\,x]}{6\,d\,(a+a\,\text{Cos}[c+d\,x])^{7/2}}-\frac{7\,\text{Cos}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{16\,a\,d\,(a+a\,\text{Cos}[c+d\,x])^{5/2}}-\frac{259\,\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{192\,a^2\,d\,(a+a\,\text{Cos}[c+d\,x])^{3/2}}+\frac{189\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{64\,a^3\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 477 leaves):

$$-\left(\left(7\,i\,e^{\frac{1}{2}i(c+dx)}\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}\right.\right.$$
$$\cos\left[\frac{c}{2}+\frac{dx}{2}\right]^7\left(-64\,i\,d\,x-64\,\text{ArcSinh}\left[e^{i(c+dx)}\right]+91\sqrt{2}\,\text{Log}\left[1+e^{i(c+dx)}\right]+\right.$$
$$\left.\left.\left.64\,\text{Log}\left[1+\sqrt{1+e^{2i(c+dx)}}\right]-91\sqrt{2}\,\text{Log}\left[1-e^{i(c+dx)}+\sqrt{2}\sqrt{1+e^{2i(c+dx)}}\right]\right)\right)\Big/$$
$$\left.\left(8\sqrt{2}\,d\sqrt{1+e^{2i(c+dx)}}\left(a\left(1+\cos[c+dx]\right)\right)^{7/2}\right)\right)+\left(\cos\left[\frac{c}{2}+\frac{dx}{2}\right]^7\sqrt{\cos[c+dx]}\right.$$
$$\left(\frac{16\cos\left[\frac{dx}{2}\right]\sin\left[\frac{c}{2}\right]}{d}+\frac{16\cos\left[\frac{c}{2}\right]\sin\left[\frac{dx}{2}\right]}{d}+\frac{523\sec\left[\frac{c}{2}\right]\sec\left[\frac{c}{2}+\frac{dx}{2}\right]^2\sin\left[\frac{dx}{2}\right]}{24\,d}-\right.$$
$$\frac{15\sec\left[\frac{c}{2}\right]\sec\left[\frac{c}{2}+\frac{dx}{2}\right]^4\sin\left[\frac{dx}{2}\right]}{4\,d}+\frac{\sec\left[\frac{c}{2}\right]\sec\left[\frac{c}{2}+\frac{dx}{2}\right]^6\sin\left[\frac{dx}{2}\right]}{3\,d}+\frac{523\sec\left[\frac{c}{2}+\frac{dx}{2}\right]\tan\left[\frac{c}{2}\right]}{24\,d}-$$
$$\left.\left.\frac{15\sec\left[\frac{c}{2}+\frac{dx}{2}\right]^3\tan\left[\frac{c}{2}\right]}{4\,d}+\frac{\sec\left[\frac{c}{2}+\frac{dx}{2}\right]^5\tan\left[\frac{c}{2}\right]}{3\,d}\right)\right)\Big/\left(a\left(1+\cos[c+dx]\right)\right)^{7/2}$$

Problem 252: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\cos[c+dx]^{7/2}}{\left(a+a\cos[c+dx]\right)^{7/2}}\,dx$$

Optimal (type 3, 214 leaves, 8 steps):

$$\frac{2\,\text{ArcSin}\left[\frac{\sqrt{a}\sin[c+dx]}{\sqrt{a+a\cos[c+dx]}}\right]}{a^{7/2}\,d}-\frac{177\,\text{ArcTan}\left[\frac{\sqrt{a}\sin[c+dx]}{\sqrt{2}\sqrt{\cos[c+dx]}\sqrt{a+a\cos[c+dx]}}\right]}{64\sqrt{2}\,a^{7/2}\,d}-$$
$$\frac{\cos[c+dx]^{5/2}\sin[c+dx]}{6\,d\left(a+a\cos[c+dx]\right)^{7/2}}-\frac{17\cos[c+dx]^{3/2}\sin[c+dx]}{48\,a\,d\left(a+a\cos[c+dx]\right)^{5/2}}-\frac{49\sqrt{\cos[c+dx]}\sin[c+dx]}{64\,a^2\,d\left(a+a\cos[c+dx]\right)^{3/2}}$$

Result (type 3, 445 leaves):

$$\left(e^{\frac{1}{2}i(c+dx)}\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}\,\text{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^7\right.$$
$$\left(128\,dx-128\,i\,\text{ArcSinh}\left[e^{i(c+dx)}\right]+177\,i\sqrt{2}\,\text{Log}\left[1+e^{i(c+dx)}\right]+\right.$$
$$\left.\left.128\,i\,\text{Log}\left[1+\sqrt{1+e^{2i(c+dx)}}\right]-177\,i\sqrt{2}\,\text{Log}\left[1-e^{i(c+dx)}+\sqrt{2}\sqrt{1+e^{2i(c+dx)}}\right]\right)\right)\Big/$$
$$\left(8\sqrt{2}\,d\sqrt{1+e^{2i(c+dx)}}\left(a\left(1+\text{Cos}[c+dx]\right)\right)^{7/2}\right)+$$
$$\left(\text{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^7\sqrt{\text{Cos}[c+dx]}\left(-\frac{247\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^2\text{Sin}\left[\frac{dx}{2}\right]}{24\,d}+\right.\right.$$
$$\frac{11\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^4\text{Sin}\left[\frac{dx}{2}\right]}{4\,d}-\frac{\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^6\text{Sin}\left[\frac{dx}{2}\right]}{3\,d}-\frac{247\,\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]\text{Tan}\left[\frac{c}{2}\right]}{24\,d}+$$
$$\left.\left.\frac{11\,\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^3\text{Tan}\left[\frac{c}{2}\right]}{4\,d}-\frac{\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^5\text{Tan}\left[\frac{c}{2}\right]}{3\,d}\right)\right)\Big/\left(a\left(1+\text{Cos}[c+dx]\right)\right)^{7/2}$$

Problem 253: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\text{Cos}[c+dx]^{5/2}}{\left(a+a\,\text{Cos}[c+dx]\right)^{7/2}}\,dx$$

Optimal (type 3, 177 leaves, 6 steps):

$$\frac{5\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+dx]}{\sqrt{2}\sqrt{\text{Cos}[c+dx]}\sqrt{a+a\,\text{Cos}[c+dx]}}\right]}{64\sqrt{2}\,a^{7/2}\,d}-\frac{\text{Cos}[c+dx]^{3/2}\,\text{Sin}[c+dx]}{6\,d\left(a+a\,\text{Cos}[c+dx]\right)^{7/2}}-$$
$$\frac{13\sqrt{\text{Cos}[c+dx]}\,\text{Sin}[c+dx]}{48\,a\,d\left(a+a\,\text{Cos}[c+dx]\right)^{5/2}}+\frac{67\sqrt{\text{Cos}[c+dx]}\,\text{Sin}[c+dx]}{192\,a^2\,d\left(a+a\,\text{Cos}[c+dx]\right)^{3/2}}$$

Result (type 3, 382 leaves):

$$-\left(\left(5\,i\,e^{\frac{1}{2}i(c+dx)}\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}\,\text{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^7\left(\text{Log}\left[1+e^{i(c+dx)}\right]-\text{Log}\left[1-e^{i(c+dx)}+\sqrt{2}\sqrt{1+e^{2i(c+dx)}}\right]\right)\right)\Big/\left(8\,d\sqrt{1+e^{2i(c+dx)}}\left(a\left(1+\text{Cos}[c+dx]\right)\right)^{7/2}\right)\right)+\left(\text{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^7\sqrt{\text{Cos}[c+dx]}\left(\frac{67\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^2\text{Sin}\left[\frac{dx}{2}\right]}{24\,d}-\frac{7\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^4\text{Sin}\left[\frac{dx}{2}\right]}{4\,d}+\frac{\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^6\text{Sin}\left[\frac{dx}{2}\right]}{3\,d}+\frac{67\,\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]\text{Tan}\left[\frac{c}{2}\right]}{24\,d}-\frac{7\,\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^3\text{Tan}\left[\frac{c}{2}\right]}{4\,d}+\frac{\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^5\text{Tan}\left[\frac{c}{2}\right]}{3\,d}\right)\right)\Big/\left(a\left(1+\text{Cos}[c+dx]\right)\right)^{7/2}$$

Problem 254: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\text{Cos}[c+dx]^{3/2}}{\left(a+a\,\text{Cos}[c+dx]\right)^{7/2}}\,dx$$

Optimal (type 3, 177 leaves, 6 steps):

$$\frac{7\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+dx]}{\sqrt{2}\sqrt{\text{Cos}[c+dx]}\sqrt{a+a\,\text{Cos}[c+dx]}}\right]}{64\sqrt{2}\,a^{7/2}\,d}-\frac{\sqrt{\text{Cos}[c+dx]}\,\text{Sin}[c+dx]}{6\,d\left(a+a\,\text{Cos}[c+dx]\right)^{7/2}}+\frac{3\sqrt{\text{Cos}[c+dx]}\,\text{Sin}[c+dx]}{16\,a\,d\left(a+a\,\text{Cos}[c+dx]\right)^{5/2}}+\frac{17\sqrt{\text{Cos}[c+dx]}\,\text{Sin}[c+dx]}{192\,a^2\,d\left(a+a\,\text{Cos}[c+dx]\right)^{3/2}}$$

Result (type 3, 382 leaves):

$$-\left(\left(7\,i\,e^{\frac{1}{2}i(c+dx)}\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}\,\text{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^7\left(\text{Log}\left[1+e^{i(c+dx)}\right]-\text{Log}\left[1-e^{i(c+dx)}+\sqrt{2}\sqrt{1+e^{2i(c+dx)}}\right]\right)\right)\Big/\left(8\,d\sqrt{1+e^{2i(c+dx)}}\left(a\left(1+\text{Cos}[c+dx]\right)\right)^{7/2}\right)\right)+\left(\text{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^7\sqrt{\text{Cos}[c+dx]}\left(\frac{17\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^2\text{Sin}\left[\frac{dx}{2}\right]}{24\,d}+\frac{3\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^4\text{Sin}\left[\frac{dx}{2}\right]}{4\,d}-\frac{\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^6\text{Sin}\left[\frac{dx}{2}\right]}{3\,d}+\frac{17\,\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]\text{Tan}\left[\frac{c}{2}\right]}{24\,d}+\frac{3\,\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^3\text{Tan}\left[\frac{c}{2}\right]}{4\,d}-\frac{\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^5\text{Tan}\left[\frac{c}{2}\right]}{3\,d}\right)\right)\Big/\left(a\left(1+\text{Cos}[c+dx]\right)\right)^{7/2}$$

Problem 255: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{\text{Cos}[c+d\,x]}}{\left(a+a\,\text{Cos}[c+d\,x]\right)^{7/2}}\,dx$$

Optimal (type 3, 177 leaves, 6 steps):

$$\frac{13\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{64\,\sqrt{2}\,a^{7/2}\,d}+\frac{\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{6\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{7/2}}+\frac{\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{16\,a\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}}-\frac{5\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{192\,a^2\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}}$$

Result (type 3, 382 leaves):

$$-\left(\left(13\,i\,e^{\frac{1}{2}i\,(c+d\,x)}\,\sqrt{e^{-i\,(c+d\,x)}\,\left(1+e^{2\,i\,(c+d\,x)}\right)}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^7\left(\text{Log}\left[1+e^{i\,(c+d\,x)}\right]-\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/\left(8\,d\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{7/2}\right)\right)+\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^7\sqrt{\text{Cos}[c+d\,x]}\left(-\frac{5\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Sin}\left[\frac{d\,x}{2}\right]}{24\,d}+\frac{\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\text{Sin}\left[\frac{d\,x}{2}\right]}{4\,d}+\frac{\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Sin}\left[\frac{d\,x}{2}\right]}{3\,d}-\frac{5\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Tan}\left[\frac{c}{2}\right]}{24\,d}+\frac{\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\,\text{Tan}\left[\frac{c}{2}\right]}{4\,d}+\frac{\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\text{Tan}\left[\frac{c}{2}\right]}{3\,d}\right)\right)\Big/\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{7/2}$$

Problem 256: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{\text{Cos}[c+d\,x]}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{7/2}}\,dx$$

Optimal (type 3, 177 leaves, 6 steps):

$$\frac{63\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]}{64\,\sqrt{2}\,a^{7/2}\,d}-\frac{\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{6\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{7/2}}-\frac{5\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{16\,a\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}}-\frac{103\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{192\,a^2\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}}$$

Result (type 3, 382 leaves):

$$-\left(\left(63\,i\,e^{\frac{1}{2}i(c+dx)}\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^7\left(\mathrm{Log}\left[1+e^{i(c+dx)}\right]-\mathrm{Log}\left[1-e^{i(c+dx)}+\sqrt{2}\sqrt{1+e^{2i(c+dx)}}\right]\right)\right)\Big/\left(8\,d\sqrt{1+e^{2i(c+dx)}}\left(a\left(1+\mathrm{Cos}[c+dx]\right)\right)^{7/2}\right)\right)+\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^7\sqrt{\mathrm{Cos}[c+dx]}\left(-\frac{103\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^2\mathrm{Sin}\left[\frac{dx}{2}\right]}{24\,d}-\frac{5\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^4\mathrm{Sin}\left[\frac{dx}{2}\right]}{4\,d}-\frac{\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^6\mathrm{Sin}\left[\frac{dx}{2}\right]}{3\,d}-\frac{103\,\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]\mathrm{Tan}\left[\frac{c}{2}\right]}{24\,d}-\frac{5\,\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^3\mathrm{Tan}\left[\frac{c}{2}\right]}{4\,d}-\frac{\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^5\mathrm{Tan}\left[\frac{c}{2}\right]}{3\,d}\right)\right)\Big/\left(a\left(1+\mathrm{Cos}[c+dx]\right)\right)^{7/2}$$

Problem 257: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\mathrm{Cos}[c+dx]^{3/2}\left(a+a\,\mathrm{Cos}[c+dx]\right)^{7/2}}\,dx$$

Optimal (type 3, 217 leaves, 7 steps):

$$-\frac{363\,\mathrm{ArcTan}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+dx]}{\sqrt{2}\sqrt{\mathrm{Cos}[c+dx]}\sqrt{a+a\,\mathrm{Cos}[c+dx]}}\right]}{64\sqrt{2}\,a^{7/2}\,d}-\frac{\mathrm{Sin}[c+dx]}{6\,d\sqrt{\mathrm{Cos}[c+dx]}\left(a+a\,\mathrm{Cos}[c+dx]\right)^{7/2}}-\frac{19\,\mathrm{Sin}[c+dx]}{48\,a\,d\sqrt{\mathrm{Cos}[c+dx]}\left(a+a\,\mathrm{Cos}[c+dx]\right)^{5/2}}-\frac{199\,\mathrm{Sin}[c+dx]}{192\,a^2\,d\sqrt{\mathrm{Cos}[c+dx]}\left(a+a\,\mathrm{Cos}[c+dx]\right)^{3/2}}+\frac{691\,\mathrm{Sin}[c+dx]}{192\,a^3\,d\sqrt{\mathrm{Cos}[c+dx]}\sqrt{a+a\,\mathrm{Cos}[c+dx]}}$$

Result (type 3, 406 leaves):

$$\left(363\, i\, e^{\frac{1}{2} i (c+d x)} \sqrt{e^{-i (c+d x)} \left(1+e^{2 i (c+d x)}\right)}\right.$$
$$\left.\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^7 \left(\text{Log}\left[1+e^{i (c+d x)}\right]-\text{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right)\Big/$$
$$\left(8 d \sqrt{1+e^{2 i (c+d x)}} \left(a \left(1+\text{Cos}[c+d x]\right)\right)^{7/2}\right)+\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^7 \sqrt{\text{Cos}[c+d x]}\right.$$
$$\left(\frac{307 \text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2 \text{Sin}\left[\frac{d x}{2}\right]}{24 d}+\frac{9 \text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^4 \text{Sin}\left[\frac{d x}{2}\right]}{4 d}+\right.$$
$$\frac{\text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^6 \text{Sin}\left[\frac{d x}{2}\right]}{3 d}+\frac{32 \text{Sec}[c+d x] \text{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]}{d}+\frac{307 \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] \text{Tan}\left[\frac{c}{2}\right]}{24 d}+$$
$$\left.\left.\frac{9 \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \text{Tan}\left[\frac{c}{2}\right]}{4 d}+\frac{\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5 \text{Tan}\left[\frac{c}{2}\right]}{3 d}\right)\right)\Big/\left(a \left(1+\text{Cos}[c+d x]\right)\right)^{7/2}$$

Problem 258: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\text{Cos}[c+d x]^{5/2} \left(a+a \text{Cos}[c+d x]\right)^{7/2}} \, dx$$

Optimal (type 3, 257 leaves, 8 steps):

$$\frac{1015 \text{ArcTan}\left[\frac{\sqrt{a} \text{Sin}[c+d x]}{\sqrt{2} \sqrt{\text{Cos}[c+d x]} \sqrt{a+a \text{Cos}[c+d x]}}\right]}{64 \sqrt{2} a^{7/2} d}-\frac{\text{Sin}[c+d x]}{6 d \text{Cos}[c+d x]^{3/2} \left(a+a \text{Cos}[c+d x]\right)^{7/2}}-$$
$$\frac{23 \text{Sin}[c+d x]}{48 a d \text{Cos}[c+d x]^{3/2} \left(a+a \text{Cos}[c+d x]\right)^{5/2}}-\frac{109 \text{Sin}[c+d x]}{64 a^2 d \text{Cos}[c+d x]^{3/2} \left(a+a \text{Cos}[c+d x]\right)^{3/2}}+$$
$$\frac{193 \text{Sin}[c+d x]}{64 a^3 d \text{Cos}[c+d x]^{3/2} \sqrt{a+a \text{Cos}[c+d x]}}-\frac{629 \text{Sin}[c+d x]}{64 a^3 d \sqrt{\text{Cos}[c+d x]} \sqrt{a+a \text{Cos}[c+d x]}}$$

Result (type 3, 436 leaves):

$$-\left(\left(1015\,i\,e^{\frac{1}{2}i(c+dx)}\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^7\left(\mathrm{Log}\left[1+e^{i(c+dx)}\right]-\mathrm{Log}\left[1-e^{i(c+dx)}+\sqrt{2}\sqrt{1+e^{2i(c+dx)}}\right]\right)\right)\Big/\left(8\,d\sqrt{1+e^{2i(c+dx)}}\,\left(a\left(1+\mathrm{Cos}[c+dx]\right)\right)^{7/2}\right)\right)+$$

$$\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^7\sqrt{\mathrm{Cos}[c+dx]}\left(-\frac{607\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^2\mathrm{Sin}\left[\frac{dx}{2}\right]}{24\,d}-\frac{13\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^4\mathrm{Sin}\left[\frac{dx}{2}\right]}{4\,d}-\frac{\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^6\mathrm{Sin}\left[\frac{dx}{2}\right]}{3\,d}-\frac{320\,\mathrm{Sec}[c+dx]\,\mathrm{Sin}\left[\frac{c}{2}+\frac{dx}{2}\right]}{3\,d}+\frac{32\,\mathrm{Sec}[c+dx]^2\,\mathrm{Sin}\left[\frac{c}{2}+\frac{dx}{2}\right]}{3\,d}-\frac{607\,\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]\mathrm{Tan}\left[\frac{c}{2}\right]}{24\,d}-\frac{13\,\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^3\mathrm{Tan}\left[\frac{c}{2}\right]}{4\,d}-\frac{\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^5\mathrm{Tan}\left[\frac{c}{2}\right]}{3\,d}\right)\right)\Big/\left(a\left(1+\mathrm{Cos}[c+dx]\right)\right)^{7/2}$$

Problem 259: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\mathrm{Cos}[c+dx]^{7/2}}{\left(a+a\,\mathrm{Cos}[c+dx]\right)^{9/2}}\,dx$$

Optimal (type 3, 217 leaves, 7 steps):

$$\frac{35\,\mathrm{ArcTan}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+dx]}{\sqrt{2}\sqrt{\mathrm{Cos}[c+dx]}\sqrt{a+a\,\mathrm{Cos}[c+dx]}}\right]}{1024\sqrt{2}\,a^{9/2}\,d}-\frac{\mathrm{Cos}[c+dx]^{5/2}\,\mathrm{Sin}[c+dx]}{8\,d\left(a+a\,\mathrm{Cos}[c+dx]\right)^{9/2}}-\frac{19\,\mathrm{Cos}[c+dx]^{3/2}\,\mathrm{Sin}[c+dx]}{96\,a\,d\left(a+a\,\mathrm{Cos}[c+dx]\right)^{7/2}}-\frac{187\sqrt{\mathrm{Cos}[c+dx]}\,\mathrm{Sin}[c+dx]}{768\,a^2\,d\left(a+a\,\mathrm{Cos}[c+dx]\right)^{5/2}}+\frac{853\sqrt{\mathrm{Cos}[c+dx]}\,\mathrm{Sin}[c+dx]}{3072\,a^3\,d\left(a+a\,\mathrm{Cos}[c+dx]\right)^{3/2}}$$

Result (type 3, 445 leaves):

$$-\left(\left(35\, i\, e^{\frac{1}{2} i (c+d x)} \sqrt{e^{-i (c+d x)} \left(1+e^{2 i (c+d x)}\right)}\, \mathrm{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^9 \left(\mathrm{Log}\left[1+e^{i (c+d x)}\right]-\mathrm{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \Bigg/ \left(64\, d \sqrt{1+e^{2 i (c+d x)}} \left(a \left(1+\mathrm{Cos}[c+d x]\right)\right)^{9/2}\right)\right)+$$

$$\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^9 \sqrt{\mathrm{Cos}[c+d x]} \left(\frac{853\, \mathrm{Sec}\left[\frac{c}{2}\right] \mathrm{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2 \mathrm{Sin}\left[\frac{d x}{2}\right]}{192\, d}-\frac{145\, \mathrm{Sec}\left[\frac{c}{2}\right] \mathrm{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^4 \mathrm{Sin}\left[\frac{d x}{2}\right]}{32\, d}+\frac{43\, \mathrm{Sec}\left[\frac{c}{2}\right] \mathrm{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^6 \mathrm{Sin}\left[\frac{d x}{2}\right]}{24\, d}-\frac{\mathrm{Sec}\left[\frac{c}{2}\right] \mathrm{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^8 \mathrm{Sin}\left[\frac{d x}{2}\right]}{4\, d}+\frac{853\, \mathrm{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] \mathrm{Tan}\left[\frac{c}{2}\right]}{192\, d}-\frac{145\, \mathrm{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \mathrm{Tan}\left[\frac{c}{2}\right]}{32\, d}+\frac{43\, \mathrm{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5 \mathrm{Tan}\left[\frac{c}{2}\right]}{24\, d}-\frac{\mathrm{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^7 \mathrm{Tan}\left[\frac{c}{2}\right]}{4\, d}\right)\right) \Bigg/ \left(a \left(1+\mathrm{Cos}[c+d x]\right)\right)^{9/2}$$

Problem 260: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\mathrm{Cos}[c+d x]^{5/2}}{\left(a+a\, \mathrm{Cos}[c+d x]\right)^{9/2}}\, dx$$

Optimal (type 3, 217 leaves, 7 steps):

$$\frac{45\, \mathrm{ArcTan}\left[\frac{\sqrt{a}\, \mathrm{Sin}[c+d x]}{\sqrt{2} \sqrt{\mathrm{Cos}[c+d x]} \sqrt{a+a\, \mathrm{Cos}[c+d x]}}\right]}{1024 \sqrt{2}\, a^{9/2}\, d}-\frac{\mathrm{Cos}[c+d x]^{3/2}\, \mathrm{Sin}[c+d x]}{8\, d \left(a+a\, \mathrm{Cos}[c+d x]\right)^{9/2}}-\frac{5 \sqrt{\mathrm{Cos}[c+d x]}\, \mathrm{Sin}[c+d x]}{32\, a\, d \left(a+a\, \mathrm{Cos}[c+d x]\right)^{7/2}}+\frac{33 \sqrt{\mathrm{Cos}[c+d x]}\, \mathrm{Sin}[c+d x]}{256\, a^2\, d \left(a+a\, \mathrm{Cos}[c+d x]\right)^{5/2}}+\frac{73 \sqrt{\mathrm{Cos}[c+d x]}\, \mathrm{Sin}[c+d x]}{1024\, a^3\, d \left(a+a\, \mathrm{Cos}[c+d x]\right)^{3/2}}$$

Result (type 3, 445 leaves):

$$-\left(\left(45\,i\,e^{\frac{1}{2}i(c+dx)}\sqrt{e^{-i(c+dx)}\left(1+e^{2i(c+dx)}\right)}\,\text{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^9\left(\text{Log}\left[1+e^{i(c+dx)}\right]-\text{Log}\left[1-e^{i(c+dx)}+\sqrt{2}\sqrt{1+e^{2i(c+dx)}}\right]\right)\right)\Big/\left(64\,d\sqrt{1+e^{2i(c+dx)}}\left(a\left(1+\text{Cos}[c+dx]\right)\right)^{9/2}\right)\right)+$$

$$\left(\text{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^9\sqrt{\text{Cos}[c+dx]}\left(\frac{73\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^2\text{Sin}\left[\frac{dx}{2}\right]}{64\,d}+\frac{33\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^4\text{Sin}\left[\frac{dx}{2}\right]}{32\,d}-\frac{9\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^6\text{Sin}\left[\frac{dx}{2}\right]}{8\,d}+\frac{\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^8\text{Sin}\left[\frac{dx}{2}\right]}{4\,d}+\frac{73\,\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]\text{Tan}\left[\frac{c}{2}\right]}{64\,d}+\frac{33\,\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^3\text{Tan}\left[\frac{c}{2}\right]}{32\,d}-\frac{9\,\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^5\text{Tan}\left[\frac{c}{2}\right]}{8\,d}+\frac{\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^7\text{Tan}\left[\frac{c}{2}\right]}{4\,d}\right)\right)\Big/\left(a\left(1+\text{Cos}[c+dx]\right)\right)^{9/2}$$

Problem 263: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \text{Cos}[c+dx]^{3/2}\sqrt{a-a\,\text{Cos}[c+dx]}\,dx$$

Optimal (type 3, 129 leaves, 4 steps):

$$-\frac{3\sqrt{a}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+dx]}{\sqrt{\text{Cos}[c+dx]}\sqrt{a-a\,\text{Cos}[c+dx]}}\right]}{4\,d}+\frac{3\,a\sqrt{\text{Cos}[c+dx]}\,\text{Sin}[c+dx]}{4\,d\sqrt{a-a\,\text{Cos}[c+dx]}}-\frac{a\,\text{Cos}[c+dx]^{3/2}\,\text{Sin}[c+dx]}{2\,d\sqrt{a-a\,\text{Cos}[c+dx]}}$$

Result (type 3, 395 leaves):

$$-\frac{1}{8\,d\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}}$$

$$\sqrt{\mathrm{Cos}[c+d\,x]}\;\sqrt{a-a\,\mathrm{Cos}[c+d\,x]}\;\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]\;\Bigg(3\,\mathrm{Cos}\left[\frac{d\,x}{2}\right]$$

$$\mathrm{Log}\left[2\,\left(e^{i\,d\,x}\,\mathrm{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\mathrm{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}\right)\right]+$$

$$3\,\mathrm{ArcTanh}\left[\left(\mathrm{Cos}\left[\frac{c}{2}\right]+i\,\mathrm{Sin}\left[\frac{c}{2}\right]\right)\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}\right]$$

$$\left(\mathrm{Cos}\left[\frac{d\,x}{2}\right]+i\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]\right)+$$

$$3\,i\,\mathrm{Log}\left[2\,\left(e^{i\,d\,x}\,\mathrm{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\mathrm{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}\right)\right]$$

$$\mathrm{Sin}\left[\frac{d\,x}{2}\right]-4\,\sqrt{2}\,\mathrm{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\sqrt{\mathrm{Cos}[c+d\,x]\,\left(\mathrm{Cos}[d\,x]+i\,\mathrm{Sin}[d\,x]\right)}+$$

$$2\,\sqrt{2}\,\mathrm{Cos}\left[\frac{3}{2}\,(c+d\,x)\right]\,\sqrt{\mathrm{Cos}[c+d\,x]\,\left(\mathrm{Cos}[d\,x]+i\,\mathrm{Sin}[d\,x]\right)}\Bigg)$$

Problem 264: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\sqrt{\mathrm{Cos}[c+d\,x]}\;\sqrt{a-a\,\mathrm{Cos}[c+d\,x]}\;dx$$

Optimal (type 3, 85 leaves, 3 steps):

$$\frac{\sqrt{a}\;\mathrm{ArcTanh}\left[\frac{\sqrt{a}\;\mathrm{Sin}[c+d\,x]}{\sqrt{\mathrm{Cos}[c+d\,x]}\;\sqrt{a-a\,\mathrm{Cos}[c+d\,x]}}\right]}{d}-\frac{a\,\sqrt{\mathrm{Cos}[c+d\,x]}\;\mathrm{Sin}[c+d\,x]}{d\,\sqrt{a-a\,\mathrm{Cos}[c+d\,x]}}$$

Result (type 3, 352 leaves):

$$\frac{1}{2\,d\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}}$$

$$\sqrt{\mathrm{Cos}[c+d\,x]}\;\sqrt{a-a\,\mathrm{Cos}[c+d\,x]}\;\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]\;\Bigg(\mathrm{Cos}\left[\frac{d\,x}{2}\right]$$

$$\mathrm{Log}\left[2\,\left(e^{i\,d\,x}\,\mathrm{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\mathrm{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}\right)\right]+$$

$$\mathrm{ArcTanh}\left[\left(\mathrm{Cos}\left[\frac{c}{2}\right]+i\,\mathrm{Sin}\left[\frac{c}{2}\right]\right)\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}\right]$$

$$\left(\mathrm{Cos}\left[\frac{d\,x}{2}\right]+i\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]\right)+$$

$$i\,\mathrm{Log}\left[2\,\left(e^{i\,d\,x}\,\mathrm{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\mathrm{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\mathrm{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\mathrm{Sin}[c]}\right)\right]$$

$$\mathrm{Sin}\left[\frac{d\,x}{2}\right]-2\,\sqrt{2}\,\mathrm{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\sqrt{\mathrm{Cos}[c+d\,x]\,\left(\mathrm{Cos}[d\,x]+i\,\mathrm{Sin}[d\,x]\right)}\Bigg)$$

Problem 265: Result unnecessarily involves complex numbers and more than

twice size of optimal antiderivative.

$$\int \frac{\sqrt{a - a \operatorname{Cos}[c + d x]}}{\sqrt{\operatorname{Cos}[c + d x]}} \, dx$$

Optimal (type 3, 48 leaves, 2 steps):

$$-\frac{2 \sqrt{a} \operatorname{ArcTanh}\left[\frac{\sqrt{a} \operatorname{Sin}[c+d x]}{\sqrt{\operatorname{Cos}[c+d x]} \sqrt{a-a \operatorname{Cos}[c+d x]}}\right]}{d}$$

Result (type 3, 243 leaves):

$$-\left(\left(e^{\frac{i d x}{2}} \sqrt{a - a \operatorname{Cos}[c + d x]} \operatorname{Csc}\left[\frac{1}{2} (c + d x)\right] \left(\operatorname{ArcTanh}\left[\left(\operatorname{Cos}\left[\frac{c}{2}\right] + i \operatorname{Sin}\left[\frac{c}{2}\right]\right) \sqrt{\left(1 + e^{2 i d x}\right) \operatorname{Cos}[c] + i \left(-1 + e^{2 i d x}\right) \operatorname{Sin}[c]}\right] + \operatorname{Log}\left[2 \left(e^{i d x} \operatorname{Cos}\left[\frac{c}{2}\right] + i e^{i d x} \operatorname{Sin}\left[\frac{c}{2}\right] + \sqrt{\left(1 + e^{2 i d x}\right) \operatorname{Cos}[c] + i \left(-1 + e^{2 i d x}\right) \operatorname{Sin}[c]}\right)\right]\right) \sqrt{e^{-i d x} \left(\left(1 + e^{2 i d x}\right) \operatorname{Cos}[c] + i \left(-1 + e^{2 i d x}\right) \operatorname{Sin}[c]\right)}\right) \Big/ \left(d \sqrt{2 \left(1 + e^{2 i d x}\right) \operatorname{Cos}[c] + 2 i \left(-1 + e^{2 i d x}\right) \operatorname{Sin}[c]}\right)\right)$$

Problem 269: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \sqrt{1 - \operatorname{Cos}[c + d x]} \operatorname{Cos}[c + d x]^{3/2} \, dx$$

Optimal (type 3, 114 leaves, 4 steps):

$$-\frac{3 \operatorname{ArcTanh}\left[\frac{\operatorname{Sin}[c+d x]}{\sqrt{1-\operatorname{Cos}[c+d x]} \sqrt{\operatorname{Cos}[c+d x]}}\right]}{4 d} + \frac{3 \sqrt{\operatorname{Cos}[c + d x]} \operatorname{Sin}[c + d x]}{4 d \sqrt{1 - \operatorname{Cos}[c + d x]}} - \frac{\operatorname{Cos}[c + d x]^{3/2} \operatorname{Sin}[c + d x]}{2 d \sqrt{1 - \operatorname{Cos}[c + d x]}}$$

Result (type 3, 390 leaves):

$$-\frac{1}{8\,d\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}}\sqrt{-\left(-1+\text{Cos}[c+d\,x]\right)\,\text{Cos}[c+d\,x]}\;\text{Csc}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\left(3\,\text{Cos}\left[\frac{d\,x}{2}\right]\right.$$
$$\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]+$$
$$3\,\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+i\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right]$$
$$\left(\text{Cos}\left[\frac{d\,x}{2}\right]+i\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)+$$
$$3\,i\,\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]$$
$$\text{Sin}\left[\frac{d\,x}{2}\right]-4\,\sqrt{2}\,\text{Cos}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\sqrt{\text{Cos}[c+d\,x]\,\left(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x]\right)}+$$
$$\left.2\,\sqrt{2}\,\text{Cos}\left[\frac{3}{2}\,\left(c+d\,x\right)\right]\,\sqrt{\text{Cos}[c+d\,x]\,\left(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x]\right)}\right)$$

Problem 270: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\sqrt{1-\text{Cos}[c+d\,x]}\,\sqrt{\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 3, 72 leaves, 3 steps):

$$\frac{\text{ArcTanh}\left[\frac{\text{Sin}[c+d\,x]}{\sqrt{1-\text{Cos}[c+d\,x]}\,\sqrt{\text{Cos}[c+d\,x]}}\right]}{d}-\frac{\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d\,\sqrt{1-\text{Cos}[c+d\,x]}}$$

Result (type 3, 340 leaves):

$$\frac{1}{2\,d\,\sqrt{\text{Cos}[c+d\,x]\,\left(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x]\right)}}\text{Csc}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\left(\text{Cos}\left[\frac{d\,x}{2}\right]\right.$$
$$\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]+$$
$$\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+i\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right]$$
$$\left(\text{Cos}\left[\frac{d\,x}{2}\right]+i\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)+i\,\text{Log}\left[\right.$$
$$\left.2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]-$$
$$\left.2\,\sqrt{2}\,\text{Cos}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\sqrt{\text{Cos}[c+d\,x]\,\left(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x]\right)}\right)\,\sqrt{\text{Cos}[c+d\,x]\,\text{Sin}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2}$$

Problem 271: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{1-\text{Cos}[c+d\,x]}}{\sqrt{\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 37 leaves, 2 steps):

$$-\frac{2\,\text{ArcTanh}\left[\frac{\text{Sin}[c+d\,x]}{\sqrt{1-\text{Cos}[c+d\,x]}\,\sqrt{\text{Cos}[c+d\,x]}}\right]}{d}$$

Result (type 3, 242 leaves):

$$-\left(\left(e^{\frac{i\,d\,x}{2}}\sqrt{1-\text{Cos}[c+d\,x]}\,\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]\right.\right.$$
$$\left(\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+i\,\text{Sin}\left[\frac{c}{2}\right]\right)\sqrt{\left(1+e^{2\,i\,d\,x}\right)\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\text{Sin}[c]}\,\right]+\right.$$
$$\left.\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\text{Sin}[c]}\,\right)\right]\right)$$
$$\left.\sqrt{e^{-i\,d\,x}\,\left(\left(1+e^{2\,i\,d\,x}\right)\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\text{Sin}[c]\right)}\,\right)\Big/$$
$$\left.\left(d\,\sqrt{2\,\left(1+e^{2\,i\,d\,x}\right)\text{Cos}[c]+2\,i\,\left(-1+e^{2\,i\,d\,x}\right)\text{Sin}[c]}\,\right)\right)$$

Problem 275: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Cos}[c+d\,x]^{5/2}}{\sqrt{a-a\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 185 leaves, 7 steps):

$$\frac{7\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a-a\,\text{Cos}[c+d\,x]}}\right]}{4\,\sqrt{a}\,d}-\frac{\sqrt{2}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a-a\,\text{Cos}[c+d\,x]}}\right]}{\sqrt{a}\,d}+$$
$$\frac{\sqrt{\text{Cos}[c+d\,x]}\,\,\text{Sin}[c+d\,x]}{4\,d\,\sqrt{a-a\,\text{Cos}[c+d\,x]}}+\frac{\text{Cos}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{2\,d\,\sqrt{a-a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 246 leaves):

$$\left(\left(\frac{4\sqrt{\text{Cos}[c+d x]}\left(2\,\text{Cos}\left[\frac{1}{2}(c+d x)\right]+\text{Cos}\left[\frac{3}{2}(c+d x)\right]\right)}{d}+\left(\sqrt{2}\,e^{\frac{1}{2} i (c+d x)}\sqrt{e^{-i (c+d x)}\left(1+e^{2 i (c+d x)}\right)}\left(-7 i d x+7\,\text{ArcSinh}\left[e^{i (c+d x)}\right]+8\sqrt{2}\,\text{Log}\left[1-e^{i (c+d x)}\right]+7\,\text{Log}\left[1+\sqrt{1+e^{2 i (c+d x)}}\right]-8\sqrt{2}\,\text{Log}\left[1+e^{i (c+d x)}+\sqrt{2}\sqrt{1+e^{2 i (c+d x)}}\right]\right)\right)\Big/\left(d\sqrt{1+e^{2 i (c+d x)}}\right)\right)\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)\Big/\left(8\sqrt{a-a\,\text{Cos}[c+d x]}\right)$$

Problem 276: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Cos}[c+d x]^{3/2}}{\sqrt{a-a\,\text{Cos}[c+d x]}}\,dx$$

Optimal (type 3, 141 leaves, 6 steps):

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{\text{Cos}[c+d x]}\sqrt{a-a\,\text{Cos}[c+d x]}}\right]}{\sqrt{a}\,d}-\frac{\sqrt{2}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{2}\sqrt{\text{Cos}[c+d x]}\sqrt{a-a\,\text{Cos}[c+d x]}}\right]}{\sqrt{a}\,d}+\frac{\sqrt{\text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{d\sqrt{a-a\,\text{Cos}[c+d x]}}$$

Result (type 3, 229 leaves):

$$\left(\left(\frac{4\,\text{Cos}\left[\frac{1}{2}(c+d x)\right]\sqrt{\text{Cos}[c+d x]}}{d}+\left(\sqrt{2}\,e^{\frac{1}{2} i (c+d x)}\sqrt{e^{-i (c+d x)}\left(1+e^{2 i (c+d x)}\right)}\left(-i d x+\text{ArcSinh}\left[e^{i (c+d x)}\right]+2\sqrt{2}\,\text{Log}\left[1-e^{i (c+d x)}\right]+\text{Log}\left[1+\sqrt{1+e^{2 i (c+d x)}}\right]-2\sqrt{2}\,\text{Log}\left[1+e^{i (c+d x)}+\sqrt{2}\sqrt{1+e^{2 i (c+d x)}}\right]\right)\right)\Big/\left(d\sqrt{1+e^{2 i (c+d x)}}\right)\right)\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)\Big/\left(2\sqrt{a-a\,\text{Cos}[c+d x]}\right)$$

Problem 277: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{\text{Cos}[c+d x]}}{\sqrt{a-a\,\text{Cos}[c+d x]}}\,dx$$

Optimal (type 3, 107 leaves, 5 steps):

$$\frac{2\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a-a\,\text{Cos}[c+d\,x]}}\right]}{\sqrt{a}\,d}-\frac{\sqrt{2}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a-a\,\text{Cos}[c+d\,x]}}\right]}{\sqrt{a}\,d}$$

Result (type 3, 191 leaves):

$$-\left(\left(i\left(-1+e^{i(c+d\,x)}\right)\sqrt{e^{-i(c+d\,x)}\left(1+e^{2\,i(c+d\,x)}\right)}\left(-i\,d\,x+\text{ArcSinh}\left[e^{i(c+d\,x)}\right]+\sqrt{2}\,\text{Log}\left[1-e^{i(c+d\,x)}\right]+\text{Log}\left[1+\sqrt{1+e^{2\,i(c+d\,x)}}\right]-\sqrt{2}\,\text{Log}\left[1+e^{i(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i(c+d\,x)}}\right]\right)\right)\Big/\left(\sqrt{2}\,d\,\sqrt{1+e^{2\,i(c+d\,x)}}\,\sqrt{a-a\,\text{Cos}[c+d\,x]}\right)\right)$$

Problem 278: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a-a\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 58 leaves, 2 steps):

$$-\frac{\sqrt{2}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a-a\,\text{Cos}[c+d\,x]}}\right]}{\sqrt{a}\,d}$$

Result (type 3, 137 leaves):

$$-\left(\left(i\left(-1+e^{i(c+d\,x)}\right)\sqrt{e^{-i(c+d\,x)}\left(1+e^{2\,i(c+d\,x)}\right)}\left(\text{Log}\left[1-e^{i(c+d\,x)}\right]-\text{Log}\left[1+e^{i(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i(c+d\,x)}}\right]\right)\right)\Big/\left(d\,\sqrt{1+e^{2\,i(c+d\,x)}}\,\sqrt{a-a\,\text{Cos}[c+d\,x]}\right)\right)$$

Problem 279: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\text{Cos}[c+d\,x]^{3/2}\,\sqrt{a-a\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 95 leaves, 4 steps):

$$-\frac{\sqrt{2}\,\text{ArcTanh}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a-a\,\text{Cos}[c+d\,x]}}\right]}{\sqrt{a}\,d}+\frac{2\,\text{Sin}[c+d\,x]}{d\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a-a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 194 leaves):

$$\left(e^{-\frac{1}{2} i (c+d x)} \left(2 \left(1+e^{i (c+d x)}\right) \sqrt{1+e^{2 i (c+d x)}}+\sqrt{2} \left(1+e^{2 i (c+d x)}\right) \text{Log}\left[1-e^{i (c+d x)}\right]-\sqrt{2} \left(1+e^{2 i (c+d x)}\right) \text{Log}\left[1+e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right) \text{Sin}\left[\frac{1}{2} (c+d x)\right]\right) \Big/ \left(d \sqrt{1+e^{2 i (c+d x)}} \sqrt{\text{Cos}[c+d x]} \sqrt{a-a \text{Cos}[c+d x]}\right)$$

Problem 280: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\text{Cos}[c+d x]^{5/2} \sqrt{a-a \text{Cos}[c+d x]}} \, dx$$

Optimal (type 3, 135 leaves, 5 steps):

$$-\frac{\sqrt{2} \text{ArcTanh}\left[\frac{\sqrt{a} \text{Sin}[c+d x]}{\sqrt{2} \sqrt{\text{Cos}[c+d x]} \sqrt{a-a \text{Cos}[c+d x]}}\right]}{\sqrt{a} d}+\frac{2 \text{Sin}[c+d x]}{3 d \text{Cos}[c+d x]^{3/2} \sqrt{a-a \text{Cos}[c+d x]}}+\frac{2 \text{Sin}[c+d x]}{3 d \sqrt{\text{Cos}[c+d x]} \sqrt{a-a \text{Cos}[c+d x]}}$$

Result (type 3, 185 leaves):

$$\left(e^{-\frac{3}{2} i (c+d x)} \left(2 \left(1+e^{i (c+d x)}\right)^3 \sqrt{1+e^{2 i (c+d x)}}+3 \sqrt{2} \left(1+e^{2 i (c+d x)}\right)^2 \left(\text{Log}\left[1-e^{i (c+d x)}\right]-\text{Log}\left[1+e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \text{Sin}\left[\frac{1}{2} (c+d x)\right]\right) \Big/ \left(6 d \sqrt{1+e^{2 i (c+d x)}} \text{Cos}[c+d x]^{3/2} \sqrt{a-a \text{Cos}[c+d x]}\right)$$

Problem 281: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\text{Cos}[c+d x]^{7/2} \sqrt{a-a \text{Cos}[c+d x]}} \, dx$$

Optimal (type 3, 173 leaves, 6 steps):

$$-\frac{\sqrt{2} \text{ArcTanh}\left[\frac{\sqrt{a} \text{Sin}[c+d x]}{\sqrt{2} \sqrt{\text{Cos}[c+d x]} \sqrt{a-a \text{Cos}[c+d x]}}\right]}{\sqrt{a} d}+\frac{2 \text{Sin}[c+d x]}{5 d \text{Cos}[c+d x]^{5/2} \sqrt{a-a \text{Cos}[c+d x]}}+\frac{2 \text{Sin}[c+d x]}{15 d \text{Cos}[c+d x]^{3/2} \sqrt{a-a \text{Cos}[c+d x]}}+\frac{26 \text{Sin}[c+d x]}{15 d \sqrt{\text{Cos}[c+d x]} \sqrt{a-a \text{Cos}[c+d x]}}$$

Result (type 3, 192 leaves):

$$\left(\left(\frac{4\,\mathrm{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\left(3+\mathrm{Cos}[c+d\,x]+13\,\mathrm{Cos}[c+d\,x]^2\right)}{15\,d\,\mathrm{Cos}[c+d\,x]^{5/2}}+\left(2\,e^{\frac{1}{2}\,i\,(c+d\,x)}\,\sqrt{e^{-i\,(c+d\,x)}\,\left(1+e^{2\,i\,(c+d\,x)}\right)}\right.\right.\right.$$
$$\left.\left(\mathrm{Log}\left[1-e^{i\,(c+d\,x)}\right]-\mathrm{Log}\left[1+e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/$$
$$\left.\left.\left(d\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right)\right)\,\mathrm{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)\Big/\left(\sqrt{a-a\,\mathrm{Cos}[c+d\,x]}\right)$$

Problem 282: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\mathrm{Cos}[c+d\,x]^{5/2}}{\sqrt{1-\mathrm{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 161 leaves, 7 steps):

$$\frac{7\,\mathrm{ArcTanh}\left[\frac{\mathrm{Sin}[c+d\,x]}{\sqrt{1-\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Cos}[c+d\,x]}}\right]}{4\,d}-\frac{\sqrt{2}\,\mathrm{ArcTanh}\left[\frac{\mathrm{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{1-\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Cos}[c+d\,x]}}\right]}{d}+$$
$$\frac{\sqrt{\mathrm{Cos}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{4\,d\,\sqrt{1-\mathrm{Cos}[c+d\,x]}}+\frac{\mathrm{Cos}[c+d\,x]^{3/2}\,\mathrm{Sin}[c+d\,x]}{2\,d\,\sqrt{1-\mathrm{Cos}[c+d\,x]}}$$

Result (type 3, 245 leaves):

$$\left(\left(\frac{4\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\left(2\,\mathrm{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\mathrm{Cos}\left[\frac{3}{2}\,(c+d\,x)\right]\right)}{d}+\right.\right.$$
$$\left(\sqrt{2}\,e^{\frac{1}{2}\,i\,(c+d\,x)}\,\sqrt{e^{-i\,(c+d\,x)}\,\left(1+e^{2\,i\,(c+d\,x)}\right)}\right.$$
$$\left(-7\,i\,d\,x+7\,\mathrm{ArcSinh}\left[e^{i\,(c+d\,x)}\right]+8\,\sqrt{2}\,\mathrm{Log}\left[1-e^{i\,(c+d\,x)}\right]+7\,\mathrm{Log}\left[1+\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]-\right.$$
$$\left.\left.8\,\sqrt{2}\,\mathrm{Log}\left[1+e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/$$
$$\left.\left.\left(d\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right)\right)\,\mathrm{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)\Big/\left(8\,\sqrt{1-\mathrm{Cos}[c+d\,x]}\right)$$

Problem 283: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\mathrm{Cos}[c+d\,x]^{3/2}}{\sqrt{1-\mathrm{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 118 leaves, 6 steps):

$$\frac{\text{ArcTanh}\left[\frac{\text{Sin}[c+d x]}{\sqrt{1-\text{Cos}[c+d x]}\,\sqrt{\text{Cos}[c+d x]}}\right]}{d}-\frac{\sqrt{2}\,\text{ArcTanh}\left[\frac{\text{Sin}[c+d x]}{\sqrt{2}\,\sqrt{1-\text{Cos}[c+d x]}\,\sqrt{\text{Cos}[c+d x]}}\right]}{d}+\frac{\sqrt{\text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{d\,\sqrt{1-\text{Cos}[c+d x]}}$$

Result (type 3, 228 leaves):

$$\left(\left(\frac{4\,\text{Cos}\left[\frac{1}{2}\,(c+d x)\right]\sqrt{\text{Cos}[c+d x]}}{d}+\left(\sqrt{2}\,e^{\frac{1}{2}\,i\,(c+d x)}\sqrt{e^{-i\,(c+d x)}\left(1+e^{2\,i\,(c+d x)}\right)}\left(-i\,d\,x+\text{ArcSinh}\left[e^{i\,(c+d x)}\right]+2\,\sqrt{2}\,\text{Log}\left[1-e^{i\,(c+d x)}\right]+\text{Log}\left[1+\sqrt{1+e^{2\,i\,(c+d x)}}\right]-2\,\sqrt{2}\,\text{Log}\left[1+e^{i\,(c+d x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d x)}}\right]\right)\right)\Big/\left(d\,\sqrt{1+e^{2\,i\,(c+d x)}}\right)\right)\text{Sin}\left[\frac{1}{2}\,(c+d x)\right]\right)\Big/\left(2\,\sqrt{1-\text{Cos}[c+d x]}\right)$$

Problem 284: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{\text{Cos}[c+d x]}}{\sqrt{1-\text{Cos}[c+d x]}}\,dx$$

Optimal (type 3, 85 leaves, 5 steps):

$$\frac{2\,\text{ArcTanh}\left[\frac{\text{Sin}[c+d x]}{\sqrt{1-\text{Cos}[c+d x]}\,\sqrt{\text{Cos}[c+d x]}}\right]}{d}-\frac{\sqrt{2}\,\text{ArcTanh}\left[\frac{\text{Sin}[c+d x]}{\sqrt{2}\,\sqrt{1-\text{Cos}[c+d x]}\,\sqrt{\text{Cos}[c+d x]}}\right]}{d}$$

Result (type 3, 190 leaves):

$$-\left(\left(i\left(-1+e^{i\,(c+d x)}\right)\sqrt{e^{-i\,(c+d x)}\left(1+e^{2\,i\,(c+d x)}\right)}\left(-i\,d\,x+\text{ArcSinh}\left[e^{i\,(c+d x)}\right]+\sqrt{2}\,\text{Log}\left[1-e^{i\,(c+d x)}\right]+\text{Log}\left[1+\sqrt{1+e^{2\,i\,(c+d x)}}\right]-\sqrt{2}\,\text{Log}\left[1+e^{i\,(c+d x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d x)}}\right]\right)\right)\Big/\left(\sqrt{2}\,d\,\sqrt{1+e^{2\,i\,(c+d x)}}\,\sqrt{1-\text{Cos}[c+d x]}\right)\right)$$

Problem 285: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{1-\text{Cos}[c+d x]}\,\sqrt{\text{Cos}[c+d x]}}\,dx$$

Optimal (type 3, 47 leaves, 2 steps):

$$-\frac{\sqrt{2}\ \text{ArcTanh}\left[\frac{\text{Sin}[c+d x]}{\sqrt{2}\ \sqrt{1-\text{Cos}[c+d x]}\ \sqrt{\text{Cos}[c+d x]}}\right]}{d}$$

Result (type 3, 129 leaves):

$$-\left(\left(\mathrm{i}\ e^{-\mathrm{i}\ (c+d x)}\ \left(-1+e^{\mathrm{i}\ (c+d x)}\right)\ \sqrt{1+e^{2\ \mathrm{i}\ (c+d x)}}\ \left(\text{Log}\left[1-e^{\mathrm{i}\ (c+d x)}\right]-\text{Log}\left[1+e^{\mathrm{i}\ (c+d x)}+\sqrt{2}\ \sqrt{1+e^{2\ \mathrm{i}\ (c+d x)}}\ \right]\right)\right)\Big/\left(\sqrt{2}\ d\ \sqrt{-\left(-1+\text{Cos}[c+d x]\right)\ \text{Cos}[c+d x]}\right)\right)$$

Problem 286: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{1-\text{Cos}[c+d x]}\ \text{Cos}[c+d x]^{3/2}}\, dx$$

Optimal (type 3, 83 leaves, 3 steps):

$$-\frac{\sqrt{2}\ \text{ArcTanh}\left[\frac{\text{Sin}[c+d x]}{\sqrt{2}\ \sqrt{1-\text{Cos}[c+d x]}\ \sqrt{\text{Cos}[c+d x]}}\right]}{d}+\frac{2\ \text{Sin}[c+d x]}{d\ \sqrt{1-\text{Cos}[c+d x]}\ \sqrt{\text{Cos}[c+d x]}}$$

Result (type 3, 189 leaves):

$$\left(e^{-\frac{1}{2}\mathrm{i}\ (c+d x)}\ \left(2\ \left(1+e^{\mathrm{i}\ (c+d x)}\right)\ \sqrt{1+e^{2\ \mathrm{i}\ (c+d x)}}+\sqrt{2}\ \left(1+e^{2\ \mathrm{i}\ (c+d x)}\right)\ \text{Log}\left[1-e^{\mathrm{i}\ (c+d x)}\right]-\sqrt{2}\ \left(1+e^{2\ \mathrm{i}\ (c+d x)}\right)\ \text{Log}\left[1+e^{\mathrm{i}\ (c+d x)}+\sqrt{2}\ \sqrt{1+e^{2\ \mathrm{i}\ (c+d x)}}\ \right]\right)\ \text{Sin}\left[\frac{1}{2}\ (c+d x)\right]\right)\Big/\left(d\ \sqrt{1+e^{2\ \mathrm{i}\ (c+d x)}}\ \sqrt{-\left(-1+\text{Cos}[c+d x]\right)\ \text{Cos}[c+d x]}\right)$$

Problem 287: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{1-\text{Cos}[c+d x]}\ \text{Cos}[c+d x]^{5/2}}\, dx$$

Optimal (type 3, 122 leaves, 5 steps):

$$-\frac{\sqrt{2}\ \text{ArcTanh}\left[\frac{\text{Sin}[c+d x]}{\sqrt{2}\ \sqrt{1-\text{Cos}[c+d x]}\ \sqrt{\text{Cos}[c+d x]}}\right]}{d}+\frac{2\ \text{Sin}[c+d x]}{3\ d\ \sqrt{1-\text{Cos}[c+d x]}\ \text{Cos}[c+d x]^{3/2}}+\frac{2\ \text{Sin}[c+d x]}{3\ d\ \sqrt{1-\text{Cos}[c+d x]}\ \sqrt{\text{Cos}[c+d x]}}$$

Result (type 3, 184 leaves):

$$\left(e^{-\frac{3}{2} i (c+d x)} \left(2 \left(1+e^{i (c+d x)}\right)^3 \sqrt{1+e^{2 i (c+d x)}} + 3 \sqrt{2} \left(1+e^{2 i (c+d x)}\right)^2 \left(\text{Log}\left[1-e^{i (c+d x)}\right] - \text{Log}\left[1+e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \text{Sin}\left[\frac{1}{2} (c+d x)\right]\right) \Big/ \left(6 d \sqrt{1+e^{2 i (c+d x)}} \sqrt{1-\text{Cos}[c+d x]} \text{Cos}[c+d x]^{3/2}\right)$$

Problem 288: Attempted integration timed out after 120 seconds.

$$\int \text{Cos}[c+d x]^{4/3} (a+a \text{Cos}[c+d x])^{1/3} \, dx$$

Optimal (type 6, 78 leaves, 3 steps):

$$\left(2^{5/6} \text{AppellF1}\left[\frac{1}{2}, -\frac{4}{3}, \frac{1}{6}, \frac{3}{2}, 1-\text{Cos}[c+d x], \frac{1}{2} (1-\text{Cos}[c+d x])\right] (a+a \text{Cos}[c+d x])^{1/3} \text{Sin}[c+d x]\right) \Big/ \left(d (1+\text{Cos}[c+d x])^{5/6}\right)$$

Result (type 1, 1 leaves):

???

Problem 289: Unable to integrate problem.

$$\int \text{Cos}[c+d x]^{4/3} (a+a \text{Cos}[c+d x])^{2/3} \, dx$$

Optimal (type 6, 79 leaves, 3 steps):

$$\left(2 \times 2^{1/6} \text{AppellF1}\left[\frac{1}{2}, -\frac{4}{3}, -\frac{1}{6}, \frac{3}{2}, 1-\text{Cos}[c+d x], \frac{1}{2} (1-\text{Cos}[c+d x])\right] (a+a \text{Cos}[c+d x])^{2/3} \text{Sin}[c+d x]\right) \Big/ \left(d (1+\text{Cos}[c+d x])^{7/6}\right)$$

Result (type 8, 27 leaves):

$$\int \text{Cos}[c+d x]^{4/3} (a+a \text{Cos}[c+d x])^{2/3} \, dx$$

Problem 290: Unable to integrate problem.

$$\int \text{Cos}[c+d x]^{5/3} (a+a \text{Cos}[c+d x])^{2/3} \, dx$$

Optimal (type 6, 79 leaves, 3 steps):

$$\left(2 \times 2^{1/6} \text{AppellF1}\left[\frac{1}{2}, -\frac{5}{3}, -\frac{1}{6}, \frac{3}{2}, 1-\text{Cos}[c+d x], \frac{1}{2} (1-\text{Cos}[c+d x])\right] (a+a \text{Cos}[c+d x])^{2/3} \text{Sin}[c+d x]\right) \Big/ \left(d (1+\text{Cos}[c+d x])^{7/6}\right)$$

Result (type 8, 27 leaves):

$$\int \text{Cos}[c+d\,x]^{5/3}\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{2/3}\,dx$$

Problem 291: Result unnecessarily involves higher level functions.

$$\int \left(a+a\,\text{Cos}[c+d\,x]\right)\,\text{Sec}[c+d\,x]^{7/2}\,dx$$

Optimal (type 4, 151 leaves, 9 steps):

$$-\frac{6\,a\,\sqrt{\text{Cos}[c+d\,x]}\;\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{5\,d}+\frac{2\,a\,\sqrt{\text{Cos}[c+d\,x]}\;\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{3\,d}+\frac{6\,a\,\sqrt{\text{Sec}[c+d\,x]}\;\text{Sin}[c+d\,x]}{5\,d}+\frac{2\,a\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{3\,d}+\frac{2\,a\,\text{Sec}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{5\,d}$$

Result (type 5, 268 leaves):

$$\frac{1}{15\,\left(d-d\,e^{2\,i\,c}\right)}\,a\,\left(1+\text{Cos}[c+d\,x]\right)\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\Bigg(i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\,\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\,\Bigg(9\,\left(1+e^{2\,i\,(c+d\,x)}\right)+9\,\left(-1+e^{2\,i\,c}\right)\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\;\text{Hypergeometric2F1}\left[-\frac{1}{4},\,\frac{1}{2},\,\frac{3}{4},\,-e^{2\,i\,(c+d\,x)}\right]+5\,e^{i\,(c+d\,x)}\,\left(-1+e^{2\,i\,c}\right)\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\;\text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{5}{4},\,-e^{2\,i\,(c+d\,x)}\right]\Bigg)+\left(1-e^{2\,i\,c}\right)\,\sqrt{\text{Sec}[c+d\,x]}\,\left(9\,\text{Cos}[d\,x]\,\text{Csc}[c]+\left(5+3\,\text{Sec}[c+d\,x]\right)\,\text{Tan}[c+d\,x]\right)\Bigg)$$

Problem 292: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \left(a+a\,\text{Cos}[c+d\,x]\right)\,\text{Sec}[c+d\,x]^{5/2}\,dx$$

Optimal (type 4, 123 leaves, 8 steps):

$$-\frac{2\,a\,\sqrt{\text{Cos}[c+d\,x]}\;\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{d}+\frac{2\,a\,\sqrt{\text{Cos}[c+d\,x]}\;\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{3\,d}+\frac{2\,a\,\sqrt{\text{Sec}[c+d\,x]}\;\text{Sin}[c+d\,x]}{d}+\frac{2\,a\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{3\,d}$$

Result (type 5, 255 leaves):

$$\frac{1}{3\left(d-d\,e^{2\,i\,c}\right)}a\left(1+\text{Cos}[c+d\,x]\right)\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\left(i\sqrt{2}\,e^{-i\,(c+d\,x)}\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\left(3\left(1+e^{2\,i\,(c+d\,x)}\right)+3\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+e^{i\,(c+d\,x)}\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)-\left(-1+e^{2\,i\,c}\right)\sqrt{\text{Sec}[c+d\,x]}\left(3\,\text{Cos}[d\,x]\,\text{Csc}[c]+\text{Tan}[c+d\,x]\right)\right)$$

Problem 293: Result unnecessarily involves higher level functions.

$$\int\left(a+a\,\text{Cos}[c+d\,x]\right)\text{Sec}[c+d\,x]^{3/2}\,dx$$

Optimal (type 4, 97 leaves, 7 steps):

$$-\frac{2\,a\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticE}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{d}+\frac{2\,a\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticF}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{d}+\frac{2\,a\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d}$$

Result (type 5, 124 leaves):

$$-\frac{1}{d}2\,i\,a\,e^{-i\,(c+d\,x)}\left(-1+\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+e^{i\,(c+d\,x)}\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)\sqrt{\text{Sec}[c+d\,x]}$$

Problem 294: Result unnecessarily involves higher level functions.

$$\int\left(a+a\,\text{Cos}[c+d\,x]\right)\sqrt{\text{Sec}[c+d\,x]}\,dx$$

Optimal (type 4, 75 leaves, 6 steps):

$$\frac{2\,a\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticE}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{d}+\frac{2\,a\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticF}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{d}$$

Result (type 5, 141 leaves):

$$-\left(\left(2\,\mathrm{i}\,a\left(1+e^{2\,\mathrm{i}\,(c+d\,x)}-2\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\ \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,\mathrm{i}\,(c+d\,x)}\right]+2\,e^{\mathrm{i}\,(c+d\,x)}\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\ \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,\mathrm{i}\,(c+d\,x)}\right]\right)\right)\Big/\left(d\left(1+e^{2\,\mathrm{i}\,(c+d\,x)}\right)\sqrt{\text{Sec}[c+d\,x]}\right)\right)$$

Problem 295: Result unnecessarily involves higher level functions.

$$\int \frac{a+a\,\text{Cos}[c+d\,x]}{\sqrt{\text{Sec}[c+d\,x]}}\,dx$$

Optimal (type 4, 101 leaves, 7 steps):

$$\frac{2\,a\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticE}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{d}+\frac{2\,a\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticF}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{3\,d}+\frac{2\,a\,\text{Sin}[c+d\,x]}{3\,d\sqrt{\text{Sec}[c+d\,x]}}$$

Result (type 5, 140 leaves):

$$\left(a\,e^{-2\,\mathrm{i}\,c}\left(-\mathrm{i}\,\text{Cos}[2\,c]+\text{Sin}[2\,c]\right)\left(6-\frac{12\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,\mathrm{i}\,(c+d\,x)}\right]}{\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}}+2\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\ \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,\mathrm{i}\,(c+d\,x)}\right]\text{Sec}[c+d\,x]+2\,\mathrm{i}\,\text{Sin}[c+d\,x]\right)\right)\Big/\left(3\,d\sqrt{\text{Sec}[c+d\,x]}\right)$$

Problem 296: Result unnecessarily involves higher level functions.

$$\int \frac{a+a\,\text{Cos}[c+d\,x]}{\text{Sec}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 4, 127 leaves, 8 steps):

$$\frac{6\,a\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticE}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{5\,d}+\frac{2\,a\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticF}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{3\,d}+\frac{2\,a\,\text{Sin}[c+d\,x]}{5\,d\,\text{Sec}[c+d\,x]^{3/2}}+\frac{2\,a\,\text{Sin}[c+d\,x]}{3\,d\sqrt{\text{Sec}[c+d\,x]}}$$

Result (type 5, 224 leaves):

$$-\frac{1}{120\,d}\,\mathbb{i}\,a\,e^{-3\,\mathbb{i}\,(c+d\,x)}\,\left(1+\text{Cos}[c+d\,x]\right)\left(-3-10\,e^{\mathbb{i}\,(c+d\,x)}+33\,e^{2\,\mathbb{i}\,(c+d\,x)}+39\,e^{4\,\mathbb{i}\,(c+d\,x)}+10\,e^{5\,\mathbb{i}\,(c+d\,x)}+3\,e^{6\,\mathbb{i}\,(c+d\,x)}-72\,e^{2\,\mathbb{i}\,(c+d\,x)}\,\sqrt{1+e^{2\,\mathbb{i}\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,\mathbb{i}\,(c+d\,x)}\right]+40\,e^{3\,\mathbb{i}\,(c+d\,x)}\,\sqrt{1+e^{2\,\mathbb{i}\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,\mathbb{i}\,(c+d\,x)}\right]\right)\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\sqrt{\text{Sec}[c+d\,x]}$$

Problem 297: Result unnecessarily involves higher level functions.

$$\int \frac{a+a\,\text{Cos}[c+d\,x]}{\text{Sec}[c+d\,x]^{5/2}}\,dx$$

Optimal (type 4, 151 leaves, 9 steps):

$$\frac{6\,a\,\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{5\,d}+\frac{10\,a\,\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{21\,d}+\frac{2\,a\,\text{Sin}[c+d\,x]}{7\,d\,\text{Sec}[c+d\,x]^{5/2}}+\frac{2\,a\,\text{Sin}[c+d\,x]}{5\,d\,\text{Sec}[c+d\,x]^{3/2}}+\frac{10\,a\,\text{Sin}[c+d\,x]}{21\,d\,\sqrt{\text{Sec}[c+d\,x]}}$$

Result (type 5, 198 leaves):

$$\frac{1}{420\,d}\,a\,e^{-4\,\mathbb{i}\,(c+d\,x)}\,\sqrt{\text{Sec}[c+d\,x]}\,\left(\text{Cos}[4\,(c+d\,x)]+\mathbb{i}\,\text{Sin}[4\,(c+d\,x)]\right)\left(-504\,\mathbb{i}\,\text{Cos}[c+d\,x]+504\,\mathbb{i}\,e^{-\mathbb{i}\,(c+d\,x)}\,\sqrt{1+e^{2\,\mathbb{i}\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,\mathbb{i}\,(c+d\,x)}\right]-200\,\mathbb{i}\,\sqrt{1+e^{2\,\mathbb{i}\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,\mathbb{i}\,(c+d\,x)}\right]+42\,\text{Sin}[c+d\,x]+130\,\text{Sin}[2\,(c+d\,x)]+42\,\text{Sin}[3\,(c+d\,x)]+15\,\text{Sin}[4\,(c+d\,x)]\right)$$

Problem 298: Result unnecessarily involves higher level functions.

$$\int (a+a\,\text{Cos}[c+d\,x])^2\,\text{Sec}[c+d\,x]^{7/2}\,dx$$

Optimal (type 4, 161 leaves, 9 steps):

$$-\frac{16\,a^2\,\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{5\,d}+\frac{4\,a^2\,\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{3\,d}+\frac{16\,a^2\,\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{5\,d}+\frac{4\,a^2\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{3\,d}+\frac{2\,a^2\,\text{Sec}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{5\,d}$$

Result (type 5, 261 leaves):

$$\frac{1}{30\,d}a^2\,\left(1+\text{Cos}[c+d\,x]\right)^2\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^4\left(-\frac{1}{-1+e^{2\,i\,c}}2\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\,\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\,\left(12\,\left(1+e^{2\,i\,(c+d\,x)}\right)+12\,\left(-1+e^{2\,i\,c}\right)\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+5\,e^{i\,(c+d\,x)}\,\left(-1+e^{2\,i\,c}\right)\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)+\sqrt{\text{Sec}[c+d\,x]}\,\left(24\,\text{Cos}[d\,x]\,\text{Csc}[c]+\left(10+3\,\text{Sec}[c+d\,x]\right)\,\text{Tan}[c+d\,x]\right)\right)$$

Problem 299: Result unnecessarily involves higher level functions.

$$\int\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Sec}[c+d\,x]^{5/2}\,dx$$

Optimal (type 4, 131 leaves, 8 steps):

$$-\frac{4\,a^2\,\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticE}\left[\frac{1}{2}\,\left(c+d\,x\right),2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{d}+\frac{8\,a^2\,\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticF}\left[\frac{1}{2}\,\left(c+d\,x\right),2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{3\,d}+\frac{4\,a^2\,\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d}+\frac{2\,a^2\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{3\,d}$$

Result (type 5, 250 leaves):

$$\frac{1}{6\,d}a^2\,\left(1+\text{Cos}[c+d\,x]\right)^2\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^4\left(-\frac{1}{-1+e^{2\,i\,c}}2\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\,\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\,\left(3\,\left(1+e^{2\,i\,(c+d\,x)}\right)+3\,\left(-1+e^{2\,i\,c}\right)\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+2\,e^{i\,(c+d\,x)}\,\left(-1+e^{2\,i\,c}\right)\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)+\sqrt{\text{Sec}[c+d\,x]}\,\left(6\,\text{Cos}[d\,x]\,\text{Csc}[c]+\text{Tan}[c+d\,x]\right)\right)$$

Problem 301: Result unnecessarily involves higher level functions.

$$\int\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\sqrt{\text{Sec}[c+d\,x]}\,dx$$

Optimal (type 4, 107 leaves, 7 steps):

$$\frac{4 a^2 \sqrt{\text{Cos}[c+d x]}\ \text{EllipticE}\left[\frac{1}{2}(c+d x),2\right] \sqrt{\text{Sec}[c+d x]}}{d}+\frac{8 a^2 \sqrt{\text{Cos}[c+d x]}\ \text{EllipticF}\left[\frac{1}{2}(c+d x),2\right] \sqrt{\text{Sec}[c+d x]}}{3 d}+\frac{2 a^2 \text{Sin}[c+d x]}{3 d \sqrt{\text{Sec}[c+d x]}}$$

Result (type 5, 127 leaves):

$$\left(a^2\left(\frac{24\, i\, \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2 i (c+d x)}\right]}{\sqrt{1+e^{2 i (c+d x)}}}+2\left(-6 i-4 i \sqrt{1+e^{2 i (c+d x)}}\ \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2 i (c+d x)}\right] \text{Sec}[c+d x]+\text{Sin}[c+d x]\right)\right)\right)\Big/\left(3 d \sqrt{\text{Sec}[c+d x]}\right)$$

Problem 302: Result unnecessarily involves higher level functions.

$$\int \frac{(a+a\,\text{Cos}[c+d x])^2}{\sqrt{\text{Sec}[c+d x]}}\, dx$$

Optimal (type 4, 135 leaves, 8 steps):

$$\frac{16 a^2 \sqrt{\text{Cos}[c+d x]}\ \text{EllipticE}\left[\frac{1}{2}(c+d x),2\right] \sqrt{\text{Sec}[c+d x]}}{5 d}+\frac{4 a^2 \sqrt{\text{Cos}[c+d x]}\ \text{EllipticF}\left[\frac{1}{2}(c+d x),2\right] \sqrt{\text{Sec}[c+d x]}}{3 d}+\frac{2 a^2 \text{Sin}[c+d x]}{5 d\, \text{Sec}[c+d x]^{3/2}}+\frac{4 a^2 \text{Sin}[c+d x]}{3 d \sqrt{\text{Sec}[c+d x]}}$$

Result (type 5, 136 leaves):

$$\left(a^2\left(-96 i+\frac{192\, i\, \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2 i (c+d x)}\right]}{\sqrt{1+e^{2 i (c+d x)}}}-40 i \sqrt{1+e^{2 i (c+d x)}}\ \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2 i (c+d x)}\right] \text{Sec}[c+d x]+40\, \text{Sin}[c+d x]+6\, \text{Sin}[2(c+d x)]\right)\right)\Big/\left(30 d \sqrt{\text{Sec}[c+d x]}\right)$$

Problem 303: Result unnecessarily involves higher level functions.

$$\int \frac{(a+a\,\text{Cos}[c+d x])^2}{\text{Sec}[c+d x]^{3/2}}\, dx$$

Optimal (type 4, 161 leaves, 9 steps):

$$\frac{12\,a^2\,\sqrt{\mathrm{Cos}[c+d\,x]}\;\mathrm{EllipticE}\left[\frac{1}{2}\,(c+d\,x),2\right]\,\sqrt{\mathrm{Sec}[c+d\,x]}}{5\,d}+\frac{8\,a^2\,\sqrt{\mathrm{Cos}[c+d\,x]}\;\mathrm{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]\,\sqrt{\mathrm{Sec}[c+d\,x]}}{7\,d}+\frac{2\,a^2\,\mathrm{Sin}[c+d\,x]}{7\,d\,\mathrm{Sec}[c+d\,x]^{5/2}}+\frac{4\,a^2\,\mathrm{Sin}[c+d\,x]}{5\,d\,\mathrm{Sec}[c+d\,x]^{3/2}}+\frac{8\,a^2\,\mathrm{Sin}[c+d\,x]}{7\,d\,\sqrt{\mathrm{Sec}[c+d\,x]}}$$

Result (type 5, 149 leaves):

$$\left(a^2\left(\frac{672\,i\,\mathrm{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]}{\sqrt{1+e^{2\,i\,(c+d\,x)}}}+2\left(-168\,i-80\,i\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\;\mathrm{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\,\mathrm{Sec}[c+d\,x]+85\,\mathrm{Sin}[c+d\,x]+28\,\mathrm{Sin}[2\,(c+d\,x)]+5\,\mathrm{Sin}[3\,(c+d\,x)]\right)\right)\right)\Big/\left(140\,d\,\sqrt{\mathrm{Sec}[c+d\,x]}\right)$$

Problem 304: Result unnecessarily involves higher level functions.

$$\int (a+a\,\mathrm{Cos}[c+d\,x])^3\,\mathrm{Sec}[c+d\,x]^{9/2}\,dx$$

Optimal (type 4, 187 leaves, 17 steps):

$$-\frac{28\,a^3\,\sqrt{\mathrm{Cos}[c+d\,x]}\;\mathrm{EllipticE}\left[\frac{1}{2}\,(c+d\,x),2\right]\,\sqrt{\mathrm{Sec}[c+d\,x]}}{5\,d}+\frac{52\,a^3\,\sqrt{\mathrm{Cos}[c+d\,x]}\;\mathrm{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]\,\sqrt{\mathrm{Sec}[c+d\,x]}}{21\,d}+\frac{28\,a^3\,\sqrt{\mathrm{Sec}[c+d\,x]}\;\mathrm{Sin}[c+d\,x]}{5\,d}+\frac{52\,a^3\,\mathrm{Sec}[c+d\,x]^{3/2}\,\mathrm{Sin}[c+d\,x]}{21\,d}+\frac{6\,a^3\,\mathrm{Sec}[c+d\,x]^{5/2}\,\mathrm{Sin}[c+d\,x]}{5\,d}+\frac{2\,a^3\,\mathrm{Sec}[c+d\,x]^{7/2}\,\mathrm{Sin}[c+d\,x]}{7\,d}$$

Result (type 5, 279 leaves):

$$\frac{1}{420\,d}a^3\,(1+\mathrm{Cos}[c+d\,x])^3\,\mathrm{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^6\left(-\frac{1}{-1+e^{2\,i\,c}}2\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\,\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\,\left(147\,\left(1+e^{2\,i\,(c+d\,x)}\right)+147\,\left(-1+e^{2\,i\,c}\right)\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\mathrm{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+65\,e^{i\,(c+d\,x)}\,\left(-1+e^{2\,i\,c}\right)\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\mathrm{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)+\sqrt{\mathrm{Sec}[c+d\,x]}\,(294\,\mathrm{Cos}[d\,x]\,\mathrm{Csc}[c]+(80+63\,\mathrm{Cos}[c+d\,x]+65\,\mathrm{Cos}[2\,(c+d\,x)])\,\mathrm{Sec}[c+d\,x]^2\,\mathrm{Tan}[c+d\,x])\right)$$

Problem 305: Result unnecessarily involves higher level functions.

$$\int(a+a\,\mathrm{Cos}[c+d\,x])^3\,\mathrm{Sec}[c+d\,x]^{7/2}\,dx$$

Optimal (type 4, 157 leaves, 15 steps):

$$-\frac{36\,a^3\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\mathrm{EllipticE}\left[\frac{1}{2}\,(c+d\,x),2\right]\,\sqrt{\mathrm{Sec}[c+d\,x]}}{5\,d}+\frac{4\,a^3\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\mathrm{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]\,\sqrt{\mathrm{Sec}[c+d\,x]}}{d}+\frac{36\,a^3\,\sqrt{\mathrm{Sec}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{5\,d}+\frac{2\,a^3\,\mathrm{Sec}[c+d\,x]^{3/2}\,\mathrm{Sin}[c+d\,x]}{d}+\frac{2\,a^3\,\mathrm{Sec}[c+d\,x]^{5/2}\,\mathrm{Sin}[c+d\,x]}{5\,d}$$

Result (type 5, 259 leaves):

$$\frac{1}{20\,d}a^3\,(1+\mathrm{Cos}[c+d\,x])^3\,\mathrm{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^6\left(-\frac{1}{-1+e^{2\,i\,c}}2\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\,\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\,\left(9\,\left(1+e^{2\,i\,(c+d\,x)}\right)+9\,\left(-1+e^{2\,i\,c}\right)\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\mathrm{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+5\,e^{i\,(c+d\,x)}\,\left(-1+e^{2\,i\,c}\right)\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\mathrm{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)+\sqrt{\mathrm{Sec}[c+d\,x]}\,(18\,\mathrm{Cos}[d\,x]\,\mathrm{Csc}[c]+(5+\mathrm{Sec}[c+d\,x])\,\mathrm{Tan}[c+d\,x])\right)$$

Problem 306: Result unnecessarily involves higher level functions.

$$\int(a+a\,\mathrm{Cos}[c+d\,x])^3\,\mathrm{Sec}[c+d\,x]^{5/2}\,dx$$

Optimal (type 4, 131 leaves, 13 steps):

$$-\frac{4 a^3 \sqrt{\text{Cos}[c+d x]}\ \text{EllipticE}\left[\frac{1}{2}(c+d x),2\right] \sqrt{\text{Sec}[c+d x]}}{d}+\frac{20 a^3 \sqrt{\text{Cos}[c+d x]}\ \text{EllipticF}\left[\frac{1}{2}(c+d x),2\right] \sqrt{\text{Sec}[c+d x]}}{3 d}+\frac{6 a^3 \sqrt{\text{Sec}[c+d x]}\ \text{Sin}[c+d x]}{d}+\frac{2 a^3 \text{Sec}[c+d x]^{3/2} \text{Sin}[c+d x]}{3 d}$$

Result (type 5, 157 leaves):

$$-\frac{1}{3 d} i\, a^3 \text{Sec}[c+d x]^{3/2} \left(-6-6 \text{Cos}[2 (c+d x)]+6 e^{-2 i (c+d x)} \left(1+e^{2 i (c+d x)}\right)^{3/2} \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2 i (c+d x)}\right]+20 \sqrt{1+e^{2 i (c+d x)}}\ \text{Cos}[c+d x]\ \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2 i (c+d x)}\right]+2 i \text{Sin}[c+d x]+9 i \text{Sin}[2 (c+d x)]\right)$$

Problem 307: Result unnecessarily involves higher level functions.

$$\int (a+a \text{Cos}[c+d x])^3 \text{Sec}[c+d x]^{3/2}\, dx$$

Optimal (type 4, 131 leaves, 13 steps):

$$\frac{4 a^3 \sqrt{\text{Cos}[c+d x]}\ \text{EllipticE}\left[\frac{1}{2}(c+d x),2\right] \sqrt{\text{Sec}[c+d x]}}{d}+\frac{20 a^3 \sqrt{\text{Cos}[c+d x]}\ \text{EllipticF}\left[\frac{1}{2}(c+d x),2\right] \sqrt{\text{Sec}[c+d x]}}{3 d}+\frac{2 a^3 \text{Sin}[c+d x]}{3 d \sqrt{\text{Sec}[c+d x]}}+\frac{2 a^3 \sqrt{\text{Sec}[c+d x]}\ \text{Sin}[c+d x]}{d}$$

Result (type 5, 135 leaves):

$$\left(a^3 \left(\frac{24 i\, \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2 i (c+d x)}\right]}{\sqrt{1+e^{2 i (c+d x)}}}+2 \left(-6 i-10 i \sqrt{1+e^{2 i (c+d x)}}\ \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2 i (c+d x)}\right] \text{Sec}[c+d x]+\text{Sin}[c+d x]+3 \text{Tan}[c+d x]\right)\right)\right) \Big/ \left(3 d \sqrt{\text{Sec}[c+d x]}\right)$$

Problem 308: Result unnecessarily involves higher level functions.

$$\int (a+a \text{Cos}[c+d x])^3 \sqrt{\text{Sec}[c+d x]}\, dx$$

Optimal (type 4, 131 leaves, 13 steps):

$$\frac{36\,a^3\,\sqrt{\text{Cos}[c+d\,x]}\,\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x)\,,\,2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{5\,d}+\frac{4\,a^3\,\sqrt{\text{Cos}[c+d\,x]}\,\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x)\,,\,2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{d}+\frac{2\,a^3\,\text{Sin}[c+d\,x]}{5\,d\,\text{Sec}[c+d\,x]^{3/2}}+\frac{2\,a^3\,\text{Sin}[c+d\,x]}{d\,\sqrt{\text{Sec}[c+d\,x]}}$$

Result (type 5, 137 leaves):

$$\left(a^3\left(\frac{144\,i\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]}{\sqrt{1+e^{2\,i\,(c+d\,x)}}}+2\left(-36\,i-20\,i\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\,\text{Sec}[c+d\,x]+10\,\text{Sin}[c+d\,x]+\text{Sin}[2\,(c+d\,x)]\right)\right)\right)\Big/\left(10\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)$$

Problem 309: Result unnecessarily involves higher level functions.

$$\int\frac{(a+a\,\text{Cos}[c+d\,x])^3}{\sqrt{\text{Sec}[c+d\,x]}}\,dx$$

Optimal (type 4, 161 leaves, 15 steps):

$$\frac{28\,a^3\,\sqrt{\text{Cos}[c+d\,x]}\,\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x)\,,\,2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{5\,d}+\frac{52\,a^3\,\sqrt{\text{Cos}[c+d\,x]}\,\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x)\,,\,2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{21\,d}+\frac{2\,a^3\,\text{Sin}[c+d\,x]}{7\,d\,\text{Sec}[c+d\,x]^{5/2}}+\frac{6\,a^3\,\text{Sin}[c+d\,x]}{5\,d\,\text{Sec}[c+d\,x]^{3/2}}+\frac{52\,a^3\,\text{Sin}[c+d\,x]}{21\,d\,\sqrt{\text{Sec}[c+d\,x]}}$$

Result (type 5, 146 leaves):

$$\left(a^3\left(-2352\,i+\frac{4704\,i\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]}{\sqrt{1+e^{2\,i\,(c+d\,x)}}}-1040\,i\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\,\text{Sec}[c+d\,x]+1070\,\text{Sin}[c+d\,x]+252\,\text{Sin}[2\,(c+d\,x)]+30\,\text{Sin}[3\,(c+d\,x)]\right)\right)\Big/\left(420\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)$$

Problem 310: Result unnecessarily involves higher level functions.

$$\int\frac{(a+a\,\text{Cos}[c+d\,x])^3}{\text{Sec}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 4, 187 leaves, 17 steps):

$$\frac{68\,a^3\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\sqrt{\text{Sec}[c+d\,x]}}{15\,d}+$$
$$\frac{44\,a^3\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\sqrt{\text{Sec}[c+d\,x]}}{21\,d}+$$
$$\frac{2\,a^3\,\text{Sin}[c+d\,x]}{9\,d\,\text{Sec}[c+d\,x]^{7/2}}+\frac{6\,a^3\,\text{Sin}[c+d\,x]}{7\,d\,\text{Sec}[c+d\,x]^{5/2}}+\frac{68\,a^3\,\text{Sin}[c+d\,x]}{45\,d\,\text{Sec}[c+d\,x]^{3/2}}+\frac{44\,a^3\,\text{Sin}[c+d\,x]}{21\,d\sqrt{\text{Sec}[c+d\,x]}}$$

Result (type 5, 156 leaves):

$$\left(a^3\left(-11\,424\,i+\frac{22\,848\,i\ \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]}{\sqrt{1+e^{2\,i\,(c+d\,x)}}}-5280\,i\sqrt{1+e^{2\,i\,(c+d\,x)}}\right.\right.$$
$$\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\text{Sec}[c+d\,x]+5820\,\text{Sin}[c+d\,x]+$$
$$\left.\left.2044\,\text{Sin}[2\,(c+d\,x)]+540\,\text{Sin}[3\,(c+d\,x)]+70\,\text{Sin}[4\,(c+d\,x)]\right)\right)\Big/\left(2520\,d\sqrt{\text{Sec}[c+d\,x]}\right)$$

Problem 311: Result unnecessarily involves higher level functions.

$$\int(a+a\,\text{Cos}[c+d\,x])^4\,\text{Sec}[c+d\,x]^{9/2}\,dx$$

Optimal (type 4, 187 leaves, 19 steps):

$$-\frac{64\,a^4\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\sqrt{\text{Sec}[c+d\,x]}}{5\,d}+$$
$$\frac{136\,a^4\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\sqrt{\text{Sec}[c+d\,x]}}{21\,d}+\frac{64\,a^4\sqrt{\text{Sec}[c+d\,x]}\ \text{Sin}[c+d\,x]}{5\,d}+$$
$$\frac{94\,a^4\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{21\,d}+\frac{8\,a^4\,\text{Sec}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{5\,d}+\frac{2\,a^4\,\text{Sec}[c+d\,x]^{7/2}\,\text{Sin}[c+d\,x]}{7\,d}$$

Result (type 5, 271 leaves):

$$\frac{1}{840\,d}\,a^4\,(1+\text{Cos}[c+d\,x])^4\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^8$$
$$\left(-\frac{1}{-1+e^{2\,i\,c}}4\,i\sqrt{2}\,e^{-i\,(c+d\,x)}\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\left(168\left(1+e^{2\,i\,(c+d\,x)}\right)+\right.\right.$$
$$168\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\ \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+$$
$$\left.85\,e^{i\,(c+d\,x)}\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\ \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)+$$
$$\left.\sqrt{\text{Sec}[c+d\,x]}\left(672\,\text{Cos}[d\,x]\,\text{Csc}[c]+\left(235+84\,\text{Sec}[c+d\,x]+15\,\text{Sec}[c+d\,x]^2\right)\text{Tan}[c+d\,x]\right)\right)$$

Problem 312: Result unnecessarily involves higher level functions.

$$\int (a + a \text{Cos}[c + d x])^4 \text{Sec}[c + d x]^{7/2} \, dx$$

Optimal (type 4, 161 leaves, 17 steps):

$$-\frac{56 a^4 \sqrt{\text{Cos}[c+d x]} \, \text{EllipticE}\left[\frac{1}{2} (c+d x), 2\right] \sqrt{\text{Sec}[c+d x]}}{5 d} + \frac{32 a^4 \sqrt{\text{Cos}[c+d x]} \, \text{EllipticF}\left[\frac{1}{2} (c+d x), 2\right] \sqrt{\text{Sec}[c+d x]}}{3 d} + \frac{66 a^4 \sqrt{\text{Sec}[c+d x]} \, \text{Sin}[c+d x]}{5 d} + \frac{8 a^4 \text{Sec}[c+d x]^{3/2} \text{Sin}[c+d x]}{3 d} + \frac{2 a^4 \text{Sec}[c+d x]^{5/2} \text{Sin}[c+d x]}{5 d}$$

Result (type 5, 278 leaves):

$$\frac{1}{240 d} a^4 (1 + \text{Cos}[c + d x])^4 \text{Sec}\left[\frac{1}{2} (c + d x)\right]^8 \left(-\frac{1}{-1 + e^{2 i c}} 8 i \sqrt{2} \, e^{-i (c+d x)} \sqrt{\frac{e^{i (c+d x)}}{1 + e^{2 i (c+d x)}}} \left(21 \left(1 + e^{2 i (c+d x)}\right) + 21 \left(-1 + e^{2 i c}\right) \sqrt{1 + e^{2 i (c+d x)}} \, \text{Hypergeometric2F1}\left[-\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, -e^{2 i (c+d x)}\right] + 20 e^{i (c+d x)} \left(-1 + e^{2 i c}\right) \sqrt{1 + e^{2 i (c+d x)}} \, \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{5}{4}, -e^{2 i (c+d x)}\right]\right) + \sqrt{\text{Sec}[c + d x]} \left(-3 (-61 + 5 \text{Cos}[2 c]) \text{Cos}[d x] \text{Csc}[c] + 30 \text{Cos}[c] \text{Sin}[d x] + 2 (20 + 3 \text{Sec}[c + d x]) \text{Tan}[c + d x]\right)\right)$$

Problem 314: Result unnecessarily involves higher level functions.

$$\int (a + a \text{Cos}[c + d x])^4 \text{Sec}[c + d x]^{3/2} \, dx$$

Optimal (type 4, 159 leaves, 16 steps):

$$\frac{56 a^4 \sqrt{\text{Cos}[c+d x]} \, \text{EllipticE}\left[\frac{1}{2} (c+d x), 2\right] \sqrt{\text{Sec}[c+d x]}}{5 d} + \frac{32 a^4 \sqrt{\text{Cos}[c+d x]} \, \text{EllipticF}\left[\frac{1}{2} (c+d x), 2\right] \sqrt{\text{Sec}[c+d x]}}{3 d} + \frac{2 a^4 \text{Sin}[c+d x]}{5 d \, \text{Sec}[c+d x]^{3/2}} + \frac{8 a^4 \text{Sin}[c+d x]}{3 d \sqrt{\text{Sec}[c+d x]}} + \frac{2 a^4 \sqrt{\text{Sec}[c+d x]} \, \text{Sin}[c+d x]}{d}$$

Result (type 5, 150 leaves):

$$\left(a^4 \left(-336\, i + \frac{672\, i\, \text{Hypergeometric2F1}\left[-\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, -e^{2 i (c+d x)}\right]}{\sqrt{1 + e^{2 i (c+d x)}}} - 320\, i \sqrt{1 + e^{2 i (c+d x)}}\, \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{5}{4}, -e^{2 i (c+d x)}\right] \text{Sec}[c + d x] + 80\, \text{Sin}[c + d x] + 3\, \text{Sec}[c + d x]\, \text{Sin}\left[3 (c + d x)\right] + 63\, \text{Tan}[c + d x]\right)\right) \Big/ \left(30\, d \sqrt{\text{Sec}[c + d x]}\right)$$

Problem 315: Result unnecessarily involves higher level functions.

$$\int (a + a\, \text{Cos}[c + d x])^4 \sqrt{\text{Sec}[c + d x]}\, dx$$

Optimal (type 4, 161 leaves, 17 steps):

$$\frac{64\, a^4 \sqrt{\text{Cos}[c + d x]}\, \text{EllipticE}\left[\frac{1}{2} (c + d x), 2\right] \sqrt{\text{Sec}[c + d x]}}{5\, d} + \frac{136\, a^4 \sqrt{\text{Cos}[c + d x]}\, \text{EllipticF}\left[\frac{1}{2} (c + d x), 2\right] \sqrt{\text{Sec}[c + d x]}}{21\, d} + \frac{2\, a^4\, \text{Sin}[c + d x]}{7\, d\, \text{Sec}[c + d x]^{5/2}} + \frac{8\, a^4\, \text{Sin}[c + d x]}{5\, d\, \text{Sec}[c + d x]^{3/2}} + \frac{94\, a^4\, \text{Sin}[c + d x]}{21\, d \sqrt{\text{Sec}[c + d x]}}$$

Result (type 5, 146 leaves):

$$\left(a^4 \left(-5376\, i + \frac{10\,752\, i\, \text{Hypergeometric2F1}\left[-\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, -e^{2 i (c+d x)}\right]}{\sqrt{1 + e^{2 i (c+d x)}}} - 2720\, i \sqrt{1 + e^{2 i (c+d x)}}\, \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{5}{4}, -e^{2 i (c+d x)}\right] \text{Sec}[c + d x] + 1910\, \text{Sin}[c + d x] + 336\, \text{Sin}\left[2 (c + d x)\right] + 30\, \text{Sin}\left[3 (c + d x)\right]\right)\right) \Big/ \left(420\, d \sqrt{\text{Sec}[c + d x]}\right)$$

Problem 316: Result unnecessarily involves higher level functions.

$$\int \frac{(a + a\, \text{Cos}[c + d x])^4}{\sqrt{\text{Sec}[c + d x]}}\, dx$$

Optimal (type 4, 187 leaves, 19 steps):

$$\frac{152\, a^4 \sqrt{\text{Cos}[c + d x]}\, \text{EllipticE}\left[\frac{1}{2} (c + d x), 2\right] \sqrt{\text{Sec}[c + d x]}}{15\, d} + \frac{32\, a^4 \sqrt{\text{Cos}[c + d x]}\, \text{EllipticF}\left[\frac{1}{2} (c + d x), 2\right] \sqrt{\text{Sec}[c + d x]}}{7\, d} + \frac{2\, a^4\, \text{Sin}[c + d x]}{9\, d\, \text{Sec}[c + d x]^{7/2}} + \frac{8\, a^4\, \text{Sin}[c + d x]}{7\, d\, \text{Sec}[c + d x]^{5/2}} + \frac{122\, a^4\, \text{Sin}[c + d x]}{45\, d\, \text{Sec}[c + d x]^{3/2}} + \frac{32\, a^4\, \text{Sin}[c + d x]}{7\, d \sqrt{\text{Sec}[c + d x]}}$$

Result (type 5, 156 leaves):

$$\left(a^4\left(-25536\,i+\frac{51072\,i\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]}{\sqrt{1+e^{2\,i\,(c+d\,x)}}}-11520\,i\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\text{Sec}[c+d\,x]+12240\,\text{Sin}[c+d\,x]+3556\,\text{Sin}[2\,(c+d\,x)]+720\,\text{Sin}[3\,(c+d\,x)]+70\,\text{Sin}[4\,(c+d\,x)]\right)\right)\Big/\left(2520\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)$$

Problem 317: Result unnecessarily involves higher level functions.

$$\int\frac{\text{Sec}[c+d\,x]^{5/2}}{a+a\,\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 4, 164 leaves, 9 steps):

$$\frac{3\sqrt{\text{Cos}[c+d\,x]}\;\text{EllipticE}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{a\,d}+\frac{5\sqrt{\text{Cos}[c+d\,x]}\;\text{EllipticF}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{3\,a\,d}-\frac{3\sqrt{\text{Sec}[c+d\,x]}\;\text{Sin}[c+d\,x]}{a\,d}+\frac{5\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{3\,a\,d}-\frac{\text{Sec}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{d\,(a+a\,\text{Sec}[c+d\,x])}$$

Result (type 5, 285 leaves):

$$\frac{1}{3\,a\,d\,(1+\text{Cos}[c+d\,x])}\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\left(\frac{1}{-1+e^{2\,i\,c}}2\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\left(9\left(1+e^{2\,i\,(c+d\,x)}\right)+9\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]-5\,e^{i\,(c+d\,x)}\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)-\sqrt{\text{Sec}[c+d\,x]}\left(18\,\text{Cos}[d\,x]\,\text{Csc}[c]+\text{Sec}[c+d\,x]\left(-5\,\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]\text{Sin}\left[\frac{3}{2}(c+d\,x)\right]+\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)\right)\right)$$

Problem 318: Result unnecessarily involves higher level functions.

$$\int\frac{\text{Sec}[c+d\,x]^{3/2}}{a+a\,\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 4, 136 leaves, 8 steps):

$$-\frac{3\sqrt{\text{Cos}[c+d\,x]}\;\text{EllipticE}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{a\,d}-\frac{\sqrt{\text{Cos}[c+d\,x]}\;\text{EllipticF}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{a\,d}+\frac{3\sqrt{\text{Sec}[c+d\,x]}\;\text{Sin}[c+d\,x]}{a\,d}-\frac{\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{d\,(a+a\,\text{Sec}[c+d\,x])}$$

Result (type 5, 256 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\left(-\frac{1}{d\left(-1+e^{2\,i\,c}\right)}2\,i\sqrt{2}\,e^{-i\,(c+d\,x)}\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\left(3\left(1+e^{2\,i\,(c+d\,x)}\right)+3\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\;\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]-e^{i\,(c+d\,x)}\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\;\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)+\frac{\sqrt{\text{Sec}[c+d\,x]}\left(6\,\text{Cos}[d\,x]\,\text{Csc}[c]-2\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)}{d}\right)\right)\Big/\left(a\,(1+\text{Cos}[c+d\,x])\right)$$

Problem 319: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{\text{Sec}[c+d\,x]}}{a+a\,\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 4, 110 leaves, 7 steps):

$$\frac{\sqrt{\text{Cos}[c+d\,x]}\;\text{EllipticE}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{a\,d}+\frac{\sqrt{\text{Cos}[c+d\,x]}\;\text{EllipticF}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{a\,d}-\frac{\sqrt{\text{Sec}[c+d\,x]}\;\text{Sin}[c+d\,x]}{d\,(a+a\,\text{Sec}[c+d\,x])}$$

Result (type 5, 180 leaves):

$$-\left(\left(4\,i\,\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\left(1+e^{2\,i\,(c+d\,x)}-\left(1+e^{i\,(c+d\,x)}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\;\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+e^{i\,(c+d\,x)}\left(1+e^{i\,(c+d\,x)}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\;\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)\sqrt{\text{Sec}[c+d\,x]}\right)\Big/\left(a\,d\left(1+e^{i\,(c+d\,x)}\right)^3\right)\right)$$

Problem 320: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a + a \operatorname{Cos}[c + d x]) \sqrt{\operatorname{Sec}[c + d x]}} \, dx$$

Optimal (type 4, 110 leaves, 7 steps):

$$-\frac{\sqrt{\operatorname{Cos}[c + d x]} \operatorname{EllipticE}\left[\frac{1}{2} (c + d x), 2\right] \sqrt{\operatorname{Sec}[c + d x]}}{a d} + \frac{\sqrt{\operatorname{Cos}[c + d x]} \operatorname{EllipticF}\left[\frac{1}{2} (c + d x), 2\right] \sqrt{\operatorname{Sec}[c + d x]}}{a d} + \frac{\sqrt{\operatorname{Sec}[c + d x]} \operatorname{Sin}[c + d x]}{d (a + a \operatorname{Sec}[c + d x])}$$

Result (type 5, 181 leaves):

$$-\left(\left(4 i \operatorname{Cos}\left[\frac{1}{2} (c + d x)\right]^2 \left(-1 - e^{2 i (c+d x)} + \left(1 + e^{i (c+d x)}\right) \sqrt{1 + e^{2 i (c+d x)}} \operatorname{Hypergeometric2F1}\left[-\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, -e^{2 i (c+d x)}\right] + e^{i (c+d x)} \left(1 + e^{i (c+d x)}\right) \sqrt{1 + e^{2 i (c+d x)}} \operatorname{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{5}{4}, -e^{2 i (c+d x)}\right]\right) \sqrt{\operatorname{Sec}[c + d x]}\right) \Big/ \left(a d \left(1 + e^{i (c+d x)}\right)^3\right)\right)$$

Problem 321: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{1}{(a + a \operatorname{Cos}[c + d x]) \operatorname{Sec}[c + d x]^{3/2}} \, dx$$

Optimal (type 4, 112 leaves, 7 steps):

$$\frac{3 \sqrt{\operatorname{Cos}[c + d x]} \operatorname{EllipticE}\left[\frac{1}{2} (c + d x), 2\right] \sqrt{\operatorname{Sec}[c + d x]}}{a d} - \frac{\sqrt{\operatorname{Cos}[c + d x]} \operatorname{EllipticF}\left[\frac{1}{2} (c + d x), 2\right] \sqrt{\operatorname{Sec}[c + d x]}}{a d} - \frac{\sqrt{\operatorname{Sec}[c + d x]} \operatorname{Sin}[c + d x]}{d (a + a \operatorname{Sec}[c + d x])}$$

Result (type 5, 311 leaves):

$$\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]^2\left(\frac{1}{d\left(-1+e^{2 i c}\right)}2 i \sqrt{2}\, e^{-i (c+d x)} \sqrt{\frac{e^{i (c+d x)}}{1+e^{2 i (c+d x)}}} \left(3\left(1+e^{2 i (c+d x)}\right)+3\left(-1+e^{2 i c}\right)\sqrt{1+e^{2 i (c+d x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2 i (c+d x)}\right]+e^{i (c+d x)}\left(-1+e^{2 i c}\right)\sqrt{1+e^{2 i (c+d x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2 i (c+d x)}\right]\right)-\frac{1}{2 d}\left(\text{Cos}\left[\frac{1}{2}(c-d x)\right]+2\,\text{Cos}\left[\frac{1}{2}(3 c+d x)\right]+2\,\text{Cos}\left[\frac{1}{2}(c+3 d x)\right]+\text{Cos}\left[\frac{1}{2}(5 c+3 d x)\right]\right)\text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{1}{2}(c+d x)\right]\sqrt{\text{Sec}[c+d x]}\right)\right)\Big/\left(a\left(1+\text{Cos}[c+d x]\right)\right)$$

Problem 322: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(a+a\,\text{Cos}[c+d x]\right)\text{Sec}[c+d x]^{5/2}}\,dx$$

Optimal (type 4, 140 leaves, 8 steps):

$$-\frac{3\sqrt{\text{Cos}[c+d x]}\,\text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]\sqrt{\text{Sec}[c+d x]}}{a d}+\frac{5\sqrt{\text{Cos}[c+d x]}\,\text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]\sqrt{\text{Sec}[c+d x]}}{3 a d}+\frac{5\,\text{Sin}[c+d x]}{3 a d\sqrt{\text{Sec}[c+d x]}}-\frac{\text{Sin}[c+d x]}{d\sqrt{\text{Sec}[c+d x]}\left(a+a\,\text{Sec}[c+d x]\right)}$$

Result (type 5, 374 leaves):

$$-\left(\left(\left(2\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\,\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\left(9\left(1+e^{2\,i\,(c+d\,x)}\right)+9\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+5\,e^{i\,(c+d\,x)}\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)\right)\Big/\left(3\,d\left(-1+e^{2\,i\,c}\right)\left(a+a\,\text{Cos}[c+d\,x]\right)\right)\right)+\frac{1}{a+a\,\text{Cos}[c+d\,x]}\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2$$

$$\sqrt{\text{Sec}[c+d\,x]}\left(\frac{\left(2+\text{Cos}[2\,c]\right)\text{Cos}[d\,x]\,\text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}\right]}{d}+\frac{2\,\text{Cos}[2\,d\,x]\,\text{Sin}[2\,c]}{3\,d}-\frac{2\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Sin}\left[\frac{d\,x}{2}\right]}{d}-\frac{4\,\text{Cos}[c]\,\text{Sin}[d\,x]}{d}+\frac{2\,\text{Cos}[2\,c]\,\text{Sin}[2\,d\,x]}{3\,d}-\frac{2\,\text{Tan}\left[\frac{c}{2}\right]}{d}\right)$$

Problem 323: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{1}{\left(a+a\,\text{Cos}[c+d\,x]\right)\text{Sec}[c+d\,x]^{7/2}}\,dx$$

Optimal (type 4, 168 leaves, 9 steps):

$$\frac{21\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticE}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{5\,a\,d}-\frac{5\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticF}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{3\,a\,d}+\frac{7\,\text{Sin}[c+d\,x]}{5\,a\,d\,\text{Sec}[c+d\,x]^{3/2}}-\frac{5\,\text{Sin}[c+d\,x]}{3\,a\,d\sqrt{\text{Sec}[c+d\,x]}}-\frac{\text{Sin}[c+d\,x]}{d\,\text{Sec}[c+d\,x]^{3/2}\left(a+a\,\text{Sec}[c+d\,x]\right)}$$

Result (type 5, 341 leaves):

$$\frac{1}{60\, a\, d\, \left(1+\text{Cos}[c+d\, x]\right)}\text{Cos}\left[\frac{1}{2}\left(c+d\, x\right)\right]^2 \left(\frac{1}{-1+e^{2\, i\, c}} 8\, i\, \sqrt{2}\, e^{-i\, (c+d\, x)} \sqrt{\frac{e^{i\, (c+d\, x)}}{1+e^{2\, i\, (c+d\, x)}}}\, \left(63\, \left(1+e^{2\, i\, (c+d\, x)}\right) + 63\, \left(-1+e^{2\, i\, c}\right) \sqrt{1+e^{2\, i\, (c+d\, x)}}\ \text{Hypergeometric2F1}\left[-\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, -e^{2\, i\, (c+d\, x)}\right] + 25\, e^{i\, (c+d\, x)} \left(-1+e^{2\, i\, c}\right) \sqrt{1+e^{2\, i\, (c+d\, x)}}\ \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{5}{4}, -e^{2\, i\, (c+d\, x)}\right]\right) - \sqrt{\text{Sec}[c+d\, x]}\, \left(18\, \left(17+11\, \text{Cos}[2\, c]\right)\, \text{Cos}[d\, x]\, \text{Csc}[c] + 4\, \left(10\, \text{Cos}[2\, d\, x]\, \text{Sin}[2\, c] - 3\, \text{Cos}[3\, d\, x]\, \text{Sin}[3\, c] - 30\, \text{Sec}\left[\frac{c}{2}\right]\, \text{Sec}\left[\frac{1}{2}\left(c+d\, x\right)\right]\, \text{Sin}\left[\frac{d\, x}{2}\right] - 99\, \text{Cos}[c]\, \text{Sin}[d\, x] + 10\, \text{Cos}[2\, c]\, \text{Sin}[2\, d\, x] - 3\, \text{Cos}[3\, c]\, \text{Sin}[3\, d\, x] - 30\, \text{Tan}\left[\frac{c}{2}\right]\right)\right)\right)$$

Problem 324: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\text{Sec}[c+d\, x]^{5/2}}{\left(a+a\, \text{Cos}[c+d\, x]\right)^2}\, dx$$

Optimal (type 4, 202 leaves, 10 steps):

$$\frac{7\, \sqrt{\text{Cos}[c+d\, x]}\, \text{EllipticE}\left[\frac{1}{2}\left(c+d\, x\right), 2\right] \sqrt{\text{Sec}[c+d\, x]}}{a^2\, d} + \frac{10\, \sqrt{\text{Cos}[c+d\, x]}\, \text{EllipticF}\left[\frac{1}{2}\left(c+d\, x\right), 2\right] \sqrt{\text{Sec}[c+d\, x]}}{3\, a^2\, d} - \frac{7\, \sqrt{\text{Sec}[c+d\, x]}\, \text{Sin}[c+d\, x]}{a^2\, d} + \frac{10\, \text{Sec}[c+d\, x]^{3/2}\, \text{Sin}[c+d\, x]}{3\, a^2\, d} - \frac{7\, \text{Sec}[c+d\, x]^{5/2}\, \text{Sin}[c+d\, x]}{3\, a^2\, d\, \left(1+\text{Sec}[c+d\, x]\right)} - \frac{\text{Sec}[c+d\, x]^{7/2}\, \text{Sin}[c+d\, x]}{3\, d\, \left(a+a\, \text{Sec}[c+d\, x]\right)^2}$$

Result (type 5, 443 leaves):

$$\left(7\sqrt{2}\,e^{-i\,(2c+dx)}\sqrt{\frac{e^{i\,(c+dx)}}{1+e^{2\,i\,(c+dx)}}}\;\text{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^4\text{Csc}\left[\frac{c}{2}\right]\left(1+e^{2\,i\,(c+dx)}+\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+dx)}}\;\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+dx)}\right]\right)\text{Sec}\left[\frac{c}{2}\right]\right)\Big/\left(d\,\left(a+a\,\text{Cos}[c+dx]\right)^2\right)+$$

$$\left(20\,\text{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^4\sqrt{\text{Cos}[c+dx]}\;\text{Csc}\left[\frac{c}{2}\right]\text{EllipticF}\left[\frac{1}{2}(c+dx),2\right]\text{Sec}\left[\frac{c}{2}\right]\sqrt{\text{Sec}[c+dx]}\;\text{Sin}[c]\right)\Big/\left(3\,d\,\left(a+a\,\text{Cos}[c+dx]\right)^2\right)+\left(\text{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^4\sqrt{\text{Sec}[c+dx]}\right.$$

$$\left(-\frac{14\,\text{Cos}[dx]\,\text{Csc}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}\right]}{d}+\frac{4\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}[c]\left(-3\,\text{Sin}\left[\frac{c}{2}\right]+5\,\text{Sin}\left[\frac{3c}{2}\right]\right)}{3\,d}+\frac{32\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]\text{Sin}\left[\frac{dx}{2}\right]}{3\,d}+\frac{2\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^3\text{Sin}\left[\frac{dx}{2}\right]}{3\,d}+\frac{8\,\text{Sec}[c]\,\text{Sec}[c+dx]\,\text{Sin}[dx]}{3\,d}+\frac{2\,\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^2\text{Tan}\left[\frac{c}{2}\right]}{3\,d}\right)\left.\right)\Big/\left(a+a\,\text{Cos}[c+dx]\right)^2$$

Problem 325: Result unnecessarily involves higher level functions.

$$\int\frac{\text{Sec}[c+dx]^{3/2}}{\left(a+a\,\text{Cos}[c+dx]\right)^2}\,dx$$

Optimal (type 4, 176 leaves, 9 steps):

$$-\frac{4\sqrt{\text{Cos}[c+dx]}\;\text{EllipticE}\left[\frac{1}{2}(c+dx),2\right]\sqrt{\text{Sec}[c+dx]}}{a^2\,d}-\frac{5\sqrt{\text{Cos}[c+dx]}\;\text{EllipticF}\left[\frac{1}{2}(c+dx),2\right]\sqrt{\text{Sec}[c+dx]}}{3\,a^2\,d}+\frac{4\sqrt{\text{Sec}[c+dx]}\;\text{Sin}[c+dx]}{a^2\,d}-\frac{5\,\text{Sec}[c+dx]^{3/2}\,\text{Sin}[c+dx]}{3\,a^2\,d\,\left(1+\text{Sec}[c+dx]\right)}-\frac{\text{Sec}[c+dx]^{5/2}\,\text{Sin}[c+dx]}{3\,d\,\left(a+a\,\text{Sec}[c+dx]\right)^2}$$

Result (type 5, 259 leaves):

$$-\frac{1}{6\,a^2\,d\,\left(1+\text{Cos}[c+d\,x]\right)^2}\,e^{-i\,(2\,c+d\,x)}\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\sqrt{\text{Sec}[c+d\,x]}\,\left(12\,i\,e^{-2\,i\,(c+d\,x)}\,\left(1+e^{i\,(c+d\,x)}\right)^3\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right.$$
$$\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+40\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^3\,\sqrt{\text{Cos}[c+d\,x]}$$
$$\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+i\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)-$$
$$\left.i\,\left(29+50\,\text{Cos}[c+d\,x]+17\,\text{Cos}[2\,(c+d\,x)]-12\,i\,\text{Sin}[c+d\,x]-7\,i\,\text{Sin}[2\,(c+d\,x)]\right)\right)$$
$$\left(\text{Cos}\left[\frac{1}{2}\,(3\,c+d\,x)\right]+i\,\text{Sin}\left[\frac{1}{2}\,(3\,c+d\,x)\right]\right)$$

Problem 326: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{\text{Sec}[c+d\,x]}}{\left(a+a\,\text{Cos}[c+d\,x]\right)^2}\,dx$$

Optimal (type 4, 149 leaves, 8 steps):

$$\frac{\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{a^2\,d}+\frac{2\,\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{3\,a^2\,d}-\frac{\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{a^2\,d\,\left(1+\text{Sec}[c+d\,x]\right)}-\frac{\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{3\,d\,\left(a+a\,\text{Sec}[c+d\,x]\right)^2}$$

Result (type 5, 249 leaves):

$$\frac{1}{6\,a^2\,d\,\left(1+\text{Cos}[c+d\,x]\right)^2}\,e^{-i\,(2\,c+d\,x)}\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\sqrt{\text{Sec}[c+d\,x]}$$
$$\left(3\,i\,e^{-2\,i\,(c+d\,x)}\,\left(1+e^{i\,(c+d\,x)}\right)^3\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+\right.$$
$$16\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^3\,\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]$$
$$\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+i\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)-$$
$$\left.i\,\left(5+14\,\text{Cos}[c+d\,x]+5\,\text{Cos}[2\,(c+d\,x)]-i\,\text{Sin}[2\,(c+d\,x)]\right)\right)$$
$$\left(\text{Cos}\left[\frac{1}{2}\,(3\,c+d\,x)\right]+i\,\text{Sin}\left[\frac{1}{2}\,(3\,c+d\,x)\right]\right)$$

Problem 328: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\left(a+a\,\text{Cos}[c+d\,x]\right)^2\,\text{Sec}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 4, 149 leaves, 8 steps):

$$-\frac{\sqrt{\text{Cos}[c+d x]}\ \text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]\sqrt{\text{Sec}[c+d x]}}{a^2 d}+\frac{2\sqrt{\text{Cos}[c+d x]}\ \text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]\sqrt{\text{Sec}[c+d x]}}{3 a^2 d}+\frac{\sqrt{\text{Sec}[c+d x]}\ \text{Sin}[c+d x]}{a^2 d\,(1+\text{Sec}[c+d x])}-\frac{\text{Sec}[c+d x]^{3/2}\,\text{Sin}[c+d x]}{3 d\,(a+a\,\text{Sec}[c+d x])^2}$$

Result (type 5, 247 leaves):

$$\frac{1}{6 a^2 d\,(1+\text{Cos}[c+d x])^2}e^{-i(2c+dx)}\,\text{Cos}\left[\frac{1}{2}(c+d x)\right]\sqrt{\text{Sec}[c+d x]}\left(16\,\text{Cos}\left[\frac{1}{2}(c+d x)\right]^3\sqrt{\text{Cos}[c+d x]}\ \text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]+i\,\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)-i\left(-7-10\,\text{Cos}[c+d x]-7\,\text{Cos}[2(c+d x)]+3 e^{-2i(c+dx)}\left(1+e^{i(c+dx)}\right)^3\sqrt{1+e^{2i(c+dx)}}\ \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right]-i\,\text{Sin}[2(c+d x)]\right)\right)\left(\text{Cos}\left[\frac{1}{2}(3c+d x)\right]+i\,\text{Sin}\left[\frac{1}{2}(3c+d x)\right]\right)$$

Problem 329: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(a+a\,\text{Cos}[c+d x])^2\,\text{Sec}[c+d x]^{5/2}}\,dx$$

Optimal (type 4, 152 leaves, 8 steps):

$$\frac{4\sqrt{\text{Cos}[c+d x]}\ \text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]\sqrt{\text{Sec}[c+d x]}}{a^2 d}-\frac{5\sqrt{\text{Cos}[c+d x]}\ \text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]\sqrt{\text{Sec}[c+d x]}}{3 a^2 d}-\frac{5\sqrt{\text{Sec}[c+d x]}\ \text{Sin}[c+d x]}{3 a^2 d\,(1+\text{Sec}[c+d x])}-\frac{\sqrt{\text{Sec}[c+d x]}\ \text{Sin}[c+d x]}{3 d\,(a+a\,\text{Sec}[c+d x])^2}$$

Result (type 5, 231 leaves):

$$-\left(\left(\left(i\, e^{-3 i (c+d x)} \left(1+e^{i (c+d x)}\right) \left(9+20 e^{i (c+d x)}+25 e^{2 i (c+d x)}+23 e^{3 i (c+d x)}+16 e^{4 i (c+d x)}+3 e^{5 i (c+d x)}-5 i e^{i (c+d x)} \left(1+e^{i (c+d x)}\right)^3 \sqrt{\text{Cos}[c+d x]}\ \text{EllipticF}\left[\frac{1}{2} (c+d x), 2\right]-12 \left(1+e^{i (c+d x)}\right)^3 \sqrt{1+e^{2 i (c+d x)}}\ \text{Hypergeometric2F1}\left[-\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, -e^{2 i (c+d x)}\right]\right) \sqrt{\text{Sec}[c+d x]}\right) \middle/ \left(12 a^2 d \left(1+\text{Cos}[c+d x]\right)^2\right)\right)\right)$$

Problem 330: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+a\,\text{Cos}[c+d x])^2\, \text{Sec}[c+d x]^{7/2}}\, dx$$

Optimal (type 4, 178 leaves, 9 steps):

$$-\frac{7 \sqrt{\text{Cos}[c+d x]}\ \text{EllipticE}\left[\frac{1}{2} (c+d x), 2\right] \sqrt{\text{Sec}[c+d x]}}{a^2 d}+\frac{10 \sqrt{\text{Cos}[c+d x]}\ \text{EllipticF}\left[\frac{1}{2} (c+d x), 2\right] \sqrt{\text{Sec}[c+d x]}}{3 a^2 d}+\frac{10\, \text{Sin}[c+d x]}{3 a^2 d \sqrt{\text{Sec}[c+d x]}}-\frac{7\, \text{Sin}[c+d x]}{3 a^2 d \sqrt{\text{Sec}[c+d x]}\ (1+\text{Sec}[c+d x])}-\frac{\text{Sin}[c+d x]}{3 d \sqrt{\text{Sec}[c+d x]}\ (a+a\, \text{Sec}[c+d x])^2}$$

Result (type 5, 270 leaves):

$$\left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]^4 \left(\frac{40 \sqrt{\text{Cos}[c+d x]}\ \text{EllipticF}\left[\frac{1}{2} (c+d x), 2\right] \sqrt{\text{Sec}[c+d x]}}{d}+\left(2 i\, e^{-2 i (c+d x)} \left(1+33 e^{i (c+d x)}+73 e^{2 i (c+d x)}+87 e^{3 i (c+d x)}+81 e^{4 i (c+d x)}+53 e^{5 i (c+d x)}+9 e^{6 i (c+d x)}-e^{7 i (c+d x)}-42 e^{i (c+d x)} \left(1+e^{i (c+d x)}\right)^3 \sqrt{1+e^{2 i (c+d x)}}\ \text{Hypergeometric2F1}\left[-\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, -e^{2 i (c+d x)}\right]\right) \sqrt{\text{Sec}[c+d x]}\right) \middle/ \left(d \left(1+e^{i (c+d x)}\right)^3\right)\right)\right) \middle/ \left(3 a^2 \left(1+\text{Cos}[c+d x]\right)^2\right)$$

Problem 331: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+a\,\text{Cos}[c+d x])^2\, \text{Sec}[c+d x]^{9/2}}\, dx$$

Optimal (type 4, 200 leaves, 10 steps):

$$\frac{56\sqrt{\text{Cos}[c+d x]}\ \text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]\sqrt{\text{Sec}[c+d x]}}{5 a^2 d}-\frac{5\sqrt{\text{Cos}[c+d x]}\ \text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]\sqrt{\text{Sec}[c+d x]}}{a^2 d}+\frac{56\,\text{Sin}[c+d x]}{15 a^2 d\,\text{Sec}[c+d x]^{3/2}}-\frac{5\,\text{Sin}[c+d x]}{a^2 d\sqrt{\text{Sec}[c+d x]}}-\frac{3\,\text{Sin}[c+d x]}{a^2 d\,\text{Sec}[c+d x]^{3/2}(1+\text{Sec}[c+d x])}-\frac{\text{Sin}[c+d x]}{3 d\,\text{Sec}[c+d x]^{3/2}(a+a\,\text{Sec}[c+d x])^2}$$

Result (type 5, 298 leaves):

$$-\frac{1}{15 a^2 d\left(1+e^{i(c+d x)}\right)^7}4\,i\,e^{-i(c+d x)}\,\text{Cos}\left[\frac{1}{2}(c+d x)\right]^4\Big(-3+11 e^{i(c+d x)}+504 e^{2 i(c+d x)}+1156 e^{3 i(c+d x)}+1378 e^{4 i(c+d x)}+1310 e^{5 i(c+d x)}+860 e^{6 i(c+d x)}+168 e^{7 i(c+d x)}-11 e^{8 i(c+d x)}+3 e^{9 i(c+d x)}-300\,i\,e^{3 i(c+d x)}\left(1+e^{i(c+d x)}\right)^3\sqrt{\text{Cos}[c+d x]}\ \text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]-672 e^{2 i(c+d x)}\left(1+e^{i(c+d x)}\right)^3\sqrt{1+e^{2 i(c+d x)}}\ \text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2 i(c+d x)}\right]\Big)\sqrt{\text{Sec}[c+d x]}$$

Problem 332: Result unnecessarily involves higher level functions.

$$\int\frac{\text{Sec}[c+d x]^{3/2}}{(a+a\,\text{Cos}[c+d x])^3}\,dx$$

Optimal (type 4, 221 leaves, 10 steps):

$$-\frac{49\sqrt{\text{Cos}[c+d x]}\ \text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]\sqrt{\text{Sec}[c+d x]}}{10 a^3 d}-\frac{13\sqrt{\text{Cos}[c+d x]}\ \text{EllipticF}\left[\frac{1}{2}(c+d x),2\right]\sqrt{\text{Sec}[c+d x]}}{6 a^3 d}+\frac{49\sqrt{\text{Sec}[c+d x]}\ \text{Sin}[c+d x]}{10 a^3 d}-\frac{\text{Sec}[c+d x]^{7/2}\,\text{Sin}[c+d x]}{5 d(a+a\,\text{Sec}[c+d x])^3}-\frac{8\,\text{Sec}[c+d x]^{5/2}\,\text{Sin}[c+d x]}{15 a d(a+a\,\text{Sec}[c+d x])^2}-\frac{13\,\text{Sec}[c+d x]^{3/2}\,\text{Sin}[c+d x]}{6 d\left(a^3+a^3\,\text{Sec}[c+d x]\right)}$$

Result (type 5, 363 leaves):

$$\frac{1}{15\,a^3\,d\,\left(1+\text{Cos}[c+d\,x]\right)^3}\,2\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^6\left(-\frac{1}{-1+e^{2\,i\,c}}2\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\,\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\,\left(147\,\left(1+e^{2\,i\,(c+d\,x)}\right)+147\,\left(-1+e^{2\,i\,c}\right)\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]-65\,e^{i\,(c+d\,x)}\,\left(-1+e^{2\,i\,c}\right)\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)+\frac{1}{32}\left(1284\,\text{Cos}\left[\frac{1}{2}\,(c-d\,x)\right]+921\,\text{Cos}\left[\frac{1}{2}\,(3\,c+d\,x)\right]+1243\,\text{Cos}\left[\frac{1}{2}\,(c+3\,d\,x)\right]+374\,\text{Cos}\left[\frac{1}{2}\,(5\,c+3\,d\,x)\right]+670\,\text{Cos}\left[\frac{1}{2}\,(3\,c+5\,d\,x)\right]+65\,\text{Cos}\left[\frac{1}{2}\,(7\,c+5\,d\,x)\right]+147\,\text{Cos}\left[\frac{1}{2}\,(5\,c+7\,d\,x)\right]\right)\,\text{Csc}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^5\,\sqrt{\text{Sec}[c+d\,x]}\right)$$

Problem 333: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{\text{Sec}[c+d\,x]}}{\left(a+a\,\text{Cos}[c+d\,x]\right)^3}\,dx$$

Optimal (type 4, 195 leaves, 9 steps):

$$\frac{9\,\sqrt{\text{Cos}[c+d\,x]}\,\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{10\,a^3\,d}+\frac{\sqrt{\text{Cos}[c+d\,x]}\,\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{2\,a^3\,d}-\frac{\text{Sec}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{5\,d\,\left(a+a\,\text{Sec}[c+d\,x]\right)^3}-\frac{2\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{5\,a\,d\,\left(a+a\,\text{Sec}[c+d\,x]\right)^2}-\frac{9\,\sqrt{\text{Sec}[c+d\,x]}\,\,\text{Sin}[c+d\,x]}{10\,d\,\left(a^3+a^3\,\text{Sec}[c+d\,x]\right)}$$

Result (type 5, 281 leaves):

$$\frac{1}{40\,a^3\,d\,\left(1+\text{Cos}[c+d\,x]\right)^3}\,e^{-i\,(2\,c+d\,x)}\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\sqrt{\text{Sec}[c+d\,x]}\,\left(9\,i\,e^{-3\,i\,(c+d\,x)}\,\left(1+e^{i\,(c+d\,x)}\right)^5\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+160\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^5\,\sqrt{\text{Cos}[c+d\,x]}\,\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+i\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)-2\,i\,\left(34+69\,\text{Cos}[c+d\,x]+34\,\text{Cos}[2\,(c+d\,x)]+7\,\text{Cos}[3\,(c+d\,x)]-2\,i\,\text{Sin}[c+d\,x]-6\,i\,\text{Sin}[2\,(c+d\,x)]-2\,i\,\text{Sin}[3\,(c+d\,x)]\right)\,\left(\text{Cos}\left[\frac{1}{2}\,(3\,c+d\,x)\right]+i\,\text{Sin}\left[\frac{1}{2}\,(3\,c+d\,x)\right]\right)\right)$$

Problem 334: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+a\,\text{Cos}[c+d\,x])^3\,\sqrt{\text{Sec}[c+d\,x]}}\,dx$$

Optimal (type 4, 195 leaves, 9 steps):

$$\frac{\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{10\,a^3\,d}+\frac{\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{6\,a^3\,d}-\frac{\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{5\,d\,(a+a\,\text{Sec}[c+d\,x])^3}-\frac{4\,\sqrt{\text{Sec}[c+d\,x]}\ \text{Sin}[c+d\,x]}{15\,a\,d\,(a+a\,\text{Sec}[c+d\,x])^2}+\frac{\sqrt{\text{Sec}[c+d\,x]}\ \text{Sin}[c+d\,x]}{6\,d\,(a^3+a^3\,\text{Sec}[c+d\,x])}$$

Result (type 5, 363 leaves):

$$\frac{1}{15\,a^3\,d\,(1+\text{Cos}[c+d\,x])^3}\,2\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^6\left(\frac{1}{-1+e^{2\,i\,c}}2\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\right.$$
$$\left(3\,\left(1+e^{2\,i\,(c+d\,x)}\right)+3\,\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\ \text{Hypergeometric2F1}\left[-\frac{1}{4},\,\frac{1}{2},\,\frac{3}{4},\,-e^{2\,i\,(c+d\,x)}\right]-\right.$$
$$\left.5\,e^{i\,(c+d\,x)}\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\ \text{Hypergeometric2F1}\left[\frac{1}{4},\,\frac{1}{2},\,\frac{5}{4},\,-e^{2\,i\,(c+d\,x)}\right]\right)-$$
$$\frac{1}{32}\left(36\,\text{Cos}\left[\frac{1}{2}\,(c-d\,x)\right]+9\,\text{Cos}\left[\frac{1}{2}\,(3\,c+d\,x)\right]+7\,\text{Cos}\left[\frac{1}{2}\,(c+3\,d\,x)\right]+26\,\text{Cos}\left[\frac{1}{2}\,(5\,c+3\,d\,x)\right]+\right.$$
$$\left.10\,\text{Cos}\left[\frac{1}{2}\,(3\,c+5\,d\,x)\right]+5\,\text{Cos}\left[\frac{1}{2}\,(7\,c+5\,d\,x)\right]+3\,\text{Cos}\left[\frac{1}{2}\,(5\,c+7\,d\,x)\right]\right)$$
$$\left.\text{Csc}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^5\sqrt{\text{Sec}[c+d\,x]}\right)$$

Problem 335: Result unnecessarily involves higher level functions.

$$\int \frac{1}{(a+a\,\text{Cos}[c+d\,x])^3\,\text{Sec}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 4, 195 leaves, 9 steps):

$$-\frac{\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{10\,a^3\,d}+\frac{\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{6\,a^3\,d}+\frac{\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{5\,d\,(a+a\,\text{Sec}[c+d\,x])^3}-\frac{\sqrt{\text{Sec}[c+d\,x]}\ \text{Sin}[c+d\,x]}{15\,a\,d\,(a+a\,\text{Sec}[c+d\,x])^2}+\frac{\sqrt{\text{Sec}[c+d\,x]}\ \text{Sin}[c+d\,x]}{6\,d\,(a^3+a^3\,\text{Sec}[c+d\,x])}$$

Result (type 5, 363 leaves):

$$\frac{1}{15\,a^3\,d\,\left(1+\text{Cos}[c+d\,x]\right)^3}\,2\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^6\left(-\frac{1}{-1+e^{2\,i\,c}}2\,i\,\sqrt{2}\,e^{-i\,(c+d\,x)}\,\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\,\left(3\,\left(1+e^{2\,i\,(c+d\,x)}\right)+3\,\left(-1+e^{2\,i\,c}\right)\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\;\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+5\,e^{i\,(c+d\,x)}\,\left(-1+e^{2\,i\,c}\right)\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\;\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)+\frac{1}{32}\left(36\,\text{Cos}\left[\frac{1}{2}\,(c-d\,x)\right]+9\,\text{Cos}\left[\frac{1}{2}\,(3\,c+d\,x)\right]+17\,\text{Cos}\left[\frac{1}{2}\,(c+3\,d\,x)\right]+16\,\text{Cos}\left[\frac{1}{2}\,(5\,c+3\,d\,x)\right]+20\,\text{Cos}\left[\frac{1}{2}\,(3\,c+5\,d\,x)\right]-5\,\text{Cos}\left[\frac{1}{2}\,(7\,c+5\,d\,x)\right]+3\,\text{Cos}\left[\frac{1}{2}\,(5\,c+7\,d\,x)\right]\right)\text{Csc}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^5\,\sqrt{\text{Sec}[c+d\,x]}\right)$$

Problem 336: Result unnecessarily involves higher level functions.

$$\int\frac{1}{\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}[c+d\,x]^{5/2}}\,dx$$

Optimal (type 4, 195 leaves, 9 steps):

$$-\frac{9\,\sqrt{\text{Cos}[c+d\,x]}\;\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{10\,a^3\,d}+\frac{\sqrt{\text{Cos}[c+d\,x]}\;\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]\,\sqrt{\text{Sec}[c+d\,x]}}{2\,a^3\,d}-\frac{\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{5\,d\,\left(a+a\,\text{Sec}[c+d\,x]\right)^3}+\frac{2\,\sqrt{\text{Sec}[c+d\,x]}\;\text{Sin}[c+d\,x]}{5\,a\,d\,\left(a+a\,\text{Sec}[c+d\,x]\right)^2}+\frac{\sqrt{\text{Sec}[c+d\,x]}\;\text{Sin}[c+d\,x]}{2\,d\,\left(a^3+a^3\,\text{Sec}[c+d\,x]\right)}$$

Result (type 5, 281 leaves):

$$\frac{1}{40\, a^3\, d\, \left(1+\text{Cos}[c+d\,x]\right)^3}\, e^{-i\,(2\,c+d\,x)}\, \text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\, \sqrt{\text{Sec}[c+d\,x]}$$
$$\left(-9\, i\, e^{-3\,i\,(c+d\,x)}\, \left(1+e^{i\,(c+d\,x)}\right)^5\, \sqrt{1+e^{2\,i\,(c+d\,x)}}\, \text{Hypergeometric2F1}\left[-\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, -e^{2\,i\,(c+d\,x)}\right] + \right.$$
$$160\, \text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^5\, \sqrt{\text{Cos}[c+d\,x]}\, \text{EllipticF}\left[\frac{1}{2}\,(c+d\,x), 2\right]$$
$$\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right] + i\, \text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right) +$$
$$2\, i\, \left(34 + 64\, \text{Cos}[c+d\,x] + 34\, \text{Cos}[2\,(c+d\,x)] + 12\, \text{Cos}[3\,(c+d\,x)] + 3\, i\, \text{Sin}[c+d\,x] + \right.$$
$$\left.\left. 4\, i\, \text{Sin}[2\,(c+d\,x)] + 3\, i\, \text{Sin}[3\,(c+d\,x)]\right)\right) \left(\text{Cos}\left[\frac{1}{2}\,(3\,c+d\,x)\right] + i\, \text{Sin}\left[\frac{1}{2}\,(3\,c+d\,x)\right]\right)$$

Problem 337: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\left(a+a\,\text{Cos}[c+d\,x]\right)^3\, \text{Sec}[c+d\,x]^{7/2}}\, dx$$

Optimal (type 4, 195 leaves, 9 steps):

$$\frac{49\, \sqrt{\text{Cos}[c+d\,x]}\, \text{EllipticE}\left[\frac{1}{2}\,(c+d\,x), 2\right]\, \sqrt{\text{Sec}[c+d\,x]}}{10\, a^3\, d} - $$
$$\frac{13\, \sqrt{\text{Cos}[c+d\,x]}\, \text{EllipticF}\left[\frac{1}{2}\,(c+d\,x), 2\right]\, \sqrt{\text{Sec}[c+d\,x]}}{6\, a^3\, d} - \frac{\sqrt{\text{Sec}[c+d\,x]}\, \text{Sin}[c+d\,x]}{5\, d\, \left(a+a\,\text{Sec}[c+d\,x]\right)^3} - $$
$$\frac{8\, \sqrt{\text{Sec}[c+d\,x]}\, \text{Sin}[c+d\,x]}{15\, a\, d\, \left(a+a\,\text{Sec}[c+d\,x]\right)^2} - \frac{13\, \sqrt{\text{Sec}[c+d\,x]}\, \text{Sin}[c+d\,x]}{6\, d\, \left(a^3+a^3\,\text{Sec}[c+d\,x]\right)}$$

Result (type 5, 378 leaves):

$$\frac{1}{15\,a^3\,d\,\left(1+\text{Cos}[c+d\,x]\right)^3}\;2\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^6\left(\frac{1}{-1+e^{2\,i\,c}}2\,i\,\sqrt{2}\;e^{-i\,(c+d\,x)}\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\,\left(147\,\left(1+e^{2\,i\,(c+d\,x)}\right)+147\,\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\;\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2\,i\,(c+d\,x)}\right]+65\,e^{i\,(c+d\,x)}\,\left(-1+e^{2\,i\,c}\right)\sqrt{1+e^{2\,i\,(c+d\,x)}}\;\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-e^{2\,i\,(c+d\,x)}\right]\right)-\frac{1}{32}\left(1134\,\text{Cos}\left[\frac{1}{2}\,(c-d\,x)\right]+1071\,\text{Cos}\left[\frac{1}{2}\,(3\,c+d\,x)\right]+923\,\text{Cos}\left[\frac{1}{2}\,(c+3\,d\,x)\right]+694\,\text{Cos}\left[\frac{1}{2}\,(5\,c+3\,d\,x)\right]+470\,\text{Cos}\left[\frac{1}{2}\,(3\,c+5\,d\,x)\right]+265\,\text{Cos}\left[\frac{1}{2}\,(7\,c+5\,d\,x)\right]+117\,\text{Cos}\left[\frac{1}{2}\,(5\,c+7\,d\,x)\right]+30\,\text{Cos}\left[\frac{1}{2}\,(9\,c+7\,d\,x)\right]\right)\text{Csc}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^5\sqrt{\text{Sec}[c+d\,x]}\right)$$

Problem 338: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{1}{\left(a+a\,\text{Cos}[c+d\,x]\right)^3\,\text{Sec}[c+d\,x]^{9/2}}\,dx$$

Optimal (type 4, 221 leaves, 10 steps):

$$-\frac{119\,\sqrt{\text{Cos}[c+d\,x]}\;\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{10\,a^3\,d}+\frac{11\,\sqrt{\text{Cos}[c+d\,x]}\;\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{2\,a^3\,d}+\frac{11\,\text{Sin}[c+d\,x]}{2\,a^3\,d\,\sqrt{\text{Sec}[c+d\,x]}}-\frac{\text{Sin}[c+d\,x]}{5\,d\,\sqrt{\text{Sec}[c+d\,x]}\,\left(a+a\,\text{Sec}[c+d\,x]\right)^3}-\frac{2\,\text{Sin}[c+d\,x]}{3\,a\,d\,\sqrt{\text{Sec}[c+d\,x]}\,\left(a+a\,\text{Sec}[c+d\,x]\right)^2}-\frac{119\,\text{Sin}[c+d\,x]}{30\,d\,\sqrt{\text{Sec}[c+d\,x]}\,\left(a^3+a^3\,\text{Sec}[c+d\,x]\right)}$$

Result (type 5, 521 leaves):

$$-\left(\left(\left(119\sqrt{2}\,e^{-i(2c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^6\mathrm{Csc}\left[\frac{c}{2}\right]\left(1+e^{2i(c+dx)}+\left(-1+e^{2ic}\right)\sqrt{1+e^{2i(c+dx)}}\,\mathrm{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-e^{2i(c+dx)}\right]\right)\mathrm{Sec}\left[\frac{c}{2}\right]\right)\Big/\left(5d\left(a+a\,\mathrm{Cos}[c+dx]\right)^3\right)\right)+\left(22\,\mathrm{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^6\sqrt{\mathrm{Cos}[c+dx]}\,\mathrm{Csc}\left[\frac{c}{2}\right]\mathrm{EllipticF}\left[\frac{1}{2}(c+dx),2\right]\mathrm{Sec}\left[\frac{c}{2}\right]\sqrt{\mathrm{Sec}[c+dx]}\,\mathrm{Sin}[c]\right)\Big/\left(d\left(a+a\,\mathrm{Cos}[c+dx]\right)^3\right)+\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^6\sqrt{\mathrm{Sec}[c+dx]}\left(\frac{2\left(89+30\,\mathrm{Cos}[2c]\right)\mathrm{Cos}[dx]\,\mathrm{Csc}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}\right]}{5d}+\frac{8\,\mathrm{Cos}[2dx]\,\mathrm{Sin}[2c]}{3d}-\frac{172\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]\mathrm{Sin}\left[\frac{dx}{2}\right]}{3d}+\frac{88\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^3\mathrm{Sin}\left[\frac{dx}{2}\right]}{15d}-\frac{2\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^5\mathrm{Sin}\left[\frac{dx}{2}\right]}{5d}-\frac{48\,\mathrm{Cos}[c]\,\mathrm{Sin}[dx]}{d}+\frac{8\,\mathrm{Cos}[2c]\,\mathrm{Sin}[2dx]}{3d}-\frac{172\,\mathrm{Tan}\left[\frac{c}{2}\right]}{3d}+\frac{88\,\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^2\mathrm{Tan}\left[\frac{c}{2}\right]}{15d}-\frac{2\,\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^4\mathrm{Tan}\left[\frac{c}{2}\right]}{5d}\right)\right)\Big/\left(a+a\,\mathrm{Cos}[c+dx]\right)^3$$

Problem 343: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\sqrt{a+a\,\mathrm{Cos}[c+dx]}\,\sqrt{\mathrm{Sec}[c+dx]}\,dx$$

Optimal (type 3, 57 leaves, 3 steps):

$$\frac{2\sqrt{a}\,\mathrm{ArcSin}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+dx]}{\sqrt{a+a\,\mathrm{Cos}[c+dx]}}\right]\sqrt{\mathrm{Cos}[c+dx]}\,\sqrt{\mathrm{Sec}[c+dx]}}{d}$$

Result (type 3, 216 leaves):

$$\left(i \sqrt{a\,(1+\mathrm{Cos}[c+d\,x])}\right.$$
$$\left(\mathrm{ArcTanh}\left[\left(\mathrm{Cos}\left[\frac{c}{2}\right]+i\,\mathrm{Sin}\left[\frac{c}{2}\right]\right)\sqrt{\left(1+e^{2\,i\,d\,x}\right)\mathrm{Cos}[c]+i\left(-1+e^{2\,i\,d\,x}\right)\mathrm{Sin}[c]}\,\right]-\right.$$
$$\left.\mathrm{Log}\left[2\left(e^{i\,d\,x}\,\mathrm{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\mathrm{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\mathrm{Cos}[c]+i\left(-1+e^{2\,i\,d\,x}\right)\mathrm{Sin}[c]}\right)\right]\right)$$
$$\left.\mathrm{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]\left(\mathrm{Cos}\left[\frac{d\,x}{2}\right]+i\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]\right)\right)\Big/$$
$$\left(\sqrt{2}\,d\,\sqrt{\mathrm{Sec}[c+d\,x]}\,\sqrt{\mathrm{Cos}[c+d\,x]\,(\mathrm{Cos}[d\,x]+i\,\mathrm{Sin}[d\,x])}\right)$$

Problem 344: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}{\sqrt{\mathrm{Sec}[c+d\,x]}}\,dx$$

Optimal (type 3, 92 leaves, 4 steps):

$$\frac{\sqrt{a}\,\mathrm{ArcSin}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+d\,x]}{\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}\right]\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}}{d}+\frac{a\,\mathrm{Sin}[c+d\,x]}{d\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}}$$

Result (type 3, 349 leaves):

$$\frac{1}{2\sqrt{2}\,d\,\sqrt{\mathrm{Sec}[c+d\,x]}\,\sqrt{\mathrm{Cos}[c+d\,x]\,(\mathrm{Cos}[d\,x]+i\,\mathrm{Sin}[d\,x])}}$$
$$\sqrt{a\,(1+\mathrm{Cos}[c+d\,x])}\,\mathrm{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]\left(-i\,\mathrm{Cos}\left[\frac{d\,x}{2}\right]\right.$$
$$\mathrm{Log}\left[2\left(e^{i\,d\,x}\,\mathrm{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\mathrm{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\mathrm{Cos}[c]+i\left(-1+e^{2\,i\,d\,x}\right)\mathrm{Sin}[c]}\right)\right]+$$
$$i\,\mathrm{ArcTanh}\left[\left(\mathrm{Cos}\left[\frac{c}{2}\right]+i\,\mathrm{Sin}\left[\frac{c}{2}\right]\right)\sqrt{\left(1+e^{2\,i\,d\,x}\right)\mathrm{Cos}[c]+i\left(-1+e^{2\,i\,d\,x}\right)\mathrm{Sin}[c]}\,\right]$$
$$\left(\mathrm{Cos}\left[\frac{d\,x}{2}\right]+i\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]\right)+$$
$$\mathrm{Log}\left[2\left(e^{i\,d\,x}\,\mathrm{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\mathrm{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\mathrm{Cos}[c]+i\left(-1+e^{2\,i\,d\,x}\right)\mathrm{Sin}[c]}\right)\right]$$
$$\left.\mathrm{Sin}\left[\frac{d\,x}{2}\right]+2\sqrt{2}\,\sqrt{\mathrm{Cos}[c+d\,x]\,(\mathrm{Cos}[d\,x]+i\,\mathrm{Sin}[d\,x])}\,\mathrm{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)$$

Problem 345: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}{\mathrm{Sec}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 3, 136 leaves, 5 steps):

$$\frac{3\sqrt{a}\,\text{ArcSin}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}{4\,d}+\frac{a\,\text{Sin}[c+d\,x]}{2\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{3/2}}+\frac{3\,a\,\text{Sin}[c+d\,x]}{4\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}$$

Result (type 3, 391 leaves):

$$\frac{1}{8\sqrt{2}\,d\,\sqrt{\text{Sec}[c+d\,x]}\,\sqrt{\text{Cos}[c+d\,x]\,(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x])}}\sqrt{a\,(1+\text{Cos}[c+d\,x])}\,\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]\left(-3\,i\,\text{Cos}\left[\frac{d\,x}{2}\right]\right.$$
$$\text{Log}\left[2\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\text{Cos}[c]+i\left(-1+e^{2\,i\,d\,x}\right)\text{Sin}[c]}\right)\right]+$$
$$3\,i\,\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+i\,\text{Sin}\left[\frac{c}{2}\right]\right)\sqrt{\left(1+e^{2\,i\,d\,x}\right)\text{Cos}[c]+i\left(-1+e^{2\,i\,d\,x}\right)\text{Sin}[c]}\right]$$
$$\left(\text{Cos}\left[\frac{d\,x}{2}\right]+i\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)+$$
$$3\,\text{Log}\left[2\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\text{Cos}[c]+i\left(-1+e^{2\,i\,d\,x}\right)\text{Sin}[c]}\right)\right]$$
$$\text{Sin}\left[\frac{d\,x}{2}\right]+4\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]\,(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x])}\,\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]+$$
$$\left.2\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]\,(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x])}\,\text{Sin}\left[\frac{3}{2}(c+d\,x)\right]\right)$$

Problem 349: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int (a+a\,\text{Cos}[c+d\,x])^{3/2}\,\text{Sec}[c+d\,x]^{3/2}\,dx$$

Optimal (type 3, 96 leaves, 5 steps):

$$\frac{2\,a^{3/2}\,\text{ArcSin}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}{d}+\frac{2\,a^2\,\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 297 leaves):

$$\frac{1}{d\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}}\,a\sqrt{a\,\left(1+\text{Cos}[c+d\,x]\right)}\,\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\sqrt{\text{Sec}[c+d\,x]}\,\left(\text{Cos}\left[\frac{d\,x}{2}\right]+i\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)$$
$$\left(i\,\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+i\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\,\right]\,\text{Cos}[c+d\,x]-\right.$$
$$i\,\text{Cos}[c+d\,x]$$
$$\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\,\right)\right]+$$
$$\left.2\,\sqrt{2}\,\left(\text{Cos}\left[\frac{d\,x}{2}\right]-i\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)\,\sqrt{\text{Cos}[c+d\,x]\,\left(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x]\right)}\,\,\text{Sin}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right)$$

Problem 350: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}\,\sqrt{\text{Sec}[c+d\,x]}\,\,dx$$

Optimal (type 3, 95 leaves, 5 steps):

$$\frac{3\,a^{3/2}\,\text{ArcSin}\left[\frac{\sqrt{a}\,\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]\,\sqrt{\text{Cos}[c+d\,x]}\,\,\sqrt{\text{Sec}[c+d\,x]}}{d}+\frac{a^2\,\text{Sin}[c+d\,x]}{d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}\,\,\sqrt{\text{Sec}[c+d\,x]}}$$

Result (type 3, 351 leaves):

$$\frac{1}{2\,\sqrt{2}\,\,d\,\sqrt{\text{Sec}[c+d\,x]}\,\,\sqrt{\text{Cos}[c+d\,x]\,\left(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x]\right)}}\,a\,\sqrt{a\,\left(1+\text{Cos}[c+d\,x]\right)}\,\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\left(-3\,i\,\text{Cos}\left[\frac{d\,x}{2}\right]\right.$$
$$\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\,\right)\right]+$$
$$3\,i\,\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+i\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\,\right]$$
$$\left(\text{Cos}\left[\frac{d\,x}{2}\right]+i\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)+$$
$$3\,\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\,\right)\right]$$
$$\left.\text{Sin}\left[\frac{d\,x}{2}\right]+2\,\sqrt{2}\,\,\sqrt{\text{Cos}[c+d\,x]\,\left(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x]\right)}\,\,\text{Sin}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right)$$

Problem 351: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}}{\sqrt{\text{Sec}[c+d\,x]}}\,dx$$

Optimal (type 3, 140 leaves, 6 steps):

$$\frac{7 a^{3/2} \text{ArcSin}\left[\frac{\sqrt{a} \text{ Sin}[c+d x]}{\sqrt{a+a \text{ Cos}[c+d x]}}\right] \sqrt{\text{Cos}[c+d x]} \sqrt{\text{Sec}[c+d x]}}{4 d}+$$
$$\frac{a^2 \text{ Sin}[c+d x]}{2 d \sqrt{a+a \text{ Cos}[c+d x]} \text{ Sec}[c+d x]^{3/2}}+\frac{7 a^2 \text{ Sin}[c+d x]}{4 d \sqrt{a+a \text{ Cos}[c+d x]} \sqrt{\text{Sec}[c+d x]}}$$

Result (type 3, 392 leaves):

$$\frac{1}{8 \sqrt{2} d \sqrt{\text{Sec}[c+d x]} \sqrt{\text{Cos}[c+d x] (\text{Cos}[d x]+i \text{ Sin}[d x])}}$$
$$a \sqrt{a (1+\text{Cos}[c+d x])} \text{ Sec}\left[\frac{1}{2} (c+d x)\right] \left(-7 i \text{ Cos}\left[\frac{d x}{2}\right]\right.$$
$$\text{Log}\left[2 \left(e^{i d x} \text{ Cos}\left[\frac{c}{2}\right]+i e^{i d x} \text{ Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2 i d x}\right) \text{Cos}[c]+i \left(-1+e^{2 i d x}\right) \text{Sin}[c]}\right)\right]+$$
$$7 i \text{ ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+i \text{ Sin}\left[\frac{c}{2}\right]\right) \sqrt{\left(1+e^{2 i d x}\right) \text{Cos}[c]+i \left(-1+e^{2 i d x}\right) \text{Sin}[c]}\right]$$
$$\left(\text{Cos}\left[\frac{d x}{2}\right]+i \text{ Sin}\left[\frac{d x}{2}\right]\right)+$$
$$7 \text{ Log}\left[2 \left(e^{i d x} \text{ Cos}\left[\frac{c}{2}\right]+i e^{i d x} \text{ Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2 i d x}\right) \text{Cos}[c]+i \left(-1+e^{2 i d x}\right) \text{Sin}[c]}\right)\right]$$
$$\text{Sin}\left[\frac{d x}{2}\right]+12 \sqrt{2} \sqrt{\text{Cos}[c+d x] (\text{Cos}[d x]+i \text{ Sin}[d x])} \text{ Sin}\left[\frac{1}{2} (c+d x)\right]+$$
$$\left.2 \sqrt{2} \sqrt{\text{Cos}[c+d x] (\text{Cos}[d x]+i \text{ Sin}[d x])} \text{ Sin}\left[\frac{3}{2} (c+d x)\right]\right)$$

Problem 352: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{(a+a \text{ Cos}[c+d x])^{3/2}}{\text{Sec}[c+d x]^{3/2}} \, dx$$

Optimal (type 3, 180 leaves, 7 steps):

$$\frac{11 a^{3/2} \text{ArcSin}\left[\frac{\sqrt{a} \text{ Sin}[c+d x]}{\sqrt{a+a \text{ Cos}[c+d x]}}\right] \sqrt{\text{Cos}[c+d x]} \sqrt{\text{Sec}[c+d x]}}{8 d}+$$
$$\frac{a^2 \text{ Sin}[c+d x]}{3 d \sqrt{a+a \text{ Cos}[c+d x]} \text{ Sec}[c+d x]^{5/2}}+$$
$$\frac{11 a^2 \text{ Sin}[c+d x]}{12 d \sqrt{a+a \text{ Cos}[c+d x]} \text{ Sec}[c+d x]^{3/2}}+\frac{11 a^2 \text{ Sin}[c+d x]}{8 d \sqrt{a+a \text{ Cos}[c+d x]} \sqrt{\text{Sec}[c+d x]}}$$

Result (type 3, 433 leaves):

$$\frac{1}{48\sqrt{2}\,d\sqrt{\text{Sec}[c+d x]}\,\sqrt{\text{Cos}[c+d x]\,(\text{Cos}[d x]+\text{i}\,\text{Sin}[d x])}}$$
$$a\sqrt{a\,(1+\text{Cos}[c+d x])}\,\text{Sec}\left[\frac{1}{2}(c+d x)\right]\left(-33\,\text{i}\,\text{Cos}\left[\frac{d x}{2}\right]\right.$$
$$\text{Log}\left[2\left(e^{\text{i} d x}\text{Cos}\left[\frac{c}{2}\right]+\text{i}\,e^{\text{i} d x}\text{Sin}\left[\frac{c}{2}\right]+\sqrt{(1+e^{2\text{i} d x})\,\text{Cos}[c]+\text{i}\,(-1+e^{2\text{i} d x})\,\text{Sin}[c]}\right)\right]+$$
$$33\,\text{i}\,\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+\text{i}\,\text{Sin}\left[\frac{c}{2}\right]\right)\sqrt{(1+e^{2\text{i} d x})\,\text{Cos}[c]+\text{i}\,(-1+e^{2\text{i} d x})\,\text{Sin}[c]}\right]$$
$$\left(\text{Cos}\left[\frac{d x}{2}\right]+\text{i}\,\text{Sin}\left[\frac{d x}{2}\right]\right)+$$
$$33\,\text{Log}\left[2\left(e^{\text{i} d x}\text{Cos}\left[\frac{c}{2}\right]+\text{i}\,e^{\text{i} d x}\text{Sin}\left[\frac{c}{2}\right]+\sqrt{(1+e^{2\text{i} d x})\,\text{Cos}[c]+\text{i}\,(-1+e^{2\text{i} d x})\,\text{Sin}[c]}\right)\right]$$
$$\text{Sin}\left[\frac{d x}{2}\right]+52\sqrt{2}\,\sqrt{\text{Cos}[c+d x]\,(\text{Cos}[d x]+\text{i}\,\text{Sin}[d x])}\,\text{Sin}\left[\frac{1}{2}(c+d x)\right]+$$
$$18\sqrt{2}\,\sqrt{\text{Cos}[c+d x]\,(\text{Cos}[d x]+\text{i}\,\text{Sin}[d x])}\,\text{Sin}\left[\frac{3}{2}(c+d x)\right]+$$
$$\left.4\sqrt{2}\,\sqrt{\text{Cos}[c+d x]\,(\text{Cos}[d x]+\text{i}\,\text{Sin}[d x])}\,\text{Sin}\left[\frac{5}{2}(c+d x)\right]\right)$$

Problem 356: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int (a+a\,\text{Cos}[c+d x])^{5/2}\,\text{Sec}[c+d x]^{5/2}\,dx$$

Optimal (type 3, 138 leaves, 5 steps):

$$\frac{2\,a^{5/2}\,\text{ArcSin}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{a+a\,\text{Cos}[c+d x]}}\right]\sqrt{\text{Cos}[c+d x]}\,\sqrt{\text{Sec}[c+d x]}}{d}+$$
$$\frac{14\,a^3\sqrt{\text{Sec}[c+d x]}\,\text{Sin}[c+d x]}{3\,d\sqrt{a+a\,\text{Cos}[c+d x]}}+\frac{2\,a^2\sqrt{a+a\,\text{Cos}[c+d x]}\,\text{Sec}[c+d x]^{3/2}\,\text{Sin}[c+d x]}{3\,d}$$

Result (type 3, 882 leaves):

$$\frac{1}{4}\sqrt{\text{Cos}[c+d\,x]}\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}$$

$$\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\sqrt{\text{Sec}[c+d\,x]}\,\left(\frac{1}{2}\,\text{i}\,\text{Sin}\left[\frac{c}{2}\right]\,\left(-\left(\left(2\,\text{i}\,e^{\frac{i\,d\,x}{2}}\,\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+\text{i}\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+\text{i}\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]\right.\right.\right.\right.$$

$$\left.\left(\text{Cos}\left[\frac{c}{2}\right]-\text{i}\,\text{Sin}\left[\frac{c}{2}\right]\right)\sqrt{e^{-i\,d\,x}\,\left(\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+\text{i}\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]\right)}\right)\Big/$$

$$\left(d\,\sqrt{2\,\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+2\,\text{i}\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\Bigg)-$$

$$\left(2\,\text{i}\,e^{\frac{i\,d\,x}{2}}\,\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+\text{i}\,\text{Sin}\left[\frac{c}{2}\right]\right)\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+\text{i}\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right]\right.$$

$$\left.\left(\text{Cos}\left[\frac{c}{2}\right]+\text{i}\,\text{Sin}\left[\frac{c}{2}\right]\right)\sqrt{e^{-i\,d\,x}\,\left(\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+\text{i}\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]\right)}\right)\Big/$$

$$\left(d\,\sqrt{2\,\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+2\,\text{i}\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\Bigg)+$$

$$\frac{1}{2}\,\text{Cos}\left[\frac{c}{2}\right]\,\left(-\left(\left(2\,\text{i}\,e^{\frac{i\,d\,x}{2}}\,\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+\text{i}\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+\text{i}\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]\right.\right.\right.$$

$$\left.\left(\text{Cos}\left[\frac{c}{2}\right]-\text{i}\,\text{Sin}\left[\frac{c}{2}\right]\right)\sqrt{e^{-i\,d\,x}\,\left(\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+\text{i}\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]\right)}\right)\Big/$$

$$\left(d\,\sqrt{2\,\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+2\,\text{i}\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\Bigg)+$$

$$\left(2\,\text{i}\,e^{\frac{i\,d\,x}{2}}\,\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+\text{i}\,\text{Sin}\left[\frac{c}{2}\right]\right)\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+\text{i}\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right]\right.$$

$$\left.\left(\text{Cos}\left[\frac{c}{2}\right]+\text{i}\,\text{Sin}\left[\frac{c}{2}\right]\right)\sqrt{e^{-i\,d\,x}\,\left(\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+\text{i}\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]\right)}\right)\Big/$$

$$\left(d\,\sqrt{2\,\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+2\,\text{i}\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\Bigg)\Bigg)\Bigg)+$$

$$\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5$$

$$\sqrt{\text{Sec}[c+d\,x]}\,\left(\frac{4\,\text{Cos}\left[\frac{d\,x}{2}\right]\,\text{Sin}\left[\frac{c}{2}\right]}{3\,d}+\frac{4\,\text{Cos}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]}{3\,d}+\frac{\text{Sec}[c+d\,x]\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{6\,d}\right)$$

Problem 357: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}\,\text{Sec}[c+d\,x]^{3/2}\,dx$$

Optimal (type 3, 134 leaves, 5 steps):

$$\frac{5\,a^{5/2}\,\text{ArcSin}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}{d}-\frac{a^3\,\text{Sin}[c+d\,x]}{d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}+\frac{2\,a^2\,\sqrt{a+a\,\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d}$$

Result (type 3, 575 leaves):

$$\frac{1}{4\,d\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}}\,a^2\,\sqrt{a\,\left(1+\text{Cos}[c+d\,x]\right)}\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\sqrt{\text{Sec}[c+d\,x]}\,\left(-5\,i\,\text{Cos}\left[c+\frac{d\,x}{2}\right]\right.$$
$$\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]-5$$
$$i\,\text{Cos}\left[c+\frac{3\,d\,x}{2}\right]$$
$$\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]+$$
$$10\,i\,\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+i\,\text{Sin}\left[\frac{c}{2}\right]\right)\,\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\,\right]$$
$$\text{Cos}[c+d\,x]\,\left(\text{Cos}\left[\frac{d\,x}{2}\right]+i\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)-$$
$$5\,\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]$$
$$\text{Sin}\left[c+\frac{d\,x}{2}\right]+6\,\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]\,\left(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x]\right)}\,\text{Sin}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]+$$
$$2\,\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]\,\left(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x]\right)}\,\text{Sin}\left[\frac{3}{2}\,\left(c+d\,x\right)\right]+$$
$$5\,\text{Log}\left[2\,\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\,\text{Cos}[c]+i\,\left(-1+e^{2\,i\,d\,x}\right)\,\text{Sin}[c]}\right)\right]$$
$$\left.\text{Sin}\left[c+\frac{3\,d\,x}{2}\right]\right)$$

Problem 358: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}\,\sqrt{\text{Sec}[c+d\,x]}\,dx$$

Optimal (type 3, 140 leaves, 5 steps):

$$\frac{19\,a^{5/2}\,\text{ArcSin}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}{4\,d}+\frac{9\,a^3\,\text{Sin}[c+d\,x]}{4\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}+\frac{a^2\,\sqrt{a+a\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{2\,d\,\sqrt{\text{Sec}[c+d\,x]}}$$

Result (type 3, 394 leaves):

$$\frac{1}{8\sqrt{2}\,d\,\sqrt{\mathrm{Sec}[c+d\,x]}\,\sqrt{\mathrm{Cos}[c+d\,x]\,(\mathrm{Cos}[d\,x]+\mathrm{i}\,\mathrm{Sin}[d\,x])}}\,a^2\sqrt{a\,(1+\mathrm{Cos}[c+d\,x])}\,\mathrm{Sec}\left[\frac{1}{2}(c+d\,x)\right]\Bigg(-19\,\mathrm{i}\,\mathrm{Cos}\left[\frac{d\,x}{2}\right]$$
$$\mathrm{Log}\left[2\left(e^{\mathrm{i}\,d\,x}\,\mathrm{Cos}\left[\frac{c}{2}\right]+\mathrm{i}\,e^{\mathrm{i}\,d\,x}\,\mathrm{Sin}\left[\frac{c}{2}\right]+\sqrt{(1+e^{2\,\mathrm{i}\,d\,x})\,\mathrm{Cos}[c]+\mathrm{i}\,(-1+e^{2\,\mathrm{i}\,d\,x})\,\mathrm{Sin}[c]}\right)\right]+$$
$$19\,\mathrm{i}\,\mathrm{ArcTanh}\left[\left(\mathrm{Cos}\left[\frac{c}{2}\right]+\mathrm{i}\,\mathrm{Sin}\left[\frac{c}{2}\right]\right)\sqrt{(1+e^{2\,\mathrm{i}\,d\,x})\,\mathrm{Cos}[c]+\mathrm{i}\,(-1+e^{2\,\mathrm{i}\,d\,x})\,\mathrm{Sin}[c]}\right]$$
$$\left(\mathrm{Cos}\left[\frac{d\,x}{2}\right]+\mathrm{i}\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]\right)+$$
$$19\,\mathrm{Log}\left[2\left(e^{\mathrm{i}\,d\,x}\,\mathrm{Cos}\left[\frac{c}{2}\right]+\mathrm{i}\,e^{\mathrm{i}\,d\,x}\,\mathrm{Sin}\left[\frac{c}{2}\right]+\sqrt{(1+e^{2\,\mathrm{i}\,d\,x})\,\mathrm{Cos}[c]+\mathrm{i}\,(-1+e^{2\,\mathrm{i}\,d\,x})\,\mathrm{Sin}[c]}\right)\right]$$
$$\mathrm{Sin}\left[\frac{d\,x}{2}\right]+20\sqrt{2}\,\sqrt{\mathrm{Cos}[c+d\,x]\,(\mathrm{Cos}[d\,x]+\mathrm{i}\,\mathrm{Sin}[d\,x])}\,\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]+$$
$$2\sqrt{2}\,\sqrt{\mathrm{Cos}[c+d\,x]\,(\mathrm{Cos}[d\,x]+\mathrm{i}\,\mathrm{Sin}[d\,x])}\,\mathrm{Sin}\left[\frac{3}{2}(c+d\,x)\right]\Bigg)$$

Problem 359: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{(a+a\,\mathrm{Cos}[c+d\,x])^{5/2}}{\sqrt{\mathrm{Sec}[c+d\,x]}}\,dx$$

Optimal (type 3, 180 leaves, 6 steps):

$$\frac{25\,a^{5/2}\,\mathrm{ArcSin}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+d\,x]}{\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}\right]\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}}{8\,d}+$$
$$\frac{13\,a^3\,\mathrm{Sin}[c+d\,x]}{12\,d\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}\,\mathrm{Sec}[c+d\,x]^{3/2}}+$$
$$\frac{a^2\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{3\,d\,\mathrm{Sec}[c+d\,x]^{3/2}}+\frac{25\,a^3\,\mathrm{Sin}[c+d\,x]}{8\,d\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}}$$

Result (type 3, 435 leaves):

$$\frac{1}{48\sqrt{2}\,d\,\sqrt{\text{Sec}[c+d\,x]}\,\sqrt{\text{Cos}[c+d\,x]\,(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x])}}$$
$$a^2\sqrt{a\,(1+\text{Cos}[c+d\,x])}\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]\left(-75\,i\,\text{Cos}\left[\frac{d\,x}{2}\right]\right.$$
$$\text{Log}\left[2\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\text{Cos}[c]+i\left(-1+e^{2\,i\,d\,x}\right)\text{Sin}[c]}\right)\right]+$$
$$75\,i\,\text{ArcTanh}\left[\left(\text{Cos}\left[\frac{c}{2}\right]+i\,\text{Sin}\left[\frac{c}{2}\right]\right)\sqrt{\left(1+e^{2\,i\,d\,x}\right)\text{Cos}[c]+i\left(-1+e^{2\,i\,d\,x}\right)\text{Sin}[c]}\right]$$
$$\left(\text{Cos}\left[\frac{d\,x}{2}\right]+i\,\text{Sin}\left[\frac{d\,x}{2}\right]\right)+$$
$$75\,\text{Log}\left[2\left(e^{i\,d\,x}\,\text{Cos}\left[\frac{c}{2}\right]+i\,e^{i\,d\,x}\,\text{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right)\text{Cos}[c]+i\left(-1+e^{2\,i\,d\,x}\right)\text{Sin}[c]}\right)\right]$$
$$\text{Sin}\left[\frac{d\,x}{2}\right]+124\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]\,(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x])}\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]+$$
$$30\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]\,(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x])}\,\text{Sin}\left[\frac{3}{2}\,(c+d\,x)\right]+$$
$$\left.4\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]\,(\text{Cos}[d\,x]+i\,\text{Sin}[d\,x])}\,\text{Sin}\left[\frac{5}{2}\,(c+d\,x)\right]\right)$$

Problem 360: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{(a+a\,\text{Cos}[c+d\,x])^{5/2}}{\text{Sec}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 3, 220 leaves, 7 steps):

$$\frac{163\,a^{5/2}\,\text{ArcSin}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}{64\,d}+$$
$$\frac{17\,a^3\,\text{Sin}[c+d\,x]}{24\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{5/2}}+\frac{a^2\sqrt{a+a\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{4\,d\,\text{Sec}[c+d\,x]^{5/2}}+$$
$$\frac{163\,a^3\,\text{Sin}[c+d\,x]}{96\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{3/2}}+\frac{163\,a^3\,\text{Sin}[c+d\,x]}{64\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}$$

Result (type 3, 476 leaves):

$$\frac{1}{384\sqrt{2}\, d\, \sqrt{\mathrm{Sec}[c+d\,x]}\, \sqrt{\mathrm{Cos}[c+d\,x]\, (\mathrm{Cos}[d\,x]+i\, \mathrm{Sin}[d\,x])}}$$

$$a^2 \sqrt{a\, (1+\mathrm{Cos}[c+d\,x])}\, \mathrm{Sec}\left[\frac{1}{2}\, (c+d\,x)\right] \left(-489\, i\, \mathrm{Cos}\left[\frac{d\,x}{2}\right]\right.$$

$$\mathrm{Log}\left[2 \left(e^{i\,d\,x}\, \mathrm{Cos}\left[\frac{c}{2}\right]+i\, e^{i\,d\,x}\, \mathrm{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right) \mathrm{Cos}[c]+i \left(-1+e^{2\,i\,d\,x}\right) \mathrm{Sin}[c]}\right)\right]+$$

$$489\, i\, \mathrm{ArcTanh}\left[\left(\mathrm{Cos}\left[\frac{c}{2}\right]+i\, \mathrm{Sin}\left[\frac{c}{2}\right]\right) \sqrt{\left(1+e^{2\,i\,d\,x}\right) \mathrm{Cos}[c]+i \left(-1+e^{2\,i\,d\,x}\right) \mathrm{Sin}[c]}\right]$$

$$\left(\mathrm{Cos}\left[\frac{d\,x}{2}\right]+i\, \mathrm{Sin}\left[\frac{d\,x}{2}\right]\right)+$$

$$489\, \mathrm{Log}\left[2 \left(e^{i\,d\,x}\, \mathrm{Cos}\left[\frac{c}{2}\right]+i\, e^{i\,d\,x}\, \mathrm{Sin}\left[\frac{c}{2}\right]+\sqrt{\left(1+e^{2\,i\,d\,x}\right) \mathrm{Cos}[c]+i \left(-1+e^{2\,i\,d\,x}\right) \mathrm{Sin}[c]}\right)\right]$$

$$\mathrm{Sin}\left[\frac{d\,x}{2}\right]+800\sqrt{2}\, \sqrt{\mathrm{Cos}[c+d\,x]\, (\mathrm{Cos}[d\,x]+i\, \mathrm{Sin}[d\,x])}\, \mathrm{Sin}\left[\frac{1}{2}\, (c+d\,x)\right]+$$

$$270\sqrt{2}\, \sqrt{\mathrm{Cos}[c+d\,x]\, (\mathrm{Cos}[d\,x]+i\, \mathrm{Sin}[d\,x])}\, \mathrm{Sin}\left[\frac{3}{2}\, (c+d\,x)\right]+$$

$$80\sqrt{2}\, \sqrt{\mathrm{Cos}[c+d\,x]\, (\mathrm{Cos}[d\,x]+i\, \mathrm{Sin}[d\,x])}\, \mathrm{Sin}\left[\frac{5}{2}\, (c+d\,x)\right]+$$

$$\left.12\sqrt{2}\, \sqrt{\mathrm{Cos}[c+d\,x]\, (\mathrm{Cos}[d\,x]+i\, \mathrm{Sin}[d\,x])}\, \mathrm{Sin}\left[\frac{7}{2}\, (c+d\,x)\right]\right)$$

Problem 361: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\mathrm{Sec}[c+d\,x]^{7/2}}{\sqrt{1+\mathrm{Cos}[c+d\,x]}}\, dx$$

Optimal (type 3, 154 leaves, 7 steps):

$$-\frac{\sqrt{2}\, \mathrm{ArcSin}\left[\frac{\mathrm{Sin}[c+d\,x]}{1+\mathrm{Cos}[c+d\,x]}\right] \sqrt{\mathrm{Cos}[c+d\,x]}\, \sqrt{\mathrm{Sec}[c+d\,x]}}{d}+$$

$$\frac{26\sqrt{\mathrm{Sec}[c+d\,x]}\, \mathrm{Sin}[c+d\,x]}{15\, d\, \sqrt{1+\mathrm{Cos}[c+d\,x]}}-\frac{2\, \mathrm{Sec}[c+d\,x]^{3/2}\, \mathrm{Sin}[c+d\,x]}{15\, d\, \sqrt{1+\mathrm{Cos}[c+d\,x]}}+\frac{2\, \mathrm{Sec}[c+d\,x]^{5/2}\, \mathrm{Sin}[c+d\,x]}{5\, d\, \sqrt{1+\mathrm{Cos}[c+d\,x]}}$$

Result (type 3, 260 leaves):

$$\left(i\, e^{-i\,(c+d\,x)}\, \mathrm{Cos}\left[\frac{1}{2}\, (c+d\,x)\right] \left(26-30\, e^{i\,(c+d\,x)}+80\, e^{2\,i\,(c+d\,x)}-80\, e^{3\,i\,(c+d\,x)}+\right.\right.$$

$$30\, e^{4\,i\,(c+d\,x)}-26\, e^{5\,i\,(c+d\,x)}+15\sqrt{2}\, \left(1+e^{2\,i\,(c+d\,x)}\right)^{5/2} \mathrm{Log}\left[1+e^{i\,(c+d\,x)}\right]-$$

$$\left.15\sqrt{2}\, \left(1+e^{2\,i\,(c+d\,x)}\right)^{5/2} \mathrm{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\, \sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)$$

$$\left.\sqrt{\mathrm{Sec}[c+d\,x]}\, \left(\mathrm{Cos}\left[\frac{1}{2}\, (c+d\,x)\right]+i\, \mathrm{Sin}\left[\frac{1}{2}\, (c+d\,x)\right]\right)\right) \Big/$$

$$\left(15\, d\, \left(1+e^{2\,i\,(c+d\,x)}\right)^2 \sqrt{1+\mathrm{Cos}[c+d\,x]}\right)$$

Problem 362: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Sec}[c+d\,x]^{5/2}}{\sqrt{1+\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 118 leaves, 6 steps):

$$\frac{\sqrt{2}\,\text{ArcSin}\left[\frac{\text{Sin}[c+d\,x]}{1+\text{Cos}[c+d\,x]}\right]\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}{d}-\frac{2\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{3\,d\,\sqrt{1+\text{Cos}[c+d\,x]}}+\frac{2\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{3\,d\,\sqrt{1+\text{Cos}[c+d\,x]}}$$

Result (type 3, 211 leaves):

$$\left(i\,e^{-i\,(c+d\,x)}\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\left(2\,\left(-1+e^{i\,(c+d\,x)}\right)^3-3\,\sqrt{2}\,\left(1+e^{2\,i\,(c+d\,x)}\right)^{3/2}\text{Log}\left[1+e^{i\,(c+d\,x)}\right]+3\,\sqrt{2}\,\left(1+e^{2\,i\,(c+d\,x)}\right)^{3/2}\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\sqrt{\text{Sec}[c+d\,x]}\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+i\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)\right)\Big/\left(3\,d\,\left(1+e^{2\,i\,(c+d\,x)}\right)\,\sqrt{1+\text{Cos}[c+d\,x]}\right)$$

Problem 363: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{Sec}[c+d\,x]^{3/2}}{\sqrt{1+\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 82 leaves, 4 steps):

$$-\frac{\sqrt{2}\,\text{ArcSin}\left[\frac{\text{Sin}[c+d\,x]}{1+\text{Cos}[c+d\,x]}\right]\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}{d}+\frac{2\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d\,\sqrt{1+\text{Cos}[c+d\,x]}}$$

Result (type 3, 170 leaves):

$$\left(i\,e^{-i\,(c+d\,x)}\,\left(1+e^{i\,(c+d\,x)}\right)\left(2-2\,e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Log}\left[1+e^{i\,(c+d\,x)}\right]-\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\sqrt{\text{Sec}[c+d\,x]}\right)\Big/\left(2\,d\,\sqrt{1+\text{Cos}[c+d\,x]}\right)$$

Problem 364: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{\text{Sec}[c+d\,x]}}{\sqrt{1+\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 47 leaves, 3 steps):

$$\frac{\sqrt{2}\ \text{ArcSin}\left[\frac{\text{Sin}[c+d\,x]}{1+\text{Cos}[c+d\,x]}\right]\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{\text{Sec}[c+d\,x]}}{d}$$

Result (type 3, 146 leaves):

$$-\left(\left(2\,i\,e^{-\frac{1}{2}i\,(c+d\,x)}\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\ \sqrt{1+e^{2\,i\,(c+d\,x)}}\ \text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\left(\text{Log}\left[1+e^{i\,(c+d\,x)}\right]-\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\ \sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/\left(d\,\sqrt{1+\text{Cos}[c+d\,x]}\right)\right)$$

Problem 365: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{1+\text{Cos}[c+d\,x]}\ \sqrt{\text{Sec}[c+d\,x]}}\,dx$$

Optimal (type 3, 94 leaves, 6 steps):

$$-\frac{\sqrt{2}\ \text{ArcSin}\left[\frac{\text{Sin}[c+d\,x]}{1+\text{Cos}[c+d\,x]}\right]\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{\text{Sec}[c+d\,x]}}{d}+\frac{2\,\text{ArcSin}\left[\frac{\text{Sin}[c+d\,x]}{\sqrt{1+\text{Cos}[c+d\,x]}}\right]\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{\text{Sec}[c+d\,x]}}{d}$$

Result (type 3, 207 leaves):

$$\left(\sqrt{2}\ e^{-\frac{1}{2}i\,(c+d\,x)}\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\ \sqrt{1+e^{2\,i\,(c+d\,x)}}\ \text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\left(d\,x-i\,\text{ArcSinh}\left[e^{i\,(c+d\,x)}\right]+i\,\sqrt{2}\ \text{Log}\left[1+e^{i\,(c+d\,x)}\right]+i\,\text{Log}\left[1+\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]-i\,\sqrt{2}\ \text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\ \sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/\left(d\,\sqrt{1+\text{Cos}[c+d\,x]}\right)$$

Problem 366: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{1+\text{Cos}[c+d\,x]}\ \text{Sec}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 3, 125 leaves, 7 steps):

$$\frac{\sqrt{2}\,\text{ArcSin}\left[\frac{\text{Sin}[c+d\,x]}{1+\text{Cos}[c+d\,x]}\right]\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}{d}-\frac{\text{ArcSin}\left[\frac{\text{Sin}[c+d\,x]}{\sqrt{1+\text{Cos}[c+d\,x]}}\right]\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}{d}+\frac{\text{Sin}[c+d\,x]}{d\,\sqrt{1+\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}$$

Result (type 3, 244 leaves):

$$\left(\mathrm{i}\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\left(\sqrt{2}\,e^{-\frac{1}{2}\,\mathrm{i}\,(c+d\,x)}\,\sqrt{\frac{e^{\mathrm{i}\,(c+d\,x)}}{1+e^{2\,\mathrm{i}\,(c+d\,x)}}}\,\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\,\left(\mathrm{i}\,d\,x+\text{ArcSinh}\left[e^{\mathrm{i}\,(c+d\,x)}\right]-2\,\sqrt{2}\,\text{Log}\left[1+e^{\mathrm{i}\,(c+d\,x)}\right]-\text{Log}\left[1+\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\right]+2\,\sqrt{2}\,\text{Log}\left[1-e^{\mathrm{i}\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\right]\right)+2\,\mathrm{i}\,\sqrt{\text{Sec}[c+d\,x]}\,\left(\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{3}{2}\,(c+d\,x)\right]\right)\right)\right)\Big/\left(2\,d\,\sqrt{1+\text{Cos}[c+d\,x]}\right)$$

Problem 367: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Sec}[c+d\,x]^{7/2}}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 189 leaves, 7 steps):

$$-\frac{1}{\sqrt{a}\,d}\sqrt{2}\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}+\frac{26\,\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{15\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}-\frac{2\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{15\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}+\frac{2\,\text{Sec}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{5\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 262 leaves):

$$\left(\mathrm{i}\,e^{-\mathrm{i}\,(c+d\,x)}\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\left(26-30\,e^{\mathrm{i}\,(c+d\,x)}+80\,e^{2\,\mathrm{i}\,(c+d\,x)}-80\,e^{3\,\mathrm{i}\,(c+d\,x)}+30\,e^{4\,\mathrm{i}\,(c+d\,x)}-26\,e^{5\,\mathrm{i}\,(c+d\,x)}+15\,\sqrt{2}\,\left(1+e^{2\,\mathrm{i}\,(c+d\,x)}\right)^{5/2}\,\text{Log}\left[1+e^{\mathrm{i}\,(c+d\,x)}\right]-15\,\sqrt{2}\,\left(1+e^{2\,\mathrm{i}\,(c+d\,x)}\right)^{5/2}\,\text{Log}\left[1-e^{\mathrm{i}\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\right]\right)\sqrt{\text{Sec}[c+d\,x]}\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\mathrm{i}\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)\right)\Big/\left(15\,d\,\left(1+e^{2\,\mathrm{i}\,(c+d\,x)}\right)^2\,\sqrt{a\,\left(1+\text{Cos}[c+d\,x]\right)}\right)$$

Problem 368: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Sec}[c+d\,x]^{5/2}}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 151 leaves, 6 steps):

$$\frac{\sqrt{2}\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}{\sqrt{a}\,d}-\frac{2\,\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{3\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}+\frac{2\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{3\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 213 leaves):

$$\left(i\,e^{-i\,(c+d\,x)}\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\left(2\,\left(-1+e^{i\,(c+d\,x)}\right)^{3}-3\,\sqrt{2}\,\left(1+e^{2\,i\,(c+d\,x)}\right)^{3/2}\,\text{Log}\left[1+e^{i\,(c+d\,x)}\right]+3\,\sqrt{2}\,\left(1+e^{2\,i\,(c+d\,x)}\right)^{3/2}\,\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\sqrt{\text{Sec}[c+d\,x]}\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+i\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)\right)\Big/\left(3\,d\,\left(1+e^{2\,i\,(c+d\,x)}\right)\sqrt{a\,(1+\text{Cos}[c+d\,x])}\right)$$

Problem 369: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Sec}[c+d\,x]^{3/2}}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 113 leaves, 5 steps):

$$-\frac{1}{\sqrt{a}\,d}\sqrt{2}\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}+\frac{2\,\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 172 leaves):

$$\left(i\,e^{-i\,(c+d\,x)}\,\left(1+e^{i\,(c+d\,x)}\right)\left(2-2\,e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Log}\left[1+e^{i\,(c+d\,x)}\right]-\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\sqrt{\text{Sec}[c+d\,x]}\right)\Big/\left(2\,d\,\sqrt{a\,(1+\text{Cos}[c+d\,x])}\right)$$

Problem 370: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{\text{Sec}[c+d\,x]}}{\sqrt{a+a\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 3, 56 leaves, 3 steps):

$$\frac{\sqrt{2}\ \text{ArcTan}\left[\frac{\sqrt{a}\ \sqrt{\text{Sec}[c+d x]}\ \text{Sin}[c+d x]}{\sqrt{2}\ \sqrt{a+a\,\text{Cos}[c+d x]}}\right]}{\sqrt{a}\ d}$$

Result (type 3, 148 leaves):

$$-\left(\left(2\,\text{i}\,e^{-\frac{1}{2}\,\text{i}\,(c+d x)}\sqrt{\frac{e^{\text{i}\,(c+d x)}}{1+e^{2\,\text{i}\,(c+d x)}}}\ \sqrt{1+e^{2\,\text{i}\,(c+d x)}}\ \text{Cos}\left[\frac{1}{2}\,(c+d x)\right]\left(\text{Log}\left[1+e^{\text{i}\,(c+d x)}\right]-\text{Log}\left[1-e^{\text{i}\,(c+d x)}+\sqrt{2}\ \sqrt{1+e^{2\,\text{i}\,(c+d x)}}\right]\right)\right)\Big/\left(d\,\sqrt{a\,(1+\text{Cos}[c+d x])}\right)\right)$$

Problem 371: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{a+a\,\text{Cos}[c+d x]}\ \sqrt{\text{Sec}[c+d x]}}\,dx$$

Optimal (type 3, 105 leaves, 6 steps):

$$\frac{2\,\text{ArcTan}\left[\frac{\sqrt{a}\ \sqrt{\text{Sec}[c+d x]}\ \text{Sin}[c+d x]}{\sqrt{a+a\,\text{Cos}[c+d x]}}\right]}{\sqrt{a}\ d}-\frac{\sqrt{2}\ \text{ArcTan}\left[\frac{\sqrt{a}\ \sqrt{\text{Sec}[c+d x]}\ \text{Sin}[c+d x]}{\sqrt{2}\ \sqrt{a+a\,\text{Cos}[c+d x]}}\right]}{\sqrt{a}\ d}$$

Result (type 3, 209 leaves):

$$\left(\sqrt{2}\ e^{-\frac{1}{2}\,\text{i}\,(c+d x)}\sqrt{\frac{e^{\text{i}\,(c+d x)}}{1+e^{2\,\text{i}\,(c+d x)}}}\ \sqrt{1+e^{2\,\text{i}\,(c+d x)}}\ \text{Cos}\left[\frac{1}{2}\,(c+d x)\right]\left(d\,x-\text{i}\,\text{ArcSinh}\left[e^{\text{i}\,(c+d x)}\right]+\text{i}\,\sqrt{2}\ \text{Log}\left[1+e^{\text{i}\,(c+d x)}\right]+\text{i}\,\text{Log}\left[1+\sqrt{1+e^{2\,\text{i}\,(c+d x)}}\right]-\text{i}\,\sqrt{2}\ \text{Log}\left[1-e^{\text{i}\,(c+d x)}+\sqrt{2}\ \sqrt{1+e^{2\,\text{i}\,(c+d x)}}\right]\right)\right)\Big/\left(d\,\sqrt{a\,(1+\text{Cos}[c+d x])}\right)$$

Problem 372: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{a+a\,\text{Cos}[c+d x]}\ \text{Sec}[c+d x]^{3/2}}\,dx$$

Optimal (type 3, 168 leaves, 7 steps):

$$-\frac{\text{ArcSin}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{a+a\,\text{Cos}[c+d x]}}\right]\sqrt{\text{Cos}[c+d x]}\,\sqrt{\text{Sec}[c+d x]}}{\sqrt{a}\,d}+\frac{\sqrt{2}\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d x]}\,\sqrt{a+a\,\text{Cos}[c+d x]}}\right]\sqrt{\text{Cos}[c+d x]}\,\sqrt{\text{Sec}[c+d x]}}{\sqrt{a}\,d}+\frac{\text{Sin}[c+d x]}{d\sqrt{a+a\,\text{Cos}[c+d x]}\,\sqrt{\text{Sec}[c+d x]}}$$

Result (type 3, 246 leaves):

$$\left(i\,\text{Cos}\left[\frac{1}{2}(c+d x)\right]\left(\sqrt{2}\,e^{-\frac{1}{2}i(c+d x)}\sqrt{\frac{e^{i(c+d x)}}{1+e^{2i(c+d x)}}}\sqrt{1+e^{2i(c+d x)}}\left(i\,d\,x+\text{ArcSinh}\left[e^{i(c+d x)}\right]-2\sqrt{2}\,\text{Log}\left[1+e^{i(c+d x)}\right]-\text{Log}\left[1+\sqrt{1+e^{2i(c+d x)}}\right]+2\sqrt{2}\,\text{Log}\left[1-e^{i(c+d x)}+\sqrt{2}\,\sqrt{1+e^{2i(c+d x)}}\right]\right)+2\,i\sqrt{\text{Sec}[c+d x]}\left(\text{Sin}\left[\frac{1}{2}(c+d x)\right]-\text{Sin}\left[\frac{3}{2}(c+d x)\right]\right)\right)\right)\Big/\left(2\,d\sqrt{a\,(1+\text{Cos}[c+d x])}\right)$$

Problem 373: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Sec}[c+d x]^{5/2}}{(a+a\,\text{Cos}[c+d x])^{3/2}}\,dx$$

Optimal (type 3, 197 leaves, 7 steps):

$$\frac{11\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d x]}\,\sqrt{a+a\,\text{Cos}[c+d x]}}\right]\sqrt{\text{Cos}[c+d x]}\,\sqrt{\text{Sec}[c+d x]}}{2\sqrt{2}\,a^{3/2}\,d}-\frac{19\sqrt{\text{Sec}[c+d x]}\,\text{Sin}[c+d x]}{6\,a\,d\sqrt{a+a\,\text{Cos}[c+d x]}}-\frac{\text{Sec}[c+d x]^{3/2}\,\text{Sin}[c+d x]}{2\,d\,(a+a\,\text{Cos}[c+d x])^{3/2}}+\frac{7\,\text{Sec}[c+d x]^{3/2}\,\text{Sin}[c+d x]}{6\,a\,d\sqrt{a+a\,\text{Cos}[c+d x]}}$$

Result (type 3, 316 leaves):

$$-\left(\left(11\, i\, e^{-\frac{1}{2} i (c+d x)} \sqrt{\frac{e^{i (c+d x)}}{1+e^{2 i (c+d x)}}} \sqrt{1+e^{2 i (c+d x)}} \operatorname{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \left(\operatorname{Log}\left[1+e^{i (c+d x)}\right]-\operatorname{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \Big/ \left(d \left(a \left(1+\operatorname{Cos}[c+d x]\right)\right)^{3/2}\right)\right)+\left(\operatorname{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \sqrt{\operatorname{Sec}[c+d x]} \left(-\frac{38 \operatorname{Cos}\left[\frac{d x}{2}\right] \operatorname{Sin}\left[\frac{c}{2}\right]}{3 d}-\frac{38 \operatorname{Cos}\left[\frac{c}{2}\right] \operatorname{Sin}\left[\frac{d x}{2}\right]}{3 d}+\frac{\operatorname{Sec}\left[\frac{c}{2}\right] \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2 \operatorname{Sin}\left[\frac{d x}{2}\right]}{d}+\frac{8 \operatorname{Sec}[c+d x] \operatorname{Sin}\left[\frac{c}{2}+\frac{d x}{2}\right]}{3 d}+\frac{\operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] \operatorname{Tan}\left[\frac{c}{2}\right]}{d}\right)\right) \Big/ \left(a \left(1+\operatorname{Cos}[c+d x]\right)\right)^{3/2}$$

Problem 374: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\operatorname{Sec}[c+d x]^{3/2}}{\left(a+a \operatorname{Cos}[c+d x]\right)^{3/2}} \, dx$$

Optimal (type 3, 157 leaves, 6 steps):

$$-\frac{7 \operatorname{ArcTan}\left[\frac{\sqrt{a} \operatorname{Sin}[c+d x]}{\sqrt{2} \sqrt{\operatorname{Cos}[c+d x]} \sqrt{a+a \operatorname{Cos}[c+d x]}}\right] \sqrt{\operatorname{Cos}[c+d x]} \sqrt{\operatorname{Sec}[c+d x]}}{2 \sqrt{2}\, a^{3/2} d}-\frac{\sqrt{\operatorname{Sec}[c+d x]} \operatorname{Sin}[c+d x]}{2 d \left(a+a \operatorname{Cos}[c+d x]\right)^{3/2}}+\frac{5 \sqrt{\operatorname{Sec}[c+d x]} \operatorname{Sin}[c+d x]}{2 a d \sqrt{a+a \operatorname{Cos}[c+d x]}}$$

Result (type 3, 288 leaves):

$$\left(7\, i\, e^{-\frac{1}{2} i (c+d x)} \sqrt{\frac{e^{i (c+d x)}}{1+e^{2 i (c+d x)}}} \sqrt{1+e^{2 i (c+d x)}} \operatorname{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \left(\operatorname{Log}\left[1+e^{i (c+d x)}\right]-\operatorname{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \Big/ \left(d \left(a \left(1+\operatorname{Cos}[c+d x]\right)\right)^{3/2}\right)+\left(\operatorname{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \sqrt{\operatorname{Sec}[c+d x]} \left(\frac{10 \operatorname{Cos}\left[\frac{d x}{2}\right] \operatorname{Sin}\left[\frac{c}{2}\right]}{d}+\frac{10 \operatorname{Cos}\left[\frac{c}{2}\right] \operatorname{Sin}\left[\frac{d x}{2}\right]}{d}-\frac{\operatorname{Sec}\left[\frac{c}{2}\right] \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2 \operatorname{Sin}\left[\frac{d x}{2}\right]}{d}-\frac{\operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] \operatorname{Tan}\left[\frac{c}{2}\right]}{d}\right)\right) \Big/ \left(a \left(1+\operatorname{Cos}[c+d x]\right)\right)^{3/2}$$

Problem 375: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{\text{Sec}[c+d x]}}{(a+a \text{Cos}[c+d x])^{3/2}} \, dx$$

Optimal (type 3, 117 leaves, 5 steps):

$$\frac{3 \text{ArcTan}\left[\frac{\sqrt{a} \text{Sin}[c+d x]}{\sqrt{2} \sqrt{\text{Cos}[c+d x]} \sqrt{a+a \text{Cos}[c+d x]}}\right] \sqrt{\text{Cos}[c+d x]} \sqrt{\text{Sec}[c+d x]}}{2 \sqrt{2} a^{3/2} d}-\frac{\text{Sin}[c+d x]}{2 d (a+a \text{Cos}[c+d x])^{3/2} \sqrt{\text{Sec}[c+d x]}}$$

Result (type 3, 277 leaves):

$$\frac{1}{2 d \left(a (1+\text{Cos}[c+d x])\right)^{3/2} \sqrt{\text{Sec}[c+d x]}} e^{-\frac{1}{2} i (c+d x)} \text{Cos}\left[\frac{1}{2} (c+d x)\right] \left(2 e^{\frac{1}{2} i (c+d x)} \text{Sec}\left[\frac{c}{2}\right] \text{Sec}[c+d x] \text{Sin}\left[\frac{d x}{2}\right]+2 e^{\frac{1}{2} i (c+d x)} \text{Cos}\left[\frac{1}{2} (c+d x)\right] \text{Sec}[c+d x] \text{Tan}\left[\frac{c}{2}\right]-e^{-i (c+d x)} \text{Cos}\left[\frac{1}{2} (c+d x)\right]^2 \left(-2+2 e^{i (c+d x)}-3 \sqrt{2} \sqrt{1+e^{2 i (c+d x)}} \text{Log}\left[1+e^{i (c+d x)}\right]+3 \sqrt{2} \sqrt{1+e^{2 i (c+d x)}} \text{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right) (-i+\text{Tan}[c+d x])\right)$$

Problem 376: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{(a+a \text{Cos}[c+d x])^{3/2} \sqrt{\text{Sec}[c+d x]}} \, dx$$

Optimal (type 3, 117 leaves, 5 steps):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{a} \text{Sin}[c+d x]}{\sqrt{2} \sqrt{\text{Cos}[c+d x]} \sqrt{a+a \text{Cos}[c+d x]}}\right] \sqrt{\text{Cos}[c+d x]} \sqrt{\text{Sec}[c+d x]}}{2 \sqrt{2} a^{3/2} d}+\frac{\text{Sin}[c+d x]}{2 d (a+a \text{Cos}[c+d x])^{3/2} \sqrt{\text{Sec}[c+d x]}}$$

Result (type 3, 288 leaves):

$$-\left(\left(\left(\mathrm{i}\, e^{-\frac{1}{2}\mathrm{i}\,(c+d\,x)}\sqrt{\frac{e^{\mathrm{i}\,(c+d\,x)}}{1+e^{2\,\mathrm{i}\,(c+d\,x)}}}\,\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\left(\mathrm{Log}\left[1+e^{\mathrm{i}\,(c+d\,x)}\right]-\mathrm{Log}\left[1-e^{\mathrm{i}\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\right]\right)\right)\middle/\left(d\,\left(a\,\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{3/2}\right)\right)+\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\sqrt{\mathrm{Sec}[c+d\,x]}\left(\frac{2\,\mathrm{Cos}\left[\frac{d\,x}{2}\right]\,\mathrm{Sin}\left[\frac{c}{2}\right]}{d}+\frac{2\,\mathrm{Cos}\left[\frac{c}{2}\right]\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{d}-\frac{\mathrm{Sec}\left[\frac{c}{2}\right]\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{d}-\frac{\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\mathrm{Tan}\left[\frac{c}{2}\right]}{d}\right)\right)\middle/\left(a\,\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{3/2}$$

Problem 377: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{3/2}\,\mathrm{Sec}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 3, 174 leaves, 7 steps):

$$\frac{2\,\mathrm{ArcSin}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+d\,x]}{\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}\right]\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}}{a^{3/2}\,d}-\frac{5\,\mathrm{ArcTan}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}\right]\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}}{2\,\sqrt{2}\,a^{3/2}\,d}-\frac{\mathrm{Sin}[c+d\,x]}{2\,d\,\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{3/2}\sqrt{\mathrm{Sec}[c+d\,x]}}$$

Result (type 3, 263 leaves):

$$\left(\mathrm{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^3\left(\sqrt{2}\,e^{-\frac{1}{2}\mathrm{i}\,(c+d\,x)}\sqrt{\frac{e^{\mathrm{i}\,(c+d\,x)}}{1+e^{2\,\mathrm{i}\,(c+d\,x)}}}\,\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\left(4\,d\,x-4\,\mathrm{i}\,\mathrm{ArcSinh}\left[e^{\mathrm{i}\,(c+d\,x)}\right]+5\,\mathrm{i}\,\sqrt{2}\,\mathrm{Log}\left[1+e^{\mathrm{i}\,(c+d\,x)}\right]+4\,\mathrm{i}\,\mathrm{Log}\left[1+\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\right]-5\,\mathrm{i}\,\sqrt{2}\,\mathrm{Log}\left[1-e^{\mathrm{i}\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\right]\right)+\mathrm{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\sqrt{\mathrm{Sec}[c+d\,x]}\left(\mathrm{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]-\mathrm{Sin}\left[\frac{3}{2}\,(c+d\,x)\right]\right)\right)\right)\middle/\left(2\,d\,\left(a\,\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{3/2}\right)$$

Problem 378: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{(a+a\,\mathrm{Cos}[c+d\,x])^{3/2}\,\mathrm{Sec}[c+d\,x]^{5/2}}\,dx$$

Optimal (type 3, 214 leaves, 8 steps):

$$-\frac{3\,\mathrm{ArcSin}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+d\,x]}{\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}\right]\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}}{a^{3/2}\,d}+\frac{9\,\mathrm{ArcTan}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}\right]\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}}{2\,\sqrt{2}\,a^{3/2}\,d}-\frac{\mathrm{Sin}[c+d\,x]}{2\,d\,(a+a\,\mathrm{Cos}[c+d\,x])^{3/2}\,\mathrm{Sec}[c+d\,x]^{3/2}}+\frac{3\,\mathrm{Sin}[c+d\,x]}{2\,a\,d\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}}$$

Result (type 3, 347 leaves):

$$-\left(\left(3\,i\,e^{-\frac{1}{2}\,i\,(c+d\,x)}\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\left(-2\,i\,d\,x-2\,\mathrm{ArcSinh}\left[e^{i\,(c+d\,x)}\right]+3\,\sqrt{2}\,\mathrm{Log}\left[1+e^{i\,(c+d\,x)}\right]+2\,\mathrm{Log}\left[1+\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]-3\,\sqrt{2}\,\mathrm{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/\left(\sqrt{2}\,d\,(a\,(1+\mathrm{Cos}[c+d\,x]))^{3/2}\right)\right)+\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\sqrt{\mathrm{Sec}[c+d\,x]}\left(\frac{2\,\mathrm{Cos}\left[\frac{3\,d\,x}{2}\right]\mathrm{Sin}\left[\frac{3\,c}{2}\right]}{d}-\frac{\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{d}+\frac{2\,\mathrm{Cos}\left[\frac{3\,c}{2}\right]\mathrm{Sin}\left[\frac{3\,d\,x}{2}\right]}{d}-\frac{\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\mathrm{Tan}\left[\frac{c}{2}\right]}{d}\right)\right)\Big/(a\,(1+\mathrm{Cos}[c+d\,x]))^{3/2}$$

Problem 379: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\mathrm{Sec}[c+d\,x]^{5/2}}{(a+a\,\mathrm{Cos}[c+d\,x])^{5/2}}\,dx$$

Optimal (type 3, 237 leaves, 8 steps):

$$\frac{163\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}{16\,\sqrt{2}\,a^{5/2}\,d}-\frac{299\,\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{48\,a^2\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}-\frac{\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{4\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}}-\frac{17\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{16\,a\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}}+\frac{95\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{48\,a^2\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 387 leaves):

$$-\left(\left(\left(163\,i\,e^{-\frac{1}{2}i\,(c+d\,x)}\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\left(\text{Log}\left[1+e^{i\,(c+d\,x)}\right]-\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/\left(4\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}\right)\right)+\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\sqrt{\text{Sec}[c+d\,x]}\left(-\frac{299\,\text{Cos}\left[\frac{d\,x}{2}\right]\text{Sin}\left[\frac{c}{2}\right]}{6\,d}-\frac{299\,\text{Cos}\left[\frac{c}{2}\right]\text{Sin}\left[\frac{d\,x}{2}\right]}{6\,d}+\frac{21\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\text{Sin}\left[\frac{d\,x}{2}\right]}{4\,d}+\frac{\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\text{Sin}\left[\frac{d\,x}{2}\right]}{2\,d}+\frac{16\,\text{Sec}[c+d\,x]\,\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{3\,d}+\frac{21\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Tan}\left[\frac{c}{2}\right]}{4\,d}+\frac{\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\text{Tan}\left[\frac{c}{2}\right]}{2\,d}\right)\right)\Big/\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{5/2}$$

Problem 380: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Sec}[c+d\,x]^{3/2}}{\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}}\,dx$$

Optimal (type 3, 197 leaves, 7 steps):

$$-\frac{75\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}{16\,\sqrt{2}\,a^{5/2}\,d}-\frac{\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{4\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}}-\frac{13\,\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{16\,a\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}}+\frac{49\,\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{16\,a^2\,d\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}$$

Result (type 3, 361 leaves):

$$\left(75\,i\,e^{-\frac{1}{2} i (c+d x)}\sqrt{\frac{e^{i (c+d x)}}{1+e^{2 i (c+d x)}}}\sqrt{1+e^{2 i (c+d x)}}\,\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\right.$$
$$\left.\left(\text{Log}\left[1+e^{i (c+d x)}\right]-\text{Log}\left[1-e^{i (c+d x)}+\sqrt{2}\sqrt{1+e^{2 i (c+d x)}}\right]\right)\right)\Big/\left(4 d \left(a \left(1+\text{Cos}[c+d x]\right)\right)^{5/2}\right)+$$
$$\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\sqrt{\text{Sec}[c+d x]}\left(\frac{49\,\text{Cos}\left[\frac{d x}{2}\right]\text{Sin}\left[\frac{c}{2}\right]}{2 d}+\frac{49\,\text{Cos}\left[\frac{c}{2}\right]\text{Sin}\left[\frac{d x}{2}\right]}{2 d}-\right.\right.$$
$$\frac{13\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2\text{Sin}\left[\frac{d x}{2}\right]}{4 d}-\frac{\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^4\text{Sin}\left[\frac{d x}{2}\right]}{2 d}-$$
$$\left.\left.\frac{13\,\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]\text{Tan}\left[\frac{c}{2}\right]}{4 d}-\frac{\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3\text{Tan}\left[\frac{c}{2}\right]}{2 d}\right)\right)\Big/\left(a\left(1+\text{Cos}[c+d x]\right)\right)^{5/2}$$

Problem 381: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{\text{Sec}[c+d x]}}{\left(a+a\,\text{Cos}[c+d x]\right)^{5/2}}\,dx$$

Optimal (type 3, 157 leaves, 6 steps):

$$\frac{19\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d x]}{\sqrt{2}\sqrt{\text{Cos}[c+d x]}\sqrt{a+a\,\text{Cos}[c+d x]}}\right]\sqrt{\text{Cos}[c+d x]}\sqrt{\text{Sec}[c+d x]}}{16\sqrt{2}\,a^{5/2}\,d}-$$
$$\frac{\text{Sin}[c+d x]}{4 d\left(a+a\,\text{Cos}[c+d x]\right)^{5/2}\sqrt{\text{Sec}[c+d x]}}-\frac{9\,\text{Sin}[c+d x]}{16\,a\,d\left(a+a\,\text{Cos}[c+d x]\right)^{3/2}\sqrt{\text{Sec}[c+d x]}}$$

Result (type 3, 361 leaves):

$$-\left(\left(19\,i\,e^{-\frac{1}{2}i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\sqrt{1+e^{2i(c+dx)}}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^5\left(\mathrm{Log}\left[1+e^{i(c+dx)}\right]-\mathrm{Log}\left[1-e^{i(c+dx)}+\sqrt{2}\sqrt{1+e^{2i(c+dx)}}\right]\right)\right)\Big/\left(4\,d\,\left(a\,\left(1+\mathrm{Cos}[c+dx]\right)\right)^{5/2}\right)\right)+$$

$$\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^5\sqrt{\mathrm{Sec}[c+dx]}\left(-\frac{9\,\mathrm{Cos}\left[\frac{dx}{2}\right]\mathrm{Sin}\left[\frac{c}{2}\right]}{2\,d}-\frac{9\,\mathrm{Cos}\left[\frac{c}{2}\right]\mathrm{Sin}\left[\frac{dx}{2}\right]}{2\,d}+\frac{5\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^2\mathrm{Sin}\left[\frac{dx}{2}\right]}{4\,d}+\frac{\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^4\mathrm{Sin}\left[\frac{dx}{2}\right]}{2\,d}+\frac{5\,\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]\mathrm{Tan}\left[\frac{c}{2}\right]}{4\,d}+\frac{\mathrm{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^3\mathrm{Tan}\left[\frac{c}{2}\right]}{2\,d}\right)\right)\Big/\left(a\,\left(1+\mathrm{Cos}[c+dx]\right)\right)^{5/2}$$

Problem 382: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\left(a+a\,\mathrm{Cos}[c+dx]\right)^{5/2}\sqrt{\mathrm{Sec}[c+dx]}}\,dx$$

Optimal (type 3, 157 leaves, 6 steps):

$$\frac{5\,\mathrm{ArcTan}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+dx]}{\sqrt{2}\sqrt{\mathrm{Cos}[c+dx]}\sqrt{a+a\,\mathrm{Cos}[c+dx]}}\right]\sqrt{\mathrm{Cos}[c+dx]}\sqrt{\mathrm{Sec}[c+dx]}}{16\sqrt{2}\,a^{5/2}\,d}+\frac{\mathrm{Sin}[c+dx]}{4\,d\,\left(a+a\,\mathrm{Cos}[c+dx]\right)^{5/2}\sqrt{\mathrm{Sec}[c+dx]}}+\frac{\mathrm{Sin}[c+dx]}{16\,a\,d\,\left(a+a\,\mathrm{Cos}[c+dx]\right)^{3/2}\sqrt{\mathrm{Sec}[c+dx]}}$$

Result (type 3, 361 leaves):

$$-\left(\left(5\,i\,e^{-\frac{1}{2}i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\sqrt{1+e^{2i(c+dx)}}\,\text{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^5\left(\text{Log}\left[1+e^{i(c+dx)}\right]-\text{Log}\left[1-e^{i(c+dx)}+\sqrt{2}\sqrt{1+e^{2i(c+dx)}}\right]\right)\right)\Big/\left(4\,d\,(a\,(1+\text{Cos}[c+dx]))^{5/2}\right)\right)+$$

$$\left(\text{Cos}\left[\frac{c}{2}+\frac{dx}{2}\right]^5\sqrt{\text{Sec}[c+dx]}\left(\frac{\text{Cos}\left[\frac{dx}{2}\right]\text{Sin}\left[\frac{c}{2}\right]}{2d}+\frac{\text{Cos}\left[\frac{c}{2}\right]\text{Sin}\left[\frac{dx}{2}\right]}{2d}+\frac{3\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^2\text{Sin}\left[\frac{dx}{2}\right]}{4d}-\frac{\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^4\text{Sin}\left[\frac{dx}{2}\right]}{2d}+\frac{3\,\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]\text{Tan}\left[\frac{c}{2}\right]}{4d}-\frac{\text{Sec}\left[\frac{c}{2}+\frac{dx}{2}\right]^3\text{Tan}\left[\frac{c}{2}\right]}{2d}\right)\right)\Big/(a\,(1+\text{Cos}[c+dx]))^{5/2}$$

Problem 383: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{(a+a\,\text{Cos}[c+dx])^{5/2}\,\text{Sec}[c+dx]^{3/2}}\,dx$$

Optimal (type 3, 157 leaves, 6 steps):

$$\frac{3\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+dx]}{\sqrt{2}\sqrt{\text{Cos}[c+dx]}\sqrt{a+a\,\text{Cos}[c+dx]}}\right]\sqrt{\text{Cos}[c+dx]}\sqrt{\text{Sec}[c+dx]}}{16\sqrt{2}\,a^{5/2}\,d}-\frac{\text{Sin}[c+dx]}{4d\,(a+a\,\text{Cos}[c+dx])^{5/2}\sqrt{\text{Sec}[c+dx]}}+\frac{7\,\text{Sin}[c+dx]}{16\,a\,d\,(a+a\,\text{Cos}[c+dx])^{3/2}\sqrt{\text{Sec}[c+dx]}}$$

Result (type 3, 361 leaves):

$$-\left(\left(3\,\mathrm{i}\,e^{-\frac{1}{2}\mathrm{i}\,(c+d\,x)}\sqrt{\frac{e^{\mathrm{i}\,(c+d\,x)}}{1+e^{2\,\mathrm{i}\,(c+d\,x)}}}\,\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\left(\mathrm{Log}\left[1+e^{\mathrm{i}\,(c+d\,x)}\right]-\mathrm{Log}\left[1-e^{\mathrm{i}\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\right]\right)\right)\Big/\left(4\,d\,\left(a\,\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{5/2}\right)\right)+$$

$$\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\sqrt{\mathrm{Sec}[c+d\,x]}\left(\frac{7\,\mathrm{Cos}\left[\frac{d\,x}{2}\right]\mathrm{Sin}\left[\frac{c}{2}\right]}{2\,d}+\frac{7\,\mathrm{Cos}\left[\frac{c}{2}\right]\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{2\,d}-\frac{11\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{4\,d}+\frac{\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{2\,d}-\frac{11\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\mathrm{Tan}\left[\frac{c}{2}\right]}{4\,d}+\frac{\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\mathrm{Tan}\left[\frac{c}{2}\right]}{2\,d}\right)\right)\Big/\left(a\,\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{5/2}$$

Problem 384: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{5/2}\,\mathrm{Sec}[c+d\,x]^{5/2}}\,dx$$

Optimal (type 3, 214 leaves, 8 steps):

$$\frac{2\,\mathrm{ArcSin}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+d\,x]}{\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}\right]\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}}{a^{5/2}\,d}-\frac{43\,\mathrm{ArcTan}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}\right]\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}}{16\,\sqrt{2}\,a^{5/2}\,d}-\frac{\mathrm{Sin}[c+d\,x]}{4\,d\,\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{5/2}\,\mathrm{Sec}[c+d\,x]^{3/2}}-\frac{11\,\mathrm{Sin}[c+d\,x]}{16\,a\,d\,\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{3/2}\,\sqrt{\mathrm{Sec}[c+d\,x]}}$$

Result (type 3, 424 leaves):

$$\left(e^{-\frac{1}{2} i (c+d x)} \sqrt{\frac{e^{i (c+d x)}}{1+e^{2 i (c+d x)}}} \sqrt{1+e^{2 i (c+d x)}} \operatorname{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5 \left(32 d x-32 i \operatorname{ArcSinh}\left[e^{i (c+d x)}\right]+43 i \sqrt{2} \operatorname{Log}\left[1+e^{i (c+d x)}\right]+32 i \operatorname{Log}\left[1+\sqrt{1+e^{2 i (c+d x)}}\right]-43 i \sqrt{2} \operatorname{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \Big/ \left(4 \sqrt{2} d \left(a (1+\operatorname{Cos}[c+d x])\right)^{5/2}\right)+$$

$$\left(\operatorname{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^5 \sqrt{\operatorname{Sec}[c+d x]} \left(-\frac{15 \operatorname{Cos}\left[\frac{d x}{2}\right] \operatorname{Sin}\left[\frac{c}{2}\right]}{2 d}-\frac{15 \operatorname{Cos}\left[\frac{c}{2}\right] \operatorname{Sin}\left[\frac{d x}{2}\right]}{2 d}+\frac{19 \operatorname{Sec}\left[\frac{c}{2}\right] \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2 \operatorname{Sin}\left[\frac{d x}{2}\right]}{4 d}-\frac{\operatorname{Sec}\left[\frac{c}{2}\right] \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^4 \operatorname{Sin}\left[\frac{d x}{2}\right]}{2 d}+\frac{19 \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] \operatorname{Tan}\left[\frac{c}{2}\right]}{4 d}-\frac{\operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \operatorname{Tan}\left[\frac{c}{2}\right]}{2 d}\right)\right) \Big/ \left(a (1+\operatorname{Cos}[c+d x])\right)^{5/2}$$

Problem 385: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{(a+a \operatorname{Cos}[c+d x])^{5/2} \operatorname{Sec}[c+d x]^{7/2}} \, dx$$

Optimal (type 3, 254 leaves, 9 steps):

$$-\frac{5 \operatorname{ArcSin}\left[\frac{\sqrt{a} \operatorname{Sin}[c+d x]}{\sqrt{a+a \operatorname{Cos}[c+d x]}}\right] \sqrt{\operatorname{Cos}[c+d x]} \sqrt{\operatorname{Sec}[c+d x]}}{a^{5/2} d}+\frac{115 \operatorname{ArcTan}\left[\frac{\sqrt{a} \operatorname{Sin}[c+d x]}{\sqrt{2} \sqrt{\operatorname{Cos}[c+d x]} \sqrt{a+a \operatorname{Cos}[c+d x]}}\right] \sqrt{\operatorname{Cos}[c+d x]} \sqrt{\operatorname{Sec}[c+d x]}}{16 \sqrt{2} a^{5/2} d}-\frac{\operatorname{Sin}[c+d x]}{4 d (a+a \operatorname{Cos}[c+d x])^{5/2} \operatorname{Sec}[c+d x]^{5/2}}-\frac{15 \operatorname{Sin}[c+d x]}{16 a d (a+a \operatorname{Cos}[c+d x])^{3/2} \operatorname{Sec}[c+d x]^{3/2}}+\frac{35 \operatorname{Sin}[c+d x]}{16 a^2 d \sqrt{a+a \operatorname{Cos}[c+d x]} \sqrt{\operatorname{Sec}[c+d x]}}$$

Result (type 3, 289 leaves):

$$\frac{1}{8\,d\,\left(a\,\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{5/2}}\mathrm{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^5\left(-5\,i\,\sqrt{2}\,e^{-\frac{1}{2}\,i\,(c+d\,x)}\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right.$$
$$\left(-16\,i\,d\,x-16\,\mathrm{ArcSinh}\left[e^{i\,(c+d\,x)}\right]+23\,\sqrt{2}\,\mathrm{Log}\left[1+e^{i\,(c+d\,x)}\right]+16\,\mathrm{Log}\left[1+\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]-\right.$$
$$\left.23\,\sqrt{2}\,\mathrm{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)+\frac{1}{4}\,\mathrm{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^4\sqrt{\mathrm{Sec}[c+d\,x]}$$
$$\left.\left(16\,\mathrm{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]+39\,\mathrm{Sin}\left[\frac{3}{2}\,(c+d\,x)\right]+47\,\mathrm{Sin}\left[\frac{5}{2}\,(c+d\,x)\right]+8\,\mathrm{Sin}\left[\frac{7}{2}\,(c+d\,x)\right]\right)\right)$$

Problem 386: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\mathrm{Sec}[c+d\,x]^{5/2}}{\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{7/2}}\,dx$$

Optimal (type 3, 277 leaves, 9 steps):

$$\frac{1015\,\mathrm{ArcTan}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}\right]\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}}{64\,\sqrt{2}\,a^{7/2}\,d}-$$
$$\frac{629\,\sqrt{\mathrm{Sec}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{64\,a^3\,d\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}-\frac{\mathrm{Sec}[c+d\,x]^{3/2}\,\mathrm{Sin}[c+d\,x]}{6\,d\,\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{7/2}}-\frac{23\,\mathrm{Sec}[c+d\,x]^{3/2}\,\mathrm{Sin}[c+d\,x]}{48\,a\,d\,\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{5/2}}-$$
$$\frac{109\,\mathrm{Sec}[c+d\,x]^{3/2}\,\mathrm{Sin}[c+d\,x]}{64\,a^2\,d\,\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{3/2}}+\frac{193\,\mathrm{Sec}[c+d\,x]^{3/2}\,\mathrm{Sin}[c+d\,x]}{64\,a^3\,d\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}$$

Result (type 3, 450 leaves):

$$-\left(\left(1015\,i\,e^{-\frac{1}{2}\,i\,(c+d\,x)}\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^7\left(\mathrm{Log}\left[1+e^{i\,(c+d\,x)}\right]-\right.\right.\right.$$
$$\left.\left.\left.\mathrm{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/\left(8\,d\,\left(a\,\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{7/2}\right)\right)+$$
$$\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^7\sqrt{\mathrm{Sec}[c+d\,x]}\left(-\frac{629\,\mathrm{Cos}\left[\frac{d\,x}{2}\right]\mathrm{Sin}\left[\frac{c}{2}\right]}{4\,d}-\frac{629\,\mathrm{Cos}\left[\frac{c}{2}\right]\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{4\,d}+\right.\right.$$
$$\frac{451\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{24\,d}+\frac{31\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{12\,d}+$$
$$\frac{\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{3\,d}+\frac{32\,\mathrm{Sec}[c+d\,x]\,\mathrm{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]}{3\,d}+\frac{451\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\mathrm{Tan}\left[\frac{c}{2}\right]}{24\,d}+$$
$$\left.\left.\frac{31\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\mathrm{Tan}\left[\frac{c}{2}\right]}{12\,d}+\frac{\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\mathrm{Tan}\left[\frac{c}{2}\right]}{3\,d}\right)\right)\Big/\left(a\,\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{7/2}$$

Problem 387: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\mathrm{Sec}[c+d\,x]^{3/2}}{(a+a\,\mathrm{Cos}[c+d\,x])^{7/2}}\,dx$$

Optimal (type 3, 237 leaves, 8 steps):

$$-\frac{1}{64\sqrt{2}\,a^{7/2}\,d}363\,\mathrm{ArcTan}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}\right]\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}-\frac{\sqrt{\mathrm{Sec}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{6\,d\,(a+a\,\mathrm{Cos}[c+d\,x])^{7/2}}-\frac{19\sqrt{\mathrm{Sec}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{48\,a\,d\,(a+a\,\mathrm{Cos}[c+d\,x])^{5/2}}-\frac{199\sqrt{\mathrm{Sec}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{192\,a^2\,d\,(a+a\,\mathrm{Cos}[c+d\,x])^{3/2}}+\frac{691\sqrt{\mathrm{Sec}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{192\,a^3\,d\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}$$

Result (type 3, 424 leaves):

$$\left(363\,i\,e^{-\frac{1}{2}i\,(c+d\,x)}\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^7\left(\mathrm{Log}\left[1+e^{i\,(c+d\,x)}\right]-\mathrm{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/\left(8\,d\,(a\,(1+\mathrm{Cos}[c+d\,x]))^{7/2}\right)+\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^7\sqrt{\mathrm{Sec}[c+d\,x]}\left(\frac{691\,\mathrm{Cos}\left[\frac{d\,x}{2}\right]\mathrm{Sin}\left[\frac{c}{2}\right]}{12\,d}+\frac{691\,\mathrm{Cos}\left[\frac{c}{2}\right]\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{12\,d}-\frac{199\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{24\,d}-\frac{19\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{12\,d}-\frac{\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{3\,d}-\frac{199\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\mathrm{Tan}\left[\frac{c}{2}\right]}{24\,d}-\frac{19\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\mathrm{Tan}\left[\frac{c}{2}\right]}{12\,d}-\frac{\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\mathrm{Tan}\left[\frac{c}{2}\right]}{3\,d}\right)\right)\Big/\left(a\,(1+\mathrm{Cos}[c+d\,x])\right)^{7/2}$$

Problem 388: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{\mathrm{Sec}[c+d\,x]}}{(a+a\,\mathrm{Cos}[c+d\,x])^{7/2}}\,dx$$

Optimal (type 3, 197 leaves, 7 steps):

$$\frac{63\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}{64\,\sqrt{2}\,a^{7/2}\,d}-\frac{\text{Sin}[c+d\,x]}{6\,d\,(a+a\,\text{Cos}[c+d\,x])^{7/2}\,\sqrt{\text{Sec}[c+d\,x]}}-\frac{5\,\text{Sin}[c+d\,x]}{16\,a\,d\,(a+a\,\text{Cos}[c+d\,x])^{5/2}\,\sqrt{\text{Sec}[c+d\,x]}}-\frac{103\,\text{Sin}[c+d\,x]}{192\,a^2\,d\,(a+a\,\text{Cos}[c+d\,x])^{3/2}\,\sqrt{\text{Sec}[c+d\,x]}}$$

Result (type 3, 424 leaves):

$$-\left(\left(63\,i\,e^{-\frac{1}{2}i\,(c+d\,x)}\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\,\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^7\left(\text{Log}\left[1+e^{i\,(c+d\,x)}\right]-\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Big/\left(8\,d\,(a\,(1+\text{Cos}[c+d\,x]))^{7/2}\right)\right)+\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^7\sqrt{\text{Sec}[c+d\,x]}\left(-\frac{103\,\text{Cos}\left[\frac{d\,x}{2}\right]\text{Sin}\left[\frac{c}{2}\right]}{12\,d}-\frac{103\,\text{Cos}\left[\frac{c}{2}\right]\text{Sin}\left[\frac{d\,x}{2}\right]}{12\,d}+\frac{43\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\text{Sin}\left[\frac{d\,x}{2}\right]}{24\,d}+\frac{7\,\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\text{Sin}\left[\frac{d\,x}{2}\right]}{12\,d}+\frac{\text{Sec}\left[\frac{c}{2}\right]\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\text{Sin}\left[\frac{d\,x}{2}\right]}{3\,d}+\frac{43\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\text{Tan}\left[\frac{c}{2}\right]}{24\,d}+\frac{7\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\text{Tan}\left[\frac{c}{2}\right]}{12\,d}+\frac{\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\text{Tan}\left[\frac{c}{2}\right]}{3\,d}\right)\right)\Big/(a\,(1+\text{Cos}[c+d\,x]))^{7/2}$$

Problem 389: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{(a+a\,\text{Cos}[c+d\,x])^{7/2}\,\sqrt{\text{Sec}[c+d\,x]}}\,dx$$

Optimal (type 3, 197 leaves, 7 steps):

$$\frac{13\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}{64\,\sqrt{2}\,a^{7/2}\,d}+\frac{\text{Sin}[c+d\,x]}{6\,d\,(a+a\,\text{Cos}[c+d\,x])^{7/2}\,\sqrt{\text{Sec}[c+d\,x]}}+\frac{\text{Sin}[c+d\,x]}{16\,a\,d\,(a+a\,\text{Cos}[c+d\,x])^{5/2}\,\sqrt{\text{Sec}[c+d\,x]}}-\frac{5\,\text{Sin}[c+d\,x]}{192\,a^2\,d\,(a+a\,\text{Cos}[c+d\,x])^{3/2}\,\sqrt{\text{Sec}[c+d\,x]}}$$

Result (type 3, 424 leaves):

$$-\left(\left(13\, i\, e^{-\frac{1}{2} i (c+d x)} \sqrt{\frac{e^{i (c+d x)}}{1+e^{2 i (c+d x)}}} \sqrt{1+e^{2 i (c+d x)}} \, \text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^7 \left(\text{Log}\left[1+e^{i (c+d x)}\right]-\text{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \Big/ \left(8 d \left(a (1+\text{Cos}[c+d x])\right)^{7/2}\right)\right)+\left(\text{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^7 \sqrt{\text{Sec}[c+d x]} \left(-\frac{5 \text{Cos}\left[\frac{d x}{2}\right] \text{Sin}\left[\frac{c}{2}\right]}{12 d}-\frac{5 \text{Cos}\left[\frac{c}{2}\right] \text{Sin}\left[\frac{d x}{2}\right]}{12 d}+\frac{17 \text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2 \text{Sin}\left[\frac{d x}{2}\right]}{24 d}+\frac{5 \text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^4 \text{Sin}\left[\frac{d x}{2}\right]}{12 d}-\frac{\text{Sec}\left[\frac{c}{2}\right] \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^6 \text{Sin}\left[\frac{d x}{2}\right]}{3 d}+\frac{17 \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] \text{Tan}\left[\frac{c}{2}\right]}{24 d}+\frac{5 \text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \text{Tan}\left[\frac{c}{2}\right]}{12 d}-\frac{\text{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5 \text{Tan}\left[\frac{c}{2}\right]}{3 d}\right)\right) \Big/ \left(a (1+\text{Cos}[c+d x])\right)^{7/2}$$

Problem 390: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{(a+a\,\text{Cos}[c+d x])^{7/2}\, \text{Sec}[c+d x]^{3/2}} \, dx$$

Optimal (type 3, 197 leaves, 7 steps):

$$\frac{7 \text{ArcTan}\left[\frac{\sqrt{a} \text{Sin}[c+d x]}{\sqrt{2} \sqrt{\text{Cos}[c+d x]} \sqrt{a+a \text{Cos}[c+d x]}}\right] \sqrt{\text{Cos}[c+d x]} \sqrt{\text{Sec}[c+d x]}}{64 \sqrt{2}\, a^{7/2} d}-\frac{\text{Sin}[c+d x]}{6 d (a+a \text{Cos}[c+d x])^{7/2} \sqrt{\text{Sec}[c+d x]}}+\frac{3 \text{Sin}[c+d x]}{16 a d (a+a \text{Cos}[c+d x])^{5/2} \sqrt{\text{Sec}[c+d x]}}+\frac{17 \text{Sin}[c+d x]}{192 a^2 d (a+a \text{Cos}[c+d x])^{3/2} \sqrt{\text{Sec}[c+d x]}}$$

Result (type 3, 424 leaves):

$$-\left(\left(\left(7\,i\,e^{-\frac{1}{2}i\,(c+d\,x)}\sqrt{\frac{e^{i\,(c+d\,x)}}{1+e^{2\,i\,(c+d\,x)}}}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right.\right.\right.$$

$$\left.\left.\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^7\left(\text{Log}\left[1+e^{i\,(c+d\,x)}\right]-\text{Log}\left[1-e^{i\,(c+d\,x)}+\sqrt{2}\,\sqrt{1+e^{2\,i\,(c+d\,x)}}\right]\right)\right)\Bigg/$$

$$\left.\left(8\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{7/2}\right)\right)+\left(\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^7\sqrt{\text{Sec}[c+d\,x]}\right.$$

$$\left(\frac{17\,\text{Cos}\left[\frac{d\,x}{2}\right]\,\text{Sin}\left[\frac{c}{2}\right]}{12\,d}+\frac{17\,\text{Cos}\left[\frac{c}{2}\right]\,\text{Sin}\left[\frac{d\,x}{2}\right]}{12\,d}+\frac{19\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\text{Sin}\left[\frac{d\,x}{2}\right]}{24\,d}-\right.$$

$$\frac{17\,\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\text{Sin}\left[\frac{d\,x}{2}\right]}{12\,d}+\frac{\text{Sec}\left[\frac{c}{2}\right]\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\text{Sin}\left[\frac{d\,x}{2}\right]}{3\,d}+\frac{19\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\text{Tan}\left[\frac{c}{2}\right]}{24\,d}-$$

$$\left.\left.\frac{17\,\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\,\text{Tan}\left[\frac{c}{2}\right]}{12\,d}+\frac{\text{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\text{Tan}\left[\frac{c}{2}\right]}{3\,d}\right)\right)\Bigg/\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{7/2}$$

Problem 391: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\left(a+a\,\text{Cos}[c+d\,x]\right)^{7/2}\,\text{Sec}[c+d\,x]^{5/2}}\,dx$$

Optimal (type 3, 197 leaves, 7 steps):

$$\frac{5\,\text{ArcTan}\left[\frac{\sqrt{a}\,\text{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+a\,\text{Cos}[c+d\,x]}}\right]\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}{64\,\sqrt{2}\,a^{7/2}\,d}-$$

$$\frac{\text{Sin}[c+d\,x]}{6\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{7/2}\,\text{Sec}[c+d\,x]^{3/2}}-\frac{13\,\text{Sin}[c+d\,x]}{48\,a\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{5/2}\,\sqrt{\text{Sec}[c+d\,x]}}+$$

$$\frac{67\,\text{Sin}[c+d\,x]}{192\,a^2\,d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{3/2}\,\sqrt{\text{Sec}[c+d\,x]}}$$

Result (type 3, 424 leaves):

$$-\left(\left(5\,i\,e^{-\frac{1}{2}i(c+dx)}\sqrt{\frac{e^{i(c+dx)}}{1+e^{2i(c+dx)}}}\sqrt{1+e^{2i(c+dx)}}\right.\right.$$
$$\left.\cos\left[\frac{c}{2}+\frac{dx}{2}\right]^7\left(\mathrm{Log}\left[1+e^{i(c+dx)}\right]-\mathrm{Log}\left[1-e^{i(c+dx)}+\sqrt{2}\sqrt{1+e^{2i(c+dx)}}\right]\right)\right)\Big/$$
$$\left.\left(8\,d\,\left(a\,\left(1+\cos[c+dx]\right)\right)^{7/2}\right)\right)+\left(\cos\left[\frac{c}{2}+\frac{dx}{2}\right]^7\sqrt{\sec[c+dx]}\right.$$
$$\left(\frac{67\cos\left[\frac{dx}{2}\right]\sin\left[\frac{c}{2}\right]}{12\,d}+\frac{67\cos\left[\frac{c}{2}\right]\sin\left[\frac{dx}{2}\right]}{12\,d}-\frac{151\sec\left[\frac{c}{2}\right]\sec\left[\frac{c}{2}+\frac{dx}{2}\right]^2\sin\left[\frac{dx}{2}\right]}{24\,d}+\right.$$
$$\frac{29\sec\left[\frac{c}{2}\right]\sec\left[\frac{c}{2}+\frac{dx}{2}\right]^4\sin\left[\frac{dx}{2}\right]}{12\,d}-\frac{\sec\left[\frac{c}{2}\right]\sec\left[\frac{c}{2}+\frac{dx}{2}\right]^6\sin\left[\frac{dx}{2}\right]}{3\,d}-\frac{151\sec\left[\frac{c}{2}+\frac{dx}{2}\right]\tan\left[\frac{c}{2}\right]}{24\,d}+$$
$$\left.\left.\frac{29\sec\left[\frac{c}{2}+\frac{dx}{2}\right]^3\tan\left[\frac{c}{2}\right]}{12\,d}-\frac{\sec\left[\frac{c}{2}+\frac{dx}{2}\right]^5\tan\left[\frac{c}{2}\right]}{3\,d}\right)\right)\Big/\left(a\,\left(1+\cos[c+dx]\right)\right)^{7/2}$$

Problem 392: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\left(a+a\cos[c+dx]\right)^{7/2}\sec[c+dx]^{7/2}}\,dx$$

Optimal (type 3, 254 leaves, 9 steps):

$$\frac{2\,\mathrm{ArcSin}\left[\frac{\sqrt{a}\,\sin[c+dx]}{\sqrt{a+a\cos[c+dx]}}\right]\sqrt{\cos[c+dx]}\,\sqrt{\sec[c+dx]}}{a^{7/2}\,d}-$$
$$\frac{177\,\mathrm{ArcTan}\left[\frac{\sqrt{a}\,\sin[c+dx]}{\sqrt{2}\,\sqrt{\cos[c+dx]}\,\sqrt{a+a\cos[c+dx]}}\right]\sqrt{\cos[c+dx]}\,\sqrt{\sec[c+dx]}}{64\,\sqrt{2}\,a^{7/2}\,d}-$$
$$\frac{\sin[c+dx]}{6\,d\,\left(a+a\cos[c+dx]\right)^{7/2}\sec[c+dx]^{5/2}}-\frac{17\sin[c+dx]}{48\,a\,d\,\left(a+a\cos[c+dx]\right)^{5/2}\sec[c+dx]^{3/2}}-$$
$$\frac{49\sin[c+dx]}{64\,a^2\,d\,\left(a+a\cos[c+dx]\right)^{3/2}\sqrt{\sec[c+dx]}}$$

Result (type 3, 487 leaves):

$$\left(e^{-\frac{1}{2} i (c+d x)} \sqrt{\frac{e^{i (c+d x)}}{1+e^{2 i (c+d x)}}} \sqrt{1+e^{2 i (c+d x)}} \operatorname{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^7\right.$$

$$\left(128 d x-128 i \operatorname{ArcSinh}\left[e^{i (c+d x)}\right]+177 i \sqrt{2} \operatorname{Log}\left[1+e^{i (c+d x)}\right]+\right.$$

$$\left.\left.128 i \operatorname{Log}\left[1+\sqrt{1+e^{2 i (c+d x)}}\right]-177 i \sqrt{2} \operatorname{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right) \Big/$$

$$\left(8 \sqrt{2} d \left(a \left(1+\operatorname{Cos}[c+d x]\right)\right)^{7/2}\right)+\left(\operatorname{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^7 \sqrt{\operatorname{Sec}[c+d x]}\right.$$

$$\left(-\frac{247 \operatorname{Cos}\left[\frac{d x}{2}\right] \operatorname{Sin}\left[\frac{c}{2}\right]}{12 d}-\frac{247 \operatorname{Cos}\left[\frac{c}{2}\right] \operatorname{Sin}\left[\frac{d x}{2}\right]}{12 d}+\frac{379 \operatorname{Sec}\left[\frac{c}{2}\right] \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2 \operatorname{Sin}\left[\frac{d x}{2}\right]}{24 d}-\right.$$

$$\frac{41 \operatorname{Sec}\left[\frac{c}{2}\right] \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^4 \operatorname{Sin}\left[\frac{d x}{2}\right]}{12 d}+\frac{\operatorname{Sec}\left[\frac{c}{2}\right] \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^6 \operatorname{Sin}\left[\frac{d x}{2}\right]}{3 d}+\frac{379 \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] \operatorname{Tan}\left[\frac{c}{2}\right]}{24 d}-$$

$$\left.\left.\frac{41 \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \operatorname{Tan}\left[\frac{c}{2}\right]}{12 d}+\frac{\operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5 \operatorname{Tan}\left[\frac{c}{2}\right]}{3 d}\right)\right) \Big/ \left(a \left(1+\operatorname{Cos}[c+d x]\right)\right)^{7/2}$$

Problem 393: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\left(a+a \operatorname{Cos}[c+d x]\right)^{7/2} \operatorname{Sec}[c+d x]^{9/2}} \, dx$$

Optimal (type 3, 294 leaves, 10 steps):

$$-\frac{7 \operatorname{ArcSin}\left[\frac{\sqrt{a} \operatorname{Sin}[c+d x]}{\sqrt{a+a \operatorname{Cos}[c+d x]}}\right] \sqrt{\operatorname{Cos}[c+d x]} \sqrt{\operatorname{Sec}[c+d x]}}{a^{7/2} d}+$$

$$\frac{637 \operatorname{ArcTan}\left[\frac{\sqrt{a} \operatorname{Sin}[c+d x]}{\sqrt{2} \sqrt{\operatorname{Cos}[c+d x]} \sqrt{a+a \operatorname{Cos}[c+d x]}}\right] \sqrt{\operatorname{Cos}[c+d x]} \sqrt{\operatorname{Sec}[c+d x]}}{64 \sqrt{2} a^{7/2} d}-$$

$$\frac{\operatorname{Sin}[c+d x]}{6 d \left(a+a \operatorname{Cos}[c+d x]\right)^{7/2} \operatorname{Sec}[c+d x]^{7/2}}-\frac{7 \operatorname{Sin}[c+d x]}{16 a d \left(a+a \operatorname{Cos}[c+d x]\right)^{5/2} \operatorname{Sec}[c+d x]^{5/2}}-$$

$$\frac{259 \operatorname{Sin}[c+d x]}{192 a^2 d \left(a+a \operatorname{Cos}[c+d x]\right)^{3/2} \operatorname{Sec}[c+d x]^{3/2}}+\frac{189 \operatorname{Sin}[c+d x]}{64 a^3 d \sqrt{a+a \operatorname{Cos}[c+d x]} \sqrt{\operatorname{Sec}[c+d x]}}$$

Result (type 3, 519 leaves):

$$-\left(\left(7\,\mathrm{i}\,e^{-\frac{1}{2}\mathrm{i}(c+d x)}\sqrt{\frac{e^{\mathrm{i}(c+d x)}}{1+e^{2\mathrm{i}(c+d x)}}}\sqrt{1+e^{2\mathrm{i}(c+d x)}}\,\mathrm{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^7\left(-64\,\mathrm{i}\,d x-64\,\mathrm{ArcSinh}\left[e^{\mathrm{i}(c+d x)}\right]+91\sqrt{2}\,\mathrm{Log}\left[1+e^{\mathrm{i}(c+d x)}\right]+64\,\mathrm{Log}\left[1+\sqrt{1+e^{2\mathrm{i}(c+d x)}}\right]-91\sqrt{2}\,\mathrm{Log}\left[1-e^{\mathrm{i}(c+d x)}+\sqrt{2}\sqrt{1+e^{2\mathrm{i}(c+d x)}}\right]\right)\right)\Big/\left(8\sqrt{2}\,d\,\left(a\,(1+\mathrm{Cos}[c+d x])\right)^{7/2}\right)\right)+$$

$$\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^7\sqrt{\mathrm{Sec}[c+d x]}\left(\frac{427\,\mathrm{Cos}\left[\frac{d x}{2}\right]\mathrm{Sin}\left[\frac{c}{2}\right]}{12\,d}+\frac{8\,\mathrm{Cos}\left[\frac{3 d x}{2}\right]\mathrm{Sin}\left[\frac{3 c}{2}\right]}{d}+\frac{427\,\mathrm{Cos}\left[\frac{c}{2}\right]\mathrm{Sin}\left[\frac{d x}{2}\right]}{12\,d}-\frac{703\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2\mathrm{Sin}\left[\frac{d x}{2}\right]}{24\,d}+\frac{53\,\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^4\mathrm{Sin}\left[\frac{d x}{2}\right]}{12\,d}-\frac{\mathrm{Sec}\left[\frac{c}{2}\right]\mathrm{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^6\mathrm{Sin}\left[\frac{d x}{2}\right]}{3\,d}+\frac{8\,\mathrm{Cos}\left[\frac{3 c}{2}\right]\mathrm{Sin}\left[\frac{3 d x}{2}\right]}{d}-\frac{703\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]\mathrm{Tan}\left[\frac{c}{2}\right]}{24\,d}+\frac{53\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3\mathrm{Tan}\left[\frac{c}{2}\right]}{12\,d}-\frac{\mathrm{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5\mathrm{Tan}\left[\frac{c}{2}\right]}{3\,d}\right)\right)\Big/\left(a\,(1+\mathrm{Cos}[c+d x])\right)^{7/2}$$

Problem 394: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{(a+a\,\mathrm{Cos}[c+d x])^{9/2}\,\mathrm{Sec}[c+d x]^{5/2}}\,dx$$

Optimal (type 3, 237 leaves, 8 steps):

$$\frac{45\,\mathrm{ArcTan}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+d x]}{\sqrt{2}\sqrt{\mathrm{Cos}[c+d x]}\sqrt{a+a\,\mathrm{Cos}[c+d x]}}\right]\sqrt{\mathrm{Cos}[c+d x]}\sqrt{\mathrm{Sec}[c+d x]}}{1024\sqrt{2}\,a^{9/2}\,d}-\frac{\mathrm{Sin}[c+d x]}{8\,d\,(a+a\,\mathrm{Cos}[c+d x])^{9/2}\,\mathrm{Sec}[c+d x]^{3/2}}-\frac{5\,\mathrm{Sin}[c+d x]}{32\,a\,d\,(a+a\,\mathrm{Cos}[c+d x])^{7/2}\sqrt{\mathrm{Sec}[c+d x]}}+\frac{33\,\mathrm{Sin}[c+d x]}{256\,a^2\,d\,(a+a\,\mathrm{Cos}[c+d x])^{5/2}\sqrt{\mathrm{Sec}[c+d x]}}+\frac{73\,\mathrm{Sin}[c+d x]}{1024\,a^3\,d\,(a+a\,\mathrm{Cos}[c+d x])^{3/2}\sqrt{\mathrm{Sec}[c+d x]}}$$

Result (type 3, 487 leaves):

$$-\left(\left(45\,\mathrm{i}\,e^{-\frac{1}{2}\mathrm{i}\,(c+d\,x)}\sqrt{\frac{e^{\mathrm{i}\,(c+d\,x)}}{1+e^{2\,\mathrm{i}\,(c+d\,x)}}}\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\right.\right.$$

$$\left.\left.\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^9\left(\mathrm{Log}\left[1+e^{\mathrm{i}\,(c+d\,x)}\right]-\mathrm{Log}\left[1-e^{\mathrm{i}\,(c+d\,x)}+\sqrt{2}\sqrt{1+e^{2\,\mathrm{i}\,(c+d\,x)}}\right]\right)\right)\Big/$$

$$\left(64\,d\,\left(a\,\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{9/2}\right)\right)+\left(\mathrm{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^9\sqrt{\mathrm{Sec}[c+d\,x]}\right.$$

$$\left(\frac{73\,\mathrm{Cos}\left[\frac{d\,x}{2}\right]\,\mathrm{Sin}\left[\frac{c}{2}\right]}{32\,d}+\frac{73\,\mathrm{Cos}\left[\frac{c}{2}\right]\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{32\,d}+\frac{59\,\mathrm{Sec}\left[\frac{c}{2}\right]\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^2\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{64\,d}-\right.$$

$$\frac{105\,\mathrm{Sec}\left[\frac{c}{2}\right]\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^4\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{32\,d}+\frac{13\,\mathrm{Sec}\left[\frac{c}{2}\right]\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^6\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{8\,d}-$$

$$\frac{\mathrm{Sec}\left[\frac{c}{2}\right]\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^8\,\mathrm{Sin}\left[\frac{d\,x}{2}\right]}{4\,d}+\frac{59\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\,\mathrm{Tan}\left[\frac{c}{2}\right]}{64\,d}-\frac{105\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^3\,\mathrm{Tan}\left[\frac{c}{2}\right]}{32\,d}+$$

$$\left.\left.\frac{13\,\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^5\,\mathrm{Tan}\left[\frac{c}{2}\right]}{8\,d}-\frac{\mathrm{Sec}\left[\frac{c}{2}+\frac{d\,x}{2}\right]^7\,\mathrm{Tan}\left[\frac{c}{2}\right]}{4\,d}\right)\right)\Big/\left(a\,\left(1+\mathrm{Cos}[c+d\,x]\right)\right)^{9/2}$$

Problem 395: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{9/2}\,\mathrm{Sec}[c+d\,x]^{7/2}}\,dx$$

Optimal (type 3, 237 leaves, 8 steps):

$$\frac{35\,\mathrm{ArcTan}\left[\frac{\sqrt{a}\,\mathrm{Sin}[c+d\,x]}{\sqrt{2}\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+a\,\mathrm{Cos}[c+d\,x]}}\right]\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}}{1024\,\sqrt{2}\,a^{9/2}\,d}-$$

$$\frac{\mathrm{Sin}[c+d\,x]}{8\,d\,\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{9/2}\,\mathrm{Sec}[c+d\,x]^{5/2}}-\frac{19\,\mathrm{Sin}[c+d\,x]}{96\,a\,d\,\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{7/2}\,\mathrm{Sec}[c+d\,x]^{3/2}}-$$

$$\frac{187\,\mathrm{Sin}[c+d\,x]}{768\,a^2\,d\,\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{5/2}\,\sqrt{\mathrm{Sec}[c+d\,x]}}+\frac{853\,\mathrm{Sin}[c+d\,x]}{3072\,a^3\,d\,\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{3/2}\,\sqrt{\mathrm{Sec}[c+d\,x]}}$$

Result (type 3, 487 leaves):

$$-\left(\left(35\, i\, e^{-\frac{1}{2} i (c+d x)} \sqrt{\frac{e^{i (c+d x)}}{1+e^{2 i (c+d x)}}} \sqrt{1+e^{2 i (c+d x)}} \operatorname{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^9 \left(\operatorname{Log}\left[1+e^{i (c+d x)}\right]-\operatorname{Log}\left[1-e^{i (c+d x)}+\sqrt{2} \sqrt{1+e^{2 i (c+d x)}}\right]\right)\right)\Big/ \left(64\, d \left(a \left(1+\operatorname{Cos}[c+d x]\right)\right)^{9/2}\right)\right)+\left(\operatorname{Cos}\left[\frac{c}{2}+\frac{d x}{2}\right]^9 \sqrt{\operatorname{Sec}[c+d x]} \left(\frac{853 \operatorname{Cos}\left[\frac{d x}{2}\right] \operatorname{Sin}\left[\frac{c}{2}\right]}{96 d}+\frac{853 \operatorname{Cos}\left[\frac{c}{2}\right] \operatorname{Sin}\left[\frac{d x}{2}\right]}{96 d}-\frac{2593 \operatorname{Sec}\left[\frac{c}{2}\right] \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^2 \operatorname{Sin}\left[\frac{d x}{2}\right]}{192 d}+\frac{779 \operatorname{Sec}\left[\frac{c}{2}\right] \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^4 \operatorname{Sin}\left[\frac{d x}{2}\right]}{96 d}-\frac{55 \operatorname{Sec}\left[\frac{c}{2}\right] \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^6 \operatorname{Sin}\left[\frac{d x}{2}\right]}{24 d}+\frac{\operatorname{Sec}\left[\frac{c}{2}\right] \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^8 \operatorname{Sin}\left[\frac{d x}{2}\right]}{4 d}-\frac{2593 \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right] \operatorname{Tan}\left[\frac{c}{2}\right]}{192 d}+\frac{779 \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^3 \operatorname{Tan}\left[\frac{c}{2}\right]}{96 d}-\frac{55 \operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^5 \operatorname{Tan}\left[\frac{c}{2}\right]}{24 d}+\frac{\operatorname{Sec}\left[\frac{c}{2}+\frac{d x}{2}\right]^7 \operatorname{Tan}\left[\frac{c}{2}\right]}{4 d}\right)\right)\Big/ \left(a \left(1+\operatorname{Cos}[c+d x]\right)\right)^{9/2}$$

Problem 397: Unable to integrate problem.

$$\int \operatorname{Cos}[c+d x]^m \left(a+a \operatorname{Cos}[c+d x]\right)^4 dx$$

Optimal (type 5, 302 leaves, 7 steps):

$$\frac{a^4 \left(55+29 m+4 m^2\right) \operatorname{Cos}[c+d x]^{1+m} \operatorname{Sin}[c+d x]}{d (2+m) (3+m) (4+m)}+\frac{\operatorname{Cos}[c+d x]^{1+m} \left(a^2+a^2 \operatorname{Cos}[c+d x]\right)^2 \operatorname{Sin}[c+d x]}{d (4+m)}+\frac{2 (5+m) \operatorname{Cos}[c+d x]^{1+m} \left(a^4+a^4 \operatorname{Cos}[c+d x]\right) \operatorname{Sin}[c+d x]}{d (3+m) (4+m)}-\left(a^4 \left(35+40 m+8 m^2\right) \operatorname{Cos}[c+d x]^{1+m} \operatorname{Hypergeometric2F1}\left[\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\operatorname{Cos}[c+d x]^2\right] \operatorname{Sin}[c+d x]\right)\Big/ \left(d (1+m) (2+m) (4+m) \sqrt{\operatorname{Sin}[c+d x]^2}\right)-\left(4 a^4 (5+2 m) \operatorname{Cos}[c+d x]^{2+m} \operatorname{Hypergeometric2F1}\left[\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\operatorname{Cos}[c+d x]^2\right] \operatorname{Sin}[c+d x]\right)\Big/ \left(d (2+m) (3+m) \sqrt{\operatorname{Sin}[c+d x]^2}\right)$$

Result (type 8, 23 leaves):

$$\int \operatorname{Cos}[c+d x]^m \left(a+a \operatorname{Cos}[c+d x]\right)^4 dx$$

Problem 398: Unable to integrate problem.

$$\int \text{Cos}[c+d\,x]^m\,(a+a\,\text{Cos}[c+d\,x])^3\,dx$$

Optimal (type 5, 232 leaves, 6 steps):

$$\frac{a^3\,(7+2\,m)\,\text{Cos}[c+d\,x]^{1+m}\,\text{Sin}[c+d\,x]}{d\,(2+m)\,(3+m)}+\frac{\text{Cos}[c+d\,x]^{1+m}\,(a^3+a^3\,\text{Cos}[c+d\,x])\,\text{Sin}[c+d\,x]}{d\,(3+m)}-\left(a^3\,(5+4\,m)\,\text{Cos}[c+d\,x]^{1+m}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\text{Cos}[c+d\,x]^2\right]\,\text{Sin}[c+d\,x]\right)\Big/\left(d\,(1+m)\,(2+m)\,\sqrt{\text{Sin}[c+d\,x]^2}\right)-\left(a^3\,(11+4\,m)\,\text{Cos}[c+d\,x]^{2+m}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\text{Cos}[c+d\,x]^2\right]\,\text{Sin}[c+d\,x]\right)\Big/\left(d\,(2+m)\,(3+m)\,\sqrt{\text{Sin}[c+d\,x]^2}\right)$$

Result (type 8, 23 leaves):

$$\int \text{Cos}[c+d\,x]^m\,(a+a\,\text{Cos}[c+d\,x])^3\,dx$$

Problem 399: Unable to integrate problem.

$$\int \text{Cos}[c+d\,x]^m\,(a+a\,\text{Cos}[c+d\,x])^2\,dx$$

Optimal (type 5, 173 leaves, 4 steps):

$$\frac{a^2\,\text{Cos}[c+d\,x]^{1+m}\,\text{Sin}[c+d\,x]}{d\,(2+m)}-\left(a^2\,(3+2\,m)\,\text{Cos}[c+d\,x]^{1+m}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\text{Cos}[c+d\,x]^2\right]\,\text{Sin}[c+d\,x]\right)\Big/\left(d\,(1+m)\,(2+m)\,\sqrt{\text{Sin}[c+d\,x]^2}\right)-\left(2\,a^2\,\text{Cos}[c+d\,x]^{2+m}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\text{Cos}[c+d\,x]^2\right]\,\text{Sin}[c+d\,x]\right)\Big/\left(d\,(2+m)\,\sqrt{\text{Sin}[c+d\,x]^2}\right)$$

Result (type 8, 23 leaves):

$$\int \text{Cos}[c+d\,x]^m\,(a+a\,\text{Cos}[c+d\,x])^2\,dx$$

Problem 400: Result unnecessarily involves imaginary or complex numbers.

$$\int \text{Cos}[c+d\,x]^m\,(a+a\,\text{Cos}[c+d\,x])\,dx$$

Optimal (type 5, 131 leaves, 3 steps):

$$-\left(\left(a \operatorname{Cos}[c+d x]^{1+m} \operatorname{Hypergeometric2F1}\left[\frac{1}{2}, \frac{1+m}{2}, \frac{3+m}{2}, \operatorname{Cos}[c+d x]^2\right] \operatorname{Sin}[c+d x]\right) \Big/ \left(d (1+m) \sqrt{\operatorname{Sin}[c+d x]^2}\right)\right) - \left(a \operatorname{Cos}[c+d x]^{2+m} \operatorname{Hypergeometric2F1}\left[\frac{1}{2}, \frac{2+m}{2}, \frac{4+m}{2}, \operatorname{Cos}[c+d x]^2\right] \operatorname{Sin}[c+d x]\right) \Big/ \left(d (2+m) \sqrt{\operatorname{Sin}[c+d x]^2}\right)$$

Result (type 5, 215 leaves):

$$\left(i\, 2^{-1-m} a \left(1+e^{2 i (c+d x)}\right)^{-1-m} \left(e^{-i (c+d x)} \left(1+e^{2 i (c+d x)}\right)\right)^{1+m} \left((-1+m)\, m \operatorname{Hypergeometric2F1}\left[\frac{1}{2} (-1-m), -m, \frac{1-m}{2}, -e^{2 i (c+d x)}\right] + e^{i (c+d x)} (1+m) \left(e^{i (c+d x)} m \operatorname{Hypergeometric2F1}\left[\frac{1-m}{2}, -m, \frac{3-m}{2}, -e^{2 i (c+d x)}\right] + 2 (-1+m) \operatorname{Hypergeometric2F1}\left[-m, -\frac{m}{2}, 1-\frac{m}{2}, -e^{2 i (c+d x)}\right]\right)\right)\right) \Big/ \left(d (-1+m)\, m\, (1+m)\right)$$

Problem 401: Unable to integrate problem.

$$\int \frac{\operatorname{Cos}[c+d x]^m}{a+a \operatorname{Cos}[c+d x]} \, dx$$

Optimal (type 5, 156 leaves, 4 steps):

$$\frac{\operatorname{Cos}[c+d x]^m \operatorname{Sin}[c+d x]}{d (a+a \operatorname{Cos}[c+d x])} - \left(\operatorname{Cos}[c+d x]^m \operatorname{Hypergeometric2F1}\left[\frac{1}{2}, \frac{m}{2}, \frac{2+m}{2}, \operatorname{Cos}[c+d x]^2\right] \operatorname{Sin}[c+d x]\right) \Big/ \left(a d \sqrt{\operatorname{Sin}[c+d x]^2}\right) + \left(m \operatorname{Cos}[c+d x]^{1+m} \operatorname{Hypergeometric2F1}\left[\frac{1}{2}, \frac{1+m}{2}, \frac{3+m}{2}, \operatorname{Cos}[c+d x]^2\right] \operatorname{Sin}[c+d x]\right) \Big/ \left(a d (1+m) \sqrt{\operatorname{Sin}[c+d x]^2}\right)$$

Result (type 8, 23 leaves):

$$\int \frac{\operatorname{Cos}[c+d x]^m}{a+a \operatorname{Cos}[c+d x]} \, dx$$

Problem 402: Unable to integrate problem.

$$\int \frac{\operatorname{Cos}[c+d x]^m}{(a+a \operatorname{Cos}[c+d x])^2} \, dx$$

Optimal (type 5, 229 leaves, 5 steps):

$$-\frac{2\,(1-m)\,\text{Cos}[c+d\,x]^{1+m}\,\text{Sin}[c+d\,x]}{3\,a^2\,d\,(1+\text{Cos}[c+d\,x])}-\frac{\text{Cos}[c+d\,x]^{1+m}\,\text{Sin}[c+d\,x]}{3\,d\,(a+a\,\text{Cos}[c+d\,x])^2}+$$
$$\left((1-2\,m)\,m\,\text{Cos}[c+d\,x]^{1+m}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},\text{Cos}[c+d\,x]^2\right]\text{Sin}[c+d\,x]\right)\Big/$$
$$\left(3\,a^2\,d\,(1+m)\,\sqrt{\text{Sin}[c+d\,x]^2}\right)-$$
$$\left(2\,(1-m)\,(1+m)\,\text{Cos}[c+d\,x]^{2+m}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},\text{Cos}[c+d\,x]^2\right]\text{Sin}[c+d\,x]\right)\Big/$$
$$\left(3\,a^2\,d\,(2+m)\,\sqrt{\text{Sin}[c+d\,x]^2}\right)$$

Result (type 8, 23 leaves):

$$\int\frac{\text{Cos}[c+d\,x]^m}{(a+a\,\text{Cos}[c+d\,x])^2}\,dx$$

Problem 411: Result more than twice size of optimal antiderivative.

$$\int(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]\,dx$$

Optimal (type 3, 16 leaves, 2 steps):

$$b\,x+\frac{a\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{d}$$

Result (type 3, 73 leaves):

$$b\,x-\frac{a\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d}+\frac{a\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d}$$

Problem 412: Result more than twice size of optimal antiderivative.

$$\int(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]^2\,dx$$

Optimal (type 3, 24 leaves, 4 steps):

$$\frac{b\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{d}+\frac{a\,\text{Tan}[c+d\,x]}{d}$$

Result (type 3, 81 leaves):

$$-\frac{b\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d}+\frac{b\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d}+\frac{a\,\text{Tan}[c+d\,x]}{d}$$

Problem 415: Result more than twice size of optimal antiderivative.

$$\int(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]^5\,dx$$

Optimal (type 3, 85 leaves, 6 steps):

$$\frac{3\,a\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{8\,d}+\frac{b\,\text{Tan}[c+d\,x]}{d}+\frac{3\,a\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{8\,d}+\frac{a\,\text{Sec}[c+d\,x]^3\,\text{Tan}[c+d\,x]}{4\,d}+\frac{b\,\text{Tan}[c+d\,x]^3}{3\,d}$$

Result (type 3, 227 leaves):

$$-\frac{3\,a\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]}{8\,d}+\frac{3\,a\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]}{8\,d}+\frac{a}{16\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^4}+\frac{3\,a}{16\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^2}-\frac{a}{16\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^4}-\frac{3\,a}{16\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^2}+\frac{2\,b\,\text{Tan}[c+d\,x]}{3\,d}+\frac{b\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]}{3\,d}$$

Problem 416: Result more than twice size of optimal antiderivative.

$$\int (a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]^6\,dx$$

Optimal (type 3, 101 leaves, 6 steps):

$$\frac{3\,b\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{8\,d}+\frac{a\,\text{Tan}[c+d\,x]}{d}+\frac{3\,b\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{8\,d}+\frac{b\,\text{Sec}[c+d\,x]^3\,\text{Tan}[c+d\,x]}{4\,d}+\frac{2\,a\,\text{Tan}[c+d\,x]^3}{3\,d}+\frac{a\,\text{Tan}[c+d\,x]^5}{5\,d}$$

Result (type 3, 249 leaves):

$$-\frac{3\,b\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]}{8\,d}+\frac{3\,b\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]}{8\,d}+\frac{b}{16\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^4}+\frac{3\,b}{16\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^2}-\frac{b}{16\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^4}-\frac{3\,b}{16\,d\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right)^2}+\frac{8\,a\,\text{Tan}[c+d\,x]}{15\,d}+\frac{4\,a\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]}{15\,d}+\frac{a\,\text{Sec}[c+d\,x]^4\,\text{Tan}[c+d\,x]}{5\,d}$$

Problem 422: Result more than twice size of optimal antiderivative.

$$\int (a+b\,\text{Cos}[c+d\,x])^2\,\text{Sec}[c+d\,x]\,dx$$

Optimal (type 3, 33 leaves, 3 steps):

$$2\,a\,b\,x+\frac{a^2\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{d}+\frac{b^2\,\text{Sin}[c+d\,x]}{d}$$

Result (type 3, 105 leaves):

$$2\,a\,b\,x-\frac{a^2\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]-\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d}+\frac{a^2\,\text{Log}\left[\text{Cos}\left[\frac{c}{2}+\frac{d\,x}{2}\right]+\text{Sin}\left[\frac{c}{2}+\frac{d\,x}{2}\right]\right]}{d}+\frac{b^2\,\text{Cos}[d\,x]\,\text{Sin}[c]}{d}+\frac{b^2\,\text{Cos}[c]\,\text{Sin}[d\,x]}{d}$$

Problem 423: Result more than twice size of optimal antiderivative.

$$\int (a+b\,\text{Cos}[c+d\,x])^2\,\text{Sec}[c+d\,x]^2\,dx$$

Optimal (type 3, 33 leaves, 4 steps):

$$b^2\,x+\frac{2\,a\,b\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{d}+\frac{a^2\,\text{Tan}[c+d\,x]}{d}$$

Result (type 3, 77 leaves):

$$\frac{1}{d}\left(b\left(b\,c+b\,d\,x-2\,a\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]+2\,a\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]\right)+a^2\,\text{Tan}[c+d\,x]\right)$$

Problem 424: Result more than twice size of optimal antiderivative.

$$\int (a+b\,\text{Cos}[c+d\,x])^2\,\text{Sec}[c+d\,x]^3\,dx$$

Optimal (type 3, 59 leaves, 5 steps):

$$\frac{(a^2+2\,b^2)\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{2\,d}+\frac{2\,a\,b\,\text{Tan}[c+d\,x]}{d}+\frac{a^2\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{2\,d}$$

Result (type 3, 164 leaves):

$$\frac{1}{4\,d}\left(-2\,(a^2+2\,b^2)\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]+2\,a^2\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]+4\,b^2\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]+\frac{a^2}{\left(\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right)^2}-\frac{a^2}{\left(\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right)^2}+8\,a\,b\,\text{Tan}[c+d\,x]\right)$$

Problem 426: Result more than twice size of optimal antiderivative.

$$\int (a+b\,\mathrm{Cos}[c+d\,x])^2\,\mathrm{Sec}[c+d\,x]^5\,dx$$

Optimal (type 3, 110 leaves, 6 steps):

$$\frac{(3a^2+4b^2)\,\mathrm{ArcTanh}[\mathrm{Sin}[c+d\,x]]}{8d}+\frac{2ab\,\mathrm{Tan}[c+d\,x]}{d}+\frac{(3a^2+4b^2)\,\mathrm{Sec}[c+d\,x]\,\mathrm{Tan}[c+d\,x]}{8d}+\frac{a^2\,\mathrm{Sec}[c+d\,x]^3\,\mathrm{Tan}[c+d\,x]}{4d}+\frac{2ab\,\mathrm{Tan}[c+d\,x]^3}{3d}$$

Result (type 3, 375 leaves):

$$-\frac{3a^2\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]}{8d}-\frac{b^2\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]}{2d}+\frac{3a^2\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]}{8d}+\frac{b^2\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right]}{2d}+\frac{a^2}{16d\left(\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right)^4}+\frac{3a^2}{16d\left(\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right)^2}+\frac{b^2}{4d\left(\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]-\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right)^2}-\frac{a^2}{16d\left(\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right)^4}-\frac{3a^2}{16d\left(\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right)^2}-\frac{b^2}{4d\left(\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]+\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]\right)^2}+\frac{4ab\,\mathrm{Tan}[c+d\,x]}{3d}+\frac{2ab\,\mathrm{Sec}[c+d\,x]^2\,\mathrm{Tan}[c+d\,x]}{3d}$$

Problem 427: Result more than twice size of optimal antiderivative.

$$\int (a+b\,\mathrm{Cos}[c+d\,x])^2\,\mathrm{Sec}[c+d\,x]^6\,dx$$

Optimal (type 3, 135 leaves, 7 steps):

$$\frac{3ab\,\mathrm{ArcTanh}[\mathrm{Sin}[c+d\,x]]}{4d}+\frac{(4a^2+5b^2)\,\mathrm{Tan}[c+d\,x]}{5d}+\frac{3ab\,\mathrm{Sec}[c+d\,x]\,\mathrm{Tan}[c+d\,x]}{4d}+\frac{ab\,\mathrm{Sec}[c+d\,x]^3\,\mathrm{Tan}[c+d\,x]}{2d}+\frac{a^2\,\mathrm{Sec}[c+d\,x]^4\,\mathrm{Tan}[c+d\,x]}{5d}+\frac{(4a^2+5b^2)\,\mathrm{Tan}[c+d\,x]^3}{15d}$$

Result (type 3, 301 leaves):

$$-\frac{3 a b \operatorname{Log}\left[\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]-\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right]}{4 d}+\frac{3 a b \operatorname{Log}\left[\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]+\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right]}{4 d}+\frac{a b}{8 d\left(\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]-\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^4}+\frac{3 a b}{8 d\left(\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]-\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^2}-\frac{a b}{8 d\left(\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]+\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^4}-\frac{3 a b}{8 d\left(\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]+\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^2}+\frac{8 a^2 \operatorname{Tan}[c+d x]}{15 d}+\frac{2 b^2 \operatorname{Tan}[c+d x]}{3 d}+\frac{4 a^2 \operatorname{Sec}[c+d x]^2 \operatorname{Tan}[c+d x]}{15 d}+\frac{b^2 \operatorname{Sec}[c+d x]^2 \operatorname{Tan}[c+d x]}{3 d}+\frac{a^2 \operatorname{Sec}[c+d x]^4 \operatorname{Tan}[c+d x]}{5 d}$$

Problem 434: Result more than twice size of optimal antiderivative.

$$\int (a+b \operatorname{Cos}[c+d x])^3 \operatorname{Sec}[c+d x]^3 \, dx$$

Optimal (type 3, 79 leaves, 4 steps):

$$b^3 x+\frac{a\left(a^2+6 b^2\right) \operatorname{ArcTanh}[\operatorname{Sin}[c+d x]]}{2 d}+\frac{5 a^2 b \operatorname{Tan}[c+d x]}{2 d}+\frac{a^2 (a+b \operatorname{Cos}[c+d x]) \operatorname{Sec}[c+d x] \operatorname{Tan}[c+d x]}{2 d}$$

Result (type 3, 256 leaves):

$$\frac{1}{4 d} \operatorname{Sec}[c+d x]^2 \left(2 b^3 c+2 b^3 d x-a^3 \operatorname{Log}\left[\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]-\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right]-6 a b^2 \operatorname{Log}\left[\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]-\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right]+a^3 \operatorname{Log}\left[\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]+\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right]+6 a b^2 \operatorname{Log}\left[\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]+\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right]+\operatorname{Cos}[2(c+d x)]\left(2 b^3(c+d x)-a\left(a^2+6 b^2\right) \operatorname{Log}\left[\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]-\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right]+a\left(a^2+6 b^2\right) \operatorname{Log}\left[\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]+\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right]\right)+2 a^3 \operatorname{Sin}[c+d x]+6 a^2 b \operatorname{Sin}[2(c+d x)]\right)$$

Problem 435: Result more than twice size of optimal antiderivative.

$$\int (a+b \operatorname{Cos}[c+d x])^3 \operatorname{Sec}[c+d x]^4 \, dx$$

Optimal (type 3, 109 leaves, 6 steps):

$$\frac{b\left(3a^2+2b^2\right)\text{ArcTanh}[\text{Sin}[c+dx]]}{2d}+\frac{a\left(2a^2+9b^2\right)\text{Tan}[c+dx]}{3d}+\frac{7a^2b\,\text{Sec}[c+dx]\,\text{Tan}[c+dx]}{6d}+\frac{a^2\left(a+b\,\text{Cos}[c+dx]\right)\text{Sec}[c+dx]^2\,\text{Tan}[c+dx]}{3d}$$

Result (type 3, 383 leaves):

$$\frac{\left(-3a^2b-2b^3\right)\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+dx)\right]-\text{Sin}\left[\frac{1}{2}(c+dx)\right]\right]}{2d}+\frac{\left(3a^2b+2b^3\right)\text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+dx)\right]+\text{Sin}\left[\frac{1}{2}(c+dx)\right]\right]}{2d}+$$
$$\frac{a^3+9a^2b}{12d\left(\text{Cos}\left[\frac{1}{2}(c+dx)\right]-\text{Sin}\left[\frac{1}{2}(c+dx)\right]\right)^2}+\frac{a^3\,\text{Sin}\left[\frac{1}{2}(c+dx)\right]}{6d\left(\text{Cos}\left[\frac{1}{2}(c+dx)\right]-\text{Sin}\left[\frac{1}{2}(c+dx)\right]\right)^3}+$$
$$\frac{a^3\,\text{Sin}\left[\frac{1}{2}(c+dx)\right]}{6d\left(\text{Cos}\left[\frac{1}{2}(c+dx)\right]+\text{Sin}\left[\frac{1}{2}(c+dx)\right]\right)^3}+\frac{-a^3-9a^2b}{12d\left(\text{Cos}\left[\frac{1}{2}(c+dx)\right]+\text{Sin}\left[\frac{1}{2}(c+dx)\right]\right)^2}+$$
$$\frac{2a^3\,\text{Sin}\left[\frac{1}{2}(c+dx)\right]+9ab^2\,\text{Sin}\left[\frac{1}{2}(c+dx)\right]}{3d\left(\text{Cos}\left[\frac{1}{2}(c+dx)\right]-\text{Sin}\left[\frac{1}{2}(c+dx)\right]\right)}+\frac{2a^3\,\text{Sin}\left[\frac{1}{2}(c+dx)\right]+9ab^2\,\text{Sin}\left[\frac{1}{2}(c+dx)\right]}{3d\left(\text{Cos}\left[\frac{1}{2}(c+dx)\right]+\text{Sin}\left[\frac{1}{2}(c+dx)\right]\right)}$$

Problem 436: Result more than twice size of optimal antiderivative.

$$\int\left(a+b\,\text{Cos}[c+dx]\right)^3\text{Sec}[c+dx]^5\,dx$$

Optimal (type 3, 133 leaves, 7 steps):

$$\frac{3a\left(a^2+4b^2\right)\text{ArcTanh}[\text{Sin}[c+dx]]}{8d}+\frac{b\left(2a^2+b^2\right)\text{Tan}[c+dx]}{d}+\frac{3a\left(a^2+4b^2\right)\text{Sec}[c+dx]\,\text{Tan}[c+dx]}{8d}+\frac{3a^2b\,\text{Sec}[c+dx]^2\,\text{Tan}[c+dx]}{4d}+\frac{a^2\left(a+b\,\text{Cos}[c+dx]\right)\text{Sec}[c+dx]^3\,\text{Tan}[c+dx]}{4d}$$

Result (type 3, 455 leaves):

$$-\frac{3\left(a^3+4 a b^2\right) \operatorname{Log}\left[\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]-\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right]}{8 d}+\frac{3\left(a^3+4 a b^2\right) \operatorname{Log}\left[\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]+\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right]}{8 d}+\frac{a^3}{16 d\left(\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]-\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^4}+\frac{3 a^3+4 a^2 b+12 a b^2}{16 d\left(\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]-\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^2}+\frac{a^2 b \operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]}{2 d\left(\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]-\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^3}-\frac{a^3}{16 d\left(\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]+\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^4}+\frac{a^2 b \operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]}{2 d\left(\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]+\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^3}+\frac{-3 a^3-4 a^2 b-12 a b^2}{16 d\left(\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]+\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^2}+\frac{2 a^2 b \operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]+b^3 \operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]}{d\left(\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]-\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right)}+\frac{2 a^2 b \operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]+b^3 \operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]}{d\left(\operatorname{Cos}\left[\frac{1}{2}(c+d x)\right]+\operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]\right)}$$

Problem 437: Result more than twice size of optimal antiderivative.

$$\int(a+b \operatorname{Cos}[c+d x])^3 \operatorname{Sec}[c+d x]^6 \, dx$$

Optimal (type 3, 169 leaves, 7 steps):

$$\frac{b\left(9 a^2+4 b^2\right) \operatorname{ArcTanh}[\operatorname{Sin}[c+d x]]}{8 d}+\frac{a\left(4 a^2+15 b^2\right) \operatorname{Tan}[c+d x]}{5 d}+\frac{b\left(9 a^2+4 b^2\right) \operatorname{Sec}[c+d x] \operatorname{Tan}[c+d x]}{8 d}+\frac{11 a^2 b \operatorname{Sec}[c+d x]^3 \operatorname{Tan}[c+d x]}{20 d}+\frac{a^2(a+b \operatorname{Cos}[c+d x]) \operatorname{Sec}[c+d x]^4 \operatorname{Tan}[c+d x]}{5 d}+\frac{a\left(4 a^2+15 b^2\right) \operatorname{Tan}[c+d x]^3}{15 d}$$

Result (type 3, 619 leaves):

$$\frac{\left(-9 a^2 b-4 b^3\right) \text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d x)\right]-\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right]}{8 d}+$$

$$\frac{\left(9 a^2 b+4 b^3\right) \text{Log}\left[\text{Cos}\left[\frac{1}{2}(c+d x)\right]+\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right]}{8 d}+$$

$$\frac{2 a^3+15 a^2 b}{80 d\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]-\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^4}+\frac{19 a^3+135 a^2 b+60 a b^2+60 b^3}{240 d\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]-\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^2}+$$

$$\frac{a^3 \text{Sin}\left[\frac{1}{2}(c+d x)\right]}{20 d\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]-\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^5}+\frac{a^3 \text{Sin}\left[\frac{1}{2}(c+d x)\right]}{20 d\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]+\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^5}+$$

$$\frac{-2 a^3-15 a^2 b}{80 d\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]+\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^4}+\frac{-19 a^3-135 a^2 b-60 a b^2-60 b^3}{240 d\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]+\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^2}+$$

$$\frac{2\left(4 a^3 \text{Sin}\left[\frac{1}{2}(c+d x)\right]+15 a b^2 \text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)}{15 d\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]-\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)}+$$

$$\frac{2\left(4 a^3 \text{Sin}\left[\frac{1}{2}(c+d x)\right]+15 a b^2 \text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)}{15 d\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]+\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)}+$$

$$\frac{19 a^3 \text{Sin}\left[\frac{1}{2}(c+d x)\right]+60 a b^2 \text{Sin}\left[\frac{1}{2}(c+d x)\right]}{120 d\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]-\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^3}+\frac{19 a^3 \text{Sin}\left[\frac{1}{2}(c+d x)\right]+60 a b^2 \text{Sin}\left[\frac{1}{2}(c+d x)\right]}{120 d\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]+\text{Sin}\left[\frac{1}{2}(c+d x)\right]\right)^3}$$

Problem 445: Result more than twice size of optimal antiderivative.

$$\int (a+b \text{Cos}[c+d x])^4 \text{Sec}[c+d x]^4 \, dx$$

Optimal (type 3, 115 leaves, 5 steps):

$$b^4 x+\frac{2 a b\left(a^2+2 b^2\right) \text{ArcTanh}[\text{Sin}[c+d x]]}{d}+\frac{a^2\left(2 a^2+17 b^2\right) \text{Tan}[c+d x]}{3 d}+$$

$$\frac{4 a^3 b \text{Sec}[c+d x] \text{Tan}[c+d x]}{3 d}+\frac{a^2(a+b \text{Cos}[c+d x])^2 \text{Sec}[c+d x]^2 \text{Tan}[c+d x]}{3 d}$$

Result (type 3, 246 leaves):

$$\frac{1}{12\,d}\,\text{Sec}[c+d\,x]^3\left(9\,b\,\text{Cos}[c+d\,x]\left(b^3\,(c+d\,x)-2\,a\,\left(a^2+2\,b^2\right)\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]+2\,a\,\left(a^2+2\,b^2\right)\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]\right)+3\,b\,\text{Cos}[3\,(c+d\,x)]\left(b^3\,(c+d\,x)-2\,a\,\left(a^2+2\,b^2\right)\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]-\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]+2\,a\,\left(a^2+2\,b^2\right)\,\text{Log}\left[\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]+\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]\right]\right)+4\,a^2\,\left(2\,a^2+9\,b^2+6\,a\,b\,\text{Cos}[c+d\,x]+\left(a^2+9\,b^2\right)\,\text{Cos}[2\,(c+d\,x)]\right)\,\text{Sin}[c+d\,x]\right)$$

Problem 446: Result more than twice size of optimal antiderivative.

$$\int (a+b\,\text{Cos}[c+d\,x])^4\,\text{Sec}[c+d\,x]^5\,dx$$

Optimal (type 3, 154 leaves, 7 steps):

$$\frac{\left(3\,a^4+24\,a^2\,b^2+8\,b^4\right)\,\text{ArcTanh}[\text{Sin}[c+d\,x]]}{8\,d}+\frac{4\,a\,b\,\left(2\,a^2+3\,b^2\right)\,\text{Tan}[c+d\,x]}{3\,d}+\frac{a^2\,\left(3\,a^2+22\,b^2\right)\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{8\,d}+\frac{5\,a^3\,b\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]}{6\,d}+\frac{a^2\,(a+b\,\text{Cos}[c+d\,x])^2\,\text{Sec}[c+d\,x]^3\,\text{Tan}[c+d\,x]}{4\,d}$$

Result (type 3, 487 leaves):

$$\frac{\left(-3 a^4-24 a^2 b^2-8 b^4\right) \text{Log}\left[\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right]}{8 d}+$$
$$\frac{\left(3 a^4+24 a^2 b^2+8 b^4\right) \text{Log}\left[\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right]}{8 d}+$$
$$\frac{a^4}{16 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)^4}+\frac{9 a^4+16 a^3 b+72 a^2 b^2}{48 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)^2}+$$
$$\frac{2 a^3 b \,\text{Sin}\left[\frac{1}{2} (c+d x)\right]}{3 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)^3}-\frac{a^4}{16 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)^4}+$$
$$\frac{2 a^3 b \,\text{Sin}\left[\frac{1}{2} (c+d x)\right]}{3 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)^3}+\frac{-9 a^4-16 a^3 b-72 a^2 b^2}{48 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)^2}+$$
$$\frac{4 \left(2 a^3 b \,\text{Sin}\left[\frac{1}{2} (c+d x)\right]+3 a b^3 \,\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)}{3 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)}+$$
$$\frac{4 \left(2 a^3 b \,\text{Sin}\left[\frac{1}{2} (c+d x)\right]+3 a b^3 \,\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)}{3 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)}$$

Problem 447: Result more than twice size of optimal antiderivative.

$$\int (a+b \,\text{Cos}[c+d x])^4 \,\text{Sec}[c+d x]^6 \, dx$$

Optimal (type 3, 188 leaves, 8 steps):

$$\frac{a b \left(3 a^2+4 b^2\right) \text{ArcTanh}[\text{Sin}[c+d x]]}{2 d}+\frac{\left(8 a^4+60 a^2 b^2+15 b^4\right) \text{Tan}[c+d x]}{15 d}+$$
$$\frac{a b \left(3 a^2+4 b^2\right) \text{Sec}[c+d x] \,\text{Tan}[c+d x]}{2 d}+\frac{a^2 \left(4 a^2+27 b^2\right) \text{Sec}[c+d x]^2 \,\text{Tan}[c+d x]}{15 d}+$$
$$\frac{3 a^3 b \,\text{Sec}[c+d x]^3 \,\text{Tan}[c+d x]}{5 d}+\frac{a^2 (a+b \,\text{Cos}[c+d x])^2 \,\text{Sec}[c+d x]^4 \,\text{Tan}[c+d x]}{5 d}$$

Result (type 3, 663 leaves):

$$\frac{\left(-3 a^3 b-4 a b^3\right) \text{Log}\left[\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right]}{2 d}+$$
$$\frac{\left(3 a^3 b+4 a b^3\right) \text{Log}\left[\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right]}{2 d}+$$
$$\frac{a^4+10 a^3 b}{40 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)^4}+\frac{19 a^4+180 a^3 b+120 a^2 b^2+240 a b^3}{240 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)^2}+$$
$$\frac{a^4 \text{Sin}\left[\frac{1}{2} (c+d x)\right]}{20 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)^5}+\frac{a^4 \text{Sin}\left[\frac{1}{2} (c+d x)\right]}{20 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)^5}+$$
$$\frac{-a^4-10 a^3 b}{40 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)^4}+\frac{-19 a^4-180 a^3 b-120 a^2 b^2-240 a b^3}{240 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)^2}+$$
$$\frac{19 a^4 \text{Sin}\left[\frac{1}{2} (c+d x)\right]+120 a^2 b^2 \text{Sin}\left[\frac{1}{2} (c+d x)\right]}{120 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)^3}+$$
$$\frac{19 a^4 \text{Sin}\left[\frac{1}{2} (c+d x)\right]+120 a^2 b^2 \text{Sin}\left[\frac{1}{2} (c+d x)\right]}{120 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)^3}+$$
$$\left(8 a^4 \text{Sin}\left[\frac{1}{2} (c+d x)\right]+60 a^2 b^2 \text{Sin}\left[\frac{1}{2} (c+d x)\right]+15 b^4 \text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)\Big/$$
$$\left(15 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]-\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)\right)+$$
$$\left(8 a^4 \text{Sin}\left[\frac{1}{2} (c+d x)\right]+60 a^2 b^2 \text{Sin}\left[\frac{1}{2} (c+d x)\right]+15 b^4 \text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)\Big/$$
$$\left(15 d \left(\text{Cos}\left[\frac{1}{2} (c+d x)\right]+\text{Sin}\left[\frac{1}{2} (c+d x)\right]\right)\right)$$

Problem 459: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Cos}[c+d x]^5}{(a+b \text{Cos}[c+d x])^2} \, dx$$

Optimal (type 3, 266 leaves, 7 steps):

$$-\frac{a \left(4 a^2+b^2\right) x}{b^5}+\frac{2 a^4 \left(4 a^2-5 b^2\right) \text{ArcTan}\left[\frac{\sqrt{a-b} \, \text{Tan}\left[\frac{1}{2} (c+d x)\right]}{\sqrt{a+b}}\right]}{(a-b)^{3/2} b^5 (a+b)^{3/2} d}+$$
$$\frac{\left(12 a^4-7 a^2 b^2-2 b^4\right) \text{Sin}[c+d x]}{3 b^4 \left(a^2-b^2\right) d}-\frac{a \left(2 a^2-b^2\right) \text{Cos}[c+d x] \text{Sin}[c+d x]}{b^3 \left(a^2-b^2\right) d}+$$
$$\frac{\left(4 a^2-b^2\right) \text{Cos}[c+d x]^2 \text{Sin}[c+d x]}{3 b^2 \left(a^2-b^2\right) d}-\frac{a^2 \text{Cos}[c+d x]^3 \text{Sin}[c+d x]}{b \left(a^2-b^2\right) d (a+b \text{Cos}[c+d x])}$$

Result (type 3, 176 leaves):

$$\frac{1}{12 b^5 d}\left(-12 a (2 a-\text{i} b) (2 a+\text{i} b) (c+d x)+\frac{24 a^4 \left(4 a^2-5 b^2\right) \text{ArcTanh}\left[\frac{(a-b) \text{Tan}\left[\frac{1}{2} (c+d x)\right]}{\sqrt{-a^2+b^2}}\right]}{\left(-a^2+b^2\right)^{3/2}}+9 b \left(4 a^2+b^2\right) \text{Sin}[c+d x]+\frac{12 a^5 b \text{Sin}[c+d x]}{(a-b) (a+b) (a+b \text{Cos}[c+d x])}-6 a b^2 \text{Sin}[2 (c+d x)]+b^3 \text{Sin}[3 (c+d x)]\right)$$

Problem 491: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \sqrt{a+b \text{Cos}[c+d x]}\, \text{Sec}[c+d x]^2 \, dx$$

Optimal (type 4, 197 leaves, 9 steps):

$$-\frac{\sqrt{a+b \text{Cos}[c+d x]}\, \text{EllipticE}\left[\frac{1}{2} (c+d x),\frac{2 b}{a+b}\right]}{d \sqrt{\frac{a+b \text{Cos}[c+d x]}{a+b}}}+\frac{a \sqrt{\frac{a+b \text{Cos}[c+d x]}{a+b}}\, \text{EllipticF}\left[\frac{1}{2} (c+d x),\frac{2 b}{a+b}\right]}{d \sqrt{a+b \text{Cos}[c+d x]}}+\frac{b \sqrt{\frac{a+b \text{Cos}[c+d x]}{a+b}}\, \text{EllipticPi}\left[2,\frac{1}{2} (c+d x),\frac{2 b}{a+b}\right]}{d \sqrt{a+b \text{Cos}[c+d x]}}+\frac{\sqrt{a+b \text{Cos}[c+d x]}\, \text{Tan}[c+d x]}{d}$$

Result (type 4, 418 leaves):

$$-\frac{1}{4d}b\left(-\frac{2\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\,\text{EllipticPi}\left[2,\frac{1}{2}\left(c+d\,x\right),\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}-\right.$$

$$\left(2\,\mathrm{i}\,\sqrt{\frac{b-b\,\text{Cos}[c+d\,x]}{a+b}}\,\sqrt{-\frac{b+b\,\text{Cos}[c+d\,x]}{a-b}}\,\text{Cos}\left[2\,\left(c+d\,x\right)\right]\right.$$

$$\left(2\,a\,\left(a-b\right)\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\frac{a+b}{a-b}\right]+\right.$$

$$b\left(2\,a\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\frac{a+b}{a-b}\right]-b\,\text{EllipticPi}\left[\right.\right.$$

$$\left.\left.\left.\frac{a+b}{a},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\frac{a+b}{a-b}\right]\right)\right)\,\text{Sin}[c+d\,x]\right)\Big/$$

$$\left(a\,\sqrt{-\frac{1}{a+b}}\,\sqrt{1-\text{Cos}[c+d\,x]^2}\,\sqrt{-\frac{a^2-b^2-2\,a\,\left(a+b\,\text{Cos}[c+d\,x]\right)+\left(a+b\,\text{Cos}[c+d\,x]\right)^2}{b^2}}\right.$$

$$\left.\left.\left(2\,a^2-b^2-4\,a\,\left(a+b\,\text{Cos}[c+d\,x]\right)+2\,\left(a+b\,\text{Cos}[c+d\,x]\right)^2\right)\right)\right)+$$

$$\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\,\text{Tan}[c+d\,x]}{d}$$

Problem 492: Result unnecessarily involves imaginary or complex numbers.

$$\int\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\,\text{Sec}[c+d\,x]^3\,dx$$

Optimal (type 4, 262 leaves, 10 steps):

$$-\frac{b\sqrt{a+b\,\text{Cos}[c+d\,x]}\ \text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\frac{2\,b}{a+b}\right]}{4\,a\,d\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}}+$$

$$\frac{3\,b\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\ \text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\frac{2\,b}{a+b}\right]}{4\,d\sqrt{a+b\,\text{Cos}[c+d\,x]}}+$$

$$\frac{\left(4\,a^2-b^2\right)\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\ \text{EllipticPi}\left[2,\frac{1}{2}\,(c+d\,x),\frac{2\,b}{a+b}\right]}{4\,a\,d\sqrt{a+b\,\text{Cos}[c+d\,x]}}+$$

$$\frac{b\sqrt{a+b\,\text{Cos}[c+d\,x]}\ \text{Tan}[c+d\,x]}{4\,a\,d}+\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\ \text{Sec}[c+d\,x]\ \text{Tan}[c+d\,x]}{2\,d}$$

Result (type 4, 515 leaves) :

$$\frac{1}{16\,a\,d}\left(\frac{8\,a\,b\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\right.$$

$$\frac{2\,\left(8\,a^2-3\,b^2\right)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\,\text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}+$$

$$\left(2\,\text{i}\,b^2\,\sqrt{\frac{b-b\,\text{Cos}[c+d\,x]}{a+b}}\,\sqrt{-\frac{b+b\,\text{Cos}[c+d\,x]}{a-b}}\,\text{Cos}[2\,(c+d\,x)]\right.$$

$$\left(2\,a\,(a-b)\,\text{EllipticE}\left[\text{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]+\right.$$

$$b\left(2\,a\,\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]-b\,\text{EllipticPi}\left[\right.\right.$$

$$\left.\left.\left.\frac{a+b}{a},\,\text{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]\right)\right)\,\text{Sin}[c+d\,x]\right)\Big/$$

$$\left(a\,\sqrt{-\frac{1}{a+b}}\,\sqrt{1-\text{Cos}[c+d\,x]^2}\,\sqrt{-\frac{a^2-b^2-2\,a\,(a+b\,\text{Cos}[c+d\,x])+(a+b\,\text{Cos}[c+d\,x])^2}{b^2}}\right.$$

$$\left.\left.\left(2\,a^2-b^2-4\,a\,(a+b\,\text{Cos}[c+d\,x])+2\,(a+b\,\text{Cos}[c+d\,x])^2\right)\right)\right)+$$

$$\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\left(\frac{b\,\text{Tan}[c+d\,x]}{4\,a}+\frac{1}{2}\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]\right)}{d}$$

Problem 498: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int(a+b\,\text{Cos}[c+d\,x])^{3/2}\,\text{Sec}[c+d\,x]^2\,dx$$

Optimal (type 4, 209 leaves, 9 steps):

$$-\frac{a\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\ \mathrm{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\frac{2\,b}{a+b}\right]}{d\sqrt{\frac{a+b\,\mathrm{Cos}[c+d\,x]}{a+b}}}+$$

$$\frac{\left(a^2+2\,b^2\right)\sqrt{\frac{a+b\,\mathrm{Cos}[c+d\,x]}{a+b}}\ \mathrm{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\frac{2\,b}{a+b}\right]}{d\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}+$$

$$\frac{3\,a\,b\sqrt{\frac{a+b\,\mathrm{Cos}[c+d\,x]}{a+b}}\ \mathrm{EllipticPi}\left[2,\frac{1}{2}\,(c+d\,x),\frac{2\,b}{a+b}\right]}{d\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}+\frac{a\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\ \mathrm{Tan}[c+d\,x]}{d}$$

Result (type 4, 472 leaves) :

$$\frac{1}{4\,d}b\left(\frac{8\,b\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\right.$$

$$\frac{10\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\,\text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}+$$

$$\left(2\,i\,\sqrt{\frac{b-b\,\text{Cos}[c+d\,x]}{a+b}}\,\sqrt{-\frac{b+b\,\text{Cos}[c+d\,x]}{a-b}}\,\text{Cos}[2\,(c+d\,x)]\right.$$

$$\left(2\,a\,(a-b)\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]+\right.$$

$$b\left(2\,a\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]-b\,\text{EllipticPi}\left[\right.\right.$$

$$\left.\left.\left.\frac{a+b}{a},\,i\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]\right)\right)\,\text{Sin}[c+d\,x]\Bigg)\Bigg/$$

$$\left(\sqrt{-\frac{1}{a+b}}\,\sqrt{1-\text{Cos}[c+d\,x]^2}\,\sqrt{-\frac{a^2-b^2-2\,a\,(a+b\,\text{Cos}[c+d\,x])+(a+b\,\text{Cos}[c+d\,x])^2}{b^2}}\right.$$

$$\left.\left.\left(2\,a^2-b^2-4\,a\,(a+b\,\text{Cos}[c+d\,x])+2\,(a+b\,\text{Cos}[c+d\,x])^2\right)\right)\right)+$$

$$\frac{a\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Tan}[c+d\,x]}{d}$$

Problem 499: Result unnecessarily involves imaginary or complex numbers.

$$\int (a+b\,\text{Cos}[c+d\,x])^{3/2}\,\text{Sec}[c+d\,x]^3\,dx$$

Optimal (type 4, 255 leaves, 10 steps):

$$-\frac{5\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{4\,d\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}}+$$

$$\frac{7\,a\,b\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{4\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}+$$

$$\frac{\left(4\,a^2+3\,b^2\right)\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{4\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}+$$

$$\frac{5\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Tan}[c+d\,x]}{4\,d}+\frac{a\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{2\,d}$$

Result (type 4, 508 leaves) :

$$\frac{1}{16\,d}\left(\frac{8\,a\,b\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\right.$$

$$\frac{2\,(8\,a^2+b^2)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}+$$

$$\left(10\,i\,b^2\,\sqrt{\frac{b-b\,\text{Cos}[c+d\,x]}{a+b}}\,\sqrt{-\frac{b+b\,\text{Cos}[c+d\,x]}{a-b}}\;\text{Cos}[2\,(c+d\,x)]\right.$$

$$\left(2\,a\,(a-b)\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]+\right.$$

$$b\left(2\,a\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]-b\,\text{EllipticPi}\left[\right.\right.$$

$$\left.\left.\left.\frac{a+b}{a},\,i\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]\right)\right)\text{Sin}[c+d\,x]\right)\Big/$$

$$\left(a\,\sqrt{-\frac{1}{a+b}}\,\sqrt{1-\text{Cos}[c+d\,x]^2}\,\sqrt{-\frac{a^2-b^2-2\,a\,(a+b\,\text{Cos}[c+d\,x])+(a+b\,\text{Cos}[c+d\,x])^2}{b^2}}\right.$$

$$\left.\left.\left(2\,a^2-b^2-4\,a\,(a+b\,\text{Cos}[c+d\,x])+2\,(a+b\,\text{Cos}[c+d\,x])^2\right)\right)\right)+$$

$$\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\left(\frac{5}{4}\,b\,\text{Tan}[c+d\,x]+\frac{1}{2}\,a\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]\right)}{d}$$

Problem 504: Result unnecessarily involves imaginary or complex numbers.

$$\int(a+b\,\text{Cos}[c+d\,x])^{5/2}\,\text{Sec}[c+d\,x]\,dx$$

Optimal (type 4, 222 leaves, 9 steps):

$$\frac{14\,a\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{EllipticE}\left[\frac{1}{2}\left(c+d\,x\right),\frac{2\,b}{a+b}\right]}{3\,d\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}}+$$

$$\frac{2\,b\left(2\,a^2+b^2\right)\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticF}\left[\frac{1}{2}\left(c+d\,x\right),\frac{2\,b}{a+b}\right]}{3\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}+$$

$$\frac{2\,a^3\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticPi}\left[2,\frac{1}{2}\left(c+d\,x\right),\frac{2\,b}{a+b}\right]}{d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\frac{2\,b^2\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Sin}[c+d\,x]}{3\,d}$$

Result (type 4, 379 leaves):

$$\frac{1}{6\,d}\left(\frac{4\,b\left(9\,a^2+b^2\right)\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticF}\left[\frac{1}{2}\left(c+d\,x\right),\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\right.$$

$$\frac{2\,a\left(6\,a^2+7\,b^2\right)\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticPi}\left[2,\frac{1}{2}\left(c+d\,x\right),\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\frac{1}{\sqrt{-\frac{1}{a+b}}}$$

$$14\,i\sqrt{-\frac{b\left(-1+\text{Cos}[c+d\,x]\right)}{a+b}}\sqrt{\frac{b\left(1+\text{Cos}[c+d\,x]\right)}{-a+b}}\;\text{Csc}[c+d\,x]$$

$$\left(-2\,a\left(a-b\right)\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\frac{a+b}{a-b}\right]+\right.$$

$$b\left(-2\,a\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\frac{a+b}{a-b}\right]+\right.$$

$$\left.\left.b\,\text{EllipticPi}\left[\frac{a+b}{a},i\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\frac{a+b}{a-b}\right]\right)\right)+$$

$$\left.4\,b^2\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Sin}[c+d\,x]\right)$$

Problem 505: Result unnecessarily involves imaginary or complex numbers.

$$\int (a + b \operatorname{Cos}[c + d x])^{5/2} \operatorname{Sec}[c + d x]^2 \, dx$$

Optimal (type 4, 222 leaves, 9 steps):

$$-\frac{\left(a^2 - 2 b^2\right) \sqrt{a + b \operatorname{Cos}[c + d x]} \operatorname{EllipticE}\left[\frac{1}{2} (c + d x), \frac{2 b}{a+b}\right]}{d \sqrt{\frac{a+b \operatorname{Cos}[c+d x]}{a+b}}} + \frac{a \left(a^2 + 4 b^2\right) \sqrt{\frac{a+b \operatorname{Cos}[c+d x]}{a+b}} \operatorname{EllipticF}\left[\frac{1}{2} (c + d x), \frac{2 b}{a+b}\right]}{d \sqrt{a + b \operatorname{Cos}[c + d x]}} + \frac{5 a^2 b \sqrt{\frac{a+b \operatorname{Cos}[c+d x]}{a+b}} \operatorname{EllipticPi}\left[2, \frac{1}{2} (c + d x), \frac{2 b}{a+b}\right]}{d \sqrt{a + b \operatorname{Cos}[c + d x]}} + \frac{a^2 \sqrt{a + b \operatorname{Cos}[c + d x]} \operatorname{Tan}[c + d x]}{d}$$

Result (type 4, 390 leaves):

$$\frac{1}{4\,d}\left(\frac{24\,a\,b^2\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\right.$$

$$\frac{2\,b\,\left(9\,a^2+2\,b^2\right)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\frac{1}{a\,b\,\sqrt{-\frac{1}{a+b}}}$$

$$2\,\mathrm{i}\,\left(a^2-2\,b^2\right)\,\sqrt{-\frac{b\,(-1+\text{Cos}[c+d\,x])}{a+b}}\;\sqrt{-\frac{b\,(1+\text{Cos}[c+d\,x])}{a-b}}\;\text{Csc}[c+d\,x]$$

$$\left(2\,a\,(a-b)\;\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\right],\,\frac{a+b}{a-b}\right]+\right.$$

$$b\left(2\,a\;\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\right],\,\frac{a+b}{a-b}\right]-\right.$$

$$\left.\left.b\;\text{EllipticPi}\left[\frac{a+b}{a},\,\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\right],\,\frac{a+b}{a-b}\right]\right)\right)+$$

$$\left.4\,a^2\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Tan}[c+d\,x]\right)$$

Problem 506: Result unnecessarily involves imaginary or complex numbers.

$$\int(a+b\,\text{Cos}[c+d\,x])^{5/2}\,\text{Sec}[c+d\,x]^3\,dx$$

Optimal (type 4, 270 leaves, 10 steps):

$$-\frac{9\,a\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{4\,d\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}}+$$

$$\frac{b\,\left(11\,a^2+8\,b^2\right)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{4\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}+$$

$$\frac{a\,\left(4\,a^2+15\,b^2\right)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{4\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}+$$

$$\frac{9\,a\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Tan}[c+d\,x]}{4\,d}+\frac{a^2\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{2\,d}$$

Result (type 4, 395 leaves) :

$$\frac{1}{8\,d}\left(\frac{4\,b\,\left(a^2+4\,b^2\right)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\right.$$

$$\frac{a\,\left(8\,a^2+21\,b^2\right)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}-\frac{1}{\sqrt{-\frac{1}{a+b}}}$$

$$9\,\text{i}\,\sqrt{-\frac{b\,(-1+\text{Cos}[c+d\,x])}{a+b}}\,\sqrt{\frac{b\,(1+\text{Cos}[c+d\,x])}{-a+b}}\;\text{Csc}[c+d\,x]$$

$$\left(-2\,a\,(a-b)\,\text{EllipticE}\left[\text{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]+\right.$$

$$b\left(-2\,a\,\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]+\right.$$

$$\left.\left.b\,\text{EllipticPi}\left[\frac{a+b}{a},\,\text{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]\right)\right)+$$

$$\left.2\,a\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\left(2\,a+9\,b\,\text{Cos}[c+d\,x]\right)\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]\right)$$

Problem 507: Result unnecessarily involves imaginary or complex numbers.

$$\int (a + b \operatorname{Cos}[c + d x])^{5/2} \operatorname{Sec}[c + d x]^4 \, dx$$

Optimal (type 4, 323 leaves, 11 steps):

$$-\frac{\left(16 a^2 + 33 b^2\right) \sqrt{a + b \operatorname{Cos}[c + d x]} \operatorname{EllipticE}\left[\frac{1}{2} (c + d x), \frac{2 b}{a+b}\right]}{24 d \sqrt{\frac{a+b \operatorname{Cos}[c+d x]}{a+b}}} + \frac{a \left(16 a^2 + 59 b^2\right) \sqrt{\frac{a+b \operatorname{Cos}[c+d x]}{a+b}} \operatorname{EllipticF}\left[\frac{1}{2} (c + d x), \frac{2 b}{a+b}\right]}{24 d \sqrt{a + b \operatorname{Cos}[c + d x]}} + \frac{5 b \left(4 a^2 + b^2\right) \sqrt{\frac{a+b \operatorname{Cos}[c+d x]}{a+b}} \operatorname{EllipticPi}\left[2, \frac{1}{2} (c + d x), \frac{2 b}{a+b}\right]}{8 d \sqrt{a + b \operatorname{Cos}[c + d x]}} + \frac{\left(16 a^2 + 33 b^2\right) \sqrt{a + b \operatorname{Cos}[c + d x]} \operatorname{Tan}[c + d x]}{24 d} + \frac{13 a b \sqrt{a + b \operatorname{Cos}[c + d x]} \operatorname{Sec}[c + d x] \operatorname{Tan}[c + d x]}{12 d} + \frac{a^2 \sqrt{a + b \operatorname{Cos}[c + d x]} \operatorname{Sec}[c + d x]^2 \operatorname{Tan}[c + d x]}{3 d}$$

Result (type 4, 563 leaves):

$$-\frac{1}{96\,d}\,b\left(-\frac{104\,a\,b\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\left(2\,\left(-104\,a^2+3\,b^2\right)\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\right.\right.$$

$$\left.\text{EllipticPi}\left[2,\frac{1}{2}\,(c+d\,x),\frac{2\,b}{a+b}\right]\right)\Big/\left(\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-$$

$$\left(2\,i\,\left(16\,a^2+33\,b^2\right)\sqrt{\frac{b-b\,\text{Cos}[c+d\,x]}{a+b}}\;\sqrt{-\frac{b+b\,\text{Cos}[c+d\,x]}{a-b}}\;\text{Cos}[2\,(c+d\,x)]\right.$$

$$\left(2\,a\,(a-b)\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\frac{a+b}{a-b}\right]+\right.$$

$$b\left(2\,a\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\frac{a+b}{a-b}\right]-b\,\text{EllipticPi}\left[\right.\right.$$

$$\left.\left.\left.\frac{a+b}{a},\,i\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\frac{a+b}{a-b}\right]\right)\right)\text{Sin}[c+d\,x]\right)\Big/$$

$$\left(a\,\sqrt{-\frac{1}{a+b}}\;\sqrt{1-\text{Cos}[c+d\,x]^2}\;\sqrt{-\frac{a^2-b^2-2\,a\,(a+b\,\text{Cos}[c+d\,x])+(a+b\,\text{Cos}[c+d\,x])^2}{b^2}}\right.$$

$$\left.\left.\left(2\,a^2-b^2-4\,a\,(a+b\,\text{Cos}[c+d\,x])+2\,(a+b\,\text{Cos}[c+d\,x])^2\right)\right)\right)+$$

$$\frac{1}{d}\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\left(\frac{1}{24}\,\text{Sec}[c+d\,x]\,\left(16\,a^2\,\text{Sin}[c+d\,x]+33\,b^2\,\text{Sin}[c+d\,x]\right)+\right.$$
$$\frac{13}{12}\,a\,b\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]+$$
$$\left.\frac{1}{3}\,a^2\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)$$

Problem 514: Result unnecessarily involves imaginary or complex numbers.

$$\int\sqrt{3+4\,\text{Cos}[c+d\,x]}\;\text{Sec}[c+d\,x]^2\,dx$$

Optimal (type 4, 95 leaves, 6 steps):

$$-\frac{\sqrt{7}\ \text{EllipticE}\left[\frac{1}{2}(c+d x),\frac{8}{7}\right]}{d}+\frac{3\ \text{EllipticF}\left[\frac{1}{2}(c+d x),\frac{8}{7}\right]}{\sqrt{7}\ d}+\frac{4\ \text{EllipticPi}\left[2,\frac{1}{2}(c+d x),\frac{8}{7}\right]}{\sqrt{7}\ d}+\frac{\sqrt{3+4\,\text{Cos}[c+d x]}\ \text{Tan}[c+d x]}{d}$$

Result (type 4, 157 leaves):

$$\frac{1}{21\,d}\left(6\sqrt{7}\ \text{EllipticPi}\left[2,\frac{1}{2}(c+d x),\frac{8}{7}\right]+\frac{1}{\sqrt{\text{Sin}[c+d x]^2}}\,\mathrm{i}\sqrt{7}\left(21\ \text{EllipticE}\left[\mathrm{i}\ \text{ArcSinh}\left[\sqrt{3+4\,\text{Cos}[c+d x]}\right],-\frac{1}{7}\right]-12\ \text{EllipticF}\left[\mathrm{i}\ \text{ArcSinh}\left[\sqrt{3+4\,\text{Cos}[c+d x]}\right],-\frac{1}{7}\right]-8\ \text{EllipticPi}\left[-\frac{1}{3},\mathrm{i}\ \text{ArcSinh}\left[\sqrt{3+4\,\text{Cos}[c+d x]}\right],-\frac{1}{7}\right]\right)\text{Sin}[c+d x]+21\sqrt{3+4\,\text{Cos}[c+d x]}\ \text{Tan}[c+d x]\right)$$

Problem 515: Result unnecessarily involves imaginary or complex numbers.

$$\int\sqrt{3+4\,\text{Cos}[c+d x]}\ \text{Sec}[c+d x]^3\,dx$$

Optimal (type 4, 135 leaves, 7 steps):

$$-\frac{\sqrt{7}\ \text{EllipticE}\left[\frac{1}{2}(c+d x),\frac{8}{7}\right]}{3\,d}+\frac{3\ \text{EllipticF}\left[\frac{1}{2}(c+d x),\frac{8}{7}\right]}{\sqrt{7}\ d}+\frac{5\ \text{EllipticPi}\left[2,\frac{1}{2}(c+d x),\frac{8}{7}\right]}{3\sqrt{7}\ d}+\frac{\sqrt{3+4\,\text{Cos}[c+d x]}\ \text{Tan}[c+d x]}{3\,d}+\frac{\sqrt{3+4\,\text{Cos}[c+d x]}\ \text{Sec}[c+d x]\ \text{Tan}[c+d x]}{2\,d}$$

Result (type 4, 194 leaves):

$$\frac{1}{6\,d}\left(\frac{12\ \text{EllipticF}\left[\frac{1}{2}(c+d x),\frac{8}{7}\right]}{\sqrt{7}}+\frac{6\ \text{EllipticPi}\left[2,\frac{1}{2}(c+d x),\frac{8}{7}\right]}{\sqrt{7}}+\left(2\,\mathrm{i}\left(21\ \text{EllipticE}\left[\mathrm{i}\ \text{ArcSinh}\left[\sqrt{3+4\,\text{Cos}[c+d x]}\right],-\frac{1}{7}\right]-12\ \text{EllipticF}\left[\mathrm{i}\ \text{ArcSinh}\left[\sqrt{3+4\,\text{Cos}[c+d x]}\right],-\frac{1}{7}\right]-8\ \text{EllipticPi}\left[-\frac{1}{3},\mathrm{i}\ \text{ArcSinh}\left[\sqrt{3+4\,\text{Cos}[c+d x]}\right],-\frac{1}{7}\right]\right)\text{Sin}[c+d x]\right)\Big/\left(3\sqrt{7}\sqrt{\text{Sin}[c+d x]^2}\right)+(3+2\,\text{Cos}[c+d x])\sqrt{3+4\,\text{Cos}[c+d x]}\ \text{Sec}[c+d x]\ \text{Tan}[c+d x]\right)$$

Problem 521: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{3-4\,\text{Cos}[c+d\,x]}\ \text{Sec}[c+d\,x]^2\,dx$$

Optimal (type 4, 98 leaves, 6 steps):

$$-\frac{\sqrt{7}\ \text{EllipticE}\left[\frac{1}{2}\left(c+\pi+d\,x\right),\frac{8}{7}\right]}{d}+\frac{3\,\text{EllipticF}\left[\frac{1}{2}\left(c+\pi+d\,x\right),\frac{8}{7}\right]}{\sqrt{7}\ d}+\frac{4\,\text{EllipticPi}\left[2,\frac{1}{2}\left(c+\pi+d\,x\right),\frac{8}{7}\right]}{\sqrt{7}\ d}+\frac{\sqrt{3-4\,\text{Cos}[c+d\,x]}\ \text{Tan}[c+d\,x]}{d}$$

Result (type 4, 178 leaves):

$$\frac{1}{21\,d}\left(-\frac{42\sqrt{-3+4\,\text{Cos}[c+d\,x]}\ \text{EllipticPi}\left[2,\frac{1}{2}\left(c+d\,x\right),8\right]}{\sqrt{3-4\,\text{Cos}[c+d\,x]}}-\frac{1}{\sqrt{\text{Sin}[c+d\,x]^2}}\,i\sqrt{7}\left(21\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{3-4\,\text{Cos}[c+d\,x]}\right],-\frac{1}{7}\right]-12\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{3-4\,\text{Cos}[c+d\,x]}\right],-\frac{1}{7}\right]-8\,\text{EllipticPi}\left[-\frac{1}{3},i\,\text{ArcSinh}\left[\sqrt{3-4\,\text{Cos}[c+d\,x]}\right],-\frac{1}{7}\right]\right)\text{Sin}[c+d\,x]+21\sqrt{3-4\,\text{Cos}[c+d\,x]}\ \text{Tan}[c+d\,x]\right)$$

Problem 522: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{3-4\,\text{Cos}[c+d\,x]}\ \text{Sec}[c+d\,x]^3\,dx$$

Optimal (type 4, 138 leaves, 7 steps):

$$\frac{\sqrt{7}\ \text{EllipticE}\left[\frac{1}{2}\left(c+\pi+d\,x\right),\frac{8}{7}\right]}{3\,d}-\frac{3\,\text{EllipticF}\left[\frac{1}{2}\left(c+\pi+d\,x\right),\frac{8}{7}\right]}{\sqrt{7}\ d}-\frac{5\,\text{EllipticPi}\left[2,\frac{1}{2}\left(c+\pi+d\,x\right),\frac{8}{7}\right]}{3\sqrt{7}\ d}-\frac{\sqrt{3-4\,\text{Cos}[c+d\,x]}\ \text{Tan}[c+d\,x]}{3\,d}+\frac{\sqrt{3-4\,\text{Cos}[c+d\,x]}\ \text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{2\,d}$$

Result (type 4, 237 leaves):

$$\frac{1}{6\,d}\left(-\frac{12\,\sqrt{-3+4\,\text{Cos}[c+d\,x]}\ \text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,8\right]}{\sqrt{3-4\,\text{Cos}[c+d\,x]}}+\frac{6\,\sqrt{-3+4\,\text{Cos}[c+d\,x]}\ \text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,8\right]}{\sqrt{3-4\,\text{Cos}[c+d\,x]}}+\left(2\,i\left(21\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{3-4\,\text{Cos}[c+d\,x]}\right],\,-\frac{1}{7}\right]-12\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{3-4\,\text{Cos}[c+d\,x]}\right],\,-\frac{1}{7}\right]-8\,\text{EllipticPi}\left[-\frac{1}{3},\,i\,\text{ArcSinh}\left[\sqrt{3-4\,\text{Cos}[c+d\,x]}\right],\,-\frac{1}{7}\right]\right)\text{Sin}[c+d\,x]\right)\Big/\left(3\,\sqrt{7}\,\sqrt{\text{Sin}[c+d\,x]^2}\right)-\sqrt{3-4\,\text{Cos}[c+d\,x]}\,(-3+2\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]\right)$$

Problem 528: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{Sec}[c+d\,x]^2}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 206 leaves, 9 steps):

$$-\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\ \text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{a\,d\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}}+\frac{\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\ \text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}-\frac{b\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\ \text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{a\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\ \text{Tan}[c+d\,x]}{a\,d}$$

Result (type 4, 424 leaves):

$$
\begin{aligned}
&-\frac{1}{4\,a\,d} b \Bigg(\frac{6 \sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\ \text{EllipticPi}\left[2, \frac{1}{2}\,(c+d\,x), \frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}} - \\
&\quad \Bigg(2\,i \sqrt{\frac{b-b\,\text{Cos}[c+d\,x]}{a+b}} \sqrt{-\frac{b+b\,\text{Cos}[c+d\,x]}{a-b}}\ \text{Cos}\left[2\,(c+d\,x)\right] \\
&\qquad \Bigg(2\,a\,(a-b)\ \text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\right], \frac{a+b}{a-b}\right] + \\
&\qquad\quad b\,\Bigg(2\,a\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\right], \frac{a+b}{a-b}\right] - b\,\text{EllipticPi}\Big[\\
&\qquad\qquad \frac{a+b}{a}, i\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\right], \frac{a+b}{a-b}\Big]\Bigg)\Bigg)\ \text{Sin}[c+d\,x]\Bigg) \Bigg/ \\
&\quad \Bigg(a \sqrt{-\frac{1}{a+b}}\ \sqrt{1-\text{Cos}[c+d\,x]^2}\ \sqrt{-\frac{a^2-b^2-2\,a\,(a+b\,\text{Cos}[c+d\,x])+(a+b\,\text{Cos}[c+d\,x])^2}{b^2}} \\
&\qquad \left(2\,a^2-b^2-4\,a\,(a+b\,\text{Cos}[c+d\,x])+2\,(a+b\,\text{Cos}[c+d\,x])^2\right)\Bigg)\Bigg) + \\
&\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\ \text{Tan}[c+d\,x]}{a\,d}
\end{aligned}
$$

Problem 529: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Sec}[c+d\,x]^3}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}\, dx$$

Optimal (type 4, 268 leaves, 10 steps):

$$\frac{3\,b\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\ \mathrm{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{4\,a^2\,d\,\sqrt{\frac{a+b\,\mathrm{Cos}[c+d\,x]}{a+b}}}-\frac{b\,\sqrt{\frac{a+b\,\mathrm{Cos}[c+d\,x]}{a+b}}\ \mathrm{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{4\,a\,d\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}+$$

$$\frac{\left(4\,a^2+3\,b^2\right)\,\sqrt{\frac{a+b\,\mathrm{Cos}[c+d\,x]}{a+b}}\ \mathrm{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{4\,a^2\,d\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}-$$

$$\frac{3\,b\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\ \mathrm{Tan}[c+d\,x]}{4\,a^2\,d}+\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\ \mathrm{Sec}[c+d\,x]\,\mathrm{Tan}[c+d\,x]}{2\,a\,d}$$

Result (type 4, 518 leaves) :

$$\frac{1}{16 a^2 d}\left(\frac{8 a b \sqrt{\frac{a+b \operatorname{Cos}[c+d x]}{a+b}}\ \operatorname{EllipticF}\left[\frac{1}{2}(c+d x), \frac{2 b}{a+b}\right]}{\sqrt{a+b \operatorname{Cos}[c+d x]}}+\right.$$

$$\frac{2\left(8 a^2+9 b^2\right) \sqrt{\frac{a+b \operatorname{Cos}[c+d x]}{a+b}}\ \operatorname{EllipticPi}\left[2, \frac{1}{2}(c+d x), \frac{2 b}{a+b}\right]}{\sqrt{a+b \operatorname{Cos}[c+d x]}}-$$

$$\left(6 i b^2 \sqrt{\frac{b-b \operatorname{Cos}[c+d x]}{a+b}} \sqrt{-\frac{b+b \operatorname{Cos}[c+d x]}{a-b}} \operatorname{Cos}[2(c+d x)]\right.$$

$$\left(2 a(a-b) \operatorname{EllipticE}\left[i \operatorname{ArcSinh}\left[\sqrt{-\frac{1}{a+b}} \sqrt{a+b \operatorname{Cos}[c+d x]}\right], \frac{a+b}{a-b}\right]+\right.$$

$$b\left(2 a \operatorname{EllipticF}\left[i \operatorname{ArcSinh}\left[\sqrt{-\frac{1}{a+b}} \sqrt{a+b \operatorname{Cos}[c+d x]}\right], \frac{a+b}{a-b}\right]-b \operatorname{EllipticPi}\left[\right.\right.$$

$$\left.\left.\left.\frac{a+b}{a}, i \operatorname{ArcSinh}\left[\sqrt{-\frac{1}{a+b}} \sqrt{a+b \operatorname{Cos}[c+d x]}\right], \frac{a+b}{a-b}\right]\right)\right) \operatorname{Sin}[c+d x]\right) \Big/$$

$$\left(a \sqrt{-\frac{1}{a+b}} \sqrt{1-\operatorname{Cos}[c+d x]^2} \sqrt{-\frac{a^2-b^2-2 a(a+b \operatorname{Cos}[c+d x])+(a+b \operatorname{Cos}[c+d x])^2}{b^2}}\right.$$

$$\left.\left.\left(2 a^2-b^2-4 a(a+b \operatorname{Cos}[c+d x])+2(a+b \operatorname{Cos}[c+d x])^2\right)\right)\right)+$$

$$\frac{\sqrt{a+b \operatorname{Cos}[c+d x]}\left(-\frac{3 b \operatorname{Tan}[c+d x]}{4 a^2}+\frac{\operatorname{Sec}[c+d x] \operatorname{Tan}[c+d x]}{2 a}\right)}{d}$$

Problem 535: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{Sec}[c+d x]}{(a+b \operatorname{Cos}[c+d x])^{3/2}}\, dx$$

Optimal (type 4, 176 leaves, 7 steps):

$$-\frac{2\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{a\,\left(a^2-b^2\right)\,d\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}}+\frac{2\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{a\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\frac{2\,b^2\,\text{Sin}[c+d\,x]}{a\,\left(a^2-b^2\right)\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}$$

Result (type 4, 520 leaves) :

$$\frac{2\,b^2\,\text{Sin}[c+d\,x]}{a\,\left(a^2-b^2\right)\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}-\left(-\frac{4\,a\,b\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\right.$$

$$\frac{2\,\left(2\,a^2-3\,b^2\right)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}+$$

$$\left(2\,\mathrm{i}\,b^2\,\sqrt{\frac{b-b\,\text{Cos}[c+d\,x]}{a+b}}\,\sqrt{-\frac{b+b\,\text{Cos}[c+d\,x]}{a-b}}\;\text{Cos}[2\,(c+d\,x)]\right.$$

$$\left(2\,a\,(a-b)\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]+\right.$$

$$b\,\left(2\,a\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]-b\,\text{EllipticPi}\left[\right.\right.$$

$$\left.\left.\left.\frac{a+b}{a},\,\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]\right)\right)\,\text{Sin}[c+d\,x]\Bigg)\Bigg/$$

$$\left(a\,\sqrt{-\frac{1}{a+b}}\,\sqrt{1-\text{Cos}[c+d\,x]^2}\,\sqrt{-\frac{a^2-b^2-2\,a\,(a+b\,\text{Cos}[c+d\,x])+(a+b\,\text{Cos}[c+d\,x])^2}{b^2}}\right.$$

$$\left.\left.\left(2\,a^2-b^2-4\,a\,(a+b\,\text{Cos}[c+d\,x])+2\,(a+b\,\text{Cos}[c+d\,x])^2\right)\right)\right)\Bigg/\left(2\,a\,(-a+b)\,(a+b)\,d\right)$$

Problem 536: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Sec}[c+d\,x]^2}{\left(a+b\,\text{Cos}[c+d\,x]\right)^{3/2}}\,dx$$

Optimal (type 4, 277 leaves, 10 steps):

$$-\frac{\left(a^2-3\,b^2\right)\sqrt{a+b\,\text{Cos}[c+d\,x]}\ \text{EllipticE}\left[\frac{1}{2}\left(c+d\,x\right),\frac{2\,b}{a+b}\right]}{a^2\left(a^2-b^2\right)d\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}}+\frac{\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\ \text{EllipticF}\left[\frac{1}{2}\left(c+d\,x\right),\frac{2\,b}{a+b}\right]}{a\,d\sqrt{a+b\,\text{Cos}[c+d\,x]}}-\frac{3\,b\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\ \text{EllipticPi}\left[2,\frac{1}{2}\left(c+d\,x\right),\frac{2\,b}{a+b}\right]}{a^2\,d\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\frac{b\left(a^2-3\,b^2\right)\text{Sin}[c+d\,x]}{a^2\left(a^2-b^2\right)d\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\frac{\text{Tan}[c+d\,x]}{a\,d\sqrt{a+b\,\text{Cos}[c+d\,x]}}$$

Result (type 4, 551 leaves):

$$-\frac{1}{4 a^2 (a-b) (a+b) d} b \left(-\frac{8 a b \sqrt{\frac{a+b \text{Cos}[c+d x]}{a+b}} \text{EllipticF}\left[\frac{1}{2} (c+d x), \frac{2 b}{a+b}\right]}{\sqrt{a+b \text{Cos}[c+d x]}}+\frac{2 \left(7 a^2-9 b^2\right) \sqrt{\frac{a+b \text{Cos}[c+d x]}{a+b}} \text{EllipticPi}\left[2, \frac{1}{2} (c+d x), \frac{2 b}{a+b}\right]}{\sqrt{a+b \text{Cos}[c+d x]}}-\left(2 \text{i} \left(a^2-3 b^2\right) \sqrt{\frac{b-b \text{Cos}[c+d x]}{a+b}} \sqrt{-\frac{b+b \text{Cos}[c+d x]}{a-b}} \text{Cos}[2 (c+d x)] \left(2 a (a-b) \text{EllipticE}\left[\text{i} \text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}} \sqrt{a+b \text{Cos}[c+d x]}\right], \frac{a+b}{a-b}\right]+b \left(2 a \text{EllipticF}\left[\text{i} \text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}} \sqrt{a+b \text{Cos}[c+d x]}\right], \frac{a+b}{a-b}\right]-b \text{EllipticPi}\left[\frac{a+b}{a}, \text{i} \text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}} \sqrt{a+b \text{Cos}[c+d x]}\right], \frac{a+b}{a-b}\right]\right)\right) \text{Sin}[c+d x]\right) \Big/ \left(a \sqrt{-\frac{1}{a+b}} \sqrt{1-\text{Cos}[c+d x]^2} \sqrt{-\frac{a^2-b^2-2 a (a+b \text{Cos}[c+d x])+(a+b \text{Cos}[c+d x])^2}{b^2}} \left(2 a^2-b^2-4 a (a+b \text{Cos}[c+d x])+2 (a+b \text{Cos}[c+d x])^2\right)\right)\right)+$$

$$\frac{\sqrt{a+b \text{Cos}[c+d x]} \left(-\frac{2 b^3 \text{Sin}[c+d x]}{a^2 \left(a^2-b^2\right) (a+b \text{Cos}[c+d x])}+\frac{\text{Tan}[c+d x]}{a^2}\right)}{d}$$

Problem 537: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Sec}[c+d x]^3}{(a+b \text{Cos}[c+d x])^{3/2}} \, dx$$

Optimal (type 4, 345 leaves, 11 steps):

$$\frac{b\left(7a^2-15b^2\right)\sqrt{a+b\,\text{Cos}[c+d\,x]}\ \text{EllipticE}\left[\frac{1}{2}(c+d\,x),\frac{2b}{a+b}\right]}{4a^3\left(a^2-b^2\right)d\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}}-$$

$$\frac{5b\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\ \text{EllipticF}\left[\frac{1}{2}(c+d\,x),\frac{2b}{a+b}\right]}{4a^2d\sqrt{a+b\,\text{Cos}[c+d\,x]}}+$$

$$\frac{\left(4a^2+15b^2\right)\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\ \text{EllipticPi}\left[2,\frac{1}{2}(c+d\,x),\frac{2b}{a+b}\right]}{4a^3d\sqrt{a+b\,\text{Cos}[c+d\,x]}}-$$

$$\frac{b^2\left(7a^2-15b^2\right)\text{Sin}[c+d\,x]}{4a^3\left(a^2-b^2\right)d\sqrt{a+b\,\text{Cos}[c+d\,x]}}-\frac{5b\,\text{Tan}[c+d\,x]}{4a^2d\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\frac{\text{Sec}[c+d\,x]\ \text{Tan}[c+d\,x]}{2a\,d\sqrt{a+b\,\text{Cos}[c+d\,x]}}$$

Result (type 4, 597 leaves):

$$-\frac{1}{16\,a^3\,(-a+b)\,(a+b)\,d}\left(\frac{2\,(4\,a^3\,b-20\,a\,b^3)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\right.$$

$$\left(2\,(8\,a^4+29\,a^2\,b^2-45\,b^4)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\;\text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]\right)\Big/$$

$$\left(\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(2\,\mathrm{i}\,(7\,a^2\,b^2-15\,b^4)\,\sqrt{\frac{b-b\,\text{Cos}[c+d\,x]}{a+b}}\,\sqrt{-\frac{b+b\,\text{Cos}[c+d\,x]}{a-b}}\right.$$

$$\text{Cos}[2\,(c+d\,x)]\,\left(2\,a\,(a-b)\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]+\right.$$

$$b\,\left(2\,a\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]-b\,\text{EllipticPi}\left[\right.\right.$$

$$\left.\left.\left.\frac{a+b}{a},\,\mathrm{i}\,\text{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right],\,\frac{a+b}{a-b}\right]\right)\right)\text{Sin}[c+d\,x]\Bigg)\Big/$$

$$\left(a\,\sqrt{-\frac{1}{a+b}}\,\sqrt{1-\text{Cos}[c+d\,x]^2}\,\sqrt{-\frac{a^2-b^2-2\,a\,(a+b\,\text{Cos}[c+d\,x])+(a+b\,\text{Cos}[c+d\,x])^2}{b^2}}\right.$$

$$\left.\left.\left(2\,a^2-b^2-4\,a\,(a+b\,\text{Cos}[c+d\,x])+2\,(a+b\,\text{Cos}[c+d\,x])^2\right)\right)\right)+$$

$$\frac{1}{d}\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\left(\frac{2\,b^4\,\text{Sin}[c+d\,x]}{a^3\,(a^2-b^2)\,(a+b\,\text{Cos}[c+d\,x])}-\frac{7\,b\,\text{Tan}[c+d\,x]}{4\,a^3}+\right.$$

$$\left.\frac{\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{2\,a^2}\right)$$

Problem 544: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Sec}[c+d\,x]}{(a+b\,\text{Cos}[c+d\,x])^{5/2}}\,dx$$

Optimal (type 4, 320 leaves, 10 steps):

$$-\frac{2\,b\,\left(7\,a^2-3\,b^2\right)\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\,\text{EllipticE}\left[\frac{1}{2}\,\left(c+d\,x\right),\,\frac{2\,b}{a+b}\right]}{3\,a^2\,\left(a^2-b^2\right)^2\,d\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}}+$$

$$\frac{2\,b\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\,\,\text{EllipticF}\left[\frac{1}{2}\,\left(c+d\,x\right),\,\frac{2\,b}{a+b}\right]}{3\,a\,\left(a^2-b^2\right)\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\frac{2\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{a+b}}\,\,\text{EllipticPi}\left[2,\,\frac{1}{2}\,\left(c+d\,x\right),\,\frac{2\,b}{a+b}\right]}{a^2\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}+$$

$$\frac{2\,b^2\,\text{Sin}[c+d\,x]}{3\,a\,\left(a^2-b^2\right)\,d\,\left(a+b\,\text{Cos}[c+d\,x]\right)^{3/2}}+\frac{2\,b^2\,\left(7\,a^2-3\,b^2\right)\,\text{Sin}[c+d\,x]}{3\,a^2\,\left(a^2-b^2\right)^2\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}$$

Result (type 4, 622 leaves) :

$$\frac{1}{6 a^2 (a-b)^2 (a+b)^2 d}\left(\frac{2\left(-12 a^3 b+4 a b^3\right)\sqrt{\frac{a+b \operatorname{Cos}[c+d x]}{a+b}}\ \operatorname{EllipticF}\left[\frac{1}{2}(c+d x),\frac{2 b}{a+b}\right]}{\sqrt{a+b \operatorname{Cos}[c+d x]}}+\right.$$

$$\left(2\left(6 a^4-19 a^2 b^2+9 b^4\right)\sqrt{\frac{a+b \operatorname{Cos}[c+d x]}{a+b}}\ \operatorname{EllipticPi}\left[2,\frac{1}{2}(c+d x),\frac{2 b}{a+b}\right]\right)\Big/$$

$$\left(\sqrt{a+b \operatorname{Cos}[c+d x]}\right)-\left(2 i\left(-7 a^2 b^2+3 b^4\right)\sqrt{\frac{b-b \operatorname{Cos}[c+d x]}{a+b}}\sqrt{-\frac{b+b \operatorname{Cos}[c+d x]}{a-b}}\right.$$

$$\operatorname{Cos}[2(c+d x)]\left(2 a(a-b)\operatorname{EllipticE}\left[i \operatorname{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\sqrt{a+b \operatorname{Cos}[c+d x]}\right],\frac{a+b}{a-b}\right]+\right.$$

$$b\left(2 a \operatorname{EllipticF}\left[i \operatorname{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\sqrt{a+b \operatorname{Cos}[c+d x]}\right],\frac{a+b}{a-b}\right]-b \operatorname{EllipticPi}\left[\right.\right.$$

$$\left.\left.\left.\frac{a+b}{a},i \operatorname{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\sqrt{a+b \operatorname{Cos}[c+d x]}\right],\frac{a+b}{a-b}\right]\right)\right)\operatorname{Sin}[c+d x]\Bigg)\Big/$$

$$\left(a\sqrt{-\frac{1}{a+b}}\sqrt{1-\operatorname{Cos}[c+d x]^2}\sqrt{-\frac{a^2-b^2-2 a(a+b \operatorname{Cos}[c+d x])+(a+b \operatorname{Cos}[c+d x])^2}{b^2}}\right.$$

$$\left.\left.\left(2 a^2-b^2-4 a(a+b \operatorname{Cos}[c+d x])+2(a+b \operatorname{Cos}[c+d x])^2\right)\right)\right)+$$

$$\frac{1}{d}\sqrt{a+b \operatorname{Cos}[c+d x]}\left(\frac{2 b^2 \operatorname{Sin}[c+d x]}{3 a\left(a^2-b^2\right)(a+b \operatorname{Cos}[c+d x])^2}+\right.$$

$$\left.\frac{2\left(7 a^2 b^2 \operatorname{Sin}[c+d x]-3 b^4 \operatorname{Sin}[c+d x]\right)}{3 a^2\left(a^2-b^2\right)^2(a+b \operatorname{Cos}[c+d x])}\right)$$

Problem 545: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\operatorname{Sec}[c+d x]^2}{(a+b \operatorname{Cos}[c+d x])^{5/2}}\, dx$$

Optimal (type 4, 380 leaves, 11 steps):

$$-\left(\left(\left(3\,a^4-26\,a^2\,b^2+15\,b^4\right)\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\;\mathrm{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]\right)\Big/\left(3\,a^3\,\left(a^2-b^2\right)^2\,d\,\sqrt{\frac{a+b\,\mathrm{Cos}[c+d\,x]}{a+b}}\right)\right)+$$

$$\frac{\left(3\,a^2-5\,b^2\right)\sqrt{\frac{a+b\,\mathrm{Cos}[c+d\,x]}{a+b}}\;\mathrm{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{3\,a^2\,\left(a^2-b^2\right)\,d\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}-$$

$$\frac{5\,b\,\sqrt{\frac{a+b\,\mathrm{Cos}[c+d\,x]}{a+b}}\;\mathrm{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,\frac{2\,b}{a+b}\right]}{a^3\,d\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}+$$

$$\frac{b\,\left(3\,a^2-5\,b^2\right)\,\mathrm{Sin}[c+d\,x]}{3\,a^2\,\left(a^2-b^2\right)\,d\,\left(a+b\,\mathrm{Cos}[c+d\,x]\right)^{3/2}}+$$

$$\frac{b\,\left(3\,a^4-26\,a^2\,b^2+15\,b^4\right)\,\mathrm{Sin}[c+d\,x]}{3\,a^3\,\left(a^2-b^2\right)^2\,d\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}+\frac{\mathrm{Tan}[c+d\,x]}{a\,d\,\left(a+b\,\mathrm{Cos}[c+d\,x]\right)^{3/2}}$$

Result (type 4, 638 leaves) :

$$-\frac{1}{12\,a^3\,(-a+b)^2\,(a+b)^2\,d}\,b\left(\frac{2\,(-36\,a^3\,b+20\,a\,b^3)\,\sqrt{\frac{a+b\,\mathrm{Cos}[c+d\,x]}{a+b}}\,\mathrm{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\frac{2\,b}{a+b}\right]}{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}+\left(2\,(33\,a^4-86\,a^2\,b^2+45\,b^4)\,\sqrt{\frac{a+b\,\mathrm{Cos}[c+d\,x]}{a+b}}\,\mathrm{EllipticPi}\left[2,\frac{1}{2}\,(c+d\,x),\frac{2\,b}{a+b}\right]\right)\Big/\left(\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)-\left(2\,\mathrm{i}\,(3\,a^4-26\,a^2\,b^2+15\,b^4)\,\sqrt{\frac{b-b\,\mathrm{Cos}[c+d\,x]}{a+b}}\,\sqrt{-\frac{b+b\,\mathrm{Cos}[c+d\,x]}{a-b}}\,\mathrm{Cos}[2\,(c+d\,x)]\left(2\,a\,(a-b)\,\mathrm{EllipticE}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right],\frac{a+b}{a-b}\right]+b\left(2\,a\,\mathrm{EllipticF}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right],\frac{a+b}{a-b}\right]-b\,\mathrm{EllipticPi}\left[\frac{a+b}{a},\mathrm{i}\,\mathrm{ArcSinh}\left[\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right],\frac{a+b}{a-b}\right]\right)\right)\mathrm{Sin}[c+d\,x]\right)\Big/\left(a\,\sqrt{-\frac{1}{a+b}}\,\sqrt{1-\mathrm{Cos}[c+d\,x]^2}\,\sqrt{-\frac{a^2-b^2-2\,a\,(a+b\,\mathrm{Cos}[c+d\,x])+(a+b\,\mathrm{Cos}[c+d\,x])^2}{b^2}}\,\left(2\,a^2-b^2-4\,a\,(a+b\,\mathrm{Cos}[c+d\,x])+2\,(a+b\,\mathrm{Cos}[c+d\,x])^2\right)\right)\right)+$$

$$\frac{1}{d}\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\,\left(-\frac{2\,b^3\,\mathrm{Sin}[c+d\,x]}{3\,a^2\,(a^2-b^2)\,(a+b\,\mathrm{Cos}[c+d\,x])^2}-\frac{4\,(5\,a^2\,b^3\,\mathrm{Sin}[c+d\,x]-3\,b^5\,\mathrm{Sin}[c+d\,x])}{3\,a^3\,(a^2-b^2)^2\,(a+b\,\mathrm{Cos}[c+d\,x])}+\frac{\mathrm{Tan}[c+d\,x]}{a^3}\right)$$

Problem 552: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Sec}[c+d\,x]^2}{\sqrt{3+4\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 101 leaves, 6 steps):

$$-\frac{\sqrt{7}\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,\frac{8}{7}\right]}{3\,d}+\frac{\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,\frac{8}{7}\right]}{\sqrt{7}\,d}-\frac{4\,\text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,\frac{8}{7}\right]}{3\,\sqrt{7}\,d}+\frac{\sqrt{3+4\,\text{Cos}[c+d\,x]}\,\text{Tan}[c+d\,x]}{3\,d}$$

Result (type 4, 158 leaves):

$$\frac{1}{3\,d}\left(-\frac{6\,\text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,\frac{8}{7}\right]}{\sqrt{7}}+\left(i\left(21\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{3+4\,\text{Cos}[c+d\,x]}\right],\,-\frac{1}{7}\right]-12\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{3+4\,\text{Cos}[c+d\,x]}\right],\,-\frac{1}{7}\right]-8\,\text{EllipticPi}\left[-\frac{1}{3},\,i\,\text{ArcSinh}\left[\sqrt{3+4\,\text{Cos}[c+d\,x]}\right],\,-\frac{1}{7}\right]\right)\text{Sin}[c+d\,x]\right)\Big/\left(3\,\sqrt{7}\,\sqrt{\text{Sin}[c+d\,x]^2}\right)+\sqrt{3+4\,\text{Cos}[c+d\,x]}\,\text{Tan}[c+d\,x]\right)$$

Problem 553: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Sec}[c+d\,x]^3}{\sqrt{3+4\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 137 leaves, 7 steps):

$$\frac{\sqrt{7}\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,\frac{8}{7}\right]}{3\,d}-\frac{\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,\frac{8}{7}\right]}{3\,\sqrt{7}\,d}+\frac{\sqrt{7}\,\text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,\frac{8}{7}\right]}{3\,d}-\frac{\sqrt{3+4\,\text{Cos}[c+d\,x]}\,\text{Tan}[c+d\,x]}{3\,d}+\frac{\sqrt{3+4\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{6\,d}$$

Result (type 4, 195 leaves):

$$\frac{1}{6\,d}\left(\frac{4\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,\frac{8}{7}\right]}{\sqrt{7}}+\frac{18\,\text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,\frac{8}{7}\right]}{\sqrt{7}}-\left(2\,i\left(21\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{3+4\,\text{Cos}[c+d\,x]}\right],\,-\frac{1}{7}\right]-12\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{3+4\,\text{Cos}[c+d\,x]}\right],\,-\frac{1}{7}\right]-8\,\text{EllipticPi}\left[-\frac{1}{3},\,i\,\text{ArcSinh}\left[\sqrt{3+4\,\text{Cos}[c+d\,x]}\right],\,-\frac{1}{7}\right]\right)\text{Sin}[c+d\,x]\right)\Big/\left(3\,\sqrt{7}\,\sqrt{\text{Sin}[c+d\,x]^2}\right)-(-1+2\,\text{Cos}[c+d\,x])\,\sqrt{3+4\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]\right)$$

Problem 559: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Sec}[c+d\,x]^2}{\sqrt{3-4\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 104 leaves, 6 steps):

$$-\frac{\sqrt{7}\,\text{EllipticE}\left[\frac{1}{2}\,(c+\pi+d\,x),\,\frac{8}{7}\right]}{3\,d}+\frac{\text{EllipticF}\left[\frac{1}{2}\,(c+\pi+d\,x),\,\frac{8}{7}\right]}{\sqrt{7}\,d}-\frac{4\,\text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+\pi+d\,x),\,\frac{8}{7}\right]}{3\,\sqrt{7}\,d}+\frac{\sqrt{3-4\,\text{Cos}[c+d\,x]}\,\text{Tan}[c+d\,x]}{3\,d}$$

Result (type 4, 179 leaves):

$$\frac{1}{3\,d}\left(\frac{6\,\sqrt{-3+4\,\text{Cos}[c+d\,x]}\,\text{EllipticPi}\left[2,\,\frac{1}{2}\,(c+d\,x),\,8\right]}{\sqrt{3-4\,\text{Cos}[c+d\,x]}}-\left(i\left(21\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{3-4\,\text{Cos}[c+d\,x]}\right],\,-\frac{1}{7}\right]-12\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{3-4\,\text{Cos}[c+d\,x]}\right],\,-\frac{1}{7}\right]-8\,\text{EllipticPi}\left[-\frac{1}{3},\,i\,\text{ArcSinh}\left[\sqrt{3-4\,\text{Cos}[c+d\,x]}\right],\,-\frac{1}{7}\right]\right)\text{Sin}[c+d\,x]\right)\Big/\left(3\,\sqrt{7}\,\sqrt{\text{Sin}[c+d\,x]^2}\right)+\sqrt{3-4\,\text{Cos}[c+d\,x]}\,\text{Tan}[c+d\,x]\right)$$

Problem 560: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Sec}[c+d\,x]^3}{\sqrt{3-4\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 140 leaves, 7 steps):

$$-\frac{\sqrt{7}\,\text{EllipticE}\left[\frac{1}{2}(c+\pi+d x),\frac{8}{7}\right]}{3 d}+\frac{\text{EllipticF}\left[\frac{1}{2}(c+\pi+d x),\frac{8}{7}\right]}{3\sqrt{7}\,d}-\frac{\sqrt{7}\,\text{EllipticPi}\left[2,\frac{1}{2}(c+\pi+d x),\frac{8}{7}\right]}{3 d}+\frac{\sqrt{3-4\,\text{Cos}[c+d x]}\,\text{Tan}[c+d x]}{3 d}+\frac{\sqrt{3-4\,\text{Cos}[c+d x]}\,\text{Sec}[c+d x]\,\text{Tan}[c+d x]}{6 d}$$

Result (type 4, 236 leaves):

$$\frac{1}{6 d}\left(-\frac{4\sqrt{-3+4\,\text{Cos}[c+d x]}\,\text{EllipticF}\left[\frac{1}{2}(c+d x),8\right]}{\sqrt{3-4\,\text{Cos}[c+d x]}}+\frac{18\sqrt{-3+4\,\text{Cos}[c+d x]}\,\text{EllipticPi}\left[2,\frac{1}{2}(c+d x),8\right]}{\sqrt{3-4\,\text{Cos}[c+d x]}}-\left(2\,i\left(21\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{3-4\,\text{Cos}[c+d x]}\right],-\frac{1}{7}\right]-12\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{3-4\,\text{Cos}[c+d x]}\right],-\frac{1}{7}\right]-8\,\text{EllipticPi}\left[-\frac{1}{3},i\,\text{ArcSinh}\left[\sqrt{3-4\,\text{Cos}[c+d x]}\right],-\frac{1}{7}\right]\right)\text{Sin}[c+d x]\right)\Big/\left(3\sqrt{7}\sqrt{\text{Sin}[c+d x]^2}\right)+\sqrt{3-4\,\text{Cos}[c+d x]}\,(1+2\,\text{Cos}[c+d x])\,\text{Sec}[c+d x]\,\text{Tan}[c+d x]\right)$$

Problem 586: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\text{Cos}[c+d x]^{3/2}\,(a+b\,\text{Cos}[c+d x])}\,dx$$

Optimal (type 4, 77 leaves, 5 steps):

$$-\frac{2\,\text{EllipticE}\left[\frac{1}{2}(c+d x),2\right]}{a d}-\frac{2 b\,\text{EllipticPi}\left[\frac{2 b}{a+b},\frac{1}{2}(c+d x),2\right]}{a(a+b) d}+\frac{2\,\text{Sin}[c+d x]}{a d\sqrt{\text{Cos}[c+d x]}}$$

Result (type 4, 199 leaves):

$$-\frac{1}{2\,a\,d}\left(\frac{6\,b\,\text{EllipticPi}\left[\frac{2\,b}{a+b},\frac{1}{2}\,(c+d\,x),2\right]}{a+b}+\frac{2\,a\left(2\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]-\frac{2\,a\,\text{EllipticPi}\left[\frac{2\,b}{a+b},\frac{1}{2}\,(c+d\,x),2\right]}{a+b}\right)}{b}-\frac{4\,\text{Sin}[c+d\,x]}{\sqrt{\text{Cos}[c+d\,x]}}+\left(2\left(-2\,a\,b\,\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\text{Cos}[c+d\,x]}\right],-1\right]+2\,a\,(a+b)\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Cos}[c+d\,x]}\right],-1\right]+\left(2\,a^2-b^2\right)\text{EllipticPi}\left[-\frac{b}{a},-\text{ArcSin}\left[\sqrt{\text{Cos}[c+d\,x]}\right],-1\right]\right)\text{Sin}[c+d\,x]\right)\Big/\left(a\,b\,\sqrt{\text{Sin}[c+d\,x]^2}\right)\right)$$

Problem 587: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\text{Cos}[c+d\,x]^{5/2}\,(a+b\,\text{Cos}[c+d\,x])}\,dx$$

Optimal (type 4, 128 leaves, 7 steps):

$$\frac{2\,b\,\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),2\right]}{a^2\,d}+\frac{2\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]}{3\,a\,d}+\frac{2\,b^2\,\text{EllipticPi}\left[\frac{2\,b}{a+b},\frac{1}{2}\,(c+d\,x),2\right]}{a^2\,(a+b)\,d}+\frac{2\,\text{Sin}[c+d\,x]}{3\,a\,d\,\text{Cos}[c+d\,x]^{3/2}}-\frac{2\,b\,\text{Sin}[c+d\,x]}{a^2\,d\,\sqrt{\text{Cos}[c+d\,x]}}$$

Result (type 4, 258 leaves):

$$\frac{1}{6\,a^2\,d}\left(\frac{2\left(2\,a^2+9\,b^2\right)\text{EllipticPi}\left[\frac{2\,b}{a+b},\frac{1}{2}\,(c+d\,x),2\right]}{a+b}+8\,a\left(2\,\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),2\right]-\frac{2\,a\,\text{EllipticPi}\left[\frac{2\,b}{a+b},\frac{1}{2}\,(c+d\,x),2\right]}{a+b}\right)+\left(6\,\text{Cos}[2\,(c+d\,x)]\left(-2\,a\,b\,\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\text{Cos}[c+d\,x]}\right],-1\right]+2\,a\,(a+b)\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Cos}[c+d\,x]}\right],-1\right]+\left(2\,a^2-b^2\right)\text{EllipticPi}\left[-\frac{b}{a},-\text{ArcSin}\left[\sqrt{\text{Cos}[c+d\,x]}\right],-1\right]\right)\text{Sin}[c+d\,x]\right)\Big/\left(a\,\sqrt{1-\text{Cos}[c+d\,x]^2}\,\left(-1+2\,\text{Cos}[c+d\,x]^2\right)\right)\right)+\frac{\sqrt{\text{Cos}[c+d\,x]}\,\left(-\frac{2\,b\,\text{Tan}[c+d\,x]}{a^2}+\frac{2\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{3\,a}\right)}{d}$$

Problem 603: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \text{Cos}[c+d x]^{3/2} \sqrt{a+b \,\text{Cos}[c+d x]} \, dx$$

Optimal (type 4, 438 leaves, 7 steps):

$$-\frac{1}{4 b d}(a-b)\sqrt{a+b}\,\text{Cot}[c+d x]\,\text{EllipticE}\Big[\text{ArcSin}\Big[\frac{\sqrt{a+b\,\text{Cos}[c+d x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d x]}}\Big],-\frac{a+b}{a-b}\Big]\sqrt{\frac{a(1-\text{Sec}[c+d x])}{a+b}}\sqrt{\frac{a(1+\text{Sec}[c+d x])}{a-b}}+\frac{1}{4 b d}\sqrt{a+b}\,(a+2 b)\,\text{Cot}[c+d x]\,\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{\sqrt{a+b\,\text{Cos}[c+d x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d x]}}\Big],-\frac{a+b}{a-b}\Big]\sqrt{\frac{a(1-\text{Sec}[c+d x])}{a+b}}\sqrt{\frac{a(1+\text{Sec}[c+d x])}{a-b}}+\frac{1}{4 b^2 d}\sqrt{a+b}\,(a^2-4 b^2)\,\text{Cot}[c+d x]\,\text{EllipticPi}\Big[\frac{a+b}{b},\text{ArcSin}\Big[\frac{\sqrt{a+b\,\text{Cos}[c+d x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d x]}}\Big],-\frac{a+b}{a-b}\Big]\sqrt{\frac{a(1-\text{Sec}[c+d x])}{a+b}}\sqrt{\frac{a(1+\text{Sec}[c+d x])}{a-b}}+\frac{a\sqrt{a+b\,\text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{4 b d\sqrt{\text{Cos}[c+d x]}}+\frac{\sqrt{\text{Cos}[c+d x]}\,\sqrt{a+b\,\text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{2 d}$$

Result (type 4, 1152 leaves):

$$\frac{\sqrt{\text{Cos}[c+d x]}\,\sqrt{a+b\,\text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{2 d}+$$

$$\frac{1}{8 d}\Bigg(-\Bigg(\Bigg(\Bigg(12 a^2\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\text{Cos}[c+d x]\,\text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d x])\,\text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}\,\text{Csc}[c+d x]$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d x])\,\text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}}{\sqrt{2}}\Big],-\frac{2 a}{-a+b}\Big]\,\text{Sin}\Big[\frac{1}{2}(c+d x)\Big]^4\Bigg)\Bigg/$$

$$\left(\left(a+b\right)\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg) -$$

$$16\,a\,b\left(\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Bigg/$$

$$\left(\left(a+b\right)\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\left.\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Bigg/\left(b\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+$$

$$2\,a\left(\left(i\,\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\right],\right.\right.\right.$$

$$\left.\left.-\frac{2\,a}{-a-b}\right]\text{Sec}[c+d\,x]\right)\Bigg/$$

$$\left(b\sqrt{\text{Cos}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\text{Sec}[c+d\,x]}\,\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}2\,a\left(\left(a\sqrt{\frac{\left(a+b\right)\text{Cot}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{-a+b}}\,\sqrt{-\frac{\left(a+b\right)\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]^4\right)\Bigg/$$

$$\left(\left(a+b\right)\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-$$

$$\left(a\sqrt{\frac{\left(a+b\right)\text{Cot}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{-a+b}}\,\sqrt{-\frac{\left(a+b\right)\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\right.$$

$$\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\,\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\right.$$

$$\left.\left.\text{ArcSin}\left[\frac{\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]^4\right)\Bigg/$$

$$\left.\left.\left(b\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{b\sqrt{\text{Cos}[c+d\,x]}}\right)\right)$$

Problem 604: Result more than twice size of optimal antiderivative.

$$\int\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 4, 371 leaves, 7 steps):

$$-\frac{1}{a\,d}(a-b)\sqrt{a+b}\,\text{Cot}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{1}{d}$$

$$\sqrt{a+b}\,\text{Cot}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}-\frac{1}{b\,d}$$

$$a\sqrt{a+b}\,\text{Cot}[c+d\,x]\,\text{EllipticPi}\left[\frac{a+b}{b},\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d\sqrt{\text{Cos}[c+d\,x]}}$$

Result (type 4, 2437 leaves):

$$\left(\sqrt{\text{Cos}[c+d\,x]}\,(1+\text{Cos}[c+d\,x])^{3/2}\,\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\right.$$
$$\left(2\,(a+b)\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\,\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right],\frac{-a+b}{a+b}\right]-\right.$$
$$4\,a\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\,\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right],\frac{-a+b}{a+b}\right]-$$
$$4\,a\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\,\text{EllipticPi}\left[-1,-\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right],\frac{-a+b}{a+b}\right]+$$
$$b\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]\text{Sin}\left[\frac{3}{2}(c+d\,x)\right]+$$
$$\left.\left.2\,a\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]-b\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)\right)\Big/$$
$$\left(4\,d\left(\frac{1}{8\,(a+b\,\text{Cos}[c+d\,x])^{3/2}}\,b\,(1+\text{Cos}[c+d\,x])^{3/2}\,\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\,\text{Sin}[c+d\,x]\right.\right.$$

$$\left(2\,(a+b)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\;\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]-\right.$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\;\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]-$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\;\text{EllipticPi}\left[-1,\,-\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]+$$

$$b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]\,\text{Sin}\left[\frac{3}{2}\,(c+d\,x)\right]+$$

$$\left.2\,a\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]-b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right)-$$

$$\frac{1}{8\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,3\,\sqrt{1+\text{Cos}[c+d\,x]}\;\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Sin}[c+d\,x]$$

$$\left(2\,(a+b)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\;\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]-\right.$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\;\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]-$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\;\text{EllipticPi}\left[-1,\,-\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]+$$

$$b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]\,\text{Sin}\left[\frac{3}{2}\,(c+d\,x)\right]+$$

$$\left.2\,a\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]-b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right)+$$

$$\frac{1}{4\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,(1+\text{Cos}[c+d\,x])^{3/2}\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]$$

$$\left(2\,(a+b)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\;\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]-\right.$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\;\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]-$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\;\text{EllipticPi}\Big[-1,\,-\text{ArcSin}\Big[\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Big],\,\frac{-a+b}{a+b}\Big]+$$

$$b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]\,\text{Sin}\Big[\frac{3}{2}\,(c+d\,x)\Big]+$$

$$2\,a\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]-b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Bigg)+$$

$$\frac{1}{4\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,(1+\text{Cos}[c+d\,x])^{3/2}\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2$$

$$\Bigg(\frac{3}{2}\,b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Cos}\Big[\frac{3}{2}\,(c+d\,x)\Big]\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]+$$

$$a\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2-\frac{1}{2}\,b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2+$$

$$\Bigg((a+b)\,\text{EllipticE}\Big[\text{ArcSin}\Big[\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Big],\,\frac{-a+b}{a+b}\Big]\,\Bigg(-\frac{b\,\text{Sin}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}+$$

$$\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sin}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])^2}\Bigg)\Bigg)\Bigg/\left(\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\right)-$$

$$\Bigg(2\,a\,\text{EllipticF}\Big[\text{ArcSin}\Big[\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Big],\,\frac{-a+b}{a+b}\Big]\,\Bigg(-\frac{b\,\text{Sin}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}+$$

$$\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sin}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])^2}\Bigg)\Bigg)\Bigg/\left(\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\right)-$$

$$\Bigg(2\,a\,\text{EllipticPi}\Big[-1,\,-\text{ArcSin}\Big[\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Big],\,\frac{-a+b}{a+b}\Big]\,\Bigg(-\frac{b\,\text{Sin}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}+$$

$$\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sin}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])^2}\Bigg)\Bigg)\Bigg/\left(\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\right)+$$

$$\frac{1}{2\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}}\,b\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]\,\left(\frac{\text{Cos}[c+d\,x]\,\text{Sin}[c+d\,x]}{(1+\text{Cos}[c+d\,x])^2}-\frac{\text{Sin}[c+d\,x]}{1+\text{Cos}[c+d\,x]}\right)$$

$$\text{Sin}\left[\frac{3}{2}\left(c+d\,x\right)\right]+\frac{a\left(\frac{\text{Cos}[c+d\,x]\,\text{Sin}[c+d\,x]}{(1+\text{Cos}[c+d\,x])^2}-\frac{\text{Sin}[c+d\,x]}{1+\text{Cos}[c+d\,x]}\right)\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]}{\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}}-$$

$$\frac{b\left(\frac{\text{Cos}[c+d\,x]\,\text{Sin}[c+d\,x]}{(1+\text{Cos}[c+d\,x])^2}-\frac{\text{Sin}[c+d\,x]}{1+\text{Cos}[c+d\,x]}\right)\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]}{2\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}}+$$

$$\frac{1}{2}\,b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]\text{Sin}\left[\frac{3}{2}\left(c+d\,x\right)\right]\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]-$$

$$\frac{2\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\;\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{\sqrt{1-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}\,\sqrt{1-\frac{(-a+b)\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}{a+b}}}+$$

$$\left(2\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\,\left(1+\text{Cos}[c+d\,x]\right)}}\;\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right)\Bigg/$$

$$\left(\sqrt{1-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}\,\left(1+\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right)\sqrt{1-\frac{\left(-a+b\right)\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a+b}}\right)+$$

$$\left(\left(a+b\right)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\,\left(1+\text{Cos}[c+d\,x]\right)}}\;\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right.$$

$$\left.\left.\left.\sqrt{1-\frac{\left(-a+b\right)\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a+b}}\right)\Bigg/\left(\sqrt{1-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}\right)\right)\right)\right)$$

Problem 607: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\text{Cos}[c+d\,x]^{5/2}}\,dx$$

Optimal (type 4, 271 leaves, 4 steps):

$$\frac{1}{3a^2 d}2(a-b)\,b\sqrt{a+b}\,\text{Cot}[c+dx]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+dx]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+dx]}}\right],-\frac{a+b}{a-b}\right]$$
$$\sqrt{\frac{a(1-\text{Sec}[c+dx])}{a+b}}\sqrt{\frac{a(1+\text{Sec}[c+dx])}{a-b}}+\frac{1}{3ad}$$
$$2(a-b)\sqrt{a+b}\,\text{Cot}[c+dx]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+dx]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+dx]}}\right],-\frac{a+b}{a-b}\right]$$
$$\sqrt{\frac{a(1-\text{Sec}[c+dx])}{a+b}}\sqrt{\frac{a(1+\text{Sec}[c+dx])}{a-b}}+\frac{2\sqrt{a+b\,\text{Cos}[c+dx]}\,\text{Sin}[c+dx]}{3d\,\text{Cos}[c+dx]^{3/2}}$$

Result (type 4, 2854 leaves):

$$\frac{1}{3d}4a\left(\left(\sqrt{\text{Cot}\left[\frac{1}{2}(c+dx)\right]^2}\sqrt{-\frac{(a+b)\,\text{Cos}[c+dx]\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}\right.\right.$$
$$\sqrt{\frac{(a+b\,\text{Cos}[c+dx])\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}\,\text{Csc}[c+dx]$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-\frac{(a+b)\,\text{Cos}[c+dx]\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}}{\sqrt{2}}\right],\frac{2a}{a+b}\right]\text{Sin}\left[\frac{1}{2}(c+dx)\right]^4\right)\Bigg/$$
$$\left(\sqrt{\text{Cos}[c+dx]}\,\sqrt{a+b\,\text{Cos}[c+dx]}\right)-\left(b\sqrt{\text{Cot}\left[\frac{1}{2}(c+dx)\right]^2}\right.$$
$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+dx]\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}\sqrt{\frac{(a+b\,\text{Cos}[c+dx])\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}$$
$$\text{Csc}[c+dx]\,\text{EllipticPi}\left[\frac{a}{a+b},\text{ArcSin}\left[\frac{\sqrt{-\frac{(a+b)\,\text{Cos}[c+dx]\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}}{\sqrt{2}}\right],\frac{2a}{a+b}\right]$$
$$\left.\text{Sin}\left[\frac{1}{2}(c+dx)\right]^4\right)\Bigg/\left((a+b)\sqrt{\text{Cos}[c+dx]}\,\sqrt{a+b\,\text{Cos}[c+dx]}\right)-$$

$$\Bigg(b \sqrt{\text{Cos}[c+d\,x]}\ \left(1+\text{Cos}[c+d\,x]\right)^{3/2} \text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2$$

$$\Bigg(2\left(a+b\right)\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\left(1+\text{Cos}[c+d\,x]\right)}}\ \text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\frac{-a+b}{a+b}\right]-$$

$$4\,a\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\left(1+\text{Cos}[c+d\,x]\right)}}\ \text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\frac{-a+b}{a+b}\right]-$$

$$4\,a\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\left(1+\text{Cos}[c+d\,x]\right)}}\ \text{EllipticPi}\left[-1,-\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\frac{-a+b}{a+b}\right]+$$

$$b\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\ \text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]\text{Sin}\left[\frac{3}{2}\left(c+d\,x\right)\right]+$$

$$2\,a\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\ \text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]-b\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\ \text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\Bigg)\Bigg)\Bigg/$$

$$\Bigg(6\,a\,d\,\Bigg(\frac{1}{8\left(a+b\,\text{Cos}[c+d\,x]\right)^{3/2}}\,b\left(1+\text{Cos}[c+d\,x]\right)^{3/2}\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\text{Sin}[c+d\,x]$$

$$\Bigg(2\left(a+b\right)\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\left(1+\text{Cos}[c+d\,x]\right)}}\ \text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\frac{-a+b}{a+b}\right]-$$

$$4\,a\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\left(1+\text{Cos}[c+d\,x]\right)}}\ \text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\frac{-a+b}{a+b}\right]-$$

$$4\,a\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\left(1+\text{Cos}[c+d\,x]\right)}}\ \text{EllipticPi}\left[-1,-\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\frac{-a+b}{a+b}\right]+$$

$$b\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\ \text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]\text{Sin}\left[\frac{3}{2}\left(c+d\,x\right)\right]+$$

$$2\,a\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\ \text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]-b\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\ \text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\Bigg)-$$

$$\frac{1}{8\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,3\sqrt{1+\text{Cos}[c+d\,x]}\ \text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\text{Sin}[c+d\,x]$$

$$\left(2\,(a+b)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\,\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]-\right.$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\,\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]-$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\,\text{EllipticPi}\left[-1,\,-\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]+$$

$$b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]\,\text{Sin}\left[\frac{3}{2}\,(c+d\,x)\right]+$$

$$\left.2\,a\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]-b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right)+$$

$$\frac{1}{4\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,(1+\text{Cos}[c+d\,x])^{3/2}\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]$$

$$\left(2\,(a+b)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\,\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]-\right.$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\,\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]-$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\,\text{EllipticPi}\left[-1,\,-\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]+$$

$$b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]\,\text{Sin}\left[\frac{3}{2}\,(c+d\,x)\right]+$$

$$\left.2\,a\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]-b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right)+$$

$$\frac{1}{4\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,(1+\text{Cos}[c+d\,x])^{3/2}\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2$$

$$\left(\frac{3}{2}\,b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Cos}\left[\frac{3}{2}\,(c+d\,x)\right]\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]+\right.$$

$$a\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2-\frac{1}{2}\,b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2+$$

$$\left((a+b)\,\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],\frac{-a+b}{a+b}\right]\left(-\frac{b\,\text{Sin}[c+d x]}{(a+b)\,(1+\text{Cos}[c+d x])}+\frac{(a+b\,\text{Cos}[c+d x])\,\text{Sin}[c+d x]}{(a+b)\,(1+\text{Cos}[c+d x])^2}\right)\right)\Bigg/\left(\sqrt{\frac{a+b\,\text{Cos}[c+d x]}{(a+b)\,(1+\text{Cos}[c+d x])}}\right)-$$

$$\left(2 a\,\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],\frac{-a+b}{a+b}\right]\left(-\frac{b\,\text{Sin}[c+d x]}{(a+b)\,(1+\text{Cos}[c+d x])}+\frac{(a+b\,\text{Cos}[c+d x])\,\text{Sin}[c+d x]}{(a+b)\,(1+\text{Cos}[c+d x])^2}\right)\right)\Bigg/\left(\sqrt{\frac{a+b\,\text{Cos}[c+d x]}{(a+b)\,(1+\text{Cos}[c+d x])}}\right)-$$

$$\left(2 a\,\text{EllipticPi}\left[-1,-\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],\frac{-a+b}{a+b}\right]\left(-\frac{b\,\text{Sin}[c+d x]}{(a+b)\,(1+\text{Cos}[c+d x])}+\frac{(a+b\,\text{Cos}[c+d x])\,\text{Sin}[c+d x]}{(a+b)\,(1+\text{Cos}[c+d x])^2}\right)\right)\Bigg/\left(\sqrt{\frac{a+b\,\text{Cos}[c+d x]}{(a+b)\,(1+\text{Cos}[c+d x])}}\right)+$$

$$\frac{1}{2\sqrt{\frac{\text{Cos}[c+d x]}{1+\text{Cos}[c+d x]}}}\,b\,\text{Sec}\left[\frac{1}{2}(c+d x)\right]\left(\frac{\text{Cos}[c+d x]\,\text{Sin}[c+d x]}{(1+\text{Cos}[c+d x])^2}-\frac{\text{Sin}[c+d x]}{1+\text{Cos}[c+d x]}\right)$$

$$\text{Sin}\left[\frac{3}{2}(c+d x)\right]+\frac{a\left(\frac{\text{Cos}[c+d x]\,\text{Sin}[c+d x]}{(1+\text{Cos}[c+d x])^2}-\frac{\text{Sin}[c+d x]}{1+\text{Cos}[c+d x]}\right)\text{Tan}\left[\frac{1}{2}(c+d x)\right]}{\sqrt{\frac{\text{Cos}[c+d x]}{1+\text{Cos}[c+d x]}}}-$$

$$\frac{b\left(\frac{\text{Cos}[c+d x]\,\text{Sin}[c+d x]}{(1+\text{Cos}[c+d x])^2}-\frac{\text{Sin}[c+d x]}{1+\text{Cos}[c+d x]}\right)\text{Tan}\left[\frac{1}{2}(c+d x)\right]}{2\sqrt{\frac{\text{Cos}[c+d x]}{1+\text{Cos}[c+d x]}}}+$$

$$\frac{1}{2}\,b\sqrt{\frac{\text{Cos}[c+d x]}{1+\text{Cos}[c+d x]}}\;\text{Sec}\left[\frac{1}{2}(c+d x)\right]\text{Sin}\left[\frac{3}{2}(c+d x)\right]\text{Tan}\left[\frac{1}{2}(c+d x)\right]-$$

$$\frac{2 a\sqrt{\frac{a+b\,\text{Cos}[c+d x]}{(a+b)\,(1+\text{Cos}[c+d x])}}\;\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2}{\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}\sqrt{1-\frac{(-a+b)\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{a+b}}}+$$

$$\left(2 a\sqrt{\frac{a+b\,\text{Cos}[c+d x]}{(a+b)\,(1+\text{Cos}[c+d x])}}\;\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\right)\Bigg/$$

$$\left(\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}\left(1+\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)\sqrt{1-\frac{(-a+b)\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{a+b}}\right)+$$

$$\left((a+b)\sqrt{\frac{a+b\,\mathrm{Cos}[c+d\,x]}{(a+b)\,(1+\mathrm{Cos}[c+d\,x])}}\,\mathrm{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\right.$$

$$\left.\left.\left.\sqrt{1-\frac{(-a+b)\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}{a+b}}\right/\left(\sqrt{1-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}\right)\right)\right)\right)+$$

$$\frac{1}{d}\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\,\left(\frac{2\,b\,\mathrm{Tan}[c+d\,x]}{3\,a}+\frac{2}{3}\,\mathrm{Sec}[c+d\,x]\,\mathrm{Tan}[c+d\,x]\right)$$

Problem 608: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}{\mathrm{Cos}[c+d\,x]^{7/2}}\,dx$$

Optimal (type 4, 329 leaves, 5 steps):

$$\frac{1}{15\,a^3\,d}2\,(a-b)\,\sqrt{a+b}\,\left(9\,a^2-2\,b^2\right)\,\mathrm{Cot}[c+d\,x]\,\mathrm{EllipticE}\left[\mathrm{ArcSin}\left[\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\mathrm{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$

$$\sqrt{\frac{a\,(1-\mathrm{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\mathrm{Sec}[c+d\,x])}{a-b}}-\frac{1}{15\,a^2\,d}$$

$$2\,(a-b)\,\sqrt{a+b}\,(9\,a+2\,b)\,\mathrm{Cot}[c+d\,x]\,\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\mathrm{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$

$$\sqrt{\frac{a\,(1-\mathrm{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\mathrm{Sec}[c+d\,x])}{a-b}}+$$

$$\frac{2\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{5\,d\,\mathrm{Cos}[c+d\,x]^{5/2}}+\frac{2\,b\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{15\,a\,d\,\mathrm{Cos}[c+d\,x]^{3/2}}$$

Result (type 4, 1253 leaves):

$$-\frac{1}{15\,a^2\,d}$$

$$\left(-\left(\left(\left(4\,a\,\left(2\,a^2\,b-2\,b^3\right)\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.\right.\right.\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\;\mathrm{Csc}[c+d\,x]$$

$$\left.\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\mathrm{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Big/$$

$$\left.\left((a+b)\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)\right)-4\,a\,\left(9\,a^3-2\,a\,b^2\right)$$

$$\left(\left(\left(\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.\right.\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\;\mathrm{Csc}[c+d\,x]$$

$$\left.\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\mathrm{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Big/$$

$$\left((a+b)\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}$$

$$\mathrm{Csc}[c+d\,x]\,\mathrm{EllipticPi}\left[-\frac{a}{b},\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\left.\text{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right) \Big/ \left(b \sqrt{\text{Cos}[c+d x]} \sqrt{a+b \text{Cos}[c+d x]}\right)\right) +$$

$$2 \left(9 a^2 b-2 b^3\right) \left(\left(i \text{Cos}\left[\frac{1}{2}(c+d x)\right] \sqrt{a+b \text{Cos}[c+d x]} \text{EllipticE}\left[\right.\right.\right.$$

$$\left.\left. i \text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}(c+d x)\right]}{\sqrt{\text{Cos}[c+d x]}}\right], -\frac{2 a}{-a-b}\right] \text{Sec}[c+d x]\right) \Big/$$

$$\left(b \sqrt{\text{Cos}\left[\frac{1}{2}(c+d x)\right]^2 \text{Sec}[c+d x]} \sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Sec}[c+d x]}{a+b}}\right) +$$

$$\frac{1}{b} 2 a \left(\left(a \sqrt{\frac{(a+b) \text{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \text{Cos}[c+d x] \text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}} \text{Csc}[c+d x] \text{EllipticF}\left[\right.$$

$$\left.\left.\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}}{\sqrt{2}}\right], -\frac{2 a}{-a+b}\right] \text{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right) \Big/$$

$$\left((a+b) \sqrt{\text{Cos}[c+d x]} \sqrt{a+b \text{Cos}[c+d x]}\right) -$$

$$\left(a \sqrt{\frac{(a+b) \text{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \text{Cos}[c+d x] \text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}\right.$$

$$\sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}} \text{Csc}[c+d x] \text{EllipticPi}\left[-\frac{a}{b},\right.$$

$$\left.\left.\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}}{\sqrt{2}}\right], -\frac{2 a}{-a+b}\right] \text{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right) \Big/$$

$$\left.\left.\left(b\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\,\text{Sin}[c+d\,x]}{b\,\sqrt{\text{Cos}[c+d\,x]}}\right)\right)+$$

$$\frac{1}{d}\sqrt{\text{Cos}[c+d\,x]}\,\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\left(\frac{2\,\text{Sec}[c+d\,x]\,\left(9\,a^2\,\text{Sin}[c+d\,x]-2\,b^2\,\text{Sin}[c+d\,x]\right)}{15\,a^2}+\frac{2\,b\,\text{Sec}[c+d\,x]\,\,\text{Tan}[c+d\,x]}{15\,a}+\frac{2}{5}\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)$$

Problem 609: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\text{Cos}[c+d\,x]^{9/2}}\,dx$$

Optimal (type 4, 389 leaves, 6 steps):

$$\frac{1}{105\,a^4\,d}2\,(a-b)\,b\,\sqrt{a+b}\,\left(19\,a^2+8\,b^2\right)\,\text{Cot}[c+d\,x]\,\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$

$$\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{1}{105\,a^3\,d}2\,(a-b)\,\sqrt{a+b}$$

$$\left(25\,a^2+6\,a\,b+8\,b^2\right)\,\text{Cot}[c+d\,x]\,\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$

$$\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{2\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\,\text{Sin}[c+d\,x]}{7\,d\,\text{Cos}[c+d\,x]^{7/2}}+$$

$$\frac{2\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\,\text{Sin}[c+d\,x]}{35\,a\,d\,\text{Cos}[c+d\,x]^{5/2}}+\frac{2\,\left(25\,a^2-4\,b^2\right)\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\,\text{Sin}[c+d\,x]}{105\,a^2\,d\,\text{Cos}[c+d\,x]^{3/2}}$$

Result (type 4, 1304 leaves):

$$\frac{1}{105\,a^3\,d}\left(-\left(\left(4\,a\,\left(25\,a^4-17\,a^2\,b^2-8\,b^4\right)\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\right.\right.\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\ \sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/\left.\left((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)-$$

$$4\,a\,\left(-19\,a^3\,b-8\,a\,b^3\right)\left(\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\ \sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\ \text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\ \sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\ \text{EllipticPi}\left[-\frac{a}{b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/\left.\left(b\,\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+$$

$$2\left(-19a^2b^2-8b^4\right)\left(\left(\mathrm{i}\,\text{Cos}\left[\frac{1}{2}(c+dx)\right]\sqrt{a+b\,\text{Cos}[c+dx]}\;\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}(c+dx)\right]}{\sqrt{\text{Cos}[c+dx]}}\right],-\frac{2a}{-a-b}\right]\text{Sec}[c+dx]\right)\Big/\left(b\sqrt{\text{Cos}\left[\frac{1}{2}(c+dx)\right]^2\text{Sec}[c+dx]}\sqrt{\frac{(a+b\,\text{Cos}[c+dx])\,\text{Sec}[c+dx]}{a+b}}\right)+\right.$$

$$\frac{1}{b}2a\left(\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+dx)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\text{Cos}[c+dx]\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+dx])\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}\;\text{Csc}[c+dx]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+dx])\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+dx)\right]^4\right)\Big/$$

$$\left((a+b)\sqrt{\text{Cos}[c+dx]}\sqrt{a+b\,\text{Cos}[c+dx]}\right)-\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+dx)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+dx]\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}\sqrt{\frac{(a+b\,\text{Cos}[c+dx])\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}$$

$$\text{Csc}[c+dx]\,\text{EllipticPi}\left[-\frac{a}{b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+dx])\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2a}{-a+b}\right]$$

$$\left.\left.\text{Sin}\left[\frac{1}{2}(c+dx)\right]^4\right)\Big/\left(b\sqrt{\text{Cos}[c+dx]}\sqrt{a+b\,\text{Cos}[c+dx]}\right)\right)+$$

$$\left.\left.\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Sin}[c+d\,x]}{b\,\sqrt{\text{Cos}[c+d\,x]}}\right)\right)+\frac{1}{d}\sqrt{\text{Cos}[c+d\,x]}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}$$

$$\left(\frac{2\,\text{Sec}[c+d\,x]^2\,\left(25\,a^2\,\text{Sin}[c+d\,x]-4\,b^2\,\text{Sin}[c+d\,x]\right)}{105\,a^2}+\frac{2\,\text{Sec}[c+d\,x]\,\left(19\,a^2\,b\,\text{Sin}[c+d\,x]+8\,b^3\,\text{Sin}[c+d\,x]\right)}{105\,a^3}+\frac{2\,b\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]}{35\,a}+\frac{2}{7}\,\text{Sec}[c+d\,x]^3\,\text{Tan}[c+d\,x]\right)$$

Problem 610: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \text{Cos}[c+d\,x]^{3/2}\,\left(a+b\,\text{Cos}[c+d\,x]\right)^{3/2}\,dx$$

Optimal (type 4, 508 leaves, 8 steps):

$$-\frac{1}{24\,a\,b\,d}\left(a-b\right)\sqrt{a+b}\,\left(3\,a^2+16\,b^2\right)\,\text{Cot}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{1}{24\,b\,d}$$

$$\sqrt{a+b}\,\left(a+2\,b\right)\,\left(3\,a+8\,b\right)\,\text{Cot}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{1}{8\,b^2\,d}$$

$$a\,\sqrt{a+b}\,\left(a^2-12\,b^2\right)\,\text{Cot}[c+d\,x]\,\text{EllipticPi}\left[\frac{a+b}{b},\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+$$

$$\frac{\left(3\,a^2+16\,b^2\right)\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{24\,b\,d\,\sqrt{\text{Cos}[c+d\,x]}}+\frac{a\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{4\,d}+\frac{\sqrt{\text{Cos}[c+d\,x]}\,\left(a+b\,\text{Cos}[c+d\,x]\right)^{3/2}\,\text{Sin}[c+d\,x]}{3\,d}$$

Result (type 4, 1189 leaves):

$$\frac{1}{48\,d}\left(-\left(\left(4\,a\,\left(17\,a^2+16\,b^2\right)\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Bigg/$$

$$\left.\left.\left((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)-\right.$$

$$208\,a^2\,b\left(\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Big/$$

$$\left((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\left.\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Big/\left(b\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+$$

$$2\,(3\,a^2+16\,b^2)\left(\left(\mathbb{i}\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{EllipticE}\left[\right.\right.\right.$$

$$\left.\left.\mathbb{i}\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{2\,a}{-a-b}\right]\,\text{Sec}[c+d\,x]\right)\Big/$$

$$\left(b\,\sqrt{\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Sec}[c+d\,x]}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}2\,a\left(\left(\left(a\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\mathrm{Csc}[c+d\,x]$$

$$\left.\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left((a+b)\sqrt{\mathrm{Cos}[c+d\,x]}\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)-$$

$$\left(a\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\mathrm{Csc}[c+d\,x]\;\mathrm{EllipticPi}\left[-\frac{a}{b},\right.$$

$$\left.\left.\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left.\left.\left(b\sqrt{\mathrm{Cos}[c+d\,x]}\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)\right)+\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\;\mathrm{Sin}[c+d\,x]}{b\sqrt{\mathrm{Cos}[c+d\,x]}}\right)\right)+$$

$$\frac{1}{d}\sqrt{\mathrm{Cos}[c+d\,x]}\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\left(\frac{7}{12}a\,\mathrm{Sin}[c+d\,x]+\frac{1}{6}b\,\mathrm{Sin}[2\,(c+d\,x)]\right)$$

Problem 611: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \sqrt{\text{Cos}[c+d x]}\,(a+b\,\text{Cos}[c+d x])^{3/2}\,dx$$

Optimal (type 4, 433 leaves, 8 steps):

$$-\frac{1}{4 d}5\,(a-b)\,\sqrt{a+b}\,\text{Cot}[c+d x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d x])}{a-b}}+\frac{1}{4 d}\sqrt{a+b}\,(5 a+2 b)\,\text{Cot}[c+d x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d x])}{a-b}}-\frac{1}{4 b d}\sqrt{a+b}\,(3 a^2+4 b^2)\,\text{Cot}[c+d x]\,\text{EllipticPi}\left[\frac{a+b}{b},\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d x])}{a-b}}+\frac{3 a\sqrt{a+b\,\text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{4 d\sqrt{\text{Cos}[c+d x]}}+\frac{(a+b\,\text{Cos}[c+d x])^{3/2}\,\text{Sin}[c+d x]}{2 d\sqrt{\text{Cos}[c+d x]}}$$

Result (type 4, 1165 leaves):

$$\frac{b\sqrt{\text{Cos}[c+d x]}\,\sqrt{a+b\,\text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{2 d}+\frac{1}{8 d}\left(-\left(\left(28 a^2 b\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d x]\,\text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d x])\,\text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}\,\text{Csc}[c+d x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d x])\,\text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right)\Big/\left((a+b)\sqrt{\text{Cos}[c+d x]}\,\sqrt{a+b\,\text{Cos}[c+d x]}\right)\right)-4 a\,(8 a^2+4 b^2)$$

$$\left(\left(\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\mathrm{Csc}[c+d\,x]$$

$$\left.\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\,\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left((a+b)\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\mathrm{Csc}[c+d\,x]\,\mathrm{EllipticPi}\left[-\frac{a}{b},\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\left.\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/\left(b\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)\right)+$$

$$10\,a\,b\left(\left(\mathrm{i}\,\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\,\mathrm{EllipticE}\left[\right.\right.\right.$$

$$\left.\left.\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{\mathrm{Cos}[c+d\,x]}}\right],-\frac{2\,a}{-a-b}\right]\,\mathrm{Sec}[c+d\,x]\right)\Big/$$

$$\left(b\,\sqrt{\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\mathrm{Sec}[c+d\,x]}\,\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}2\,a\left(\left(a\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\mathrm{Csc}[c+d\,x]$$

$$\left.\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left((a+b)\sqrt{\mathrm{Cos}[c+d\,x]}\;\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)-$$

$$\left(a\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\mathrm{Csc}[c+d\,x]\;\mathrm{EllipticPi}\left[-\frac{a}{b},\right.$$

$$\left.\left.\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left.\left(b\sqrt{\mathrm{Cos}[c+d\,x]}\;\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)+\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\;\mathrm{Sin}[c+d\,x]}{b\sqrt{\mathrm{Cos}[c+d\,x]}}\right)$$

Problem 613: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{(a+b\,\mathrm{Cos}[c+d\,x])^{3/2}}{\mathrm{Cos}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 4, 337 leaves, 5 steps):

$$\frac{1}{d}2\,(a-b)\,\sqrt{a+b}\,\text{Cot}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}-\frac{1}{d}$$
$$2\,(a-2\,b)\,\sqrt{a+b}\,\text{Cot}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}-\frac{1}{d}$$
$$2\,b\,\sqrt{a+b}\,\text{Cot}[c+d\,x]\,\text{EllipticPi}\left[\frac{a+b}{b},\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}$$

Result (type 4, 1162 leaves):

$$-\left(\left(4\,a^2\,b\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.\right.$$
$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Bigg/$$
$$\left.\left((a+b)\,d\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+$$
$$\frac{1}{d}4\,a\,(a^2-b^2)\,\left(\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.\right.$$
$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Big/$$

$$\left(\left(a+b\right)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-$$

$$\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticPi}\left[-\frac{a}{b},\,\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Big/$$

$$\left.\left(b\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+\frac{2\,a\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d\,\sqrt{\text{Cos}[c+d\,x]}}-$$

$$\frac{1}{d}2\,a\,b\,\left(\left(\text{i}\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{EllipticE}\left[\text{i}\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{2\,a}{-a-b}\right]\right.\right.$$

$$\left.\text{Sec}[c+d\,x]\right)\Big/\left(b\,\sqrt{\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Sec}[c+d\,x]}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}2\,a\,\left(\left(a\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\Bigg)\Bigg/$$

$$\left((a+b)\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-$$

$$\Bigg(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\right.$$

$$\left.\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\Bigg)\Bigg/$$

$$\left(b\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg)+\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{b\sqrt{\text{Cos}[c+d\,x]}}\Bigg)$$

Problem 614: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{(a+b\,\text{Cos}[c+d\,x])^{3/2}}{\text{Cos}[c+d\,x]^{5/2}}\,dx$$

Optimal (type 4, 277 leaves, 4 steps):

$$\frac{1}{3\,a\,d}8\,(a-b)\,b\sqrt{a+b}\,\text{Cot}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$

$$\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{1}{3\,a\,d}$$

$$2\,(a-3\,b)\,(a-b)\sqrt{a+b}\,\text{Cot}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$

$$\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{2\,a\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{3\,d\,\text{Cos}[c+d\,x]^{3/2}}$$

Result (type 4, 1183 leaves):

$$\frac{1}{3 d}\Bigg(-\Bigg(\Bigg(4 a \left(a^2-b^2\right) \sqrt{\frac{(a+b) \operatorname{Cot}\left[\frac{1}{2} (c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \operatorname{Cos}[c+d x] \operatorname{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}$$

$$\sqrt{\frac{(a+b \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \operatorname{Csc}[c+d x]$$

$$\operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\frac{\sqrt{\frac{(a+b \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right] \operatorname{Sin}\left[\frac{1}{2} (c+d x)\right]^4\Bigg)\Big/$$

$$\left((a+b) \sqrt{\operatorname{Cos}[c+d x]} \sqrt{a+b \operatorname{Cos}[c+d x]}\right)\Bigg)+$$

$$16 a^2 b \Bigg(\Bigg(\sqrt{\frac{(a+b) \operatorname{Cot}\left[\frac{1}{2} (c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \operatorname{Cos}[c+d x] \operatorname{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}$$

$$\sqrt{\frac{(a+b \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \operatorname{Csc}[c+d x]$$

$$\operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\frac{\sqrt{\frac{(a+b \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right] \operatorname{Sin}\left[\frac{1}{2} (c+d x)\right]^4\Bigg)\Big/$$

$$\left((a+b) \sqrt{\operatorname{Cos}[c+d x]} \sqrt{a+b \operatorname{Cos}[c+d x]}\right)-\Bigg(\sqrt{\frac{(a+b) \operatorname{Cot}\left[\frac{1}{2} (c+d x)\right]^2}{-a+b}}$$

$$\sqrt{-\frac{(a+b) \operatorname{Cos}[c+d x] \operatorname{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \sqrt{\frac{(a+b \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}$$

$$\mathrm{Csc}[c+d\,x]\,\mathrm{EllipticPi}\left[-\frac{a}{b},\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\left.\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/\left(b\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)\right)-$$

$$8\,b^2\left(\left(\mathrm{i}\,\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\,\mathrm{EllipticE}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{\mathrm{Cos}[c+d\,x]}}\right],\right.\right.\right.$$

$$\left.\left.-\frac{2\,a}{-a-b}\right]\mathrm{Sec}[c+d\,x]\right)\Big/$$

$$\left(b\,\sqrt{\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\mathrm{Sec}[c+d\,x]}\,\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}\,2\,a\left(\left(a\,\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\mathrm{Csc}[c+d\,x]$$

$$\left.\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left((a+b)\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)-$$

$$\left(a\,\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\mathrm{Csc}[c+d\,x]\,\mathrm{EllipticPi}\left[-\frac{a}{b},\right.$$

$$\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\Bigg)\Bigg/$$

$$\left(b\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg)+\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{b\sqrt{\text{Cos}[c+d\,x]}}\Bigg)\Bigg)+$$

$$\frac{1}{d}\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\left(\frac{8}{3}\,b\,\text{Tan}[c+d\,x]+\frac{2}{3}\,a\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]\right)$$

Problem 615: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{(a+b\,\text{Cos}[c+d\,x])^{3/2}}{\text{Cos}[c+d\,x]^{7/2}}\,dx$$

Optimal (type 4, 325 leaves, 5 steps):

$$\frac{1}{5\,a^2\,d}2\,(a-b)\,\sqrt{a+b}\,\left(3\,a^2+b^2\right)\,\text{Cot}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$
$$\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}-\frac{1}{5\,a\,d}$$
$$2\,(a-b)\,(3\,a-b)\,\sqrt{a+b}\,\text{Cot}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$
$$\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+$$
$$\frac{2\,a\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{5\,d\,\text{Cos}[c+d\,x]^{5/2}}+\frac{4\,b\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{5\,d\,\text{Cos}[c+d\,x]^{3/2}}$$

Result (type 4, 1245 leaves):

$$-\frac{1}{5 a d}\left(-\left(\left(4 a\left(-a^2 b+b^3\right) \sqrt{\frac{(a+b) \operatorname{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \operatorname{Cos}[c+d x] \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}\right.\right.\right.$$

$$\sqrt{\frac{(a+b \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}} \operatorname{Csc}[c+d x]$$

$$\left.\operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\frac{\sqrt{\frac{(a+b \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right] \operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right) \Big/$$

$$\left.\left((a+b) \sqrt{\operatorname{Cos}[c+d x]} \sqrt{a+b \operatorname{Cos}[c+d x]}\right)\right)-4 a\left(3 a^3+a b^2\right)$$

$$\left(\left(\sqrt{\frac{(a+b) \operatorname{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \operatorname{Cos}[c+d x] \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}} \operatorname{Csc}[c+d x]$$

$$\left.\operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\frac{\sqrt{\frac{(a+b \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right] \operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right) \Big/$$

$$\left((a+b) \sqrt{\operatorname{Cos}[c+d x]} \sqrt{a+b \operatorname{Cos}[c+d x]}\right)-\left(\sqrt{\frac{(a+b) \operatorname{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b) \operatorname{Cos}[c+d x] \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}} \sqrt{\frac{(a+b \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}$$

$$\operatorname{Csc}[c+d x] \operatorname{EllipticPi}\left[-\frac{a}{b}, \operatorname{ArcSin}\left[\frac{\sqrt{\frac{(a+b \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right]$$

$$\left.\left.\mathrm{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right) \Big/ \left(b\sqrt{\mathrm{Cos}[c+d x]}\sqrt{a+b\,\mathrm{Cos}[c+d x]}\right)\right)+$$

$$2\left(3a^2 b+b^3\right)\left(\left(\left(i\,\mathrm{Cos}\left[\frac{1}{2}(c+d x)\right]\sqrt{a+b\,\mathrm{Cos}[c+d x]}\;\mathrm{EllipticE}\left[\right.\right.\right.\right.$$

$$\left.\left.i\,\mathrm{ArcSinh}\left[\frac{\mathrm{Sin}\left[\frac{1}{2}(c+d x)\right]}{\sqrt{\mathrm{Cos}[c+d x]}}\right],-\frac{2a}{-a-b}\right]\mathrm{Sec}[c+d x]\right)\Big/$$

$$\left(b\sqrt{\mathrm{Cos}\left[\frac{1}{2}(c+d x)\right]^2\mathrm{Sec}[c+d x]}\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d x])\,\mathrm{Sec}[c+d x]}{a+b}}\right)+$$

$$\frac{1}{b}2a\left(\left(a\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}\;\mathrm{Csc}[c+d x]\;\mathrm{EllipticF}\left[\right.$$

$$\left.\left.\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2a}{-a+b}\right]\mathrm{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right)\Big/$$

$$\left((a+b)\sqrt{\mathrm{Cos}[c+d x]}\sqrt{a+b\,\mathrm{Cos}[c+d x]}\right)-$$

$$\left(a\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}\;\mathrm{Csc}[c+d x]\;\mathrm{EllipticPi}\left[-\frac{a}{b},\right.$$

$$\left.\left.\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2a}{-a+b}\right]\mathrm{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right)\Big/$$

$$\left(b\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg) + \frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\ \text{Sin}[c+d\,x]}{b\sqrt{\text{Cos}[c+d\,x]}}\Bigg)\Bigg) +$$

$$\frac{1}{d}\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\ \left(\frac{2\,\text{Sec}[c+d\,x]\ \left(3\,a^2\,\text{Sin}[c+d\,x]+b^2\,\text{Sin}[c+d\,x]\right)}{5\,a} + \frac{4}{5}\,b\,\text{Sec}[c+d\,x]\ \text{Tan}[c+d\,x] + \frac{2}{5}\,a\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)$$

Problem 616: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b\,\text{Cos}[c+d\,x]\right)^{3/2}}{\text{Cos}[c+d\,x]^{9/2}}\,dx$$

Optimal (type 4, 387 leaves, 6 steps):

$$\frac{1}{105\,a^3\,d}4\,(a-b)\,b\,\sqrt{a+b}\,\left(41\,a^2-3\,b^2\right)\,\text{Cot}[c+d\,x]\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\ \sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$
$$\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\ \sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}} + \frac{1}{105\,a^2\,d}2\,(a-b)\,\sqrt{a+b}$$
$$\left(25\,a^2-57\,a\,b-6\,b^2\right)\,\text{Cot}[c+d\,x]\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\ \sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$
$$\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\ \sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}} + \frac{2\,a\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\ \text{Sin}[c+d\,x]}{7\,d\,\text{Cos}[c+d\,x]^{7/2}} +$$
$$\frac{16\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\ \text{Sin}[c+d\,x]}{35\,d\,\text{Cos}[c+d\,x]^{5/2}} + \frac{2\,\left(25\,a^2+3\,b^2\right)\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\ \text{Sin}[c+d\,x]}{105\,a\,d\,\text{Cos}[c+d\,x]^{3/2}}$$

Result (type 4, 1302 leaves):

$$\frac{1}{105\,a^2\,d}\left(-\left(\left(4\,a\,\left(25\,a^4-31\,a^2\,b^2+6\,b^4\right)\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\right.\right.\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\bigg/\left.\left((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)-$$

$$4\,a\,\left(-82\,a^3\,b+6\,a\,b^3\right)\left(\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\bigg/$$

$$\left((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\left.\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Bigg/\left(b\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+$$

$$2\,\left(-82\,a^2\,b^2+6\,b^4\right)\,\left(\left(\text{i}\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right.\right.$$

$$\left.\text{EllipticE}\left[\text{i}\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{2\,a}{-a-b}\right]\,\text{Sec}[c+d\,x]\right)\Bigg/$$

$$\left(b\,\sqrt{\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Sec}[c+d\,x]}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}\,2\,a\,\left(\left(a\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Bigg/$$

$$\left((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(a\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\left.\mathrm{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right) \Big/ \left(b\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)\right) +$$

$$\left.\left.\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{b\,\sqrt{\mathrm{Cos}[c+d\,x]}}\right)\right) + \frac{1}{d}\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}$$

$$\left(\frac{2\,\mathrm{Sec}[c+d\,x]^2\,\left(25\,a^2\,\mathrm{Sin}[c+d\,x]+3\,b^2\,\mathrm{Sin}[c+d\,x]\right)}{105\,a} + \frac{4\,\mathrm{Sec}[c+d\,x]\,\left(41\,a^2\,b\,\mathrm{Sin}[c+d\,x]-3\,b^3\,\mathrm{Sin}[c+d\,x]\right)}{105\,a^2} + \frac{16}{35}\,b\,\mathrm{Sec}[c+d\,x]^2\,\mathrm{Tan}[c+d\,x] + \frac{2}{7}\,a\,\mathrm{Sec}[c+d\,x]^3\,\mathrm{Tan}[c+d\,x]\right)$$

Problem 617: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{(a+b\,\mathrm{Cos}[c+d\,x])^{3/2}}{\mathrm{Cos}[c+d\,x]^{11/2}}\,dx$$

Optimal (type 4, 454 leaves, 7 steps):

$$\frac{1}{315 a^4 d} 2 (a-b) \sqrt{a+b} \left(147 a^4+33 a^2 b^2+8 b^4\right) \text{Cot}[c+d x] \\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \text{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \sqrt{\frac{a (1-\text{Sec}[c+d x])}{a+b}} \\ \sqrt{\frac{a (1+\text{Sec}[c+d x])}{a-b}}-\frac{1}{315 a^3 d} 2 (a-b) \sqrt{a+b} \left(147 a^3-39 a^2 b-6 a b^2-8 b^3\right) \\ \text{Cot}[c+d x] \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \text{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \\ \sqrt{\frac{a (1-\text{Sec}[c+d x])}{a+b}} \sqrt{\frac{a (1+\text{Sec}[c+d x])}{a-b}}+\frac{2 a \sqrt{a+b \text{Cos}[c+d x]} \text{Sin}[c+d x]}{9 d \text{Cos}[c+d x]^{9/2}}+ \\ \frac{20 b \sqrt{a+b \text{Cos}[c+d x]} \text{Sin}[c+d x]}{63 d \text{Cos}[c+d x]^{7/2}}+\frac{2 \left(49 a^2+3 b^2\right) \sqrt{a+b \text{Cos}[c+d x]} \text{Sin}[c+d x]}{315 a d \text{Cos}[c+d x]^{5/2}}+ \\ \frac{8 b \left(22 a^2-b^2\right) \sqrt{a+b \text{Cos}[c+d x]} \text{Sin}[c+d x]}{315 a^2 d \text{Cos}[c+d x]^{3/2}}$$

Result (type 4, 1368 leaves):

$$-\frac{1}{315 a^3 d}\left(-\left(\left(\left(4 a \left(-39 a^4 b+31 a^2 b^3+8 b^5\right) \right.\right.\right.\right. \\ \sqrt{\frac{(a+b) \text{Cot}\left[\frac{1}{2} (c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \text{Cos}[c+d x] \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \\ \sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \text{Csc}[c+d x] \\ \left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right] \text{Sin}\left[\frac{1}{2} (c+d x)\right]^4\right) \Big/ \\ \left.\left((a+b) \sqrt{\text{Cos}[c+d x]} \sqrt{a+b \text{Cos}[c+d x]}\right)\right)-4 a \left(147 a^5+33 a^3 b^2+8 a b^4\right)$$

$$\left(\left(\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\mathrm{Csc}[c+d\,x]$$

$$\left.\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\,\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left((a+b)\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\mathrm{Csc}[c+d\,x]\,\mathrm{EllipticPi}\left[-\frac{a}{b},\,\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]$$

$$\left.\left.\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/\left(b\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)\right)+$$

$$2\left(147\,a^4\,b+33\,a^2\,b^3+8\,b^5\right)\left(\left(\mathrm{i}\,\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right.\right.$$

$$\left.\mathrm{EllipticE}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{\mathrm{Cos}[c+d\,x]}}\right],\,-\frac{2\,a}{-a-b}\right]\,\mathrm{Sec}[c+d\,x]\right)\Big/$$

$$\left(b\,\sqrt{\mathrm{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\,\mathrm{Sec}[c+d\,x]}\,\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b} 2 a \Bigg(\Bigg(\Bigg(a \sqrt{\frac{(a+b) \operatorname{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \operatorname{Cos}[c+d x] \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}$$

$$\sqrt{\frac{(a+b \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}} \operatorname{Csc}[c+d x] \operatorname{EllipticF}\Bigg[$$

$$\operatorname{ArcSin}\Bigg[\frac{\sqrt{\frac{(a+b \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}}{\sqrt{2}}\Bigg], -\frac{2 a}{-a+b}\Bigg] \operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]^4\Bigg) \Big/$$

$$\left((a+b) \sqrt{\operatorname{Cos}[c+d x]} \sqrt{a+b \operatorname{Cos}[c+d x]}\right) -$$

$$\Bigg(a \sqrt{\frac{(a+b) \operatorname{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \operatorname{Cos}[c+d x] \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}$$

$$\sqrt{\frac{(a+b \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}} \operatorname{Csc}[c+d x] \operatorname{EllipticPi}\Bigg[-\frac{a}{b},$$

$$\operatorname{ArcSin}\Bigg[\frac{\sqrt{\frac{(a+b \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}}{\sqrt{2}}\Bigg], -\frac{2 a}{-a+b}\Bigg] \operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]^4\Bigg) \Big/$$

$$\left(b \sqrt{\operatorname{Cos}[c+d x]} \sqrt{a+b \operatorname{Cos}[c+d x]}\right)\Bigg) + \frac{\sqrt{a+b \operatorname{Cos}[c+d x]} \operatorname{Sin}[c+d x]}{b \sqrt{\operatorname{Cos}[c+d x]}}\Bigg)\Bigg) +$$

$$\frac{1}{d}\sqrt{\operatorname{Cos}[c+d x]} \sqrt{a+b \operatorname{Cos}[c+d x]} \Bigg(\frac{2 \operatorname{Sec}[c+d x]^3 \left(49 a^2 \operatorname{Sin}[c+d x]+3 b^2 \operatorname{Sin}[c+d x]\right)}{315 a} +$$

$$\frac{8 \operatorname{Sec}[c+d x]^2 \left(22 a^2 b \operatorname{Sin}[c+d x]-b^3 \operatorname{Sin}[c+d x]\right)}{315 a^2} +$$

$$\frac{1}{315 a^3} 2 \operatorname{Sec}[c+d x] \left(147 a^4 \operatorname{Sin}[c+d x]+33 a^2 b^2 \operatorname{Sin}[c+d x]+8 b^4 \operatorname{Sin}[c+d x]\right) + \frac{20}{63}$$

$$b$$

$$\text{Sec}[c+d x]^3 \text{Tan}[c+d x]+\frac{2}{9} a \text{Sec}[c+d x]^4 \text{Tan}[c+d x]\Big)$$

Problem 618: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \sqrt{\text{Cos}[c+d x]}\,(a+b \text{Cos}[c+d x])^{5/2}\,dx$$

Optimal (type 4, 506 leaves, 8 steps):

$$-\frac{1}{24 a d}(a-b)\sqrt{a+b}\left(33 a^2+16 b^2\right)\text{Cot}[c+d x]\,\text{EllipticE}\Big[\text{ArcSin}\Big[\frac{\sqrt{a+b \text{Cos}[c+d x]}}{\sqrt{a+b}\sqrt{\text{Cos}[c+d x]}}\Big],-\frac{a+b}{a-b}\Big]\sqrt{\frac{a(1-\text{Sec}[c+d x])}{a+b}}\sqrt{\frac{a(1+\text{Sec}[c+d x])}{a-b}}+\frac{1}{24 d}\sqrt{a+b}\left(33 a^2+26 a b+16 b^2\right)\text{Cot}[c+d x]\,\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{\sqrt{a+b \text{Cos}[c+d x]}}{\sqrt{a+b}\sqrt{\text{Cos}[c+d x]}}\Big],-\frac{a+b}{a-b}\Big]\sqrt{\frac{a(1-\text{Sec}[c+d x])}{a+b}}\sqrt{\frac{a(1+\text{Sec}[c+d x])}{a-b}}-\frac{1}{8 b d}5 a\sqrt{a+b}\left(a^2+4 b^2\right)\text{Cot}[c+d x]\,\text{EllipticPi}\Big[\frac{a+b}{b},\text{ArcSin}\Big[\frac{\sqrt{a+b \text{Cos}[c+d x]}}{\sqrt{a+b}\sqrt{\text{Cos}[c+d x]}}\Big],-\frac{a+b}{a-b}\Big]\sqrt{\frac{a(1-\text{Sec}[c+d x])}{a+b}}\sqrt{\frac{a(1+\text{Sec}[c+d x])}{a-b}}+\frac{\left(33 a^2+16 b^2\right)\sqrt{a+b \text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{24 d\sqrt{\text{Cos}[c+d x]}}+\frac{13 a b\sqrt{\text{Cos}[c+d x]}\sqrt{a+b \text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{12 d}+\frac{b^2 \text{Cos}[c+d x]^{3/2}\sqrt{a+b \text{Cos}[c+d x]}\,\text{Sin}[c+d x]}{3 d}$$

Result (type 4, 1203 leaves):

$$\frac{1}{48 d}\Bigg(-\Bigg(\Bigg(4 a\left(59 a^2 b+16 b^3\right)\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\text{Cos}[c+d x]\,\text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left.\left((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)-4\,a\,\left(48\,a^3+76\,a\,b^2\right)$$

$$\left(\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\,\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]$$

$$\left.\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/\left(b\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg)+$$

$$2\left(33 a^2 b+16 b^3\right)\left(\left(\mathrm{i}\,\mathrm{Cos}\left[\frac{1}{2}(c+d x)\right]\sqrt{a+b\,\mathrm{Cos}[c+d x]}\right.\right.$$

$$\left.\mathrm{EllipticE}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\mathrm{Sin}\left[\frac{1}{2}(c+d x)\right]}{\sqrt{\mathrm{Cos}[c+d x]}}\right],-\frac{2 a}{-a-b}\right]\mathrm{Sec}[c+d x]\right)\Big/$$

$$\left(b\sqrt{\mathrm{Cos}\left[\frac{1}{2}(c+d x)\right]^2\mathrm{Sec}[c+d x]}\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d x])\,\mathrm{Sec}[c+d x]}{a+b}}\right)+$$

$$\frac{1}{b}2 a\left(\left(a\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}\,\mathrm{Csc}[c+d x]$$

$$\left.\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right]\mathrm{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right)\Big/$$

$$\left((a+b)\sqrt{\mathrm{Cos}[c+d x]}\sqrt{a+b\,\mathrm{Cos}[c+d x]}\right)-$$

$$\left(a\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}\,\mathrm{Csc}[c+d x]\,\mathrm{EllipticPi}\left[-\frac{a}{b},\right.$$

$$\left.\left.\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right]\mathrm{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right)\Big/$$

$$\left.\left.\left(b\sqrt{\mathrm{Cos}[c+d x]}\sqrt{a+b\,\mathrm{Cos}[c+d x]}\right)+\frac{\sqrt{a+b\,\mathrm{Cos}[c+d x]}\,\mathrm{Sin}[c+d x]}{b\sqrt{\mathrm{Cos}[c+d x]}}\right)\right)+$$

$$\frac{1}{d}\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\left(\frac{13}{12}\,a\,b\,\text{Sin}[c+d\,x]+\frac{1}{6}\,b^2\,\text{Sin}[2\,(c+d\,x)]\right)$$

Problem 619: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{(a+b\,\text{Cos}[c+d\,x])^{5/2}}{\sqrt{\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 443 leaves, 7 steps):

$$-\frac{1}{4\,d}9\,(a-b)\,b\,\sqrt{a+b}\,\text{Cot}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{1}{4\,d}\sqrt{a+b}\,(8\,a^2+9\,a\,b+2\,b^2)\,\text{Cot}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}-\frac{1}{4\,d}\sqrt{a+b}\,(15\,a^2+4\,b^2)\,\text{Cot}[c+d\,x]\,\text{EllipticPi}\left[\frac{a+b}{b},\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{9\,a\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{4\,d\,\sqrt{\text{Cos}[c+d\,x]}}+\frac{b^2\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{2\,d}$$

Result (type 4, 1179 leaves):

$$\frac{b^2\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{2\,d}+\frac{1}{8\,d}\left(-\left(\left(4\,a\,(8\,a^3+11\,a\,b^2)\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.\right.\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\mathrm{Csc}[c+d\,x]$$

$$\left.\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left.\left((a+b)\sqrt{\mathrm{Cos}[c+d\,x]}\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)\right)-4\,a\left(24\,a^2\,b+4\,b^3\right)$$

$$\left(\left(\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\mathrm{Csc}[c+d\,x]$$

$$\left.\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left((a+b)\sqrt{\mathrm{Cos}[c+d\,x]}\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\mathrm{Csc}[c+d\,x]\,\mathrm{EllipticPi}\left[-\frac{a}{b},\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\left.\mathrm{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/\left(b\sqrt{\mathrm{Cos}[c+d\,x]}\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)\right)+$$

$$18\,a\,b^2\left(\left(\mathbb{i}\,\mathrm{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\;\mathrm{EllipticE}\left[\mathbb{i}\,\mathrm{ArcSinh}\left[\frac{\mathrm{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]}{\sqrt{\mathrm{Cos}[c+d\,x]}}\right],\,-\frac{2\,a}{-a-b}\right]\,\mathrm{Sec}[c+d\,x]\right)\Bigg/\left(b\,\sqrt{\mathrm{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\mathrm{Sec}[c+d\,x]}\;\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Sec}[c+d\,x]}{a+b}}\right)+\right.$$

$$\frac{1}{b}\,2\,a\left(\left(a\,\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\;\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\;\mathrm{Csc}[c+d\,x]$$

$$\left.\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\,\mathrm{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Bigg/$$

$$\left((a+b)\,\sqrt{\mathrm{Cos}[c+d\,x]}\;\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)-$$

$$\left(a\,\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\;\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.$$

$$\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\;\mathrm{Csc}[c+d\,x]\,\mathrm{EllipticPi}\left[-\frac{a}{b},\right.$$

$$\left.\left.\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\,\mathrm{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Bigg/$$

$$\left.\left.\left(b\,\sqrt{\mathrm{Cos}[c+d\,x]}\;\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)\right)+\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\;\mathrm{Sin}[c+d\,x]}{b\,\sqrt{\mathrm{Cos}[c+d\,x]}}\right)\right)$$

Problem 620: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{(a+b\,\text{Cos}[c+d\,x])^{5/2}}{\text{Cos}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 4, 445 leaves, 7 steps):

$$\frac{1}{a\,d}(a-b)\sqrt{a+b}\,\left(2\,a^2-b^2\right)\,\text{Cot}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}-\frac{1}{d}\sqrt{a+b}\,\left(2\,a^2-6\,a\,b-b^2\right)\,\text{Cot}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}-\frac{1}{d}5\,a\,b\,\sqrt{a+b}\,\text{Cot}[c+d\,x]\,\text{EllipticPi}\left[\frac{a+b}{b},\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{2\,a^2\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d\,\sqrt{\text{Cos}[c+d\,x]}}-\frac{\left(2\,a^2-b^2\right)\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d\,\sqrt{\text{Cos}[c+d\,x]}}$$

Result (type 4, 1185 leaves):

$$\frac{2\,a^2\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{d\,\sqrt{\text{Cos}[c+d\,x]}}+\frac{1}{2\,d}\left(\left(4\,a\,\left(-4\,a^2\,b-b^3\right)\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\right/$$

$$\left(\left(a+b\right)\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\right)+4\,a\,\left(2\,a^3-6\,a\,b^2\right)$$

$$\left(\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\ \sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\ \text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Big/$$

$$\left(\left(a+b\right)\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\ \sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\ \text{EllipticPi}\left[-\frac{a}{b},\,\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]$$

$$\left.\left.\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Big/\left(b\,\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)-$$

$$2\,\left(2\,a^2\,b-b^3\right)\left(\left(i\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\sqrt{a+b\,\text{Cos}[c+d\,x]}\ \text{EllipticE}\left[\right.\right.\right.$$

$$\left.i\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{2\,a}{-a-b}\right]\,\text{Sec}[c+d\,x]\right)\Big/$$

$$\left(b\,\sqrt{\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Sec}[c+d\,x]}\ \sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}2a\left(\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+dx)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\text{Cos}[c+dx]\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+dx])\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}\;\text{Csc}[c+dx]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+dx])\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+dx)\right]^4\right)\Big/$$

$$\left((a+b)\sqrt{\text{Cos}[c+dx]}\sqrt{a+b\,\text{Cos}[c+dx]}\right)-$$

$$\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+dx)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\text{Cos}[c+dx]\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+dx])\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}\;\text{Csc}[c+dx]\;\text{EllipticPi}\left[-\frac{a}{b},\right.$$

$$\left.\left.\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+dx])\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+dx)\right]^4\right)\Big/$$

$$\left.\left(b\sqrt{\text{Cos}[c+dx]}\sqrt{a+b\,\text{Cos}[c+dx]}\right)\right)+\frac{\sqrt{a+b\,\text{Cos}[c+dx]}\;\text{Sin}[c+dx]}{b\sqrt{\text{Cos}[c+dx]}}\Bigg)\Bigg)$$

Problem 622: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{(a+b\,\text{Cos}[c+dx])^{5/2}}{\text{Cos}[c+dx]^{7/2}}\,dx$$

Optimal (type 4, 338 leaves, 5 steps):

$$\frac{1}{15\,a\,d}2\,(a-b)\,\sqrt{a+b}\,\left(9\,a^2+23\,b^2\right)\,\text{Cot}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}-\frac{1}{15\,a\,d}2\,(a-b)\,\sqrt{a+b}\,\left(9\,a^2-8\,a\,b+15\,b^2\right)\,\text{Cot}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{2\,a^2\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{5\,d\,\text{Cos}[c+d\,x]^{5/2}}+\frac{22\,a\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{15\,d\,\text{Cos}[c+d\,x]^{3/2}}$$

Result (type 4, 1248 leaves):

$$\frac{1}{15\,d}\left(\left(4\,a\,\left(-8\,a^2\,b+8\,b^3\right)\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Big/\left((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)+4\,a\,\left(9\,a^3+23\,a\,b^2\right)\left(\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Big/\right.\right.$$

$$\left(\left(a+b\right)\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{\left(a+b\right)\,\text{Cot}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{\left(a+b\right)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\,\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\,\text{ArcSin}\left[\frac{\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]$$

$$\left.\text{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]^4\right)\Big/\left(b\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg)-$$

$$2\left(9\,a^2\,b+23\,b^3\right)\left(\left(\mathrm{i}\,\text{Cos}\left[\frac{1}{2}\left(c+d\,x\right)\right]\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{EllipticE}\right[\right.\right.$$

$$\left.\mathrm{i}\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{2\,a}{-a-b}\right]\,\text{Sec}[c+d\,x]\right)\Big/$$

$$\left(b\,\sqrt{\text{Cos}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\,\text{Sec}[c+d\,x]}\,\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}\,2\,a\left(\left(a\,\sqrt{\frac{\left(a+b\right)\,\text{Cot}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{-a+b}}\,\sqrt{-\frac{\left(a+b\right)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]^4\right)\Big/$$

$$\left(\left(a+b\right)\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(a\sqrt{\frac{\left(a+b\right)\text{Cot}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{\left(a+b\right)\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\,\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\,\text{ArcSin}\left[\frac{\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]$$

$$\left.\text{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]^4\right)\Big/\left(b\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)+$$

$$\left.\left.\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Sin}[c+d\,x]}{b\sqrt{\text{Cos}[c+d\,x]}}\right)\right)+\frac{1}{d}\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}$$

$$\left(\frac{2}{15}\,\text{Sec}[c+d\,x]\,\left(9\,a^2\,\text{Sin}[c+d\,x]+23\,b^2\,\text{Sin}[c+d\,x]\right)+\right.$$

$$\frac{22}{15}$$

$$a$$

$$b$$

$$\text{Sec}[c+d\,x]$$

$$\text{Tan}[c+d\,x]+\frac{2}{5}$$

$$a^2$$

$$\text{Sec}[c+d\,x]^2$$

$$\left.\text{Tan}[c+d\,x]\right)$$

Problem 623: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)^{5/2}}{\text{Cos}[c+d\,x]^{9/2}}\,dx$$

Optimal (type 4, 387 leaves, 6 steps):

$$\frac{1}{21 a^2 d}$$

$$2 (a-b) b \sqrt{a+b} \left(29 a^2+3 b^2\right) \text{Cot}[c+d x] \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \text{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right]$$

$$\sqrt{\frac{a (1-\text{Sec}[c+d x])}{a+b}} \sqrt{\frac{a (1+\text{Sec}[c+d x])}{a-b}}+\frac{1}{21 a d} 2 (a-b) \sqrt{a+b}$$

$$\left(5 a^2-24 a b+3 b^2\right) \text{Cot}[c+d x] \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \text{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right]$$

$$\sqrt{\frac{a (1-\text{Sec}[c+d x])}{a+b}} \sqrt{\frac{a (1+\text{Sec}[c+d x])}{a-b}}+\frac{2 a^2 \sqrt{a+b \text{Cos}[c+d x]} \text{Sin}[c+d x]}{7 d \text{Cos}[c+d x]^{7/2}}+$$

$$\frac{6 a b \sqrt{a+b \text{Cos}[c+d x]} \text{Sin}[c+d x]}{7 d \text{Cos}[c+d x]^{5/2}}+\frac{2 \left(5 a^2+9 b^2\right) \sqrt{a+b \text{Cos}[c+d x]} \text{Sin}[c+d x]}{21 d \text{Cos}[c+d x]^{3/2}}$$

Result (type 4, 1302 leaves):

$$\frac{1}{21 a d}\left(-\left(\left(4 a \left(5 a^4-2 a^2 b^2-3 b^4\right) \sqrt{\frac{(a+b) \text{Cot}\left[\frac{1}{2} (c+d x)\right]^2}{-a+b}}\right.\right.\right.$$

$$\sqrt{-\frac{(a+b) \text{Cos}[c+d x] \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}$$

$$\text{Csc}[c+d x] \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right]$$

$$\left.\left.\text{Sin}\left[\frac{1}{2} (c+d x)\right]^4\right) \Big/ \left((a+b) \sqrt{\text{Cos}[c+d x]} \sqrt{a+b \text{Cos}[c+d x]}\right)\right)-$$

$$4 a \left(-29 a^3 b-3 a b^3\right) \left(\left(\sqrt{\frac{(a+b) \text{Cot}\left[\frac{1}{2} (c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \text{Cos}[c+d x] \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \text{Csc}[c+d x]$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\Bigg)\Bigg/$$

$$\left((a+b)\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Bigg/\left(b\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg)+$$

$$2\left(-29\,a^2\,b^2-3\,b^4\right)\left(\left(\mathbb{i}\,\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]\sqrt{a+b\,\text{Cos}[c+d\,x]}\right.\right.$$

$$\left.\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{2\,a}{-a-b}\right]\text{Sec}[c+d\,x]\right)\Bigg/$$

$$\left(b\sqrt{\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Sec}[c+d\,x]}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}2\,a\left(\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\Bigg)\Bigg/$$

$$\left((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(a\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Bigg/\left(b\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg)+$$

$$\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{b\,\sqrt{\text{Cos}[c+d\,x]}}\Bigg)\Bigg)+\frac{1}{d}\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}$$

$$\left(\frac{2}{21}\,\text{Sec}[c+d\,x]^2\left(5\,a^2\,\text{Sin}[c+d\,x]+9\,b^2\,\text{Sin}[c+d\,x]\right)+\right.$$

$$\frac{2\,\text{Sec}[c+d\,x]\left(29\,a^2\,b\,\text{Sin}[c+d\,x]+3\,b^3\,\text{Sin}[c+d\,x]\right)}{21\,a}+$$

$$\frac{6}{7}\,a\,b\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]+\frac{2}{7}\,a^2\,\text{Sec}[c+d\,x]^3\,\left.\text{Tan}[c+d\,x]\right)$$

Problem 624: Result unnecessarily involves complex numbers and more than

twice size of optimal antiderivative.

$$\int \frac{(a+b\,\text{Cos}[c+d\,x])^{5/2}}{\text{Cos}[c+d\,x]^{11/2}}\,dx$$

Optimal (type 4, 454 leaves, 7 steps):

$$\frac{1}{315\,a^3\,d}2\,(a-b)\,\sqrt{a+b}\,\left(147\,a^4+279\,a^2\,b^2-10\,b^4\right)\,\text{Cot}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}-\frac{1}{315\,a^2\,d}2\,(a-b)\,\sqrt{a+b}\,\left(147\,a^3-114\,a^2\,b+165\,a\,b^2+10\,b^3\right)\,\text{Cot}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{2\,a^2\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{9\,d\,\text{Cos}[c+d\,x]^{9/2}}+\frac{38\,a\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{63\,d\,\text{Cos}[c+d\,x]^{7/2}}+\frac{2\,\left(49\,a^2+75\,b^2\right)\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{315\,d\,\text{Cos}[c+d\,x]^{5/2}}+\frac{2\,b\,\left(163\,a^2+5\,b^2\right)\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{315\,a\,d\,\text{Cos}[c+d\,x]^{3/2}}$$

Result (type 4, 1368 leaves):

$$-\frac{1}{315\,a^2\,d}\left(-\left(\left(4\,a\,\left(-114\,a^4\,b+124\,a^2\,b^3-10\,b^5\right)\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\right/$$

$$\left(\left(a+b\right)\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg)-4\,a\,\left(147\,a^5+279\,a^3\,b^2-10\,a\,b^4\right)$$

$$\Bigg(\Bigg(\sqrt{\frac{\left(a+b\right)\text{Cot}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{-a+b}}\,\sqrt{-\frac{\left(a+b\right)\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}$$

$$\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]^4\Bigg)\Big/$$

$$\left(\left(a+b\right)\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\Bigg(\sqrt{\frac{\left(a+b\right)\text{Cot}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{-a+b}}$$

$$\sqrt{-\frac{\left(a+b\right)\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\,\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\text{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]^4\Bigg)\Big/\left(b\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg)+$$

$$2\left(147\,a^4\,b+279\,a^2\,b^3-10\,b^5\right)\Bigg(\Bigg(i\,\text{Cos}\left[\frac{1}{2}\left(c+d\,x\right)\right]\sqrt{a+b\,\text{Cos}[c+d\,x]}$$

$$\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{2\,a}{-a-b}\right]\text{Sec}[c+d\,x]\Bigg)\Big/$$

$$\left(b\sqrt{\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Sec}[c+d\,x]}\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}2\,a\left(\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]\,\text{EllipticF}\Big[$$

$$\left.\text{ArcSin}\Big[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\Big],-\frac{2\,a}{-a+b}\Big]\,\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left((a+b)\sqrt{\text{Cos}[c+d\,x]}\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-$$

$$\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]\,\text{EllipticPi}\Big[-\frac{a}{b},$$

$$\left.\text{ArcSin}\Big[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\Big],-\frac{2\,a}{-a+b}\Big]\,\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left.\left.\left(b\sqrt{\text{Cos}[c+d\,x]}\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{b\sqrt{\text{Cos}[c+d\,x]}}\right)\right)+$$

$$\frac{1}{d}\sqrt{\text{Cos}[c+d\,x]}\sqrt{a+b\,\text{Cos}[c+d\,x]}\left(\frac{2}{315}\text{Sec}[c+d\,x]^3\right.$$

$$\left(49\,a^2\,\text{Sin}[c+d\,x]+75\,b^2\,\text{Sin}[c+d\,x]\right)+$$

$$\frac{2\,\text{Sec}[c+d\,x]^2\left(163\,a^2\,b\,\text{Sin}[c+d\,x]+5\,b^3\,\text{Sin}[c+d\,x]\right)}{315\,a}+$$

$$\frac{1}{315\,a^2}$$

2

$$\text{Sec}[c+d\,x]\left(147\,a^4\,\text{Sin}[c+d\,x]+279\,a^2\,b^2\,\text{Sin}[c+d\,x]-10\,b^4\,\text{Sin}[c+d\,x]\right)+\frac{38}{63}\,a\,b\,\text{Sec}[c+d\,x]^3\,\text{Tan}[c+d\,x]+\frac{2}{9}\,a^2\,\text{Sec}[c+d\,x]^4\,\text{Tan}[c+d\,x]\Big)$$

Problem 625: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{(a+b\,\text{Cos}[c+d\,x])^{5/2}}{\text{Cos}[c+d\,x]^{13/2}}\,dx$$

Optimal (type 4, 522 leaves, 8 steps):

$$\frac{1}{693\,a^4\,d}2\,(a-b)\,b\,\sqrt{a+b}\,\left(741\,a^4+51\,a^2\,b^2+8\,b^4\right)\,\text{Cot}[c+d\,x]\,\text{EllipticE}\Big[\text{ArcSin}\Big[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\Big],-\frac{a+b}{a-b}\Big]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{1}{693\,a^3\,d}2\,(a-b)\,\sqrt{a+b}\,\left(135\,a^4-606\,a^3\,b+57\,a^2\,b^2+6\,a\,b^3+8\,b^4\right)\,\text{Cot}[c+d\,x]\,\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\Big],-\frac{a+b}{a-b}\Big]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{2\,a^2\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{11\,d\,\text{Cos}[c+d\,x]^{11/2}}+\frac{46\,a\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{99\,d\,\text{Cos}[c+d\,x]^{9/2}}+\frac{2\,\left(81\,a^2+113\,b^2\right)\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{693\,d\,\text{Cos}[c+d\,x]^{7/2}}+\frac{2\,b\,\left(229\,a^2+3\,b^2\right)\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{693\,a\,d\,\text{Cos}[c+d\,x]^{5/2}}+\frac{2\,\left(135\,a^4+205\,a^2\,b^2-4\,b^4\right)\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{693\,a^2\,d\,\text{Cos}[c+d\,x]^{3/2}}$$

Result (type 4, 1431 leaves):

$$\frac{1}{693 a^3 d}\left(-\left(\left(4 a \left(135 a^6-78 a^4 b^2-49 a^2 b^4-8 b^6\right)\right.\right.\right.$$

$$\sqrt{\frac{(a+b) \text{Cot}\left[\frac{1}{2} (c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \text{Cos}[c+d x] \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}$$

$$\sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \text{Csc}[c+d x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right] \text{Sin}\left[\frac{1}{2} (c+d x)\right]^4\right)\Bigg/$$

$$\left.\left((a+b) \sqrt{\text{Cos}[c+d x]} \sqrt{a+b \text{Cos}[c+d x]}\right)\right)-4 a \left(-741 a^5 b-51 a^3 b^3-8 a b^5\right)$$

$$\left(\left(\sqrt{\frac{(a+b) \text{Cot}\left[\frac{1}{2} (c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \text{Cos}[c+d x] \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \text{Csc}[c+d x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right] \text{Sin}\left[\frac{1}{2} (c+d x)\right]^4\right)\Bigg/$$

$$\left((a+b) \sqrt{\text{Cos}[c+d x]} \sqrt{a+b \text{Cos}[c+d x]}\right)-\left(\sqrt{\frac{(a+b) \text{Cot}\left[\frac{1}{2} (c+d x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b) \text{Cos}[c+d x] \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\ \text{EllipticPi}\Big[-\frac{a}{b},\ \text{ArcSin}\Big[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\Big],\ -\frac{2\,a}{-a+b}\Big]$$

$$\text{Sin}\Big[\frac{1}{2}(c+d\,x)\Big]^4\Bigg)\Bigg/\Big(b\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\Big)\Bigg)+$$

$$2\left(-741\,a^4\,b^2-51\,a^2\,b^4-8\,b^6\right)\Bigg(\Bigg(i\,\text{Cos}\Big[\frac{1}{2}(c+d\,x)\Big]\,\sqrt{a+b\,\text{Cos}[c+d\,x]}$$

$$\text{EllipticE}\Big[i\,\text{ArcSinh}\Big[\frac{\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\Big],\ -\frac{2\,a}{-a-b}\Big]\,\text{Sec}[c+d\,x]\Bigg)\Bigg/$$

$$\Bigg(b\,\sqrt{\text{Cos}\Big[\frac{1}{2}(c+d\,x)\Big]^2\,\text{Sec}[c+d\,x]}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]}{a+b}}\Bigg)+$$

$$\frac{1}{b}\,2\,a\,\Bigg(\Bigg(a\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\Big],\ -\frac{2\,a}{-a+b}\Big]\,\text{Sin}\Big[\frac{1}{2}(c+d\,x)\Big]^4\Bigg)\Bigg/$$

$$\Big((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\Big)-\Bigg(a\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\;\text{EllipticPi}\Big[-\frac{a}{b},\;\text{ArcSin}\Big[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\Big],\;-\frac{2\,a}{-a+b}\Big]$$

$$\left.\left.\text{Sin}\Big[\frac{1}{2}\,(c+d\,x)\Big]^4\right)\Big/\left(b\,\sqrt{\text{Cos}[c+d\,x]}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+$$

$$\left.\left.\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Sin}[c+d\,x]}{b\,\sqrt{\text{Cos}[c+d\,x]}}\right)\right)+\frac{1}{d}\sqrt{\text{Cos}[c+d\,x]}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}$$

$$\Big(\frac{2}{693}\,\text{Sec}[c+d\,x]^4\,\left(81\,a^2\,\text{Sin}[c+d\,x]+113\,b^2\,\text{Sin}[c+d\,x]\right)+$$

$$\frac{2\,\text{Sec}[c+d\,x]^3\,\left(229\,a^2\,b\,\text{Sin}[c+d\,x]+3\,b^3\,\text{Sin}[c+d\,x]\right)}{693\,a}+$$

$$\frac{1}{693\,a^2}\,2\,\text{Sec}[c+d\,x]^2$$

$$\left(135\,a^4\,\text{Sin}[c+d\,x]+205\,a^2\,b^2\,\text{Sin}[c+d\,x]-4\,b^4\,\text{Sin}[c+d\,x]\right)+\frac{1}{693\,a^3}$$

$$2\,\text{Sec}[c+d\,x]\,\left(741\,a^4\,b\,\text{Sin}[c+d\,x]+51\,a^2\,b^3\,\text{Sin}[c+d\,x]+8\,b^5\,\text{Sin}[c+d\,x]\right)+$$

$$\frac{46}{99}\,a\,b\,\text{Sec}[c+d\,x]^4\,\text{Tan}[c+d\,x]+$$

$$\frac{2}{11}\,a^2\,\text{Sec}[c+d\,x]^5\,\text{Tan}[c+d\,x]\Big)$$

Problem 626: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Cos}[c+d\,x]^{3/2}}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 379 leaves, 8 steps):

$$-\frac{1}{a\,b\,d}(a-b)\sqrt{a+b}\,\text{Cot}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{1}{b\,d}\sqrt{a+b}\,\text{Cot}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{1}{b^2\,d}a\sqrt{a+b}\,\text{Cot}[c+d\,x]\,\text{EllipticPi}\left[\frac{a+b}{b},\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{b\,d\,\sqrt{\text{Cos}[c+d\,x]}}$$

Result (type 4, 479 leaves):

$$\frac{1}{2\,b\sqrt{\frac{a-b}{a+b}}\,d\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\sqrt{a+b\,\text{Cos}[c+d\,x]}}\sqrt{\text{Cos}[c+d\,x]}\left(2\,i\,(a-b)\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right],-\frac{a+b}{a-b}\right]-4\,i\,a\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right],-\frac{a+b}{a-b}\right]+4\,i\,a\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\,\text{EllipticPi}\left[\frac{a+b}{a-b},i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right],-\frac{a+b}{a-b}\right]+b\sqrt{\frac{a-b}{a+b}}\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]\text{Sin}\left[\frac{3}{2}(c+d\,x)\right]+2\,a\sqrt{\frac{a-b}{a+b}}\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]-b\sqrt{\frac{a-b}{a+b}}\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)$$

Problem 629: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{\text{Cos}[c+d\,x]^{3/2}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 224 leaves, 3 steps):

$$\frac{1}{a^2\,d}2\,(a-b)\,\sqrt{a+b}\,\text{Cot}[c+d\,x]\,\text{EllipticE}\Big[\text{ArcSin}\Big[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\Big],-\frac{a+b}{a-b}\Big]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}-\frac{1}{a\,d}2\,\sqrt{a+b}\,\text{Cot}[c+d\,x]\,\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\Big],-\frac{a+b}{a-b}\Big]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}$$

Result (type 4, 894 leaves):

$$\frac{1}{d}4\,a\left(\left(\sqrt{\frac{(a+b)\,\text{Cot}[\frac{1}{2}\,(c+d\,x)]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}[\frac{1}{2}\,(c+d\,x)]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}[\frac{1}{2}\,(c+d\,x)]^2}{a}}\,\text{Csc}[c+d\,x]\,\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}[\frac{1}{2}\,(c+d\,x)]^2}{a}}}{\sqrt{2}}\Big],-\frac{2\,a}{-a+b}\Big]\,\text{Sin}\Big[\frac{1}{2}\,(c+d\,x)\Big]^4\right)\Big/\left((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\text{Cot}[\frac{1}{2}\,(c+d\,x)]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}[\frac{1}{2}\,(c+d\,x)]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}[\frac{1}{2}\,(c+d\,x)]^2}{a}}\,\text{Csc}[c+d\,x]\,\text{EllipticPi}\Big[-\frac{a}{b},\text{ArcSin}\Big[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}[\frac{1}{2}\,(c+d\,x)]^2}{a}}}{\sqrt{2}}\Big],-\frac{2\,a}{-a+b}\Big]\,\text{Sin}\Big[\frac{1}{2}\,(c+d\,x)\Big]^4\right)\Big/$$

$$\left.\left(b\sqrt{\text{Cos}[c+d\,x]}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+$$

$$\frac{2\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Sin}[c+d\,x]}{a\,d\sqrt{\text{Cos}[c+d\,x]}}-\frac{1}{a\sqrt{\frac{a-b}{a+b}}\;d\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}}$$

$$\sqrt{\text{Cos}[c+d\,x]}\left(2\,i\,(a-b)\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\right.$$

$$\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\;\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],-\frac{a+b}{a-b}\right]-$$

$$4\,i\,a\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\;\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],-\frac{a+b}{a-b}\right]+$$

$$4\,i\,a\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}$$

$$\text{EllipticPi}\left[\frac{a+b}{a-b},\,i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\;\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],-\frac{a+b}{a-b}\right]+$$

$$b\sqrt{\frac{a-b}{a+b}}\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]\text{Sin}\left[\frac{3}{2}\,(c+d\,x)\right]+$$

$$2\,a\sqrt{\frac{a-b}{a+b}}\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]-$$

$$\left.b\sqrt{\frac{a-b}{a+b}}\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right)$$

Problem 630: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\text{Cos}[c+d\,x]^{5/2}\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 274 leaves, 4 steps):

$$-\frac{1}{3 a^3 d}4 (a-b) b \sqrt{a+b} \text{Cot}[c+d x] \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \text{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \sqrt{\frac{a (1-\text{Sec}[c+d x])}{a+b}} \sqrt{\frac{a (1+\text{Sec}[c+d x])}{a-b}}+\frac{1}{3 a^2 d} 2 \sqrt{a+b} (a+2 b) \text{Cot}[c+d x] \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \text{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \sqrt{\frac{a (1-\text{Sec}[c+d x])}{a+b}} \sqrt{\frac{a (1+\text{Sec}[c+d x])}{a-b}}+\frac{2 \sqrt{a+b \text{Cos}[c+d x]} \text{Sin}[c+d x]}{3 a d \text{Cos}[c+d x]^{3/2}}$$

Result (type 4, 1191 leaves):

$$\frac{1}{3 a^2 d}\left(-\left(\left(4 a \left(a^2+2 b^2\right) \sqrt{\frac{(a+b) \text{Cot}\left[\frac{1}{2} (c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \text{Cos}[c+d x] \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \text{Csc}[c+d x] \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right] \text{Sin}\left[\frac{1}{2} (c+d x)\right]^4\right) \Big/ \left((a+b) \sqrt{\text{Cos}[c+d x]} \sqrt{a+b \text{Cos}[c+d x]}\right)\right)-\right.$$

$$8 a^2 b \left(\left(\sqrt{\frac{(a+b) \text{Cot}\left[\frac{1}{2} (c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \text{Cos}[c+d x] \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \text{Csc}[c+d x] \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right] \text{Sin}\left[\frac{1}{2} (c+d x)\right]^4\right) \Big/\right.$$

$$\left(\left(a+b\right)\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{\left(a+b\right)\,\text{Cot}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{\left(a+b\right)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\,\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\,\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]$$

$$\left.\left.\text{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]^4\right)\Big/\left(b\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+$$

$$4\,b^2\left(\left(\mathrm{i}\,\text{Cos}\left[\frac{1}{2}\left(c+d\,x\right)\right]\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\right],\right.\right.\right.$$

$$\left.\left.-\frac{2\,a}{-a-b}\right]\,\text{Sec}[c+d\,x]\right)\Big/$$

$$\left(b\,\sqrt{\text{Cos}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\text{Sec}[c+d\,x]}\,\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}\,2\,a\left(\left(a\,\sqrt{\frac{\left(a+b\right)\,\text{Cot}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{-a+b}}\,\sqrt{-\frac{\left(a+b\right)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]^4\right)\Big/$$

$$\left(\left(a+b\right)\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-$$

$$\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\ \sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\ \text{Csc}[c+d\,x]\ \text{EllipticPi}\left[-\frac{a}{b},\right.$$

$$\left.\left.\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left.\left.\left(b\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\right)+\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\ \text{Sin}[c+d\,x]}{b\sqrt{\text{Cos}[c+d\,x]}}\right)\right)+$$

$$\frac{\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\ \left(-\frac{4\,b\,\text{Tan}[c+d\,x]}{3\,a^2}+\frac{2\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{3\,a}\right)}{d}$$

Problem 631: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\text{Cos}[c+d\,x]^{5/2}}{(a+b\,\text{Cos}[c+d\,x])^{3/2}}\,dx$$

Optimal (type 4, 465 leaves, 7 steps):

$$-\frac{1}{a\,b^2\,\sqrt{a+b}\,d}\left(3\,a^2-b^2\right)\,\mathrm{Cot}[c+d\,x]\,\mathrm{EllipticE}\left[\mathrm{ArcSin}\left[\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\mathrm{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$

$$\sqrt{\frac{a\,(1-\mathrm{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\mathrm{Sec}[c+d\,x])}{a-b}}+\frac{1}{b^2\,\sqrt{a+b}\,d}$$

$$(3\,a+b)\,\mathrm{Cot}[c+d\,x]\,\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\mathrm{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$

$$\sqrt{\frac{a\,(1-\mathrm{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\mathrm{Sec}[c+d\,x])}{a-b}}+\frac{1}{b^3\,d}$$

$$3\,a\,\sqrt{a+b}\,\mathrm{Cot}[c+d\,x]\,\mathrm{EllipticPi}\left[\frac{a+b}{b},\mathrm{ArcSin}\left[\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\mathrm{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$

$$\sqrt{\frac{a\,(1-\mathrm{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\mathrm{Sec}[c+d\,x])}{a-b}}-$$

$$\frac{2\,a^2\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{b\,\left(a^2-b^2\right)\,d\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}+\frac{\left(3\,a^2-b^2\right)\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{b^2\,\left(a^2-b^2\right)\,d\,\sqrt{\mathrm{Cos}[c+d\,x]}}$$

Result (type 4, 1201 leaves):

$$\frac{2\,a^2\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{b\,\left(-a^2+b^2\right)\,d\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}+$$

$$\frac{1}{2\,(a-b)\,b\,(a+b)\,d}\left(-\left(\left(4\,a\,\left(a^2-b^2\right)\,\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\right.\right.\right.$$

$$\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}$$

$$\mathrm{Csc}[c+d\,x]\,\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\left.\mathrm{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Big/\left((a+b)\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)\right)-$$

$$8 a^2 b \left(\left(\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}} \sqrt{\frac{(a+b\,\mathrm{Cos}[c+d x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}\,\mathrm{Csc}[c+d x]\,\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}}{\sqrt{2}}\right], -\frac{2 a}{-a+b}\right] \mathrm{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right) \Big/ \left((a+b)\sqrt{\mathrm{Cos}[c+d x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d x]}\right) - \left(\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d x]\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}} \sqrt{\frac{(a+b\,\mathrm{Cos}[c+d x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}\,\mathrm{Csc}[c+d x]\,\mathrm{EllipticPi}\left[-\frac{a}{b}, \mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d x])\,\mathrm{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}}{\sqrt{2}}\right], -\frac{2 a}{-a+b}\right] \mathrm{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right) \Big/ \left(b\sqrt{\mathrm{Cos}[c+d x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d x]}\right)\right) +$$

$$2\left(3 a^2-b^2\right)\left(\left(\mathrm{i}\,\mathrm{Cos}\left[\frac{1}{2}(c+d x)\right]\sqrt{a+b\,\mathrm{Cos}[c+d x]}\,\mathrm{EllipticE}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\mathrm{Sin}\left[\frac{1}{2}(c+d x)\right]}{\sqrt{\mathrm{Cos}[c+d x]}}\right], -\frac{2 a}{-a-b}\right] \mathrm{Sec}[c+d x]\right) \Big/ \left(b\sqrt{\mathrm{Cos}\left[\frac{1}{2}(c+d x)\right]^2 \mathrm{Sec}[c+d x]}\,\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d x])\,\mathrm{Sec}[c+d x]}{a+b}}\right) +\right.$$

$$\frac{1}{b}2\,a\left(\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left((a+b)\sqrt{\text{Cos}[c+d\,x]}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-$$

$$\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\text{Csc}[c+d\,x]\;\text{EllipticPi}\left[-\frac{a}{b},\right.$$

$$\left.\left.\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left.\left.\left(b\sqrt{\text{Cos}[c+d\,x]}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Sin}[c+d\,x]}{b\sqrt{\text{Cos}[c+d\,x]}}\right)$$

Problem 632: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\text{Cos}[c+d\,x]^{3/2}}{(a+b\,\text{Cos}[c+d\,x])^{3/2}}\,dx$$

Optimal (type 4, 387 leaves, 6 steps):

$$\frac{1}{b\sqrt{a+b}\,d}2\,\text{Cot}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$
$$\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}-\frac{1}{b\sqrt{a+b}\,d}$$
$$2\,\text{Cot}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$
$$\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}-\frac{1}{b^2\,d}$$
$$2\sqrt{a+b}\,\text{Cot}[c+d\,x]\,\text{EllipticPi}\left[\frac{a+b}{b},\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$
$$\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}-\frac{2\,a^2\,\text{Sin}[c+d\,x]}{b\,(a^2-b^2)\,d\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}$$

Result (type 4, 985 leaves):

$$\frac{2\,a\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{(a^2-b^2)\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}-$$
$$\frac{1}{(a-b)\,(a+b)\,d}\left(-4\,a\,b\left(\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.\right.$$
$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$
$$\left((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\right.$$
$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\ \text{EllipticPi}\Big[-\frac{a}{b},\ \text{ArcSin}\Big[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\Big],\ -\frac{2\,a}{-a+b}\Big]$$

$$\left.\left.\text{Sin}\Big[\frac{1}{2}\,(c+d\,x)\Big]^4\right)\Big/\left(b\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+$$

$$2\,a\,\left(\left(\mathrm{i}\,\text{Cos}\Big[\frac{1}{2}\,(c+d\,x)\Big]\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\ \text{EllipticE}\Big[\mathrm{i}\,\text{ArcSinh}\Big[\frac{\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\Big],\right.\right.$$

$$\left.-\frac{2\,a}{-a-b}\Big]\ \text{Sec}[c+d\,x]\right)\Big/$$

$$\left(b\,\sqrt{\text{Cos}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Sec}[c+d\,x]}\ \sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}\,2\,a\,\left(\left(a\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\ \sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\ \text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\Big],\ -\frac{2\,a}{-a+b}\Big]\ \text{Sin}\Big[\frac{1}{2}\,(c+d\,x)\Big]^4\right)\Big/$$

$$\left((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-$$

$$\left(a\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\ \sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\ \text{Csc}[c+d\,x]\ \text{EllipticPi}\Big[-\frac{a}{b},$$

$$\left.\left.\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left.\left.\left(b\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)+\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{b\,\sqrt{\text{Cos}[c+d\,x]}}\right)\right)$$

Problem 634: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{\text{Cos}[c+d\,x]}\,(a+b\,\text{Cos}[c+d\,x])^{3/2}}\,dx$$

Optimal (type 4, 267 leaves, 4 steps):

$$\frac{1}{a^2\sqrt{a+b}\,d}2\,b\,\text{Cot}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{a+b}{a-b}\right]$$
$$\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}+\frac{1}{a\,\sqrt{a+b}\,d}$$
$$2\,\text{Cot}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}$$
$$\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}-\frac{2\,b\,\text{Sin}[c+d\,x]}{(a^2-b^2)\,d\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}$$

Result (type 4, 2867 leaves):

$$\frac{1}{(a^2-b^2)\,d}4\,a\left(\left(\sqrt{\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}\right.\right.$$
$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$
$$\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,\frac{2\,a}{a+b}\right]$$

$$\left.\left.\text{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]^4\right)\Big/\left(\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\right.$$

$$\left(b\,\sqrt{\text{Cot}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}\,\sqrt{-\frac{\left(a+b\right)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\right.$$

$$\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\;\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticPi}\left[\frac{a}{a+b},\,\text{ArcSin}\left[\frac{\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,\frac{2\,a}{a+b}\right]\,\text{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]^4\right)\Big/$$

$$\left.\left(\left(a+b\right)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+$$

$$\frac{2\,b^2\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{a\,\left(a^2-b^2\right)\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}-\left(b\,\sqrt{\text{Cos}[c+d\,x]}\,\left(1+\text{Cos}[c+d\,x]\right)^{3/2}\right.$$

$$\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2$$

$$\left(2\,\left(a+b\right)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\,\left(1+\text{Cos}[c+d\,x]\right)}}\;\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\,\frac{-a+b}{a+b}\right]-\right.$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\,\left(1+\text{Cos}[c+d\,x]\right)}}\;\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\,\frac{-a+b}{a+b}\right]-$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\,\left(1+\text{Cos}[c+d\,x]\right)}}\;\text{EllipticPi}\left[-1,\,-\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\,\frac{-a+b}{a+b}\right]+$$

$$b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]\,\text{Sin}\left[\frac{3}{2}\left(c+d\,x\right)\right]+$$

$$\left.\left.2\,a\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]-b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right)\right)\Big/$$

$$\left(2\,a\,\left(a^2-b^2\right)\,d\,\left(\frac{1}{8\,\left(a+b\,\text{Cos}[c+d\,x]\right)^{3/2}}\,b\,\left(1+\text{Cos}[c+d\,x]\right)^{3/2}\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Sin}[c+d\,x]\right.\right.$$

$$\left(2\,\left(a+b\right)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\,\left(1+\text{Cos}[c+d\,x]\right)}}\,\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right],\,\frac{-a+b}{a+b}\right]-\right.$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\,\left(1+\text{Cos}[c+d\,x]\right)}}\,\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right],\,\frac{-a+b}{a+b}\right]-$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\,\left(1+\text{Cos}[c+d\,x]\right)}}\,\text{EllipticPi}\left[-1,\,-\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right],\,\frac{-a+b}{a+b}\right]+$$

$$b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\text{Sin}\left[\frac{3}{2}\,\left(c+d\,x\right)\right]+$$

$$\left.2\,a\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]-b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right)-$$

$$\frac{1}{8\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,3\,\sqrt{1+\text{Cos}[c+d\,x]}\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Sin}[c+d\,x]$$

$$\left(2\,\left(a+b\right)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\,\left(1+\text{Cos}[c+d\,x]\right)}}\,\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right],\,\frac{-a+b}{a+b}\right]-\right.$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\,\left(1+\text{Cos}[c+d\,x]\right)}}\,\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right],\,\frac{-a+b}{a+b}\right]-$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\,\left(1+\text{Cos}[c+d\,x]\right)}}\,\text{EllipticPi}\left[-1,\,-\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right],\,\frac{-a+b}{a+b}\right]+$$

$$b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\text{Sin}\left[\frac{3}{2}\,\left(c+d\,x\right)\right]+$$

$$\left.2\,a\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]-b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right)+$$

$$\frac{1}{4\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,\left(1+\text{Cos}[c+d\,x]\right)^{3/2}\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]$$

$$\left(2\,\left(a+b\right)\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\,\left(1+\text{Cos}[c+d\,x]\right)}}\,\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right],\,\frac{-a+b}{a+b}\right]-\right.$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\;\text{EllipticF}\Big[\text{ArcSin}\Big[\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Big],\,\frac{-a+b}{a+b}\Big]-$$

$$4\,a\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\;\text{EllipticPi}\Big[-1,\,-\text{ArcSin}\Big[\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Big],\,\frac{-a+b}{a+b}\Big]+$$

$$b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]\,\text{Sin}\Big[\frac{3}{2}\,(c+d\,x)\Big]+$$

$$2\,a\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]-b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Bigg)+$$

$$\frac{1}{4\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,(1+\text{Cos}[c+d\,x])^{3/2}\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2$$

$$\Bigg(\frac{3}{2}\,b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Cos}\Big[\frac{3}{2}\,(c+d\,x)\Big]\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]+$$

$$a\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2-\frac{1}{2}\,b\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2+$$

$$\Bigg((a+b)\,\text{EllipticE}\Big[\text{ArcSin}\Big[\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Big],\,\frac{-a+b}{a+b}\Big]\,\Bigg(-\frac{b\,\text{Sin}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}+$$

$$\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sin}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])^2}\Bigg)\Bigg)\Bigg/\Bigg(\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\Bigg)-$$

$$\Bigg(2\,a\,\text{EllipticF}\Big[\text{ArcSin}\Big[\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Big],\,\frac{-a+b}{a+b}\Big]\,\Bigg(-\frac{b\,\text{Sin}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}+$$

$$\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sin}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])^2}\Bigg)\Bigg)\Bigg/\Bigg(\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\Bigg)-$$

$$\Bigg(2\,a\,\text{EllipticPi}\Big[-1,\,-\text{ArcSin}\Big[\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Big],\,\frac{-a+b}{a+b}\Big]\,\Bigg(-\frac{b\,\text{Sin}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}+$$

$$\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sin}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])^2}\Bigg)\Bigg)\Bigg/\Bigg(\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\Bigg)+$$

$$\frac{1}{2\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}}\,b\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]\,\Bigg(\frac{\text{Cos}[c+d\,x]\,\text{Sin}[c+d\,x]}{(1+\text{Cos}[c+d\,x])^2}-\frac{\text{Sin}[c+d\,x]}{1+\text{Cos}[c+d\,x]}\Bigg)$$

$$\text{Sin}\left[\frac{3}{2}(c+d x)\right]+\frac{a\left(\frac{\text{Cos}[c+d x]\,\text{Sin}[c+d x]}{(1+\text{Cos}[c+d x])^2}-\frac{\text{Sin}[c+d x]}{1+\text{Cos}[c+d x]}\right)\text{Tan}\left[\frac{1}{2}(c+d x)\right]}{\sqrt{\frac{\text{Cos}[c+d x]}{1+\text{Cos}[c+d x]}}}-$$

$$\frac{b\left(\frac{\text{Cos}[c+d x]\,\text{Sin}[c+d x]}{(1+\text{Cos}[c+d x])^2}-\frac{\text{Sin}[c+d x]}{1+\text{Cos}[c+d x]}\right)\text{Tan}\left[\frac{1}{2}(c+d x)\right]}{2\sqrt{\frac{\text{Cos}[c+d x]}{1+\text{Cos}[c+d x]}}}+$$

$$\frac{1}{2}b\sqrt{\frac{\text{Cos}[c+d x]}{1+\text{Cos}[c+d x]}}\,\text{Sec}\left[\frac{1}{2}(c+d x)\right]\text{Sin}\left[\frac{3}{2}(c+d x)\right]\text{Tan}\left[\frac{1}{2}(c+d x)\right]-$$

$$\frac{2a\sqrt{\frac{a+b\,\text{Cos}[c+d x]}{(a+b)\,(1+\text{Cos}[c+d x])}}\,\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2}{\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}\sqrt{1-\frac{(-a+b)\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{a+b}}}+$$

$$\left(2a\sqrt{\frac{a+b\,\text{Cos}[c+d x]}{(a+b)\,(1+\text{Cos}[c+d x])}}\,\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\right)\Big/$$

$$\left(\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}\left(1+\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)\sqrt{1-\frac{(-a+b)\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{a+b}}\right)+$$

$$\left((a+b)\sqrt{\frac{a+b\,\text{Cos}[c+d x]}{(a+b)\,(1+\text{Cos}[c+d x])}}\,\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\right.$$

$$\left.\left.\left.\sqrt{1-\frac{(-a+b)\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{a+b}}\right)\Big/\left(\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}\right)\right)\right)$$

Problem 635: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\text{Cos}[c+d x]^{3/2}\,(a+b\,\text{Cos}[c+d x])^{3/2}}\,dx$$

Optimal (type 4, 285 leaves, 4 steps):

$$\frac{1}{a^3\sqrt{a+b}\;d}2\left(a^2-2b^2\right)\text{Cot}[c+d\,x]\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\;\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$

$$\sqrt{\frac{a\left(1-\text{Sec}[c+d\,x]\right)}{a+b}}\;\sqrt{\frac{a\left(1+\text{Sec}[c+d\,x]\right)}{a-b}}-\frac{1}{a^2\sqrt{a+b}\;d}$$

$$2\left(a+2b\right)\text{Cot}[c+d\,x]\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\;\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$

$$\sqrt{\frac{a\left(1-\text{Sec}[c+d\,x]\right)}{a+b}}\;\sqrt{\frac{a\left(1+\text{Sec}[c+d\,x]\right)}{a-b}}+\frac{2\,b^2\,\text{Sin}[c+d\,x]}{a\left(a^2-b^2\right)d\sqrt{\text{Cos}[c+d\,x]}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}}$$

Result (type 4, 1233 leaves):

$$\frac{1}{a^2\left(-a+b\right)\left(a+b\right)d}$$

$$\Bigg(-\Bigg(\Bigg(4\,a\left(2a^2b-2b^3\right)\sqrt{\frac{\left(a+b\right)\text{Cot}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{-a+b}}\;\sqrt{-\frac{\left(a+b\right)\text{Cos}[c+d\,x]\;\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}$$

$$\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\;\text{Csc}[c+d\,x]$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]^4\Bigg)\Bigg/$$

$$\left(\left(a+b\right)\sqrt{\text{Cos}[c+d\,x]}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg)-4\,a\left(a^3-2\,a\,b^2\right)$$

$$\Bigg(\Bigg(\sqrt{\frac{\left(a+b\right)\text{Cot}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{-a+b}}\;\sqrt{-\frac{\left(a+b\right)\text{Cos}[c+d\,x]\;\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}$$

$$\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\text{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\;\text{Csc}[c+d\,x]$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\Bigg)\Bigg/$$

$$\left((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Bigg/\left(b\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg)+$$

$$2\,\left(a^2\,b-2\,b^3\right)\left(\left(\text{i}\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{EllipticE}\right[\right.\right.$$

$$\left.\text{i}\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{2\,a}{-a-b}\right]\,\text{Sec}[c+d\,x]\Bigg)\Bigg/$$

$$\left(b\,\sqrt{\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Sec}[c+d\,x]}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}\,2\,a\left(\left(a\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\Bigg)\Bigg/$$

$$\left(\left(a+b\right)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(a\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\,\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]$$

$$\left.\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Bigg/\left(b\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg)+$$

$$\left.\left.\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{b\,\sqrt{\text{Cos}[c+d\,x]}}\right)\right)+\frac{1}{d}\sqrt{\text{Cos}[c+d\,x]}$$

$$\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\left(-\frac{2\,b^3\,\text{Sin}[c+d\,x]}{a^2\,\left(a^2-b^2\right)\,\left(a+b\,\text{Cos}[c+d\,x]\right)}+\right.$$

$$\left.\frac{2\,\text{Tan}[c+d\,x]}{a^2}\right)$$

Problem 636: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\text{Cos}[c+d\,x]^{5/2}\,\left(a+b\,\text{Cos}[c+d\,x]\right)^{3/2}}\,dx$$

Optimal (type 4, 357 leaves, 5 steps):

$$-\frac{1}{3 a^4 \sqrt{a+b}\, d} 2 b \left(5 a^2-8 b^2\right) \text{Cot}[c+d x] \,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \,\text{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \sqrt{\frac{a (1-\text{Sec}[c+d x])}{a+b}} \sqrt{\frac{a (1+\text{Sec}[c+d x])}{a-b}}+\frac{1}{3 a^3 \sqrt{a+b}\, d} 2 (a+2 b) (a+4 b) \,\text{Cot}[c+d x] \,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \,\text{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \sqrt{\frac{a (1-\text{Sec}[c+d x])}{a+b}} \sqrt{\frac{a (1+\text{Sec}[c+d x])}{a-b}}+\frac{2 b^2 \,\text{Sin}[c+d x]}{a \left(a^2-b^2\right) d \,\text{Cos}[c+d x]^{3/2} \sqrt{a+b \,\text{Cos}[c+d x]}}+\frac{2 \left(a^2-4 b^2\right) \sqrt{a+b \,\text{Cos}[c+d x]}\, \text{Sin}[c+d x]}{3 a^2 \left(a^2-b^2\right) d \,\text{Cos}[c+d x]^{3/2}}$$

Result (type 4, 1269 leaves):

$$\frac{1}{3 a^3 (a-b) (a+b) d} \left(-\left(\left(4 a \left(a^4+7 a^2 b^2-8 b^4\right) \sqrt{\frac{(a+b) \,\text{Cot}\left[\frac{1}{2} (c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \,\text{Cos}[c+d x] \,\text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \sqrt{\frac{(a+b \,\text{Cos}[c+d x]) \,\text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \,\text{Csc}[c+d x] \,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b \,\text{Cos}[c+d x]) \,\text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right] \text{Sin}\left[\frac{1}{2} (c+d x)\right]^4\right) \middle/ \left((a+b) \sqrt{\text{Cos}[c+d x]} \sqrt{a+b \,\text{Cos}[c+d x]}\right)\right)-4 a \left(5 a^3 b-8 a b^3\right) \left(\left(\sqrt{\frac{(a+b) \,\text{Cot}\left[\frac{1}{2} (c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \,\text{Cos}[c+d x] \,\text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \sqrt{\frac{(a+b \,\text{Cos}[c+d x]) \,\text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \,\text{Csc}[c+d x]\right.\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\Bigg)\Bigg/$$

$$\left((a+b)\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Bigg/\left(b\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg)+$$

$$2\left(5\,a^2\,b^2-8\,b^4\right)\left(\left(\text{i}\,\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{EllipticE}\left[\right.\right.\right.$$

$$\left.\text{i}\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{2\,a}{-a-b}\right]\text{Sec}[c+d\,x]\Bigg)\Bigg/$$

$$\left(b\sqrt{\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Sec}[c+d\,x]}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}\,2\,a\left(\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\Bigg)\Bigg/$$

$$\left((a+b)\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Bigg/\left(b\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg)+$$

$$\left.\left.\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{b\sqrt{\text{Cos}[c+d\,x]}}\right)\right)+\frac{1}{d}\sqrt{\text{Cos}[c+d\,x]}$$

$$\sqrt{a+b\,\text{Cos}[c+d\,x]}\left(\frac{2\,b^4\,\text{Sin}[c+d\,x]}{a^3\,(a^2-b^2)\,(a+b\,\text{Cos}[c+d\,x])}-\frac{10\,b\,\text{Tan}[c+d\,x]}{3\,a^3}+\frac{2\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{3\,a^2}\right)$$

Problem 637: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\text{Cos}[c+d\,x]^{7/2}\,(a+b\,\text{Cos}[c+d\,x])^{3/2}}\,dx$$

Optimal (type 4, 433 leaves, 6 steps):

$$\frac{1}{5 a^5 \sqrt{a+b}\, d} 2 \left(3 a^4+8 a^2 b^2-16 b^4\right) \text{Cot}[c+d x]\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \text{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\text{Cos}[c+d x]}}\right], -\frac{a+b}{a-b}\right] \sqrt{\frac{a (1-\text{Sec}[c+d x])}{a+b}} \sqrt{\frac{a (1+\text{Sec}[c+d x])}{a-b}} - \frac{1}{5 a^4 \sqrt{a+b}\, d} 2 (3 a+4 b) \left(a^2+4 b^2\right) \text{Cot}[c+d x]\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \text{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\text{Cos}[c+d x]}}\right], -\frac{a+b}{a-b}\right] \sqrt{\frac{a (1-\text{Sec}[c+d x])}{a+b}} \sqrt{\frac{a (1+\text{Sec}[c+d x])}{a-b}} + \frac{2 b^2 \text{Sin}[c+d x]}{a \left(a^2-b^2\right) d\, \text{Cos}[c+d x]^{5/2} \sqrt{a+b \text{Cos}[c+d x]}} + \frac{2 \left(a^2-6 b^2\right) \sqrt{a+b \text{Cos}[c+d x]}\, \text{Sin}[c+d x]}{5 a^2 \left(a^2-b^2\right) d\, \text{Cos}[c+d x]^{5/2}} - \frac{2 b \left(3 a^2-8 b^2\right) \sqrt{a+b \text{Cos}[c+d x]}\, \text{Sin}[c+d x]}{5 a^3 \left(a^2-b^2\right) d\, \text{Cos}[c+d x]^{3/2}}$$

Result (type 4, 1314 leaves):

$$\frac{1}{5 a^4 (-a+b) (a+b) d} \left(a^2+4 b^2\right) \left(-\left(\left(4 a \left(4 a^2 b-4 b^3\right) \sqrt{\frac{(a+b) \text{Cot}\left[\frac{1}{2} (c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \text{Cos}[c+d x] \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}\, \text{Csc}[c+d x]\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}}{\sqrt{2}}\right], -\frac{2 a}{-a+b}\right] \text{Sin}\left[\frac{1}{2} (c+d x)\right]^4\right) \middle/ \left((a+b) \sqrt{\text{Cos}[c+d x]} \sqrt{a+b \text{Cos}[c+d x]}\right)\right) - 4 a \left(3 a^3-4 a b^2\right) \left(\left(\sqrt{\frac{(a+b) \text{Cot}\left[\frac{1}{2} (c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \text{Cos}[c+d x] \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\;\text{Csc}[c+d\,x]$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\Bigg)\Bigg/$$

$$\left(\left(a+b\right)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{\left(a+b\right)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{\left(a+b\right)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\;\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\;\text{EllipticPi}\left[-\frac{a}{b},\,\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]$$

$$\left.\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Bigg/\left(b\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg)+$$

$$2\,\left(3\,a^2\,b-4\,b^3\right)\,\left(\left(\mathbb{i}\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{EllipticE}\right[\right.\right.$$

$$\left.\mathbb{i}\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{2\,a}{-a-b}\right]\,\text{Sec}[c+d\,x]\Bigg)\Bigg/$$

$$\left(b\,\sqrt{\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Sec}[c+d\,x]}\;\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}\,2\,a\,\left(\left(a\,\sqrt{\frac{\left(a+b\right)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\;\sqrt{-\frac{\left(a+b\right)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\ \text{Csc}[c+d\,x]\ \text{EllipticF}\Big[$$

$$\text{ArcSin}\Big[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\Big],\,-\frac{2\,a}{-a+b}\Big]\ \text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\Bigg)\Big/$$

$$\Big((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\Big)-$$

$$\Bigg(a\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\ \sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\ \text{Csc}[c+d\,x]\ \text{EllipticPi}\Big[-\frac{a}{b},$$

$$\text{ArcSin}\Big[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\Big],\,-\frac{2\,a}{-a+b}\Big]\ \text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\Bigg)\Big/$$

$$\Big(b\,\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\Big)\Bigg)+\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\ \text{Sin}[c+d\,x]}{b\,\sqrt{\text{Cos}[c+d\,x]}}\Bigg)\Bigg)+$$

$$\frac{1}{d}\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\ \Bigg(-\frac{2\,b^5\,\text{Sin}[c+d\,x]}{a^4\,(a^2-b^2)\,(a+b\,\text{Cos}[c+d\,x])}+$$

$$\frac{2\,\text{Sec}[c+d\,x]\,\left(3\,a^2\,\text{Sin}[c+d\,x]+11\,b^2\,\text{Sin}[c+d\,x]\right)}{5\,a^4}-$$

$$\frac{6\,b\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]}{5\,a^3}+$$

$$\frac{2\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]}{5\,a^2}\Bigg)$$

Problem 638: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{Cos}[c+d\,x]^{5/2}}{(a+b\,\text{Cos}[c+d\,x])^{5/2}}\,dx$$

Optimal (type 4, 497 leaves, 7 steps):

$$\left(2\left(3a^2-7b^2\right)\text{Cot}[c+dx]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+dx]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+dx]}}\right],-\frac{a+b}{a-b}\right]\right.$$
$$\left.\sqrt{\frac{a\left(1-\text{Sec}[c+dx]\right)}{a+b}}\sqrt{\frac{a\left(1+\text{Sec}[c+dx]\right)}{a-b}}\right)\Big/\left(3\left(a-b\right)b^2\left(a+b\right)^{3/2}d\right)-$$
$$\left(2\left(3a^2+ab-6b^2\right)\text{Cot}[c+dx]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+dx]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+dx]}}\right],-\frac{a+b}{a-b}\right]\right.$$
$$\left.\sqrt{\frac{a\left(1-\text{Sec}[c+dx]\right)}{a+b}}\sqrt{\frac{a\left(1+\text{Sec}[c+dx]\right)}{a-b}}\right)\Big/\left(3\left(a-b\right)b^2\left(a+b\right)^{3/2}d\right)-\frac{1}{b^3d}$$
$$2\sqrt{a+b}\,\text{Cot}[c+dx]\,\text{EllipticPi}\left[\frac{a+b}{b},\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+dx]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+dx]}}\right],-\frac{a+b}{a-b}\right]$$
$$\sqrt{\frac{a\left(1-\text{Sec}[c+dx]\right)}{a+b}}\sqrt{\frac{a\left(1+\text{Sec}[c+dx]\right)}{a-b}}-$$
$$\frac{2a^2\sqrt{\text{Cos}[c+dx]}\,\text{Sin}[c+dx]}{3b\left(a^2-b^2\right)d\left(a+b\,\text{Cos}[c+dx]\right)^{3/2}}-\frac{2a^2\left(3a^2-7b^2\right)\text{Sin}[c+dx]}{3b^2\left(a^2-b^2\right)^2d\sqrt{\text{Cos}[c+dx]}\,\sqrt{a+b\,\text{Cos}[c+dx]}}$$

Result (type 4, 1282 leaves):

$$\frac{1}{d}\sqrt{\text{Cos}[c+dx]}\,\sqrt{a+b\,\text{Cos}[c+dx]}$$
$$\left(\frac{2a^2\,\text{Sin}[c+dx]}{3b\left(-a^2+b^2\right)\left(a+b\,\text{Cos}[c+dx]\right)^2}+\frac{2\left(3a^3\,\text{Sin}[c+dx]-7ab^2\,\text{Sin}[c+dx]\right)}{3b\left(-a^2+b^2\right)^2\left(a+b\,\text{Cos}[c+dx]\right)}\right)-$$
$$\frac{1}{3\left(a-b\right)^2b\left(a+b\right)^2d}$$
$$\left(-\left(\left(4a\left(a^3-ab^2\right)\sqrt{\frac{\left(a+b\right)\text{Cot}\left[\frac{1}{2}\left(c+dx\right)\right]^2}{-a+b}}\sqrt{-\frac{\left(a+b\right)\text{Cos}[c+dx]\,\text{Csc}\left[\frac{1}{2}\left(c+dx\right)\right]^2}{a}}\right.\right.\right.$$
$$\sqrt{\frac{\left(a+b\,\text{Cos}[c+dx]\right)\text{Csc}\left[\frac{1}{2}\left(c+dx\right)\right]^2}{a}}\,\text{Csc}[c+dx]$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(a+b\,\text{Cos}[c+dx]\right)\text{Csc}\left[\frac{1}{2}\left(c+dx\right)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}\left(c+dx\right)\right]^4\right)\Big/$$

$$\left(\left(a+b\right)\sqrt{\text{Cos}[c+d\,x]}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg) - 4\,a\,\left(-a^2\,b-3\,b^3\right)$$

$$\left(\left(\sqrt{\frac{\left(a+b\right)\,\text{Cot}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2}{-a+b}}\;\sqrt{-\frac{\left(a+b\right)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Csc}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2}{a}}\;\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^4\right)\Bigg/$$

$$\left(\left(a+b\right)\sqrt{\text{Cos}[c+d\,x]}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\right) - \left(\sqrt{\frac{\left(a+b\right)\,\text{Cot}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{\left(a+b\right)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2}{a}}\;\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Csc}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\;\text{EllipticPi}\left[-\frac{a}{b},\,\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]$$

$$\left.\text{Sin}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^4\right)\Bigg/\left(b\,\sqrt{\text{Cos}[c+d\,x]}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg) +$$

$$2\,\left(3\,a^3-7\,a\,b^2\right)\left(\left(\text{i}\,\text{Cos}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{EllipticE}\left[\right.\right.\right.$$

$$\left.\left.\text{i}\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{2\,a}{-a-b}\right]\,\text{Sec}[c+d\,x]\right)\Bigg/$$

$$\left(b\,\sqrt{\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Sec}[c+d\,x]}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}\,2\,a\left(\left(a\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Bigg/$$

$$\left((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-$$

$$\left(a\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\right.$$

$$\left.\left.\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Bigg/$$

$$\left.\left.\left(b\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{b\,\sqrt{\text{Cos}[c+d\,x]}}\right)$$

Problem 639: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\text{Cos}[c+d\,x]^{3/2}}{(a+b\,\text{Cos}[c+d\,x])^{5/2}}\,dx$$

Optimal (type 4, 342 leaves, 5 steps):

$$\left(8\,b\,\mathrm{Cot}[c+d\,x]\,\mathrm{EllipticE}\left[\mathrm{ArcSin}\left[\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\mathrm{Cos}[c+d\,x]}}\right],\,-\frac{a+b}{a-b}\right]\right.$$

$$\left.\sqrt{\frac{a\,(1-\mathrm{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\mathrm{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(3\,a\,(a-b)\,(a+b)^{3/2}\,d\right)+$$

$$\left(2\,(a-3\,b)\,\mathrm{Cot}[c+d\,x]\,\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\mathrm{Cos}[c+d\,x]}}\right],\,-\frac{a+b}{a-b}\right]\right.$$

$$\left.\sqrt{\frac{a\,(1-\mathrm{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\mathrm{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(3\,a\,(a-b)\,(a+b)^{3/2}\,d\right)+$$

$$\frac{2\,a\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{3\,(a^2-b^2)\,d\,(a+b\,\mathrm{Cos}[c+d\,x])^{3/2}}-\frac{8\,a\,b\,\mathrm{Sin}[c+d\,x]}{3\,(a^2-b^2)^2\,d\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}$$

Result (type 4, 1237 leaves):

$$\frac{1}{d}\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}$$

$$\left(\frac{2\,a\,\mathrm{Sin}[c+d\,x]}{3\,(a^2-b^2)\,(a+b\,\mathrm{Cos}[c+d\,x])^2}+\frac{8\,b^2\,\mathrm{Sin}[c+d\,x]}{3\,(a^2-b^2)^2\,(a+b\,\mathrm{Cos}[c+d\,x])}\right)+$$

$$\frac{1}{3\,(a-b)^2\,(a+b)^2\,d}\left(-\left(\left(4\,a\,(a^2-b^2)\,\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\right.\right.\right.$$

$$\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}$$

$$\mathrm{Csc}[c+d\,x]\,\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]$$

$$\left.\left.\mathrm{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Big/\left((a+b)\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)\right)+$$

$$16\,a^2\,b\left(\left(\sqrt{\frac{(a+b)\,\mathrm{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left((a+b)\sqrt{\text{Cos}[c+d\,x]}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\;\text{EllipticPi}\left[-\frac{a}{b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\left.\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/\left(b\sqrt{\text{Cos}[c+d\,x]}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)-$$

$$8\,b^2\left(\left(\mathbb{i}\,\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\right],\right.\right.\right.$$

$$\left.\left.-\frac{2\,a}{-a-b}\right]\text{Sec}[c+d\,x]\right)\Big/$$

$$\left(b\sqrt{\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Sec}[c+d\,x]}\;\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}\,2\,a\left(\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\;\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\text{Csc}[c+d\,x]$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\Bigg)\Bigg/$$

$$\left((a+b)\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-$$

$$\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\text{Csc}[c+d\,x]\;\text{EllipticPi}\left[-\frac{a}{b},\right.$$

$$\left.\left.\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Bigg/$$

$$\left.\left.\left(b\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Sin}[c+d\,x]}{b\sqrt{\text{Cos}[c+d\,x]}}\right)\right)$$

Problem 640: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{\text{Cos}[c+d\,x]}}{(a+b\,\text{Cos}[c+d\,x])^{5/2}}\,dx$$

Optimal (type 4, 359 leaves, 5 steps):

$$-\left(\left(2\left(3a^2+b^2\right)\text{Cot}[c+dx]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+dx]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+dx]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\left(1-\text{Sec}[c+dx]\right)}{a+b}}\sqrt{\frac{a\left(1+\text{Sec}[c+dx]\right)}{a-b}}\right)\Big/\left(3a^2\left(a-b\right)\left(a+b\right)^{3/2}d\right)\right)+$$

$$\left(2\left(3a-b\right)\text{Cot}[c+dx]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+dx]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+dx]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\left(1-\text{Sec}[c+dx]\right)}{a+b}}\sqrt{\frac{a\left(1+\text{Sec}[c+dx]\right)}{a-b}}\right)\Big/\left(3a\left(a-b\right)\left(a+b\right)^{3/2}d\right)-$$

$$\frac{2b\sqrt{\text{Cos}[c+dx]}\,\text{Sin}[c+dx]}{3\left(a^2-b^2\right)d\left(a+b\,\text{Cos}[c+dx]\right)^{3/2}}+\frac{2\left(3a^2+b^2\right)\text{Sin}[c+dx]}{3\left(a^2-b^2\right)^2d\sqrt{\text{Cos}[c+dx]}\,\sqrt{a+b\,\text{Cos}[c+dx]}}$$

Result (type 4, 1273 leaves):

$$\frac{1}{d}\sqrt{\text{Cos}[c+dx]}\,\sqrt{a+b\,\text{Cos}[c+dx]}\left(-\frac{2b\,\text{Sin}[c+dx]}{3\left(a^2-b^2\right)\left(a+b\,\text{Cos}[c+dx]\right)^2}-\frac{2\left(3a^2b\,\text{Sin}[c+dx]+b^3\,\text{Sin}[c+dx]\right)}{3a\left(a^2-b^2\right)^2\left(a+b\,\text{Cos}[c+dx]\right)}\right)+$$

$$\frac{1}{3a\left(a-b\right)^2\left(a+b\right)^2d}$$

$$\left(-\left(\left(4a\left(-a^2b+b^3\right)\sqrt{\frac{\left(a+b\right)\text{Cot}\left[\frac{1}{2}\left(c+dx\right)\right]^2}{-a+b}}\sqrt{-\frac{\left(a+b\right)\text{Cos}[c+dx]\,\text{Csc}\left[\frac{1}{2}\left(c+dx\right)\right]^2}{a}}\right.\right.\right.$$

$$\sqrt{\frac{\left(a+b\,\text{Cos}[c+dx]\right)\text{Csc}\left[\frac{1}{2}\left(c+dx\right)\right]^2}{a}}\;\text{Csc}[c+dx]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(a+b\,\text{Cos}[c+dx]\right)\text{Csc}\left[\frac{1}{2}\left(c+dx\right)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}\left(c+dx\right)\right]^4\right)\Big/$$

$$\left.\left(\left(a+b\right)\sqrt{\text{Cos}[c+dx]}\,\sqrt{a+b\,\text{Cos}[c+dx]}\right)\right)-4a\left(3a^3+a\,b^2\right)$$

$$\left(\left(\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\;\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Bigg/$$

$$\left((a+b)\sqrt{\text{Cos}[c+d\,x]}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\;\text{EllipticPi}\left[-\frac{a}{b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\left.\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Bigg/\left(b\sqrt{\text{Cos}[c+d\,x]}\;\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+$$

$$2\left(3\,a^2\,b+b^3\right)\left(\left(\dot{\imath}\,\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{EllipticE}\left[\right.\right.\right.$$

$$\left.\dot{\imath}\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{2\,a}{-a-b}\right]\text{Sec}[c+d\,x]\right)\Bigg/$$

$$\left(b\sqrt{\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Sec}[c+d\,x]}\;\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$
\begin{aligned}
&\frac{1}{b}2\,a\left(\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.\\
&\quad\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\ \text{Csc}[c+d\,x]\\
&\quad\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/\\
&\quad\left((a+b)\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\\
&\quad\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\\
&\quad\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\ \text{Csc}[c+d\,x]\ \text{EllipticPi}\left[-\frac{a}{b},\right.\\
&\quad\left.\left.\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/\\
&\quad\left.\left(b\sqrt{\text{Cos}[c+d\,x]}\ \sqrt{a+b\,\text{Cos}[c+d\,x]}\right)+\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\ \text{Sin}[c+d\,x]}{b\sqrt{\text{Cos}[c+d\,x]}}\right)
\end{aligned}
$$

Problem 641: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{\text{Cos}[c+d\,x]}\ (a+b\,\text{Cos}[c+d\,x])^{5/2}}\,dx$$

Optimal (type 4, 381 leaves, 5 steps):

$$\left(4 b \left(3 a^2-b^2\right) \text{Cot}[c+d x] \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \text{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \sqrt{\frac{a (1-\text{Sec}[c+d x])}{a+b}} \sqrt{\frac{a (1+\text{Sec}[c+d x])}{a-b}}\right) \Big/ \left(3 a^3 (a-b) (a+b)^{3/2} d\right)+$$

$$\left(2 \left(3 a^2-3 a b-2 b^2\right) \text{Cot}[c+d x] \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \text{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \sqrt{\frac{a (1-\text{Sec}[c+d x])}{a+b}} \sqrt{\frac{a (1+\text{Sec}[c+d x])}{a-b}}\right) \Big/ \left(3 a^2 (a-b) (a+b)^{3/2} d\right)+$$

$$\frac{2 b^2 \sqrt{\text{Cos}[c+d x]} \text{Sin}[c+d x]}{3 a \left(a^2-b^2\right) d (a+b \text{Cos}[c+d x])^{3/2}}-\frac{4 b \left(3 a^2-b^2\right) \text{Sin}[c+d x]}{3 a \left(a^2-b^2\right)^2 d \sqrt{\text{Cos}[c+d x]} \sqrt{a+b \text{Cos}[c+d x]}}$$

Result (type 4, 1296 leaves):

$$\frac{1}{d}\sqrt{\text{Cos}[c+d x]} \sqrt{a+b \text{Cos}[c+d x]} \left(\frac{2 b^2 \text{Sin}[c+d x]}{3 a \left(a^2-b^2\right) (a+b \text{Cos}[c+d x])^2}+\frac{4 \left(3 a^2 b^2 \text{Sin}[c+d x]-b^4 \text{Sin}[c+d x]\right)}{3 a^2 \left(a^2-b^2\right)^2 (a+b \text{Cos}[c+d x])}\right)+$$

$$\frac{1}{3 a^2 (a-b)^2 (a+b)^2 d}\left(-\left(\left(4 a \left(3 a^4-5 a^2 b^2+2 b^4\right) \sqrt{\frac{(a+b) \text{Cot}\left[\frac{1}{2} (c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \text{Cos}[c+d x] \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}} \text{Csc}[c+d x] \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right] \text{Sin}\left[\frac{1}{2} (c+d x)\right]^4\right) \Big/ \left((a+b) \sqrt{\text{Cos}[c+d x]} \sqrt{a+b \text{Cos}[c+d x]}\right)\right)-\right.$$

$$4 a \left(-6 a^3 b+2 a b^3\right) \left(\left(\sqrt{\frac{(a+b) \text{Cot}\left[\frac{1}{2} (c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \text{Cos}[c+d x] \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\;\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Big/$$

$$\left(\left(a+b\right)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\;\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\;\text{EllipticPi}\left[-\frac{a}{b},\,\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]$$

$$\left.\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\Big/\left(b\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+$$

$$2\,\left(-6\,a^2\,b^2+2\,b^4\right)\,\left(\left(\mathrm{i}\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right.\right.$$

$$\left.\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{2\,a}{-a-b}\right]\,\text{Sec}[c+d\,x]\right)\Big/$$

$$\left(b\,\sqrt{\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Sec}[c+d\,x]}\;\sqrt{\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}\,2\,a\,\left(\left(a\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{-a+b}}\;\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\text{Csc}[c+d\,x]$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\Bigg)\Bigg/$$

$$\left((a+b)\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-$$

$$\Bigg(a\,\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\;\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\text{Csc}[c+d\,x]\;\text{EllipticPi}\left[-\frac{a}{b},\right.$$

$$\left.\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],\,-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\Bigg)\Bigg/$$

$$\left(b\,\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\Bigg)+\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Sin}[c+d\,x]}{b\,\sqrt{\text{Cos}[c+d\,x]}}\Bigg)\Bigg)$$

Problem 642: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{\text{Cos}[c+d\,x]^{3/2}\,(a+b\,\text{Cos}[c+d\,x])^{5/2}}\,dx$$

Optimal (type 4, 398 leaves, 5 steps):

$$\left(2\left(3 a^4-15 a^2 b^2+8 b^4\right) \text{Cot}[c+d x] \,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \,\text{Cos}[c+d x]}}{\sqrt{a+b}\, \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \sqrt{\frac{a\left(1-\text{Sec}[c+d x]\right)}{a+b}} \sqrt{\frac{a\left(1+\text{Sec}[c+d x]\right)}{a-b}}\right) \Big/ \left(3 a^4 (a-b)(a+b)^{3/2} d\right)-$$

$$\left(2\left(3 a^3+9 a^2 b-6 a b^2-8 b^3\right) \text{Cot}[c+d x] \,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \,\text{Cos}[c+d x]}}{\sqrt{a+b}\, \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \sqrt{\frac{a\left(1-\text{Sec}[c+d x]\right)}{a+b}} \sqrt{\frac{a\left(1+\text{Sec}[c+d x]\right)}{a-b}}\right) \Big/ \left(3 a^3 (a-b)(a+b)^{3/2} d\right)+$$

$$\frac{2 b^2 \,\text{Sin}[c+d x]}{3 a\left(a^2-b^2\right) d \sqrt{\text{Cos}[c+d x]}\left(a+b \,\text{Cos}[c+d x]\right)^{3/2}}+\frac{8 b^2\left(2 a^2-b^2\right) \text{Sin}[c+d x]}{3 a^2\left(a^2-b^2\right)^2 d \sqrt{\text{Cos}[c+d x]} \sqrt{a+b \,\text{Cos}[c+d x]}}$$

Result (type 4, 1321 leaves):

$$-\frac{1}{3 a^3 (a-b)^2 (a+b)^2 d}\left(-\left(\left(4 a\left(9 a^4 b-17 a^2 b^3+8 b^5\right) \sqrt{\frac{(a+b) \,\text{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \,\text{Cos}[c+d x] \,\text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}} \sqrt{\frac{\left(a+b \,\text{Cos}[c+d x]\right) \text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}} \,\text{Csc}[c+d x] \,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b \,\text{Cos}[c+d x]) \,\text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right] \text{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right) \Big/ \left((a+b) \sqrt{\text{Cos}[c+d x]} \sqrt{a+b \,\text{Cos}[c+d x]}\right)\right)-4 a\left(3 a^5-15 a^3 b^2+8 a b^4\right)\right.$$

$$\left(\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\,\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left((a+b)\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[-\frac{a}{b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\left.\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/\left(b\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)\right)+$$

$$2\left(3\,a^4\,b-15\,a^2\,b^3+8\,b^5\right)\left(\left(\mathbb{i}\,\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]\sqrt{a+b\,\text{Cos}[c+d\,x]}\right.\right.$$

$$\left.\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]}{\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{2\,a}{-a-b}\right]\text{Sec}[c+d\,x]\right)\Big/$$

$$\left(b\sqrt{\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Sec}[c+d\,x]}\,\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}2a\left(\left(\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+dx)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\text{Cos}[c+dx]\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}\right.\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+dx])\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}\;\text{Csc}[c+dx]\;\text{EllipticF}\Big[$$

$$\left.\text{ArcSin}\Big[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+dx])\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}}{\sqrt{2}}\Big],-\frac{2a}{-a+b}\Big]\,\text{Sin}\Big[\frac{1}{2}(c+dx)\Big]^4\right)\Big/$$

$$\left((a+b)\sqrt{\text{Cos}[c+dx]}\sqrt{a+b\,\text{Cos}[c+dx]}\right)-$$

$$\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+dx)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\text{Cos}[c+dx]\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+dx])\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}\;\text{Csc}[c+dx]\;\text{EllipticPi}\Big[-\frac{a}{b},$$

$$\left.\text{ArcSin}\Big[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+dx])\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}{a}}}{\sqrt{2}}\Big],-\frac{2a}{-a+b}\Big]\,\text{Sin}\Big[\frac{1}{2}(c+dx)\Big]^4\right)\Big/$$

$$\left.\left.\left(b\sqrt{\text{Cos}[c+dx]}\sqrt{a+b\,\text{Cos}[c+dx]}\right)\right)+\frac{\sqrt{a+b\,\text{Cos}[c+dx]}\;\text{Sin}[c+dx]}{b\sqrt{\text{Cos}[c+dx]}}\right)\right)+$$

$$\frac{1}{d}\sqrt{\text{Cos}[c+dx]}\sqrt{a+b\,\text{Cos}[c+dx]}\left(-\frac{2b^3\,\text{Sin}[c+dx]}{3a^2\left(a^2-b^2\right)\left(a+b\,\text{Cos}[c+dx]\right)^2}-\right.$$

$$\frac{2\left(9a^2b^3\,\text{Sin}[c+dx]-5b^5\,\text{Sin}[c+dx]\right)}{3a^3\left(a^2-b^2\right)^2\left(a+b\,\text{Cos}[c+dx]\right)}+$$

$$\left.\frac{2\,\text{Tan}[c+dx]}{a^3}\right)$$

Problem 643: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{\operatorname{Cos}[c+d x]^{5/2}\,(a+b\operatorname{Cos}[c+d x])^{5/2}}\,dx$$

Optimal (type 4, 473 leaves, 6 steps):

$$-\left(\left(8 b\left(2 a^4-7 a^2 b^2+4 b^4\right) \operatorname{Cot}[c+d x] \operatorname{EllipticE}\left[\operatorname{ArcSin}\left[\frac{\sqrt{a+b \operatorname{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\operatorname{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \sqrt{\frac{a(1-\operatorname{Sec}[c+d x])}{a+b}} \sqrt{\frac{a(1+\operatorname{Sec}[c+d x])}{a-b}}\right) \Big/ \left(3 a^5(a-b)(a+b)^{3/2} d\right)\right)+$$

$$\left(2\left(a^4+9 a^3 b+16 a^2 b^2-12 a b^3-16 b^4\right) \operatorname{Cot}[c+d x] \operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\frac{\sqrt{a+b \operatorname{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\operatorname{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \sqrt{\frac{a(1-\operatorname{Sec}[c+d x])}{a+b}} \sqrt{\frac{a(1+\operatorname{Sec}[c+d x])}{a-b}}\right) \Big/$$

$$\left(3 a^4(a-b)(a+b)^{3/2} d\right)+\frac{2 b^2 \operatorname{Sin}[c+d x]}{3 a\left(a^2-b^2\right) d \operatorname{Cos}[c+d x]^{3/2}(a+b \operatorname{Cos}[c+d x])^{3/2}}+$$

$$\frac{4 b^2\left(5 a^2-3 b^2\right) \operatorname{Sin}[c+d x]}{3 a^2\left(a^2-b^2\right)^2 d \operatorname{Cos}[c+d x]^{3/2} \sqrt{a+b \operatorname{Cos}[c+d x]}}+$$

$$\frac{2\left(a^4-13 a^2 b^2+8 b^4\right) \sqrt{a+b \operatorname{Cos}[c+d x]} \operatorname{Sin}[c+d x]}{3 a^3\left(a^2-b^2\right)^2 d \operatorname{Cos}[c+d x]^{3/2}}$$

Result (type 4, 1351 leaves):

$$\frac{1}{3 a^4(a-b)^2(a+b)^2 d}\left(-\left(\left(\left(4 a\left(a^6+15 a^4 b^2-32 a^2 b^4+16 b^6\right)\right.\right.\right.\right.$$

$$\sqrt{\frac{(a+b) \operatorname{Cot}\left[\frac{1}{2}(c+d x)\right]^2}{-a+b}} \sqrt{-\frac{(a+b) \operatorname{Cos}[c+d x] \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}$$

$$\sqrt{\frac{(a+b \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}} \operatorname{Csc}[c+d x]$$

$$\left.\operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\frac{\sqrt{\frac{(a+b \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2 a}{-a+b}\right] \operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right) \Big/$$

$$\left(\left(a+b\right)\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)\Bigg)-4\,a\,\left(8\,a^5\,b-28\,a^3\,b^3+16\,a\,b^5\right)$$

$$\Bigg(\Bigg(\sqrt{\frac{\left(a+b\right)\mathrm{Cot}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{-a+b}}\,\sqrt{-\frac{\left(a+b\right)\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}$$

$$\sqrt{\frac{\left(a+b\,\mathrm{Cos}[c+d\,x]\right)\mathrm{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\,\mathrm{Csc}[c+d\,x]$$

$$\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{\left(a+b\,\mathrm{Cos}[c+d\,x]\right)\mathrm{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\mathrm{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]^4\Bigg)\Big/$$

$$\left(\left(a+b\right)\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)-\Bigg(\sqrt{\frac{\left(a+b\right)\mathrm{Cot}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{-a+b}}$$

$$\sqrt{-\frac{\left(a+b\right)\mathrm{Cos}[c+d\,x]\,\mathrm{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}\,\sqrt{\frac{\left(a+b\,\mathrm{Cos}[c+d\,x]\right)\mathrm{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}$$

$$\mathrm{Csc}[c+d\,x]\,\mathrm{EllipticPi}\left[-\frac{a}{b},\mathrm{ArcSin}\left[\frac{\sqrt{\frac{\left(a+b\,\mathrm{Cos}[c+d\,x]\right)\mathrm{Csc}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\mathrm{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]^4\Bigg)\Big/\left(b\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\right)\Bigg)+$$

$$2\left(8\,a^4\,b^2-28\,a^2\,b^4+16\,b^6\right)\Bigg(\Bigg(\mathrm{i}\,\mathrm{Cos}\left[\frac{1}{2}\left(c+d\,x\right)\right]\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}$$

$$\mathrm{EllipticE}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\mathrm{Sin}\left[\frac{1}{2}\left(c+d\,x\right)\right]}{\sqrt{\mathrm{Cos}[c+d\,x]}}\right],-\frac{2\,a}{-a-b}\right]\mathrm{Sec}[c+d\,x]\Bigg)\Big/$$

$$\left(b\sqrt{\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Sec}[c+d\,x]}\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}[c+d\,x]}{a+b}}\right)+$$

$$\frac{1}{b}2\,a\left(\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\right.\right.$$

$$\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\;\text{Csc}[c+d\,x]$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$

$$\left((a+b)\sqrt{\text{Cos}[c+d\,x]}\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)-\left(a\sqrt{\frac{(a+b)\,\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}{-a+b}}\right.$$

$$\sqrt{-\frac{(a+b)\,\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}$$

$$\text{Csc}[c+d\,x]\;\text{EllipticPi}\left[-\frac{a}{b},\text{ArcSin}\left[\frac{\sqrt{\frac{(a+b\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}{a}}}{\sqrt{2}}\right],-\frac{2\,a}{-a+b}\right]$$

$$\left.\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/\left(b\sqrt{\text{Cos}[c+d\,x]}\sqrt{a+b\,\text{Cos}[c+d\,x]}\right)+$$

$$\left.\left.\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Sin}[c+d\,x]}{b\sqrt{\text{Cos}[c+d\,x]}}\right)\right)+\frac{1}{d}\sqrt{\text{Cos}[c+d\,x]}$$

$$\sqrt{a+b\,\text{Cos}[c+d\,x]}\left(\frac{2\,b^4\,\text{Sin}[c+d\,x]}{3\,a^3\,(a^2-b^2)\,(a+b\,\text{Cos}[c+d\,x])^2}+\right.$$

$$\frac{8\,(3\,a^2\,b^4\,\text{Sin}[c+d\,x]-2\,b^6\,\text{Sin}[c+d\,x])}{3\,a^4\,(a^2-b^2)^2\,(a+b\,\text{Cos}[c+d\,x])}-$$

$$\frac{16\,b\,\mathrm{Tan}[c+d\,x]}{3\,a^4}+\frac{2\,\mathrm{Sec}[c+d\,x]\,\mathrm{Tan}[c+d\,x]}{3\,a^3}\Bigg)$$

Problem 644: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{2+3\,\mathrm{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 32 leaves, 1 step):

$$\frac{2\,\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\mathrm{Sin}[c+d\,x]}{1+\mathrm{Cos}[c+d\,x]}\right],\frac{1}{5}\right]}{\sqrt{5}\,d}$$

Result (type 4, 131 leaves):

$$\left(2\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{2+3\,\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\mathrm{Csc}[c+d\,x]}\right.$$
$$\left.\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{1}{2}\,\sqrt{(2+3\,\mathrm{Cos}[c+d\,x])\,\mathrm{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\right],-4\right]\right)\Bigg/$$
$$\left(d\,\sqrt{\frac{-2-3\,\mathrm{Cos}[c+d\,x]}{-1+\mathrm{Cos}[c+d\,x]}}\,\sqrt{\frac{\mathrm{Cos}[c+d\,x]}{-1+\mathrm{Cos}[c+d\,x]}}\right)$$

Problem 645: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{-2+3\,\mathrm{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 25 leaves, 1 step):

$$\frac{2\,\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\mathrm{Sin}[c+d\,x]}{1+\mathrm{Cos}[c+d\,x]}\right],5\right]}{d}$$

Result (type 4, 156 leaves):

$$\left(4\sqrt{\text{Cot}\left[\frac{1}{2}(c+d x)\right]^2}\ \sqrt{\text{Cos}[c+d x]\ \text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}\ \sqrt{-(-2+3\,\text{Cos}[c+d x])\ \text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}\right.$$

$$\text{Csc}[c+d x]\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1}{2}\sqrt{-(-2+3\,\text{Cos}[c+d x])\ \text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}\right],\ \frac{4}{5}\right]$$

$$\left.\text{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right)\Big/\left(\sqrt{5}\ d\ \sqrt{\text{Cos}[c+d x]}\ \sqrt{-2+3\,\text{Cos}[c+d x]}\right)$$

Problem 646: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{2-3\,\text{Cos}[c+d x]}\ \sqrt{\text{Cos}[c+d x]}}\, dx$$

Optimal (type 4, 56 leaves, 2 steps):

$$-\frac{2\sqrt{-\text{Cos}[c+d x]}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\text{Sin}[c+d x]}{1-\text{Cos}[c+d x]}\right],\ \frac{1}{5}\right]}{\sqrt{5}\ d\ \sqrt{\text{Cos}[c+d x]}}$$

Result (type 4, 143 leaves):

$$-\left(\left(4\sqrt{\text{Cot}\left[\frac{1}{2}(c+d x)\right]^2}\ \sqrt{(2-3\,\text{Cos}[c+d x])\ \text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}\ \sqrt{\text{Cos}[c+d x]\ \text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}\right.\right.$$

$$\left.\text{Csc}[c+d x]\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1}{2}\sqrt{\text{Cos}[c+d x]\ \text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}\right],\ -4\right]\ \text{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right)\Big/$$

$$\left.\left(d\sqrt{2-3\,\text{Cos}[c+d x]}\ \sqrt{\text{Cos}[c+d x]}\right)\right)$$

Problem 647: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{-2-3\,\text{Cos}[c+d x]}\ \sqrt{\text{Cos}[c+d x]}}\, dx$$

Optimal (type 4, 49 leaves, 2 steps):

$$-\frac{2\sqrt{-\text{Cos}[c+d x]}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\text{Sin}[c+d x]}{1-\text{Cos}[c+d x]}\right],\ 5\right]}{d\ \sqrt{\text{Cos}[c+d x]}}$$

Result (type 4, 153 leaves):

$$\left(4\sqrt{\text{Cot}\left[\frac{1}{2}(c+d x)\right]^2}\sqrt{-\text{Cos}[c+d x]\,\text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}\sqrt{(2+3\,\text{Cos}[c+d x])\,\text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}\right.$$
$$\left.\text{Csc}[c+d x]\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{5}{2}}\sqrt{\frac{\text{Cos}[c+d x]}{-1+\text{Cos}[c+d x]}}\right],\frac{4}{5}\right]\text{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right)\Big/$$
$$\left(\sqrt{5}\,d\,\sqrt{-2-3\,\text{Cos}[c+d x]}\,\sqrt{\text{Cos}[c+d x]}\right)$$

Problem 648: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{\text{Cos}[c+d x]}\,\sqrt{3+2\,\text{Cos}[c+d x]}}\,dx$$

Optimal (type 4, 58 leaves, 1 step):

$$\frac{1}{d}2\,\text{Cot}[c+d x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{3+2\,\text{Cos}[c+d x]}}{\sqrt{5}\,\sqrt{\text{Cos}[c+d x]}}\right],-5\right]\sqrt{-\text{Tan}[c+d x]^2}$$

Result (type 4, 140 leaves):

$$\left(4\sqrt{\text{Cos}[c+d x]}\,\sqrt{3+2\,\text{Cos}[c+d x]}\,\sqrt{-\text{Cot}\left[\frac{1}{2}(c+d x)\right]^2}\right.$$
$$\left.\text{Csc}[c+d x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{(3+2\,\text{Cos}[c+d x])\,\text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}}{\sqrt{6}}\right],6\right]\right)\Big/$$
$$\left(d\sqrt{-\text{Cos}[c+d x]\,\text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}\sqrt{(3+2\,\text{Cos}[c+d x])\,\text{Csc}\left[\frac{1}{2}(c+d x)\right]^2}\right)$$

Problem 649: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{3-2\,\text{Cos}[c+d x]}\,\sqrt{\text{Cos}[c+d x]}}\,dx$$

Optimal (type 4, 60 leaves, 1 step):

$$\frac{1}{\sqrt{5}\,d}2\,\text{Cot}[c+d x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{3-2\,\text{Cos}[c+d x]}}{\sqrt{\text{Cos}[c+d x]}}\right],-\frac{1}{5}\right]\sqrt{-\text{Tan}[c+d x]^2}$$

Result (type 4, 144 leaves):

$$\left(4\sqrt{\text{Cot}\left[\frac{1}{2}(c+dx)\right]^2}\sqrt{(3-2\,\text{Cos}[c+dx])\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}\sqrt{-\text{Cos}[c+dx]\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}\right.$$
$$\left.\text{Csc}[c+dx]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\text{Cos}[c+dx]}{-1+\text{Cos}[c+dx]}}}{\sqrt{3}}\right],6\right]\text{Sin}\left[\frac{1}{2}(c+dx)\right]^4\right)\Big/$$
$$\left(d\sqrt{3-2\,\text{Cos}[c+dx]}\sqrt{\text{Cos}[c+dx]}\right)$$

Problem 652: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{-\text{Cos}[c+dx]}\sqrt{2+3\,\text{Cos}[c+dx]}}\,dx$$

Optimal (type 4, 54 leaves, 2 steps):

$$\frac{2\sqrt{\text{Cos}[c+dx]}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\text{Sin}[c+dx]}{1+\text{Cos}[c+dx]}\right],\frac{1}{5}\right]}{\sqrt{5}\,d\sqrt{-\text{Cos}[c+dx]}}$$

Result (type 4, 150 leaves):

$$-\left(\left(4\sqrt{\text{Cot}\left[\frac{1}{2}(c+dx)\right]^2}\sqrt{-\text{Cos}[c+dx]\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}\right.\right.$$
$$\sqrt{(2+3\,\text{Cos}[c+dx])\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}\;\text{Csc}[c+dx]$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{1}{2}\sqrt{(2+3\,\text{Cos}[c+dx])\,\text{Csc}\left[\frac{1}{2}(c+dx)\right]^2}\right],-4\right]\text{Sin}\left[\frac{1}{2}(c+dx)\right]^4\right)\Big/$$
$$\left.\left(d\sqrt{-\text{Cos}[c+dx]}\sqrt{2+3\,\text{Cos}[c+dx]}\right)\right)$$

Problem 653: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{-\text{Cos}[c+dx]}\sqrt{-2+3\,\text{Cos}[c+dx]}}\,dx$$

Optimal (type 4, 47 leaves, 2 steps):

$$\frac{2\sqrt{\text{Cos}[c+dx]}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\text{Sin}[c+dx]}{1+\text{Cos}[c+dx]}\right],5\right]}{d\sqrt{-\text{Cos}[c+dx]}}$$

Result (type 4, 158 leaves) :

$$\left(4 \sqrt{\operatorname{Cot}\left[\frac{1}{2}(c+d x)\right]^2} \sqrt{\operatorname{Cos}[c+d x] \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2} \sqrt{-(-2+3 \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2} \operatorname{Csc}[c+d x] \operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\frac{1}{2} \sqrt{-(-2+3 \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}\right], \frac{4}{5}\right] \operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right) \Big/ \left(\sqrt{5}\, d \sqrt{-\operatorname{Cos}[c+d x]} \sqrt{-2+3 \operatorname{Cos}[c+d x]}\right)$$

Problem 654: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{2-3 \operatorname{Cos}[c+d x]} \sqrt{-\operatorname{Cos}[c+d x]}} \, dx$$

Optimal (type 4, 34 leaves, 1 step) :

$$-\frac{2 \operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\frac{\operatorname{Sin}[c+d x]}{1-\operatorname{Cos}[c+d x]}\right], \frac{1}{5}\right]}{\sqrt{5}\, d}$$

Result (type 4, 145 leaves) :

$$-\left(\left(4 \sqrt{\operatorname{Cot}\left[\frac{1}{2}(c+d x)\right]^2} \sqrt{(2-3 \operatorname{Cos}[c+d x]) \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2} \sqrt{\operatorname{Cos}[c+d x] \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2} \operatorname{Csc}[c+d x] \operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\frac{1}{2} \sqrt{\operatorname{Cos}[c+d x] \operatorname{Csc}\left[\frac{1}{2}(c+d x)\right]^2}\right], -4\right] \operatorname{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right) \Big/ \left(d \sqrt{2-3 \operatorname{Cos}[c+d x]} \sqrt{-\operatorname{Cos}[c+d x]}\right)\right)$$

Problem 655: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{-2-3 \operatorname{Cos}[c+d x]} \sqrt{-\operatorname{Cos}[c+d x]}} \, dx$$

Optimal (type 4, 27 leaves, 1 step) :

$$-\frac{2 \operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\frac{\operatorname{Sin}[c+d x]}{1-\operatorname{Cos}[c+d x]}\right], 5\right]}{d}$$

Result (type 4, 155 leaves) :

$$\left(4\sqrt{\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}\sqrt{-\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}\sqrt{(2+3\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}\right.$$
$$\left.\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{5}{2}}\sqrt{\frac{\text{Cos}[c+d\,x]}{-1+\text{Cos}[c+d\,x]}}\right],\frac{4}{5}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$
$$\left(\sqrt{5}\,d\sqrt{-2-3\,\text{Cos}[c+d\,x]}\sqrt{-\text{Cos}[c+d\,x]}\right)$$

Problem 658: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{-\text{Cos}[c+d\,x]}\sqrt{-3+2\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 62 leaves, 1 step):

$$-\frac{1}{\sqrt{5}\,d}2\,\text{Cot}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-3+2\,\text{Cos}[c+d\,x]}}{\sqrt{-\text{Cos}[c+d\,x]}}\right],-\frac{1}{5}\right]\sqrt{-\text{Tan}[c+d\,x]^2}$$

Result (type 4, 160 leaves):

$$\left(4\sqrt{-\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}\,\text{Cot}[c+d\,x]\sqrt{-\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}\right.$$
$$\sqrt{-(-3+2\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{-3+2\,\text{Cos}[c+d\,x]}{-1+\text{Cos}[c+d\,x]}}}{\sqrt{3}}\right],\frac{6}{5}\right]$$
$$\left.\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/\left(\sqrt{5}\,d\,(-\text{Cos}[c+d\,x])^{3/2}\sqrt{-3+2\,\text{Cos}[c+d\,x]}\right)$$

Problem 659: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{-3-2\,\text{Cos}[c+d\,x]}\sqrt{-\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 60 leaves, 1 step):

$$-\frac{1}{d}2\,\text{Cot}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-3-2\,\text{Cos}[c+d\,x]}}{\sqrt{5}\sqrt{-\text{Cos}[c+d\,x]}}\right],-5\right]\sqrt{-\text{Tan}[c+d\,x]^2}$$

Result (type 4, 155 leaves):

$$\left(4\sqrt{\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}\sqrt{-\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}\sqrt{(3+2\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}\right.$$
$$\left.\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{5}{3}}\sqrt{\frac{\text{Cos}[c+d\,x]}{-1+\text{Cos}[c+d\,x]}}\right],\frac{6}{5}\right]\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/$$
$$\left(\sqrt{5}\,d\,\sqrt{-3-2\,\text{Cos}[c+d\,x]}\,\sqrt{-\text{Cos}[c+d\,x]}\right)$$

Problem 660: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{\text{Cos}[c+d\,x]}}{\sqrt{2+3\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 77 leaves, 1 step):

$$-\frac{1}{3\,d}4\,\text{Cot}[c+d\,x]$$
$$\text{EllipticPi}\left[\frac{5}{3},\text{ArcSin}\left[\frac{\sqrt{2+3\,\text{Cos}[c+d\,x]}}{\sqrt{5}\,\sqrt{\text{Cos}[c+d\,x]}}\right],5\right]\sqrt{-1-\text{Sec}[c+d\,x]}\,\sqrt{1-\text{Sec}[c+d\,x]}$$

Result (type 4, 175 leaves):

$$\left(2\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{2+3\,\text{Cos}[c+d\,x]}\,\sqrt{\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}\,\text{Csc}[c+d\,x]\right.$$
$$\left(3\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1}{2}\sqrt{(2+3\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}\right],-4\right]-\right.$$
$$\left.\left.5\,\text{EllipticPi}\left[-\frac{2}{3},\text{ArcSin}\left[\frac{1}{2}\sqrt{(2+3\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}\right],-4\right]\right)\right)\Big/$$
$$\left(3\,d\,\sqrt{\frac{-2-3\,\text{Cos}[c+d\,x]}{-1+\text{Cos}[c+d\,x]}}\,\sqrt{\frac{\text{Cos}[c+d\,x]}{-1+\text{Cos}[c+d\,x]}}\right)$$

Problem 662: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{\text{Cos}[c+d\,x]}}{\sqrt{2-3\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 99 leaves, 2 steps):

$$-\left(\left(4\,\text{Cos}[c+d\,x]^{3/2}\,\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[\frac{1}{3},\text{ArcSin}\left[\frac{\sqrt{2-3\,\text{Cos}[c+d\,x]}}{\sqrt{-\text{Cos}[c+d\,x]}}\right],\frac{1}{5}\right]\sqrt{-1+\text{Sec}[c+d\,x]}\,\sqrt{1+\text{Sec}[c+d\,x]}\right)\Big/\left(3\sqrt{5}\,d\,\sqrt{-\text{Cos}[c+d\,x]}\right)\right)$$

Result (type 4, 201 leaves):

$$\left(4\sqrt{\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}\,\sqrt{\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}\,\sqrt{-(-2+3\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}\,\text{Csc}[c+d\,x]\left(3\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1}{2}\sqrt{(2-3\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}\right],\frac{4}{5}\right]-\text{EllipticPi}\left[\frac{2}{3},\text{ArcSin}\left[\frac{1}{2}\sqrt{(2-3\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}\right],\frac{4}{5}\right]\right)\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/\left(3\sqrt{5}\,d\,\sqrt{2-3\,\text{Cos}[c+d\,x]}\,\sqrt{\text{Cos}[c+d\,x]}\right)$$

Problem 664: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{\text{Cos}[c+d\,x]}}{\sqrt{3+2\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 73 leaves, 1 step):

$$-\frac{1}{d}3\,\text{Cot}[c+d\,x]\,\text{EllipticPi}\left[\frac{5}{2},\text{ArcSin}\left[\frac{\sqrt{3+2\,\text{Cos}[c+d\,x]}}{\sqrt{5}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-5\right]\sqrt{1-\text{Sec}[c+d\,x]}\,\sqrt{1+\text{Sec}[c+d\,x]}$$

Result (type 4, 184 leaves):

$$\left(2\sqrt{\text{Cos}[c+d\,x]}\;\sqrt{3+2\,\text{Cos}[c+d\,x]}\;\sqrt{-\text{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\right.$$

$$\text{Csc}[c+d\,x]\left(2\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{(3+2\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}}{\sqrt{6}}\right],6\right]-\right.$$

$$\left.\left.5\,\text{EllipticPi}\left[-\frac{3}{2},\text{ArcSin}\left[\frac{\sqrt{(3+2\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}}{\sqrt{6}}\right],6\right]\right)\right)\Big/$$

$$\left(d\,\sqrt{-\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\;\sqrt{(3+2\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\right)$$

Problem 665: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{\text{Cos}[c+d\,x]}}{\sqrt{3-2\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 75 leaves, 1 step):

$$\frac{1}{\sqrt{5}\,d}3\,\text{Cot}[c+d\,x]\,\text{EllipticPi}\left[-\frac{1}{2},\text{ArcSin}\left[\frac{\sqrt{3-2\,\text{Cos}[c+d\,x]}}{\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{1}{5}\right]$$
$$\sqrt{1-\text{Sec}[c+d\,x]}\;\sqrt{1+\text{Sec}[c+d\,x]}$$

Result (type 4, 185 leaves):

$$\left(\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{\frac{-3+2\,\mathrm{Cos}[c+d\,x]}{-1+\mathrm{Cos}[c+d\,x]}}\,\sqrt{-\mathrm{Cot}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\right.$$
$$\left(2\,\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{\frac{-3+2\,\mathrm{Cos}[c+d\,x]}{-1+\mathrm{Cos}[c+d\,x]}}}{\sqrt{3}}\right],\frac{6}{5}\right]+\mathrm{EllipticPi}\left[\frac{3}{2},\mathrm{ArcSin}\left[\frac{\sqrt{\frac{-3+2\,\mathrm{Cos}[c+d\,x]}{-1+\mathrm{Cos}[c+d\,x]}}}{\sqrt{3}}\right],\frac{6}{5}\right]\right)$$
$$\left.\mathrm{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right)\Bigg/\left(\sqrt{5}\,d\,\sqrt{3-2\,\mathrm{Cos}[c+d\,x]}\,\sqrt{\frac{\mathrm{Cos}[c+d\,x]}{-1+\mathrm{Cos}[c+d\,x]}}\right)$$

Problem 666: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{\mathrm{Cos}[c+d\,x]}}{\sqrt{-3+2\,\mathrm{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 99 leaves, 2 steps):

$$\left(3\,\mathrm{Cos}[c+d\,x]^{3/2}\,\mathrm{Csc}[c+d\,x]\,\mathrm{EllipticPi}\left[-\frac{1}{2},\mathrm{ArcSin}\left[\frac{\sqrt{-3+2\,\mathrm{Cos}[c+d\,x]}}{\sqrt{-\mathrm{Cos}[c+d\,x]}}\right],-\frac{1}{5}\right]\right.$$
$$\left.\sqrt{1-\mathrm{Sec}[c+d\,x]}\,\sqrt{1+\mathrm{Sec}[c+d\,x]}\right)\Bigg/\left(\sqrt{5}\,d\,\sqrt{-\mathrm{Cos}[c+d\,x]}\right)$$

Result (type 4, 135 leaves):

$$-\left(\left(2\,i\,\sqrt{-3+2\,\mathrm{Cos}[c+d\,x]}\right.\right.$$
$$\sqrt{\frac{\mathrm{Cos}[c+d\,x]}{5+5\,\mathrm{Cos}[c+d\,x]}}\,\left(\mathrm{EllipticF}\left[i\,\mathrm{ArcSinh}\left[\sqrt{5}\,\mathrm{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],-\frac{1}{5}\right]-\right.$$
$$\left.\left.2\,\mathrm{EllipticPi}\left[\frac{1}{5},i\,\mathrm{ArcSinh}\left[\sqrt{5}\,\mathrm{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],-\frac{1}{5}\right]\right)\right)\Bigg/$$
$$\left.\left(d\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{\frac{3-2\,\mathrm{Cos}[c+d\,x]}{1+\mathrm{Cos}[c+d\,x]}}\right)\right)$$

Problem 670: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{-\text{Cos}[c+d x]}}{\sqrt{2-3 \text{Cos}[c+d x]}} \, dx$$

Optimal (type 4, 77 leaves, 1 step):

$$-\frac{1}{3 \sqrt{5} d} 4 \text{Cot}[c+d x] \text{EllipticPi}\left[\frac{1}{3}, \text{ArcSin}\left[\frac{\sqrt{2-3 \text{Cos}[c+d x]}}{\sqrt{-\text{Cos}[c+d x]}}\right], \frac{1}{5}\right] \sqrt{-1+\text{Sec}[c+d x]} \sqrt{1+\text{Sec}[c+d x]}$$

Result (type 4, 203 leaves):

$$\left(4 \sqrt{\text{Cot}\left[\frac{1}{2} (c+d x)\right]^2} \text{Cot}[c+d x] \sqrt{\text{Cos}[c+d x] \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2} \sqrt{-(-2+3 \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2} \left(3 \text{EllipticF}\left[\text{ArcSin}\left[\frac{1}{2} \sqrt{(2-3 \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}\right], \frac{4}{5}\right] - \text{EllipticPi}\left[\frac{2}{3}, \text{ArcSin}\left[\frac{1}{2} \sqrt{(2-3 \text{Cos}[c+d x]) \text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}\right], \frac{4}{5}\right]\right) \text{Sin}\left[\frac{1}{2} (c+d x)\right]^4\right) \Big/ \left(3 \sqrt{5} d \sqrt{2-3 \text{Cos}[c+d x]} (-\text{Cos}[c+d x])^{3/2}\right)$$

Problem 671: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{-\text{Cos}[c+d x]}}{\sqrt{-2-3 \text{Cos}[c+d x]}} \, dx$$

Optimal (type 4, 79 leaves, 1 step):

$$-\frac{1}{3 d} 4 \text{Cot}[c+d x] \text{EllipticPi}\left[\frac{5}{3}, \text{ArcSin}\left[\frac{\sqrt{-2-3 \text{Cos}[c+d x]}}{\sqrt{5} \sqrt{-\text{Cos}[c+d x]}}\right], 5\right] \sqrt{-1-\text{Sec}[c+d x]} \sqrt{1-\text{Sec}[c+d x]}$$

Result (type 4, 194 leaves):

$$\left(4 \sqrt{\text{Cot}\left[\frac{1}{2} (c+d x)\right]^2} \sqrt{-\text{Cos}[c+d x] \,\text{Csc}\left[\frac{1}{2} (c+d x)\right]^2} \sqrt{(2+3 \,\text{Cos}[c+d x]) \,\text{Csc}\left[\frac{1}{2} (c+d x)\right]^2} \right.$$
$$\text{Csc}[c+d x] \left(3 \,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1}{2} \sqrt{(2+3 \,\text{Cos}[c+d x]) \,\text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}\right], -4\right] - \right.$$
$$\left. 5 \,\text{EllipticPi}\left[-\frac{2}{3}, \text{ArcSin}\left[\frac{1}{2} \sqrt{(2+3 \,\text{Cos}[c+d x]) \,\text{Csc}\left[\frac{1}{2} (c+d x)\right]^2}\right], -4\right]\right)$$
$$\left.\text{Sin}\left[\frac{1}{2} (c+d x)\right]^4\right) \Big/ \left(3 d \sqrt{-2-3 \,\text{Cos}[c+d x]} \sqrt{-\text{Cos}[c+d x]}\right)$$

Problem 672: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{-\text{Cos}[c+d x]}}{\sqrt{3+2 \,\text{Cos}[c+d x]}} \, dx$$

Optimal (type 4, 95 leaves, 2 steps):

$$-\frac{1}{d} 3 \sqrt{-\text{Cos}[c+d x]} \sqrt{\text{Cos}[c+d x]} \,\text{Csc}[c+d x]$$
$$\text{EllipticPi}\left[\frac{5}{2}, \text{ArcSin}\left[\frac{\sqrt{3+2 \,\text{Cos}[c+d x]}}{\sqrt{5} \sqrt{\text{Cos}[c+d x]}}\right], -5\right] \sqrt{1-\text{Sec}[c+d x]} \sqrt{1+\text{Sec}[c+d x]}$$

Result (type 4, 198 leaves):

$$\left(2\sqrt{-\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}\sqrt{-\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}\sqrt{(3+2\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}\right.$$

$$\text{Csc}[c+d\,x]\left(2\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{(3+2\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}}{\sqrt{6}}\right],6\right]-\right.$$

$$\left.5\,\text{EllipticPi}\left[-\frac{3}{2},\text{ArcSin}\left[\frac{\sqrt{(3+2\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}}{\sqrt{6}}\right],6\right]\right)$$

$$\left.\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\Big/\left(d\sqrt{-\text{Cos}[c+d\,x]}\sqrt{3+2\,\text{Cos}[c+d\,x]}\right)$$

Problem 673: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{-\text{Cos}[c+d\,x]}}{\sqrt{3-2\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 97 leaves, 2 steps):

$$\frac{1}{\sqrt{5}\,d}3\sqrt{-\text{Cos}[c+d\,x]}\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]$$

$$\text{EllipticPi}\left[-\frac{1}{2},\text{ArcSin}\left[\frac{\sqrt{3-2\,\text{Cos}[c+d\,x]}}{\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{1}{5}\right]\sqrt{1-\text{Sec}[c+d\,x]}\sqrt{1+\text{Sec}[c+d\,x]}$$

Result (type 4, 202 leaves):

$$\left(2 \sqrt{-\text{Cot}\left[\frac{1}{2}(c+d x)\right]^2} \sqrt{-\text{Cos}[c+d x]\,\text{Csc}\left[\frac{1}{2}(c+d x)\right]^2} \sqrt{-(-3+2\,\text{Cos}[c+d x])\,\text{Csc}\left[\frac{1}{2}(c+d x)\right]^2\,\text{Csc}[c+d x]} \left(2\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{-3+2\,\text{Cos}[c+d x]}{-1+\text{Cos}[c+d x]}}}{\sqrt{3}}\right], \frac{6}{5}\right] + \text{EllipticPi}\left[\frac{3}{2}, \text{ArcSin}\left[\frac{\sqrt{\frac{-3+2\,\text{Cos}[c+d x]}{-1+\text{Cos}[c+d x]}}}{\sqrt{3}}\right], \frac{6}{5}\right]\right) \text{Sin}\left[\frac{1}{2}(c+d x)\right]^4\right) \Big/ \left(\sqrt{5}\, d \sqrt{3-2\,\text{Cos}[c+d x]} \sqrt{-\text{Cos}[c+d x]}\right)$$

Problem 674: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{-\text{Cos}[c+d x]}}{\sqrt{-3+2\,\text{Cos}[c+d x]}}\, dx$$

Optimal (type 4, 77 leaves, 1 step):

$$\frac{1}{\sqrt{5}\, d} 3\,\text{Cot}[c+d x]\,\text{EllipticPi}\left[-\frac{1}{2}, \text{ArcSin}\left[\frac{\sqrt{-3+2\,\text{Cos}[c+d x]}}{\sqrt{-\text{Cos}[c+d x]}}\right], -\frac{1}{5}\right] \sqrt{1-\text{Sec}[c+d x]} \sqrt{1+\text{Sec}[c+d x]}$$

Result (type 4, 140 leaves):

$$\left(2\, i \sqrt{\frac{\text{Cos}[c+d x]}{1+\text{Cos}[c+d x]}} \sqrt{-3+2\,\text{Cos}[c+d x]} \left(\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{5}\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]\right], -\frac{1}{5}\right] - 2\,\text{EllipticPi}\left[\frac{1}{5}, i\,\text{ArcSinh}\left[\sqrt{5}\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]\right], -\frac{1}{5}\right]\right)\right) \Big/ \left(\sqrt{5}\, d \sqrt{-\text{Cos}[c+d x]} \sqrt{\frac{3-2\,\text{Cos}[c+d x]}{1+\text{Cos}[c+d x]}}\right)$$

Problem 675: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{-\text{Cos}[c+d\,x]}}{\sqrt{-3-2\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 75 leaves, 1 step):

$$-\frac{1}{d}3\,\text{Cot}[c+d\,x]\;\text{EllipticPi}\left[\frac{5}{2},\,\text{ArcSin}\left[\frac{\sqrt{-3-2\,\text{Cos}[c+d\,x]}}{\sqrt{5}\,\sqrt{-\text{Cos}[c+d\,x]}}\right],\,-5\right]\sqrt{1-\text{Sec}[c+d\,x]}\,\sqrt{1+\text{Sec}[c+d\,x]}$$

Result (type 4, 198 leaves):

$$\left(2\sqrt{-\text{Cot}\left[\frac{1}{2}(c+d\,x)\right]^2}\,\sqrt{-\text{Cos}[c+d\,x]\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}\,\sqrt{(3+2\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}\right.$$
$$\text{Csc}[c+d\,x]\left(2\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{(3+2\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}}{\sqrt{6}}\right],\,6\right]-\right.$$
$$\left.5\,\text{EllipticPi}\left[-\frac{3}{2},\,\text{ArcSin}\left[\frac{\sqrt{(3+2\,\text{Cos}[c+d\,x])\,\text{Csc}\left[\frac{1}{2}(c+d\,x)\right]^2}}{\sqrt{6}}\right],\,6\right]\right)$$
$$\left.\text{Sin}\left[\frac{1}{2}(c+d\,x)\right]^4\right)\bigg/\left(d\,\sqrt{-3-2\,\text{Cos}[c+d\,x]}\,\sqrt{-\text{Cos}[c+d\,x]}\right)$$

Problem 676: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Cos}[c+d\,x]^{2/3}}{a+b\,\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 6, 176 leaves, 5 steps):

$$-\left(\left(b\,\text{AppellF1}\left[\frac{1}{2},-\frac{1}{3},1,\frac{3}{2},\text{Sin}[c+d\,x]^2,-\frac{b^2\,\text{Sin}[c+d\,x]^2}{a^2-b^2}\right]\text{Cos}[c+d\,x]^{2/3}\,\text{Sin}[c+d\,x]\right)\Big/\left(\left(a^2-b^2\right)d\left(\text{Cos}[c+d\,x]^2\right)^{1/3}\right)\right)+$$
$$\left(a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},\text{Sin}[c+d\,x]^2,-\frac{b^2\,\text{Sin}[c+d\,x]^2}{a^2-b^2}\right]\left(\text{Cos}[c+d\,x]^2\right)^{1/6}\text{Sin}[c+d\,x]\right)\Big/\left(\left(a^2-b^2\right)d\,\text{Cos}[c+d\,x]^{1/3}\right)$$

Result (type 6, 4685 leaves):

$$\Bigg(9\left(a^2-b^2\right)\text{Sin}[c+d\,x]$$
$$\Bigg(-\Bigg(\Bigg(a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\sqrt{1+\text{Tan}[c+d\,x]^2}\Bigg)\Big/$$
$$\Bigg(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+$$
$$2\Bigg(3\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)$$
$$\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\Bigg)\text{Tan}[c+d\,x]^2\Bigg)\Bigg)+$$
$$\Bigg(b\,\text{AppellF1}\left[\frac{1}{2},\frac{5}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\Bigg)\Big/$$
$$\Bigg(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{5}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+$$
$$\Bigg(6\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{6},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+5\left(a^2-b^2\right)$$
$$\text{AppellF1}\left[\frac{3}{2},\frac{11}{6},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\Bigg)\text{Tan}[c+d\,x]^2\Bigg)\Bigg)\Bigg)\Big/$$
$$\Bigg(d\,\text{Cos}[c+d\,x]^{1/3}\left(a+b\,\text{Cos}[c+d\,x]\right)\left(1+\text{Tan}[c+d\,x]^2\right)^{5/6}$$
$$\left(-b^2+a^2\left(1+\text{Tan}[c+d\,x]^2\right)\right)$$
$$\Bigg(-\frac{1}{\left(1+\text{Tan}[c+d\,x]^2\right)^{5/6}\left(-b^2+a^2\left(1+\text{Tan}[c+d\,x]^2\right)\right)^2}18\,a^2\left(a^2-b^2\right)\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]^2$$
$$\Bigg(-\Bigg(\Bigg(a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\sqrt{1+\text{Tan}[c+d\,x]^2}\Bigg)\Big/$$
$$\Bigg(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+2$$
$$\Bigg(3\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)$$
$$\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\Bigg)\text{Tan}[c+d\,x]^2\Bigg)\Bigg)+$$
$$\Bigg(b\,\text{AppellF1}\left[\frac{1}{2},\frac{5}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\Bigg)\Big/$$

$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{5}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(6 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{6},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+5\left(a^2-b^2\right)\text{AppellF1}\left[\frac{3}{2},\frac{11}{6},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d x]^2\right)\Bigg)-$$

$$\frac{1}{\left(1+\text{Tan}[c+d x]^2\right)^{11/6}\left(-b^2+a^2\left(1+\text{Tan}[c+d x]^2\right)\right)}15\left(a^2-b^2\right)\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]^2$$

$$\left(-\left(\left(a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\sqrt{1+\text{Tan}[c+d x]^2}\right)\Big/\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+2\left(3 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d x]^2\right)\right)+\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{5}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\Big/\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{5}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(6 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{6},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+5\left(a^2-b^2\right)\text{AppellF1}\left[\frac{3}{2},\frac{11}{6},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d x]^2\right)\right)+$$

$$\frac{1}{\left(1+\text{Tan}[c+d x]^2\right)^{5/6}\left(-b^2+a^2\left(1+\text{Tan}[c+d x]^2\right)\right)}9\left(a^2-b^2\right)\text{Sec}[c+d x]^2$$

$$\left(-\left(\left(a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\sqrt{1+\text{Tan}[c+d x]^2}\right)\Big/\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+2\left(3 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d x]^2\right)\right)+\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{5}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\Big/\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{5}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(6 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{6},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+5\left(a^2-b^2\right)\text{AppellF1}\left[\frac{3}{2},\frac{11}{6},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d x]^2\right)\right)+$$

$$\frac{1}{\left(1+\text{Tan}[c+d x]^2\right)^{5/6}\left(-b^2+a^2\left(1+\text{Tan}[c+d x]^2\right)\right)} 9\left(a^2-b^2\right) \text{Tan}[c+d x]$$

$$\left(-\left(\left(a \,\text{AppellF1}\left[\frac{1}{2}, \frac{1}{3}, 1, \frac{3}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right.\right.\right.$$

$$\left.\text{Sec}[c+d x]^2 \,\text{Tan}[c+d x]\right) \Big/ \left(\sqrt{1+\text{Tan}[c+d x]^2}\left(-9\left(a^2-b^2\right)\right.\right.$$

$$\text{AppellF1}\left[\frac{1}{2}, \frac{1}{3}, 1, \frac{3}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+2\left(3 a^2 \,\text{AppellF1}\left[\right.\right.$$

$$\left.\frac{3}{2}, \frac{1}{3}, 2, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right) \text{AppellF1}\left[\right.$$

$$\left.\left.\left.\left.\left.\frac{3}{2}, \frac{4}{3}, 1, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right) \text{Tan}[c+d x]^2\right)\right)\right)-$$

$$\left(a\left(-\frac{1}{3\left(a^2-b^2\right)} 2 a^2 \,\text{AppellF1}\left[\frac{3}{2}, \frac{1}{3}, 2, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right.\right.$$

$$\text{Sec}[c+d x]^2 \,\text{Tan}[c+d x]-\frac{2}{9} \text{AppellF1}\left[\frac{3}{2}, \frac{4}{3}, 1, \frac{5}{2}, -\text{Tan}[c+d x]^2,\right.$$

$$\left.\left.-\frac{a^2 \,\text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \,\text{Tan}[c+d x]\right) \sqrt{1+\text{Tan}[c+d x]^2}\right) \Big/$$

$$\left(-9\left(a^2-b^2\right) \text{AppellF1}\left[\frac{1}{2}, \frac{1}{3}, 1, \frac{3}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$

$$2\left(3 a^2 \,\text{AppellF1}\left[\frac{3}{2}, \frac{1}{3}, 2, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\right.$$

$$\left.\left.\text{AppellF1}\left[\frac{3}{2}, \frac{4}{3}, 1, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right) \text{Tan}[c+d x]^2\right)+$$

$$\left(b\left(-\frac{1}{3\left(a^2-b^2\right)} 2 a^2 \,\text{AppellF1}\left[\frac{3}{2}, \frac{5}{6}, 2, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right.\right.$$

$$\text{Sec}[c+d x]^2 \,\text{Tan}[c+d x]-\frac{5}{9} \text{AppellF1}\left[\frac{3}{2}, \frac{11}{6}, 1, \frac{5}{2},\right.$$

$$\left.\left.\left.-\text{Tan}[c+d x]^2, -\frac{a^2 \,\text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \,\text{Tan}[c+d x]\right)\right) \Big/$$

$$\left(-9\left(a^2-b^2\right) \text{AppellF1}\left[\frac{1}{2}, \frac{5}{6}, 1, \frac{3}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$

$$\left(6 a^2 \,\text{AppellF1}\left[\frac{3}{2}, \frac{5}{6}, 2, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+5\left(a^2-b^2\right)\right.$$

$$\left.\left.\text{AppellF1}\left[\frac{3}{2}, \frac{11}{6}, 1, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right) \text{Tan}[c+d x]^2\right)+$$

$$\left(a \,\text{AppellF1}\left[\frac{1}{2}, \frac{1}{3}, 1, \frac{3}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \,\text{Tan}[c+d x]^2}{a^2-b^2}\right] \sqrt{1+\text{Tan}[c+d x]^2}\right.$$

$$\left(4\left(3 a^2 \,\text{AppellF1}\left[\frac{3}{2}, \frac{1}{3}, 2, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.\right.$$

$$\left.\left(a^2-b^2\right) \text{AppellF1}\left[\frac{3}{2}, \frac{4}{3}, 1, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)$$

$$\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-9\left(a^2-b^2\right)\left(-\frac{1}{3\left(a^2-b^2\right)}2\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\right.\right.$$
$$-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{2}{9}\,\text{AppellF1}\Big[$$
$$\left.\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\Big)+$$
$$2\,\text{Tan}[c+d\,x]^2\left(3\,a^2\left(-\frac{1}{5\left(a^2-b^2\right)}12\,a^2\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{3},3,\frac{7}{2},-\text{Tan}[c+d\,x]^2,\right.\right.\right.$$
$$\left.-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{2}{5}\,\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},2,\right.$$
$$\left.\left.\frac{7}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)+$$
$$\left(a^2-b^2\right)\left(-\frac{1}{5\left(a^2-b^2\right)}6\,a^2\,\text{AppellF1}\left[\frac{5}{2},\frac{4}{3},2,\frac{7}{2},-\text{Tan}[c+d\,x]^2,\right.\right.$$
$$\left.-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{8}{5}\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{3},1,\frac{7}{2},\right.$$
$$\left.\left.\left.\left.\left.-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)\right)\right)\right)\Big/$$
$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$
$$2\left(3\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\right.$$
$$\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)^2-$$
$$\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{5}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right.$$
$$\left(2\left(6\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{6},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.\right.$$
$$\left.5\left(a^2-b^2\right)\text{AppellF1}\left[\frac{3}{2},\frac{11}{6},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)$$
$$\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-9\left(a^2-b^2\right)\left(-\frac{1}{3\left(a^2-b^2\right)}2\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{6},2,\frac{5}{2},\right.\right.$$
$$-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{5}{9}\,\text{AppellF1}\Big[$$
$$\left.\frac{3}{2},\frac{11}{6},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\Big)+$$
$$\text{Tan}[c+d\,x]^2\left(6\,a^2\left(-\frac{1}{5\left(a^2-b^2\right)}12\,a^2\,\text{AppellF1}\left[\frac{5}{2},\frac{5}{6},3,\frac{7}{2},-\text{Tan}[c+d\,x]^2,\right.\right.\right.$$
$$-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\text{AppellF1}\left[\frac{5}{2},\frac{11}{6},2,\frac{7}{2},\right.$$

$$-\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\ \text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\Bigg)+$$
$$5\,\left(a^2-b^2\right)\,\Bigg(-\frac{1}{5\,\left(a^2-b^2\right)}6\,a^2\,\text{AppellF1}\Big[\frac{5}{2},\ \frac{11}{6},\ 2,\ \frac{7}{2},\ -\text{Tan}[c+d\,x]^2,$$
$$-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\ \text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{11}{5}\,\text{AppellF1}\Big[\frac{5}{2},\ \frac{17}{6},\ 1,$$
$$\frac{7}{2},\ -\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\ \text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$
$$\Bigg(-9\,\left(a^2-b^2\right)\,\text{AppellF1}\Big[\frac{1}{2},\ \frac{5}{6},\ 1,\ \frac{3}{2},\ -\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]+$$
$$\Bigg(6\,a^2\,\text{AppellF1}\Big[\frac{3}{2},\ \frac{5}{6},\ 2,\ \frac{5}{2},\ -\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]+$$
$$5\,\left(a^2-b^2\right)\,\text{AppellF1}\Big[\frac{3}{2},\ \frac{11}{6},\ 1,\ \frac{5}{2},\ -\text{Tan}[c+d\,x]^2,$$
$$-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\Bigg)\ \text{Tan}[c+d\,x]^2\Bigg)^2\Bigg)\Bigg)\Bigg)$$

Problem 677: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Cos}[c+d\,x]^{1/3}}{a+b\,\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 6, 176 leaves, 5 steps):

$$-\Bigg(\Bigg(b\,\text{AppellF1}\Big[\frac{1}{2},\ -\frac{1}{6},\ 1,\ \frac{3}{2},\ \text{Sin}[c+d\,x]^2,\ -\frac{b^2\,\text{Sin}[c+d\,x]^2}{a^2-b^2}\Big]\ \text{Cos}[c+d\,x]^{1/3}\,\text{Sin}[c+d\,x]\Bigg)\Bigg/$$
$$\left(\left(a^2-b^2\right)\,d\,\left(\text{Cos}[c+d\,x]^2\right)^{1/6}\right)\Bigg)+$$
$$\Bigg(a\,\text{AppellF1}\Big[\frac{1}{2},\ \frac{1}{3},\ 1,\ \frac{3}{2},\ \text{Sin}[c+d\,x]^2,\ -\frac{b^2\,\text{Sin}[c+d\,x]^2}{a^2-b^2}\Big]\ \left(\text{Cos}[c+d\,x]^2\right)^{1/3}\,\text{Sin}[c+d\,x]\Bigg)\Bigg/$$
$$\left(\left(a^2-b^2\right)\,d\,\text{Cos}[c+d\,x]^{2/3}\right)$$

Result (type 6, 4613 leaves):

$$\Bigg(9\,\left(a^2-b^2\right)\,\text{Sin}[c+d\,x]$$
$$\Bigg(\Bigg(a\,\text{AppellF1}\Big[\frac{1}{2},\ \frac{1}{6},\ 1,\ \frac{3}{2},\ -\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\ \sqrt{\text{Sec}[c+d\,x]^2}\Bigg)\Bigg/$$
$$\Bigg(9\,\left(a^2-b^2\right)\,\text{AppellF1}\Big[\frac{1}{2},\ \frac{1}{6},\ 1,\ \frac{3}{2},\ -\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]+$$
$$\Bigg(-6\,a^2\,\text{AppellF1}\Big[\frac{3}{2},\ \frac{1}{6},\ 2,\ \frac{5}{2},\ -\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]+$$
$$\left(-a^2+b^2\right)\,\text{AppellF1}\Big[\frac{3}{2},\ \frac{7}{6},\ 1,\ \frac{5}{2},\ -\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\Bigg)\ \text{Tan}[c+d\,x]^2\Bigg)+$$

$$\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{2}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\Big/$$

$$\left(-9\,(a^2-b^2)\,\text{AppellF1}\left[\frac{1}{2},\frac{2}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+2\left(3\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{2}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+2\,(a^2-b^2)\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)\Big)\Big)\Big/$$

$$\Big(d\,\text{Cos}[c+d\,x]^{2/3}\,(a+b\,\text{Cos}[c+d\,x])\,\left(\text{Sec}[c+d\,x]^2\right)^{2/3}\left(-b^2+a^2\,\text{Sec}[c+d\,x]^2\right)$$

$$\Big(\frac{1}{-b^2+a^2\,\text{Sec}[c+d\,x]^2}\,9\,(a^2-b^2)\,\left(\text{Sec}[c+d\,x]^2\right)^{1/3}$$

$$\Big(\left(a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\sqrt{\text{Sec}[c+d\,x]^2}\right)\Big/$$

$$\left(9\,(a^2-b^2)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(-6\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+(-a^2+b^2)\,\text{AppellF1}\left[\frac{3}{2},\frac{7}{6},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)+$$

$$\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{2}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\Big/$$

$$\left(-9\,(a^2-b^2)\,\text{AppellF1}\left[\frac{1}{2},\frac{2}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+2\left(3\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{2}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+2\,(a^2-b^2)\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)\Big)-$$

$$\frac{1}{\left(-b^2+a^2\,\text{Sec}[c+d\,x]^2\right)^2}\,18\,a^2\,(a^2-b^2)\,\left(\text{Sec}[c+d\,x]^2\right)^{1/3}\,\text{Tan}[c+d\,x]^2$$

$$\Big(\left(a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\sqrt{\text{Sec}[c+d\,x]^2}\right)\Big/$$

$$\left(9\,(a^2-b^2)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(-6\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+(-a^2+b^2)\,\text{AppellF1}\left[\frac{3}{2},\frac{7}{6},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)+$$

$$\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{2}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\Big/$$

$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{2}{3},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$
$$2\left(3 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{2}{3},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+2\left(a^2-b^2\right)\right.$$
$$\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{5}{3},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d x]^2\right)\Bigg)-$$
$$\frac{1}{\left(\text{Sec}[c+d x]^2\right)^{2/3}\left(-b^2+a^2\,\text{Sec}[c+d x]^2\right)}\,12\left(a^2-b^2\right)\text{Tan}[c+d x]^2$$
$$\left(\left(a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\sqrt{\text{Sec}[c+d x]^2}\right)\right/$$
$$\left(9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$
$$\left(-6 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(-a^2+b^2\right)\right.$$
$$\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{7}{6},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d x]^2\right)+$$
$$\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{2}{3},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\Bigg/$$
$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{2}{3},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$
$$2\left(3 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{2}{3},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+2\left(a^2-b^2\right)\right.$$
$$\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{5}{3},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d x]^2\right)\Bigg)+$$
$$\frac{1}{\left(\text{Sec}[c+d x]^2\right)^{2/3}\left(-b^2+a^2\,\text{Sec}[c+d x]^2\right)}\,9\left(a^2-b^2\right)\text{Tan}[c+d x]$$
$$\left(\left(a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\sqrt{\text{Sec}[c+d x]^2}\,\text{Tan}[\right.\right.$$
$$\left.c+d x]\right)\Big/\left(9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$
$$\left(-6 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(-a^2+b^2\right)\right.$$
$$\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{7}{6},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d x]^2\right)+$$
$$\left(a\sqrt{\text{Sec}[c+d x]^2}\left(-\frac{1}{3\left(a^2-b^2\right)}2 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d x]^2,\right.\right.\right.$$
$$\left.-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]-\frac{1}{9}\text{AppellF1}\left[\frac{3}{2},\frac{7}{6},1,\right.$$
$$\left.\left.\left.\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]\right)\right)\Bigg/$$
$$\left(9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$

$$\left(-6\, a^2\, \text{AppellF1}\left[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(-a^2+b^2\right)\right.$$
$$\left.\text{AppellF1}\left[\frac{3}{2},\frac{7}{6},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\Big)+$$
$$\left(b\left(-\frac{1}{3\left(a^2-b^2\right)}2\, a^2\, \text{AppellF1}\left[\frac{3}{2},\frac{2}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right.\right.$$
$$\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{4}{9}\text{AppellF1}\left[\frac{3}{2},\frac{5}{3},1,\frac{5}{2},\right.$$
$$\left.\left.\left.-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)\right)\Big/$$
$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{2}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$
$$2\left(3\, a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{2}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+2\left(a^2-b^2\right)\right.$$
$$\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{5}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)-$$
$$\left(a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\sqrt{\text{Sec}[c+d\,x]^2}\right.$$
$$\left(2\left(-6\, a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.\right.$$
$$\left.\left(-a^2+b^2\right)\text{AppellF1}\left[\frac{3}{2},\frac{7}{6},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)$$
$$\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]+9\left(a^2-b^2\right)\left(-\frac{1}{3\left(a^2-b^2\right)}2\, a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},\right.\right.$$
$$\left.-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{1}{9}\text{AppellF1}\Big[$$
$$\left.\frac{3}{2},\frac{7}{6},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\Big)+$$
$$\text{Tan}[c+d\,x]^2\left(-6\, a^2\left(-\frac{1}{5\left(a^2-b^2\right)}12\, a^2\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{6},3,\frac{7}{2},-\text{Tan}[c+d\,x]^2,\right.\right.\right.$$
$$\left.-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{1}{5}\text{AppellF1}\left[\frac{5}{2},\frac{7}{6},2,\right.$$
$$\left.\left.\frac{7}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)+$$
$$\left(-a^2+b^2\right)\left(-\frac{1}{5\left(a^2-b^2\right)}6\, a^2\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{6},2,\frac{7}{2},-\text{Tan}[c+d\,x]^2,\right.\right.$$
$$\left.-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{7}{5}\text{AppellF1}\left[\frac{5}{2},\frac{13}{6},1,\frac{7}{2},\right.$$
$$\left.\left.\left.\left.\left.-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)\right)\right)\right)\Big/$$

$$\left(9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(-6\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(-a^2+b^2\right)\text{AppellF1}\left[\frac{3}{2},\frac{7}{6},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)^2-$$

$$\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{2}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right.$$
$$\left(4\left(3\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{2}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+2\left(a^2-b^2\right)\text{AppellF1}\left[\frac{3}{2},\frac{5}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\right.$$
$$\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-9\left(a^2-b^2\right)\left(-\frac{1}{3\left(a^2-b^2\right)}2\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{2}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{4}{9}\text{AppellF1}\left[\frac{3}{2},\frac{5}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)+$$
$$2\,\text{Tan}[c+d\,x]^2\left(3\,a^2\left(-\frac{1}{5\left(a^2-b^2\right)}12\,a^2\,\text{AppellF1}\left[\frac{5}{2},\frac{2}{3},3,\frac{7}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{4}{5}\text{AppellF1}\left[\frac{5}{2},\frac{5}{3},2,\frac{7}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)+\right.$$
$$\left.\left.\left.2\left(a^2-b^2\right)\left(-\frac{1}{5\left(a^2-b^2\right)}6\,a^2\,\text{AppellF1}\left[\frac{5}{2},\frac{5}{3},2,\frac{7}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-2\,\text{AppellF1}\left[\frac{5}{2},\frac{8}{3},1,\frac{7}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)\right)\right)\right)\Big/$$
$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{2}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+2\left(3\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{2}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+2\left(a^2-b^2\right)\text{AppellF1}\left[\frac{3}{2},\frac{5}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)^2\Bigg)\Bigg)\Bigg)$$

Problem 678: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\text{Cos}[c+d\,x]^{1/3}\left(a+b\,\text{Cos}[c+d\,x]\right)}\,dx$$

Optimal (type 6, 176 leaves, 5 steps):

$$-\left(\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},\text{Sin}[c+d\,x]^2,-\frac{b^2\,\text{Sin}[c+d\,x]^2}{a^2-b^2}\right]\left(\text{Cos}[c+d\,x]^2\right)^{1/6}\text{Sin}[c+d\,x]\right)\Big/\left(\left(a^2-b^2\right)d\,\text{Cos}[c+d\,x]^{1/3}\right)\right)+\left(a\,\text{AppellF1}\left[\frac{1}{2},\frac{2}{3},1,\frac{3}{2},\text{Sin}[c+d\,x]^2,-\frac{b^2\,\text{Sin}[c+d\,x]^2}{a^2-b^2}\right]\left(\text{Cos}[c+d\,x]^2\right)^{2/3}\text{Sin}[c+d\,x]\right)\Big/\left(\left(a^2-b^2\right)d\,\text{Cos}[c+d\,x]^{4/3}\right)$$

Result (type 6, 4676 leaves):

$$\Bigg(9\left(a^2-b^2\right)\text{Sin}[c+d\,x]\Bigg(-\Bigg(\Bigg(a\,\text{AppellF1}\left[\frac{1}{2},-\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\sqrt{1+\text{Tan}[c+d\,x]^2}\Bigg)\Big/\Bigg(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},-\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(6\,a^2\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(-a^2+b^2\right)\text{AppellF1}\left[\frac{3}{2},\frac{5}{6},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\Bigg)\Bigg)+\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\Big/\Bigg(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+2\left(3\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\Bigg)\Bigg)\Bigg)\Big/$$

$$\Bigg(d\,\text{Cos}[c+d\,x]^{4/3}\left(a+b\,\text{Cos}[c+d\,x]\right)\left(1+\text{Tan}[c+d\,x]^2\right)^{1/3}\left(-b^2+a^2\left(1+\text{Tan}[c+d\,x]^2\right)\right)$$

$$\Bigg(-\frac{1}{\left(1+\text{Tan}[c+d\,x]^2\right)^{1/3}\left(-b^2+a^2\left(1+\text{Tan}[c+d\,x]^2\right)\right)^2}18\,a^2\left(a^2-b^2\right)\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]^2$$

$$\Bigg(-\Bigg(\Bigg(a\,\text{AppellF1}\left[\frac{1}{2},-\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\sqrt{1+\text{Tan}[c+d\,x]^2}\Bigg)\Big/\Bigg(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},-\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(6\,a^2\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(-a^2+b^2\right)\text{AppellF1}\left[\frac{3}{2},\frac{5}{6},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\Bigg)\Bigg)+$$

$$\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\Big/$$

$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$

$$2\left(3\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\right.$$

$$\left.\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)\right)-$$

$$\frac{1}{\left(1+\text{Tan}[c+d\,x]^2\right)^{4/3}\left(-b^2+a^2\left(1+\text{Tan}[c+d\,x]^2\right)\right)}\,6\left(a^2-b^2\right)\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]^2$$

$$\left(-\left(\left(a\,\text{AppellF1}\left[\frac{1}{2},-\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\sqrt{1+\text{Tan}[c+d\,x]^2}\right)\Big/\right.\right.$$

$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},-\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$

$$\left(6\,a^2\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(-a^2+b^2\right)\right.$$

$$\left.\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{5}{6},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)\right)+$$

$$\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\Big/$$

$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$

$$2\left(3\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\right.$$

$$\left.\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)\right)+$$

$$\frac{1}{\left(1+\text{Tan}[c+d\,x]^2\right)^{1/3}\left(-b^2+a^2\left(1+\text{Tan}[c+d\,x]^2\right)\right)}\,9\left(a^2-b^2\right)\text{Sec}[c+d\,x]^2$$

$$\left(-\left(\left(a\,\text{AppellF1}\left[\frac{1}{2},-\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\sqrt{1+\text{Tan}[c+d\,x]^2}\right)\Big/\right.\right.$$

$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},-\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$

$$\left(6\,a^2\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(-a^2+b^2\right)\right.$$

$$\left.\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{5}{6},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)\right)+$$

$$\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\Big/$$

$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$

$$2\left(3\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\right.$$

$$\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\text{Tan}[c+d x]^2\Bigg)\Bigg)+$$

$$\frac{1}{\left(1+\text{Tan}[c+d x]^2\right)^{1/3}\left(-b^2+a^2\left(1+\text{Tan}[c+d x]^2\right)\right)}9\left(a^2-b^2\right)\text{Tan}[c+d x]$$

$$\Bigg(-\Bigg(\Bigg(a\,\text{AppellF1}\left[\frac{1}{2},-\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]$$

$$\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]\Bigg)\Bigg/\Bigg(\sqrt{1+\text{Tan}[c+d x]^2}\,\Bigg(-9\left(a^2-b^2\right)$$

$$\text{AppellF1}\left[\frac{1}{2},-\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+\Bigg(6a^2\,\text{AppellF1}\Big[$$

$$\frac{3}{2},-\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\Big]+\left(-a^2+b^2\right)\text{AppellF1}\Big[$$

$$\frac{3}{2},\frac{5}{6},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\Big]\Bigg)\text{Tan}[c+d x]^2\Bigg)\Bigg)\Bigg)-$$

$$\Bigg(a\,\Bigg(-\frac{1}{3\left(a^2-b^2\right)}2a^2\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]$$

$$\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]+\frac{1}{9}\text{AppellF1}\Big[\frac{3}{2},\frac{5}{6},1,\frac{5}{2},-\text{Tan}[c+d x]^2,$$

$$-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\Big]\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]\Bigg)\sqrt{1+\text{Tan}[c+d x]^2}\Bigg)\Bigg/$$

$$\Bigg(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},-\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+$$

$$\Bigg(6a^2\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(-a^2+b^2\right)$$

$$\text{AppellF1}\left[\frac{3}{2},\frac{5}{6},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\Bigg)\text{Tan}[c+d x]^2\Bigg)+$$

$$\Bigg(b\,\Bigg(-\frac{1}{3\left(a^2-b^2\right)}2a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]$$

$$\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]-\frac{2}{9}\text{AppellF1}\Big[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},$$

$$-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\Big]\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]\Bigg)\Bigg)\Bigg/$$

$$\Bigg(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+$$

$$2\,\Bigg(3a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)$$

$$\text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\Bigg)\text{Tan}[c+d x]^2\Bigg)+$$

$$\Bigg(a\,\text{AppellF1}\left[\frac{1}{2},-\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\sqrt{1+\text{Tan}[c+d x]^2}$$

$$\Bigg(2\,\Bigg(6a^2\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+$$

$$\left(-a^2+b^2\right) \text{AppellF1}\left[\frac{3}{2},\frac{5}{6},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\Bigg)$$

$$\text{Sec}[c+d x]^2 \text{Tan}[c+d x]-9\left(a^2-b^2\right)\left(-\frac{1}{3\left(a^2-b^2\right)} 2 a^2 \text{AppellF1}\left[\frac{3}{2},-\frac{1}{6},2,\frac{5}{2},\right.\right.$$

$$\left.-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]+\frac{1}{9} \text{AppellF1}\Big[$$

$$\left.\left.\frac{3}{2},\frac{5}{6},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]\right)+$$

$$\text{Tan}[c+d x]^2\left(6 a^2\left(-\frac{1}{5\left(a^2-b^2\right)} 12 a^2 \text{AppellF1}\left[\frac{5}{2},-\frac{1}{6},3,\frac{7}{2},-\text{Tan}[c+d x]^2,\right.\right.\right.$$

$$\left.-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]+\frac{1}{5} \text{AppellF1}\left[\frac{5}{2},\frac{5}{6},2,\right.$$

$$\left.\left.\frac{7}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]\right)+$$

$$\left(-a^2+b^2\right)\left(-\frac{1}{5\left(a^2-b^2\right)} 6 a^2 \text{AppellF1}\left[\frac{5}{2},\frac{5}{6},2,\frac{7}{2},-\text{Tan}[c+d x]^2,\right.\right.$$

$$\left.-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]-\text{AppellF1}\left[\frac{5}{2},\frac{11}{6},1,\frac{7}{2},\right.$$

$$\left.\left.\left.\left.\left.-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]\right)\right)\right)\right)\Bigg/$$

$$\left(-9\left(a^2-b^2\right) \text{AppellF1}\left[\frac{1}{2},-\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$

$$\left(6 a^2 \text{AppellF1}\left[\frac{3}{2},-\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(-a^2+b^2\right)\right.$$

$$\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{5}{6},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\right) \text{Tan}[c+d x]^2\right)^2-$$

$$\left(b \text{AppellF1}\left[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\right.$$

$$\left(4\left(3 a^2 \text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.\right.$$

$$\left.\left(a^2-b^2\right) \text{AppellF1}\left[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)$$

$$\text{Sec}[c+d x]^2 \text{Tan}[c+d x]-9\left(a^2-b^2\right)\left(-\frac{1}{3\left(a^2-b^2\right)} 2 a^2 \text{AppellF1}\left[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},\right.\right.$$

$$\left.-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]-\frac{2}{9} \text{AppellF1}\Big[$$

$$\left.\left.\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]\right)+$$

$$2 \text{Tan}[c+d x]^2\left(3 a^2\left(-\frac{1}{5\left(a^2-b^2\right)} 12 a^2 \text{AppellF1}\left[\frac{5}{2},\frac{1}{3},3,\frac{7}{2},-\text{Tan}[c+d x]^2,\right.\right.\right.$$

$$-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{2}{5}\,\text{AppellF1}\Big[\frac{5}{2},\frac{4}{3},2,\frac{7}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\Bigg)+$$

$$\left(a^2-b^2\right)\Bigg(-\frac{1}{5\left(a^2-b^2\right)}6\,a^2\,\text{AppellF1}\Big[\frac{5}{2},\frac{4}{3},2,\frac{7}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{8}{5}\,\text{AppellF1}\Big[\frac{5}{2},\frac{7}{3},1,\frac{7}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\Bigg(-9\left(a^2-b^2\right)\text{AppellF1}\Big[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]+2\Bigg(3\,a^2\,\text{AppellF1}\Big[\frac{3}{2},\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]+\left(a^2-b^2\right)\text{AppellF1}\Big[\frac{3}{2},\frac{4}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\Bigg)\,\text{Tan}[c+d\,x]^2\Bigg)^2\Bigg)\Bigg)\Bigg)$$

Problem 679: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\text{Cos}[c+d\,x]^{2/3}\,\left(a+b\,\text{Cos}[c+d\,x]\right)}\,dx$$

Optimal (type 6, 176 leaves, 5 steps):

$$-\left(\left(b\,\text{AppellF1}\Big[\frac{1}{2},\frac{1}{3},1,\frac{3}{2},\text{Sin}[c+d\,x]^2,-\frac{b^2\,\text{Sin}[c+d\,x]^2}{a^2-b^2}\Big]\left(\text{Cos}[c+d\,x]^2\right)^{1/3}\text{Sin}[c+d\,x]\right)\Big/\left(\left(a^2-b^2\right)d\,\text{Cos}[c+d\,x]^{2/3}\right)\right)+$$

$$\left(a\,\text{AppellF1}\Big[\frac{1}{2},\frac{5}{6},1,\frac{3}{2},\text{Sin}[c+d\,x]^2,-\frac{b^2\,\text{Sin}[c+d\,x]^2}{a^2-b^2}\Big]\left(\text{Cos}[c+d\,x]^2\right)^{5/6}\text{Sin}[c+d\,x]\right)\Big/\left(\left(a^2-b^2\right)d\,\text{Cos}[c+d\,x]^{5/3}\right)$$

Result (type 6, 4679 leaves):

$$\Bigg(9\left(a^2-b^2\right)\text{Sin}[c+d\,x]$$

$$\Bigg(-\Bigg(\Bigg(a\,\text{AppellF1}\Big[\frac{1}{2},-\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\sqrt{1+\text{Tan}[c+d\,x]^2}\Bigg)\Bigg/$$

$$\Bigg(-9\left(a^2-b^2\right)\text{AppellF1}\Big[\frac{1}{2},-\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]+2\Bigg(3\,a^2\,\text{AppellF1}\Big[\frac{3}{2},-\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]+\left(-a^2+b^2\right)\text{AppellF1}\Big[\frac{3}{2},\frac{2}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\Bigg)\,\text{Tan}[c+d\,x]^2\Bigg)\Bigg)+$$

$$\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\Big/$$

$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$

$$\left(6\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\right.$$

$$\left.\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{7}{6},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)\right)\right)\Big/$$

$$\left(d\,\text{Cos}[c+d\,x]^{5/3}\left(a+b\,\text{Cos}[c+d\,x]\right)\left(1+\text{Tan}[c+d\,x]^2\right)^{1/6}\right.$$

$$\left(-b^2+a^2\left(1+\text{Tan}[c+d\,x]^2\right)\right)$$

$$\left(-\frac{1}{\left(1+\text{Tan}[c+d\,x]^2\right)^{1/6}\left(-b^2+a^2\left(1+\text{Tan}[c+d\,x]^2\right)\right)^2}18\,a^2\left(a^2-b^2\right)\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]^2\right.$$

$$\left(-\left(\left(a\,\text{AppellF1}\left[\frac{1}{2},-\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\sqrt{1+\text{Tan}[c+d\,x]^2}\right)\Big/\right.\right.$$

$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},-\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+2\right.$$

$$\left(3\,a^2\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(-a^2+b^2\right)\right.$$

$$\left.\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{2}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)\right)+$$

$$\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\Big/$$

$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$

$$\left(6\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\right.$$

$$\left.\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{7}{6},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)\right)-$$

$$\frac{1}{\left(1+\text{Tan}[c+d\,x]^2\right)^{7/6}\left(-b^2+a^2\left(1+\text{Tan}[c+d\,x]^2\right)\right)}3\left(a^2-b^2\right)\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]^2$$

$$\left(-\left(\left(a\,\text{AppellF1}\left[\frac{1}{2},-\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\sqrt{1+\text{Tan}[c+d\,x]^2}\right)\Big/\right.\right.$$

$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},-\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$

$$2\left(3\,a^2\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(-a^2+b^2\right)\right.$$

$$\left.\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{2}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)\right)+$$

$$\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\Big/$$

$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$

$$\left(6 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\right.$$

$$\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{7}{6},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d x]^2\right)\Bigg)+$$

$$\frac{1}{\left(1+\text{Tan}[c+d x]^2\right)^{1/6}\left(-b^2+a^2\left(1+\text{Tan}[c+d x]^2\right)\right)}9\left(a^2-b^2\right)\text{Sec}[c+d x]^2$$

$$\left(-\left(\left(a\,\text{AppellF1}\left[\frac{1}{2},-\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\sqrt{1+\text{Tan}[c+d x]^2}\right)\Big/\right.\right.$$

$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},-\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$

$$2\left(3 a^2\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(-a^2+b^2\right)\right.$$

$$\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{2}{3},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d x]^2\right)\Bigg)+$$

$$\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\Big/$$

$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$

$$\left(6 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\right.$$

$$\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{7}{6},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d x]^2\right)\Bigg)+$$

$$\frac{1}{\left(1+\text{Tan}[c+d x]^2\right)^{1/6}\left(-b^2+a^2\left(1+\text{Tan}[c+d x]^2\right)\right)}9\left(a^2-b^2\right)\text{Tan}[c+d x]$$

$$\left(-\left(\left(a\,\text{AppellF1}\left[\frac{1}{2},-\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right.\right.\right.$$

$$\left.\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]\right)\Big/\left(\sqrt{1+\text{Tan}[c+d x]^2}\left(-9\left(a^2-b^2\right)\right.\right.$$

$$\text{AppellF1}\left[\frac{1}{2},-\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+2\left(3 a^2\,\text{AppellF1}\left[\right.\right.$$

$$\left.\frac{3}{2},-\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(-a^2+b^2\right)\text{AppellF1}\left[\right.$$

$$\left.\left.\left.\left.\left.\frac{3}{2},\frac{2}{3},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d x]^2\right)\right)\right)-$$

$$\left(a\left(-\frac{1}{3\left(a^2-b^2\right)}2 a^2\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right.\right.$$

$$\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]+\frac{2}{9}\text{AppellF1}\left[\frac{3}{2},\frac{2}{3},1,\frac{5}{2},-\text{Tan}[c+d x]^2,\right.$$

$$\left.\left.-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]\right)\sqrt{1+\text{Tan}[c+d x]^2}\right)\Big/$$

$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},-\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$
$$2\left(3\,a^2\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(-a^2+b^2\right)\right.$$
$$\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{2}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)+$$
$$\left(b\left(-\frac{1}{3\left(a^2-b^2\right)}2\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right.\right.$$
$$\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{1}{9}\text{AppellF1}\left[\frac{3}{2},\frac{7}{6},1,\frac{5}{2},\right.$$
$$\left.\left.\left.-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)\right)\Big/$$
$$\left(-9\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$
$$\left(6\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\right.$$
$$\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{7}{6},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)+$$
$$\left(a\,\text{AppellF1}\left[\frac{1}{2},-\frac{1}{3},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\sqrt{1+\text{Tan}[c+d\,x]^2}\right.$$
$$\left(4\left(3\,a^2\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{3},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.\right.$$
$$\left.\left(-a^2+b^2\right)\text{AppellF1}\left[\frac{3}{2},\frac{2}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)$$
$$\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-9\left(a^2-b^2\right)\left(-\frac{1}{3\left(a^2-b^2\right)}2\,a^2\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{3},2,\frac{5}{2},\right.\right.$$
$$\left.-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]+\frac{2}{9}\text{AppellF1}\left[\right.$$
$$\left.\left.\frac{3}{2},\frac{2}{3},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)+$$
$$2\,\text{Tan}[c+d\,x]^2\left(3\,a^2\left(-\frac{1}{5\left(a^2-b^2\right)}12\,a^2\,\text{AppellF1}\left[\frac{5}{2},-\frac{1}{3},3,\frac{7}{2},-\text{Tan}[c+d\,x]^2,\right.\right.\right.$$
$$\left.-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]+\frac{2}{5}\text{AppellF1}\left[\frac{5}{2},\frac{2}{3},2,\right.$$
$$\left.\left.\frac{7}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)+$$
$$\left(-a^2+b^2\right)\left(-\frac{1}{5\left(a^2-b^2\right)}6\,a^2\,\text{AppellF1}\left[\frac{5}{2},\frac{2}{3},2,\frac{7}{2},-\text{Tan}[c+d\,x]^2,\right.\right.$$
$$\left.-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{4}{5}\text{AppellF1}\left[\frac{5}{2},\frac{5}{3},1,\frac{7}{2},\right.$$

$$-\mathrm{Tan}[c+dx]^2,\ -\frac{a^2\,\mathrm{Tan}[c+dx]^2}{a^2-b^2}\Big]\ \mathrm{Sec}[c+dx]^2\,\mathrm{Tan}[c+dx]\Big)\Big)\Big)\Big)\Big)\Big/$$

$$\Big(-9\,(a^2-b^2)\,\mathrm{AppellF1}\Big[\frac{1}{2},-\frac{1}{3},1,\frac{3}{2},-\mathrm{Tan}[c+dx]^2,-\frac{a^2\,\mathrm{Tan}[c+dx]^2}{a^2-b^2}\Big]+$$

$$2\,\Big(3\,a^2\,\mathrm{AppellF1}\Big[\frac{3}{2},-\frac{1}{3},2,\frac{5}{2},-\mathrm{Tan}[c+dx]^2,-\frac{a^2\,\mathrm{Tan}[c+dx]^2}{a^2-b^2}\Big]+(-a^2+b^2)$$

$$\mathrm{AppellF1}\Big[\frac{3}{2},\frac{2}{3},1,\frac{5}{2},-\mathrm{Tan}[c+dx]^2,-\frac{a^2\,\mathrm{Tan}[c+dx]^2}{a^2-b^2}\Big]\Big)\ \mathrm{Tan}[c+dx]^2\Big)^2-$$

$$\Big(b\,\mathrm{AppellF1}\Big[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\mathrm{Tan}[c+dx]^2,-\frac{a^2\,\mathrm{Tan}[c+dx]^2}{a^2-b^2}\Big]$$

$$\Big(2\,\Big(6\,a^2\,\mathrm{AppellF1}\Big[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},-\mathrm{Tan}[c+dx]^2,-\frac{a^2\,\mathrm{Tan}[c+dx]^2}{a^2-b^2}\Big]+$$

$$(a^2-b^2)\,\mathrm{AppellF1}\Big[\frac{3}{2},\frac{7}{6},1,\frac{5}{2},-\mathrm{Tan}[c+dx]^2,-\frac{a^2\,\mathrm{Tan}[c+dx]^2}{a^2-b^2}\Big]\Big)$$

$$\mathrm{Sec}[c+dx]^2\,\mathrm{Tan}[c+dx]-9\,(a^2-b^2)\,\Big(-\frac{1}{3\,(a^2-b^2)}2\,a^2\,\mathrm{AppellF1}\Big[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},$$

$$-\mathrm{Tan}[c+dx]^2,-\frac{a^2\,\mathrm{Tan}[c+dx]^2}{a^2-b^2}\Big]\ \mathrm{Sec}[c+dx]^2\,\mathrm{Tan}[c+dx]-\frac{1}{9}\,\mathrm{AppellF1}\Big[$$

$$\frac{3}{2},\frac{7}{6},1,\frac{5}{2},-\mathrm{Tan}[c+dx]^2,-\frac{a^2\,\mathrm{Tan}[c+dx]^2}{a^2-b^2}\Big]\ \mathrm{Sec}[c+dx]^2\,\mathrm{Tan}[c+dx]\Big)+$$

$$\mathrm{Tan}[c+dx]^2\,\Big(6\,a^2\,\Big(-\frac{1}{5\,(a^2-b^2)}12\,a^2\,\mathrm{AppellF1}\Big[\frac{5}{2},\frac{1}{6},3,\frac{7}{2},-\mathrm{Tan}[c+dx]^2,$$

$$-\frac{a^2\,\mathrm{Tan}[c+dx]^2}{a^2-b^2}\Big]\ \mathrm{Sec}[c+dx]^2\,\mathrm{Tan}[c+dx]-\frac{1}{5}\,\mathrm{AppellF1}\Big[\frac{5}{2},\frac{7}{6},2,$$

$$\frac{7}{2},-\mathrm{Tan}[c+dx]^2,-\frac{a^2\,\mathrm{Tan}[c+dx]^2}{a^2-b^2}\Big]\ \mathrm{Sec}[c+dx]^2\,\mathrm{Tan}[c+dx]\Big)+$$

$$(a^2-b^2)\,\Big(-\frac{1}{5\,(a^2-b^2)}6\,a^2\,\mathrm{AppellF1}\Big[\frac{5}{2},\frac{7}{6},2,\frac{7}{2},-\mathrm{Tan}[c+dx]^2,$$

$$-\frac{a^2\,\mathrm{Tan}[c+dx]^2}{a^2-b^2}\Big]\ \mathrm{Sec}[c+dx]^2\,\mathrm{Tan}[c+dx]-\frac{7}{5}\,\mathrm{AppellF1}\Big[\frac{5}{2},\frac{13}{6},1,\frac{7}{2},$$

$$-\mathrm{Tan}[c+dx]^2,-\frac{a^2\,\mathrm{Tan}[c+dx]^2}{a^2-b^2}\Big]\ \mathrm{Sec}[c+dx]^2\,\mathrm{Tan}[c+dx]\Big)\Big)\Big)\Big)\Big)\Big/$$

$$\Big(-9\,(a^2-b^2)\,\mathrm{AppellF1}\Big[\frac{1}{2},\frac{1}{6},1,\frac{3}{2},-\mathrm{Tan}[c+dx]^2,-\frac{a^2\,\mathrm{Tan}[c+dx]^2}{a^2-b^2}\Big]+$$

$$\Big(6\,a^2\,\mathrm{AppellF1}\Big[\frac{3}{2},\frac{1}{6},2,\frac{5}{2},-\mathrm{Tan}[c+dx]^2,-\frac{a^2\,\mathrm{Tan}[c+dx]^2}{a^2-b^2}\Big]+(a^2-b^2)$$

$$\mathrm{AppellF1}\Big[\frac{3}{2},\frac{7}{6},1,\frac{5}{2},-\mathrm{Tan}[c+dx]^2,-\frac{a^2\,\mathrm{Tan}[c+dx]^2}{a^2-b^2}\Big]\Big)\ \mathrm{Tan}[c+dx]^2\Big)^2\Big)\Big)\Big)$$

Problem 681: Attempted integration timed out after 120 seconds.

$$\int \frac{\text{Cos}[c+d\,x]^{5/3}}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 8, 28 leaves, 0 steps):

$$\text{Int}\left[\frac{\text{Cos}[c+d\,x]^{5/3}}{\sqrt{a+b\,\text{Cos}[c+d\,x]}},\,x\right]$$

Result (type 1, 1 leaves):

???

Problem 687: Attempted integration timed out after 120 seconds.

$$\int \frac{1}{\text{Cos}[c+d\,x]^{4/3}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 8, 28 leaves, 0 steps):

$$\text{Int}\left[\frac{1}{\text{Cos}[c+d\,x]^{4/3}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}},\,x\right]$$

Result (type 1, 1 leaves):

???

Problem 689: Attempted integration timed out after 120 seconds.

$$\int \frac{1}{\text{Cos}[c+d\,x]^{7/3}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 8, 28 leaves, 0 steps):

$$\text{Int}\left[\frac{1}{\text{Cos}[c+d\,x]^{7/3}\,\sqrt{a+b\,\text{Cos}[c+d\,x]}},\,x\right]$$

Result (type 1, 1 leaves):

???

Problem 719: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Sec}[c+d\,x]^{3/2}}{\left(a+b\,\text{Cos}[c+d\,x]\right)^2}\,dx$$

Optimal (type 4, 277 leaves, 11 steps):

$$-\frac{1}{a^2\left(a^2-b^2\right)d}\left(2a^2-3b^2\right)\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticE}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}+\frac{b\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticF}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{a\left(a^2-b^2\right)d}-\left(b\left(5a^2-3b^2\right)\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticPi}\left[\frac{2b}{a+b},\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}\right)\Big/\left(a^2(a-b)(a+b)^2 d\right)+\frac{\left(2a^2-3b^2\right)\sqrt{\text{Sec}[c+d\,x]}\ \text{Sin}[c+d\,x]}{a^2\left(a^2-b^2\right)d}+\frac{b^2\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{a\left(a^2-b^2\right)d\left(b+a\,\text{Sec}[c+d\,x]\right)}$$

Result (type 4, 635 leaves):

$$\frac{\sqrt{\text{Sec}[c+d\,x]}\left(\frac{\left(2a^2-3b^2\right)\text{Sin}[c+d\,x]}{a^2\left(a^2-b^2\right)}+\frac{b^2\,\text{Sin}[c+d\,x]}{a\left(a^2-b^2\right)\left(a+b\,\text{Cos}[c+d\,x]\right)}\right)}{d}-\frac{1}{4a^2(a-b)(a+b)d}\Bigg(-\Bigg(\Big(2\left(4a^3-8ab^2\right)\text{Cos}[c+d\,x]^2\ \text{EllipticPi}\left[-\frac{a}{b},-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]\left(b+a\,\text{Sec}[c+d\,x]\right)\sqrt{1-\text{Sec}[c+d\,x]^2}\ \text{Sin}[c+d\,x]\Big)\Big/\left(b\left(a+b\,\text{Cos}[c+d\,x]\right)\left(1-\text{Cos}[c+d\,x]^2\right)\right)\Bigg)+\Big(2\left(10a^2b-9b^3\right)\text{Cos}[c+d\,x]^2\left(\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]+\text{EllipticPi}\left[-\frac{a}{b},-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]\right)\left(b+a\,\text{Sec}[c+d\,x]\right)\sqrt{1-\text{Sec}[c+d\,x]^2}\ \text{Sin}[c+d\,x]\Big)\Big/\left(a\left(a+b\,\text{Cos}[c+d\,x]\right)\left(1-\text{Cos}[c+d\,x]^2\right)\right)+\Big(\left(2a^2b-3b^3\right)\text{Cos}\left[2(c+d\,x)\right]\left(b+a\,\text{Sec}[c+d\,x]\right)\Big(-4ab+4ab\,\text{Sec}[c+d\,x]^2-4ab\,\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]\sqrt{\text{Sec}[c+d\,x]}\sqrt{1-\text{Sec}[c+d\,x]^2}+2(2a-b)b\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]\sqrt{\text{Sec}[c+d\,x]}\sqrt{1-\text{Sec}[c+d\,x]^2}+4a^2\,\text{EllipticPi}\left[-\frac{a}{b},-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]\sqrt{\text{Sec}[c+d\,x]}\sqrt{1-\text{Sec}[c+d\,x]^2}-2b^2\,\text{EllipticPi}\left[-\frac{a}{b},-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]\sqrt{\text{Sec}[c+d\,x]}\sqrt{1-\text{Sec}[c+d\,x]^2}\Big)\text{Sin}[c+d\,x]\Big)\Big/\left(ab^2\left(a+b\,\text{Cos}[c+d\,x]\right)\left(1-\text{Cos}[c+d\,x]^2\right)\sqrt{\text{Sec}[c+d\,x]}\left(2-\text{Sec}[c+d\,x]^2\right)\right)\Bigg)$$

Problem 720: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{\text{Sec}[c+d\,x]}}{\left(a+b\,\text{Cos}[c+d\,x]\right)^2}\,dx$$

Optimal (type 4, 217 leaves, 10 steps):

$$-\frac{b\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticE}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{a\left(a^2-b^2\right)d}-\frac{\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticF}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{\left(a^2-b^2\right)d}+$$
$$\left(\left(3a^2-b^2\right)\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticPi}\left[\frac{2b}{a+b},\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}\right)\Big/\left(a(a-b)(a+b)^2 d\right)+\frac{b^2\sqrt{\text{Sec}[c+d\,x]}\ \text{Sin}[c+d\,x]}{a\left(a^2-b^2\right)d\left(b+a\,\text{Sec}[c+d\,x]\right)}$$

Result (type 4, 590 leaves):

$$\frac{\sqrt{\text{Sec}[c+d\,x]}\left(\frac{b\,\text{Sin}[c+d\,x]}{a\left(a^2-b^2\right)}+\frac{b\,\text{Sin}[c+d\,x]}{\left(-a^2+b^2\right)\left(a+b\,\text{Cos}[c+d\,x]\right)}\right)}{d}+\frac{1}{4a(-a+b)(a+b)d}$$
$$\Bigg(-\Bigg(\Bigg(8a\,\text{Cos}[c+d\,x]^2\,\text{EllipticPi}\left[-\frac{a}{b},-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]\left(b+a\,\text{Sec}[c+d\,x]\right)$$
$$\sqrt{1-\text{Sec}[c+d\,x]^2}\ \text{Sin}[c+d\,x]\Bigg)\Big/\left(\left(a+b\,\text{Cos}[c+d\,x]\right)\left(1-\text{Cos}[c+d\,x]^2\right)\right)\Bigg)+$$
$$\Bigg(2\left(-4a^2+3b^2\right)\text{Cos}[c+d\,x]^2\Bigg(\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]+$$
$$\text{EllipticPi}\left[-\frac{a}{b},-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]\Bigg)\left(b+a\,\text{Sec}[c+d\,x]\right)$$
$$\sqrt{1-\text{Sec}[c+d\,x]^2}\ \text{Sin}[c+d\,x]\Bigg)\Big/\left(a\left(a+b\,\text{Cos}[c+d\,x]\right)\left(1-\text{Cos}[c+d\,x]^2\right)\right)+$$
$$\Bigg(\text{Cos}[2(c+d\,x)]\left(b+a\,\text{Sec}[c+d\,x]\right)\Bigg(-4ab+4ab\,\text{Sec}[c+d\,x]^2-$$
$$4ab\,\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]\sqrt{\text{Sec}[c+d\,x]}\sqrt{1-\text{Sec}[c+d\,x]^2}+$$
$$2(2a-b)\,b\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]\sqrt{\text{Sec}[c+d\,x]}\sqrt{1-\text{Sec}[c+d\,x]^2}+$$
$$4a^2\,\text{EllipticPi}\left[-\frac{a}{b},-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]\sqrt{\text{Sec}[c+d\,x]}\sqrt{1-\text{Sec}[c+d\,x]^2}-$$
$$2b^2\,\text{EllipticPi}\left[-\frac{a}{b},-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]$$
$$\sqrt{\text{Sec}[c+d\,x]}\sqrt{1-\text{Sec}[c+d\,x]^2}\Bigg)\text{Sin}[c+d\,x]\Bigg)\Big/$$
$$\left(a\left(a+b\,\text{Cos}[c+d\,x]\right)\left(1-\text{Cos}[c+d\,x]^2\right)\sqrt{\text{Sec}[c+d\,x]}\left(2-\text{Sec}[c+d\,x]^2\right)\right)\Bigg)$$

Problem 721: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\left(a+b\,\text{Cos}[c+d\,x]\right)^2\sqrt{\text{Sec}[c+d\,x]}}\,dx$$

Optimal (type 4, 208 leaves, 10 steps):

$$\frac{\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\sqrt{\text{Sec}[c+d\,x]}}{\left(a^2-b^2\right)\,d}+\frac{a\,\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\sqrt{\text{Sec}[c+d\,x]}}{b\,\left(a^2-b^2\right)\,d}-$$
$$\left(\left(a^2+b^2\right)\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticPi}\left[\frac{2\,b}{a+b},\,\frac{1}{2}\,(c+d\,x),\,2\right]\sqrt{\text{Sec}[c+d\,x]}\right)\Big/$$
$$\left(\left(a-b\right)\,b\,\left(a+b\right)^2\,d\right)-\frac{b\,\sqrt{\text{Sec}[c+d\,x]}\ \text{Sin}[c+d\,x]}{\left(a^2-b^2\right)\,d\,\left(b+a\,\text{Sec}[c+d\,x]\right)}$$

Result (type 4, 580 leaves):

$$\frac{\sqrt{\text{Sec}[c+d\,x]}\,\left(-\frac{\text{Sin}[c+d\,x]}{a^2-b^2}+\frac{a\,\text{Sin}[c+d\,x]}{\left(a^2-b^2\right)\,\left(a+b\,\text{Cos}[c+d\,x]\right)}\right)}{d}+\frac{1}{4\,(a-b)\,(a+b)\,d}$$
$$\left(-\left(\left(8\,a\,\text{Cos}[c+d\,x]^2\,\text{EllipticPi}\left[-\frac{a}{b},\,-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],\,-1\right]\,\left(b+a\,\text{Sec}[c+d\,x]\right)\right.\right.\right.$$
$$\left.\left.\sqrt{1-\text{Sec}[c+d\,x]^2}\ \text{Sin}[c+d\,x]\right)\Big/\left(b\,\left(a+b\,\text{Cos}[c+d\,x]\right)\,\left(1-\text{Cos}[c+d\,x]^2\right)\right)\right)-$$
$$\left(2\,b\,\text{Cos}[c+d\,x]^2\,\left(\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],\,-1\right]+\right.\right.$$
$$\left.\text{EllipticPi}\left[-\frac{a}{b},\,-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],\,-1\right]\right)\,\left(b+a\,\text{Sec}[c+d\,x]\right)$$
$$\left.\sqrt{1-\text{Sec}[c+d\,x]^2}\ \text{Sin}[c+d\,x]\right)\Big/\left(a\,\left(a+b\,\text{Cos}[c+d\,x]\right)\,\left(1-\text{Cos}[c+d\,x]^2\right)\right)+$$
$$\left(\text{Cos}\left[2\,(c+d\,x)\right]\,\left(b+a\,\text{Sec}[c+d\,x]\right)\,\left(-4\,a\,b+4\,a\,b\,\text{Sec}[c+d\,x]^2-\right.\right.$$
$$4\,a\,b\,\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],\,-1\right]\sqrt{\text{Sec}[c+d\,x]}\ \sqrt{1-\text{Sec}[c+d\,x]^2}+$$
$$2\,(2\,a-b)\,b\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],\,-1\right]\sqrt{\text{Sec}[c+d\,x]}\ \sqrt{1-\text{Sec}[c+d\,x]^2}+$$
$$4\,a^2\,\text{EllipticPi}\left[-\frac{a}{b},\,-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],\,-1\right]\sqrt{\text{Sec}[c+d\,x]}\ \sqrt{1-\text{Sec}[c+d\,x]^2}-$$
$$\left.2\,b^2\,\text{EllipticPi}\left[-\frac{a}{b},\,-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],\,-1\right]\sqrt{\text{Sec}[c+d\,x]}\ \sqrt{1-\text{Sec}[c+d\,x]^2}\right)$$
$$\left.\text{Sin}[c+d\,x]\right)\Big/\left(a\,b\,\left(a+b\,\text{Cos}[c+d\,x]\right)\,\left(1-\text{Cos}[c+d\,x]^2\right)\right.$$
$$\left.\left.\sqrt{\text{Sec}[c+d\,x]}\,\left(2-\text{Sec}[c+d\,x]^2\right)\right)\right)$$

Problem 722: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\left(a+b\,\text{Cos}[c+d\,x]\right)^2\,\text{Sec}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 4, 223 leaves, 10 steps):

$$-\frac{a\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticE}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{b\left(a^2-b^2\right)d}+\frac{\left(a^2-2\,b^2\right)\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticF}\left[\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}}{b^2\left(a^2-b^2\right)d}-\left(a\left(a^2-3\,b^2\right)\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticPi}\left[\frac{2\,b}{a+b},\frac{1}{2}(c+d\,x),2\right]\sqrt{\text{Sec}[c+d\,x]}\right)\Big/\left(\left(a-b\right)b^2\left(a+b\right)^2d\right)+\frac{a\sqrt{\text{Sec}[c+d\,x]}\ \text{Sin}[c+d\,x]}{\left(a^2-b^2\right)d\left(b+a\,\text{Sec}[c+d\,x]\right)}$$

Result (type 4, 577 leaves):

$$\frac{\sqrt{\text{Sec}[c+d\,x]}\left(\frac{a\,\text{Sin}[c+d\,x]}{b\left(a^2-b^2\right)}+\frac{a^2\,\text{Sin}[c+d\,x]}{b\left(-a^2+b^2\right)\left(a+b\,\text{Cos}[c+d\,x]\right)}\right)}{d}+\frac{1}{4\left(-a+b\right)\left(a+b\right)d}\left(-\left(\left(8\,\text{Cos}[c+d\,x]^2\,\text{EllipticPi}\left[-\frac{a}{b},-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]\left(b+a\,\text{Sec}[c+d\,x]\right)\sqrt{1-\text{Sec}[c+d\,x]^2}\ \text{Sin}[c+d\,x]\right)\Big/\left(\left(a+b\,\text{Cos}[c+d\,x]\right)\left(1-\text{Cos}[c+d\,x]^2\right)\right)\right)-\left(2\,\text{Cos}[c+d\,x]^2\left(\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]+\text{EllipticPi}\left[-\frac{a}{b},-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]\right)\left(b+a\,\text{Sec}[c+d\,x]\right)\sqrt{1-\text{Sec}[c+d\,x]^2}\ \text{Sin}[c+d\,x]\right)\Big/\left(\left(a+b\,\text{Cos}[c+d\,x]\right)\left(1-\text{Cos}[c+d\,x]^2\right)\right)+\left(\text{Cos}\left[2\left(c+d\,x\right)\right]\left(b+a\,\text{Sec}[c+d\,x]\right)\left(-4\,a\,b+4\,a\,b\,\text{Sec}[c+d\,x]^2-4\,a\,b\,\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]\sqrt{\text{Sec}[c+d\,x]}\sqrt{1-\text{Sec}[c+d\,x]^2}+2\left(2\,a-b\right)b\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]\sqrt{\text{Sec}[c+d\,x]}\sqrt{1-\text{Sec}[c+d\,x]^2}+4\,a^2\,\text{EllipticPi}\left[-\frac{a}{b},-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]\sqrt{\text{Sec}[c+d\,x]}\sqrt{1-\text{Sec}[c+d\,x]^2}-2\,b^2\,\text{EllipticPi}\left[-\frac{a}{b},-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],-1\right]\sqrt{\text{Sec}[c+d\,x]}\sqrt{1-\text{Sec}[c+d\,x]^2}\right)\text{Sin}[c+d\,x]\right)\Big/\left(b^2\left(a+b\,\text{Cos}[c+d\,x]\right)\left(1-\text{Cos}[c+d\,x]^2\right)\sqrt{\text{Sec}[c+d\,x]}\left(2-\text{Sec}[c+d\,x]^2\right)\right)\right)$$

Problem 723: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\left(a+b\,\text{Cos}[c+d\,x]\right)^2\,\text{Sec}[c+d\,x]^{5/2}}\,dx$$

Optimal (type 4, 245 leaves, 10 steps):

$$\frac{\left(3\,a^2-2\,b^2\right)\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\sqrt{\text{Sec}[c+d\,x]}}{b^2\left(a^2-b^2\right)d}-$$

$$\frac{1}{b^3\left(a^2-b^2\right)d}a\left(3\,a^2-4\,b^2\right)\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\sqrt{\text{Sec}[c+d\,x]}\ +$$

$$\left(a^2\left(3\,a^2-5\,b^2\right)\sqrt{\text{Cos}[c+d\,x]}\ \text{EllipticPi}\left[\frac{2\,b}{a+b},\,\frac{1}{2}\,(c+d\,x),\,2\right]\sqrt{\text{Sec}[c+d\,x]}\right)\Big/$$

$$\left((a-b)\,b^3\,(a+b)^2\,d\right)-\frac{a^2\sqrt{\text{Sec}[c+d\,x]}\ \text{Sin}[c+d\,x]}{b\left(a^2-b^2\right)d\,\left(b+a\,\text{Sec}[c+d\,x]\right)}$$

Result (type 4, 611 leaves):

$$\frac{\sqrt{\text{Sec}[c+d\,x]}\left(-\frac{a^2\,\text{Sin}[c+d\,x]}{b^2\left(a^2-b^2\right)}-\frac{a^3\,\text{Sin}[c+d\,x]}{b^2\left(-a^2+b^2\right)\left(a+b\,\text{Cos}[c+d\,x]\right)}\right)}{d}+\frac{1}{4\,(a-b)\,b\,(a+b)\,d}$$

$$\Bigg(-\Bigg(\Bigg(8\,a\,\text{Cos}[c+d\,x]^2\,\text{EllipticPi}\left[-\frac{a}{b},\,-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],\,-1\right]\left(b+a\,\text{Sec}[c+d\,x]\right)$$

$$\sqrt{1-\text{Sec}[c+d\,x]^2}\ \text{Sin}[c+d\,x]\Bigg)\Big/\left(\left(a+b\,\text{Cos}[c+d\,x]\right)\left(1-\text{Cos}[c+d\,x]^2\right)\right)\Bigg)+$$

$$\Bigg(2\left(a^2-2\,b^2\right)\text{Cos}[c+d\,x]^2\left(\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],\,-1\right]+\right.$$

$$\left.\text{EllipticPi}\left[-\frac{a}{b},\,-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],\,-1\right]\right)\left(b+a\,\text{Sec}[c+d\,x]\right)$$

$$\sqrt{1-\text{Sec}[c+d\,x]^2}\ \text{Sin}[c+d\,x]\Bigg)\Big/\left(a\left(a+b\,\text{Cos}[c+d\,x]\right)\left(1-\text{Cos}[c+d\,x]^2\right)\right)+$$

$$\Bigg(\left(3\,a^2-2\,b^2\right)\text{Cos}\left[2\,(c+d\,x)\right]\left(b+a\,\text{Sec}[c+d\,x]\right)\Big(-4\,a\,b+4\,a\,b\,\text{Sec}[c+d\,x]^2-$$

$$4\,a\,b\,\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],\,-1\right]\sqrt{\text{Sec}[c+d\,x]}\ \sqrt{1-\text{Sec}[c+d\,x]^2}\ +$$

$$2\,(2\,a-b)\,b\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],\,-1\right]\sqrt{\text{Sec}[c+d\,x]}\ \sqrt{1-\text{Sec}[c+d\,x]^2}\ +$$

$$4\,a^2\,\text{EllipticPi}\left[-\frac{a}{b},\,-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],\,-1\right]\sqrt{\text{Sec}[c+d\,x]}\ \sqrt{1-\text{Sec}[c+d\,x]^2}\ -$$

$$2\,b^2\,\text{EllipticPi}\left[-\frac{a}{b},\,-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d\,x]}\right],\,-1\right]\sqrt{\text{Sec}[c+d\,x]}\ \sqrt{1-\text{Sec}[c+d\,x]^2}\Big)$$

$$\text{Sin}[c+d\,x]\Bigg)\Big/\Big(a\,b^2\left(a+b\,\text{Cos}[c+d\,x]\right)\left(1-\text{Cos}[c+d\,x]^2\right)$$

$$\sqrt{\text{Sec}[c+d\,x]}\ \left(2-\text{Sec}[c+d\,x]^2\right)\Big)\Bigg)$$

Problem 726: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{\text{Sec}[c+d\,x]}}{\left(a+b\,\text{Cos}[c+d\,x]\right)^3}\,dx$$

Optimal (type 4, 321 leaves, 11 steps):

$$-\frac{1}{4 a^2 \left(a^2-b^2\right)^2 d} 3 b \left(3 a^2-b^2\right) \sqrt{\text{Cos}[c+d x]} \text{ EllipticE}\left[\frac{1}{2} (c+d x), 2\right] \sqrt{\text{Sec}[c+d x]} - \frac{\left(7 a^2-b^2\right) \sqrt{\text{Cos}[c+d x]} \text{ EllipticF}\left[\frac{1}{2} (c+d x), 2\right] \sqrt{\text{Sec}[c+d x]}}{4 a \left(a^2-b^2\right)^2 d} + \left(3 \left(5 a^4-2 a^2 b^2+b^4\right) \sqrt{\text{Cos}[c+d x]} \text{ EllipticPi}\left[\frac{2 b}{a+b}, \frac{1}{2} (c+d x), 2\right] \sqrt{\text{Sec}[c+d x]}\right) \Big/ \left(4 a^2 (a-b)^2 (a+b)^3 d\right) + \frac{b^2 \text{Sec}[c+d x]^{3/2} \text{Sin}[c+d x]}{2 a \left(a^2-b^2\right) d \left(b+a \text{Sec}[c+d x]\right)^2} + \frac{3 b^2 \left(3 a^2-b^2\right) \sqrt{\text{Sec}[c+d x]} \text{ Sin}[c+d x]}{4 a^2 \left(a^2-b^2\right)^2 d \left(b+a \text{Sec}[c+d x]\right)}$$

Result (type 4, 700 leaves) :

$$\frac{1}{16 a^2 (a-b)^2 (a+b)^2 d} \left(-\left(\left(2 \left(-32 a^3 b+8 a b^3\right) \text{Cos}[c+d x]^2 \text{ EllipticPi}\left[-\frac{a}{b}, -\text{ArcSin}\left[\sqrt{\text{Sec}[c+d x]}\right], -1\right] \left(b+a \text{Sec}[c+d x]\right) \sqrt{1-\text{Sec}[c+d x]^2} \text{ Sin}[c+d x]\right) \Big/ \left(b \left(a+b \text{Cos}[c+d x]\right) \left(1-\text{Cos}[c+d x]^2\right)\right)\right) + \left(2 \left(16 a^4-19 a^2 b^2+9 b^4\right) \text{Cos}[c+d x]^2 \left(\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d x]}\right], -1\right] + \text{EllipticPi}\left[-\frac{a}{b}, -\text{ArcSin}\left[\sqrt{\text{Sec}[c+d x]}\right], -1\right]\right) \left(b+a \text{Sec}[c+d x]\right) \sqrt{1-\text{Sec}[c+d x]^2} \text{ Sin}[c+d x]\right) \Big/ \left(a \left(a+b \text{Cos}[c+d x]\right) \left(1-\text{Cos}[c+d x]^2\right)\right) + \left(\left(-9 a^2 b^2+3 b^4\right) \text{Cos}[2 (c+d x)] \left(b+a \text{Sec}[c+d x]\right) \left(-4 a b+4 a b \text{Sec}[c+d x]^2 - 4 a b \text{ EllipticE}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d x]}\right], -1\right] \sqrt{\text{Sec}[c+d x]} \sqrt{1-\text{Sec}[c+d x]^2} + 2 (2 a-b) b \text{ EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d x]}\right], -1\right] \sqrt{\text{Sec}[c+d x]} \sqrt{1-\text{Sec}[c+d x]^2} + 4 a^2 \text{ EllipticPi}\left[-\frac{a}{b}, -\text{ArcSin}\left[\sqrt{\text{Sec}[c+d x]}\right], -1\right] \sqrt{\text{Sec}[c+d x]} \sqrt{1-\text{Sec}[c+d x]^2} - 2 b^2 \text{ EllipticPi}\left[-\frac{a}{b}, -\text{ArcSin}\left[\sqrt{\text{Sec}[c+d x]}\right], -1\right] \sqrt{\text{Sec}[c+d x]} \sqrt{1-\text{Sec}[c+d x]^2}\right) \text{Sin}[c+d x]\right) \Big/ \left(a b^2 \left(a+b \text{Cos}[c+d x]\right) \left(1-\text{Cos}[c+d x]^2\right) \sqrt{\text{Sec}[c+d x]} \left(2-\text{Sec}[c+d x]^2\right)\right)\right) + \frac{1}{d} \sqrt{\text{Sec}[c+d x]} \left(\frac{3 b \left(3 a^2-b^2\right) \text{Sin}[c+d x]}{4 a^2 \left(a^2-b^2\right)^2} - \frac{b \text{ Sin}[c+d x]}{2 \left(a^2-b^2\right) \left(a+b \text{Cos}[c+d x]\right)^2} + \frac{-7 a^2 b \text{ Sin}[c+d x]+b^3 \text{Sin}[c+d x]}{4 a \left(a^2-b^2\right)^2 \left(a+b \text{Cos}[c+d x]\right)}\right)$$

Problem 727: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{(a+b\,\text{Cos}[c+d\,x])^3\,\sqrt{\text{Sec}[c+d\,x]}}\,dx$$

Optimal (type 4, 317 leaves, 11 steps):

$$\frac{\left(5\,a^2+b^2\right)\sqrt{\text{Cos}[c+d\,x]}\;\text{EllipticE}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\sqrt{\text{Sec}[c+d\,x]}}{4\,a\,\left(a^2-b^2\right)^2\,d}+$$
$$\frac{3\,\left(a^2+b^2\right)\sqrt{\text{Cos}[c+d\,x]}\;\text{EllipticF}\left[\frac{1}{2}\,(c+d\,x),\,2\right]\sqrt{\text{Sec}[c+d\,x]}}{4\,b\,\left(a^2-b^2\right)^2\,d}-$$
$$\left(\left(3\,a^4+10\,a^2\,b^2-b^4\right)\sqrt{\text{Cos}[c+d\,x]}\;\text{EllipticPi}\left[\frac{2\,b}{a+b},\,\frac{1}{2}\,(c+d\,x),\,2\right]\sqrt{\text{Sec}[c+d\,x]}\right)\Big/$$
$$\left(4\,a\,(a-b)^2\,b\,(a+b)^3\,d\right)+$$
$$\frac{b^2\,\sqrt{\text{Sec}[c+d\,x]}\;\text{Sin}[c+d\,x]}{2\,a\,\left(a^2-b^2\right)\,d\,(b+a\,\text{Sec}[c+d\,x])^2}-\frac{b\,\left(7\,a^2-b^2\right)\sqrt{\text{Sec}[c+d\,x]}\;\text{Sin}[c+d\,x]}{4\,a\,\left(a^2-b^2\right)^2\,d\,(b+a\,\text{Sec}[c+d\,x])}$$

Result (type 4, 680 leaves):

$$\frac{1}{16\,a\,(a-b)^2\,(a+b)^2\,d}\Bigg(-\Bigg(\Big(2\,(16\,a^3+8\,a\,b^2)\,\text{Cos}[c+d\,x]^2\,\text{EllipticPi}\Big[-\frac{a}{b},\,-\text{ArcSin}\Big[\sqrt{\text{Sec}[c+d\,x]}\Big],\,-1\Big]$$

$$(b+a\,\text{Sec}[c+d\,x])\,\sqrt{1-\text{Sec}[c+d\,x]^2}\,\text{Sin}[c+d\,x]\Big)\Big/$$

$$\Big(b\,(a+b\,\text{Cos}[c+d\,x])\,(1-\text{Cos}[c+d\,x]^2)\Big)\Bigg)+$$

$$\Big(2\,(-9\,a^2\,b+3\,b^3)\,\text{Cos}[c+d\,x]^2\,\Big(\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\text{Sec}[c+d\,x]}\Big],\,-1\Big]+$$

$$\text{EllipticPi}\Big[-\frac{a}{b},\,-\text{ArcSin}\Big[\sqrt{\text{Sec}[c+d\,x]}\Big],\,-1\Big]\Big)\,(b+a\,\text{Sec}[c+d\,x])$$

$$\sqrt{1-\text{Sec}[c+d\,x]^2}\,\text{Sin}[c+d\,x]\Big)\Big/\Big(a\,(a+b\,\text{Cos}[c+d\,x])\,(1-\text{Cos}[c+d\,x]^2)\Big)+$$

$$\Big((5\,a^2\,b+b^3)\,\text{Cos}[2\,(c+d\,x)]\,(b+a\,\text{Sec}[c+d\,x])\,\Big(-4\,a\,b+4\,a\,b\,\text{Sec}[c+d\,x]^2-$$

$$4\,a\,b\,\text{EllipticE}\Big[\text{ArcSin}\Big[\sqrt{\text{Sec}[c+d\,x]}\Big],\,-1\Big]\,\sqrt{\text{Sec}[c+d\,x]}\,\sqrt{1-\text{Sec}[c+d\,x]^2}+$$

$$2\,(2\,a-b)\,b\,\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\text{Sec}[c+d\,x]}\Big],\,-1\Big]\,\sqrt{\text{Sec}[c+d\,x]}\,\sqrt{1-\text{Sec}[c+d\,x]^2}+$$

$$4\,a^2\,\text{EllipticPi}\Big[-\frac{a}{b},\,-\text{ArcSin}\Big[\sqrt{\text{Sec}[c+d\,x]}\Big],\,-1\Big]\,\sqrt{\text{Sec}[c+d\,x]}\,\sqrt{1-\text{Sec}[c+d\,x]^2}-$$

$$2\,b^2\,\text{EllipticPi}\Big[-\frac{a}{b},\,-\text{ArcSin}\Big[\sqrt{\text{Sec}[c+d\,x]}\Big],\,-1\Big]\,\sqrt{\text{Sec}[c+d\,x]}\,\sqrt{1-\text{Sec}[c+d\,x]^2}\Big)$$

$$\text{Sin}[c+d\,x]\Big)\Big/\Big(a\,b^2\,(a+b\,\text{Cos}[c+d\,x])\,(1-\text{Cos}[c+d\,x]^2)$$

$$\sqrt{\text{Sec}[c+d\,x]}\,(2-\text{Sec}[c+d\,x]^2)\Big)\Bigg)+\frac{1}{d}$$

$$\sqrt{\text{Sec}[c+d\,x]}\,\Bigg(-\frac{(5\,a^2+b^2)\,\text{Sin}[c+d\,x]}{4\,a\,(a^2-b^2)^2}+\frac{a\,\text{Sin}[c+d\,x]}{2\,(a^2-b^2)\,(a+b\,\text{Cos}[c+d\,x])^2}+$$

$$\frac{3\,(a^2\,\text{Sin}[c+d\,x]+b^2\,\text{Sin}[c+d\,x])}{4\,(a^2-b^2)^2\,(a+b\,\text{Cos}[c+d\,x])}\Bigg)$$

Problem 728: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{(a+b\,\text{Cos}[c+d\,x])^3\,\text{Sec}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 4, 302 leaves, 11 steps):

$$-\frac{\left(a^2+5 b^2\right) \sqrt{\text{Cos}[c+d x]}\ \text{EllipticE}\left[\frac{1}{2} (c+d x),2\right] \sqrt{\text{Sec}[c+d x]}}{4 b \left(a^2-b^2\right)^2 d}+\frac{a \left(a^2-7 b^2\right) \sqrt{\text{Cos}[c+d x]}\ \text{EllipticF}\left[\frac{1}{2} (c+d x),2\right] \sqrt{\text{Sec}[c+d x]}}{4 b^2 \left(a^2-b^2\right)^2 d}-\left(\left(a^4-10 a^2 b^2-3 b^4\right) \sqrt{\text{Cos}[c+d x]}\ \text{EllipticPi}\left[\frac{2 b}{a+b},\frac{1}{2} (c+d x),2\right] \sqrt{\text{Sec}[c+d x]}\right)\Big/\left(4 (a-b)^2 b^2 (a+b)^3 d\right)-\frac{b \sqrt{\text{Sec}[c+d x]}\ \text{Sin}[c+d x]}{2 \left(a^2-b^2\right) d\, (b+a\, \text{Sec}[c+d x])^2}+\frac{3 \left(a^2+b^2\right) \sqrt{\text{Sec}[c+d x]}\ \text{Sin}[c+d x]}{4 \left(a^2-b^2\right)^2 d\, (b+a\, \text{Sec}[c+d x])}$$

Result (type 4, 671 leaves):

$$-\frac{1}{16 (a-b)^2 (a+b)^2 d}\Bigg(-\Bigg(\Bigg(48 a\, \text{Cos}[c+d x]^2\, \text{EllipticPi}\left[-\frac{a}{b},-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d x]}\right],-1\right] (b+a\, \text{Sec}[c+d x]) \sqrt{1-\text{Sec}[c+d x]^2}\ \text{Sin}[c+d x]\Bigg)\Big/\left((a+b\, \text{Cos}[c+d x]) \left(1-\text{Cos}[c+d x]^2\right)\right)\Bigg)+\Bigg(2 \left(-5 a^2-b^2\right) \text{Cos}[c+d x]^2 \Bigg(\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d x]}\right],-1\right]+\text{EllipticPi}\left[-\frac{a}{b},-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d x]}\right],-1\right]\Bigg) (b+a\, \text{Sec}[c+d x]) \sqrt{1-\text{Sec}[c+d x]^2}\ \text{Sin}[c+d x]\Bigg)\Big/\left(a\, (a+b\, \text{Cos}[c+d x]) \left(1-\text{Cos}[c+d x]^2\right)\right)+\Bigg(\left(a^2+5 b^2\right) \text{Cos}[2 (c+d x)]\, (b+a\, \text{Sec}[c+d x]) \Bigg(-4 a b+4 a b\, \text{Sec}[c+d x]^2-4 a b\, \text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d x]}\right],-1\right] \sqrt{\text{Sec}[c+d x]} \sqrt{1-\text{Sec}[c+d x]^2}+2 (2 a-b)\, b\, \text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\text{Sec}[c+d x]}\right],-1\right] \sqrt{\text{Sec}[c+d x]} \sqrt{1-\text{Sec}[c+d x]^2}+4 a^2\, \text{EllipticPi}\left[-\frac{a}{b},-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d x]}\right],-1\right] \sqrt{\text{Sec}[c+d x]} \sqrt{1-\text{Sec}[c+d x]^2}-2 b^2\, \text{EllipticPi}\left[-\frac{a}{b},-\text{ArcSin}\left[\sqrt{\text{Sec}[c+d x]}\right],-1\right] \sqrt{\text{Sec}[c+d x]} \sqrt{1-\text{Sec}[c+d x]^2}\Bigg) \text{Sin}[c+d x]\Bigg)\Big/\left(a b^2 (a+b\, \text{Cos}[c+d x]) \left(1-\text{Cos}[c+d x]^2\right) \sqrt{\text{Sec}[c+d x]} \left(2-\text{Sec}[c+d x]^2\right)\right)\Bigg)+\frac{1}{d}\sqrt{\text{Sec}[c+d x]} \left(\frac{\left(a^2+5 b^2\right) \text{Sin}[c+d x]}{4 b \left(-a^2+b^2\right)^2}+\frac{a^2\, \text{Sin}[c+d x]}{2 b \left(-a^2+b^2\right) (a+b\, \text{Cos}[c+d x])^2}+\frac{a^3\, \text{Sin}[c+d x]-7 a b^2\, \text{Sin}[c+d x]}{4 b \left(-a^2+b^2\right)^2 (a+b\, \text{Cos}[c+d x])}\right)$$

Problem 729: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{(a+b\,\text{Cos}[c+d\,x])^3\,\text{Sec}[c+d\,x]^{5/2}}\,dx$$

Optimal (type 4, 319 leaves, 11 steps):

$$-\frac{1}{4\,b^2\,(a^2-b^2)^2\,d}3\,a\,(a^2-3\,b^2)\,\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticE}\Big[\frac{1}{2}\,(c+d\,x),\,2\Big]\,\sqrt{\text{Sec}[c+d\,x]}+\frac{1}{4\,b^3\,(a^2-b^2)^2\,d}(3\,a^4-5\,a^2\,b^2+8\,b^4)\,\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticF}\Big[\frac{1}{2}\,(c+d\,x),\,2\Big]\,\sqrt{\text{Sec}[c+d\,x]}-\left(3\,a\,(a^4-2\,a^2\,b^2+5\,b^4)\,\sqrt{\text{Cos}[c+d\,x]}\,\text{EllipticPi}\Big[\frac{2\,b}{a+b},\,\frac{1}{2}\,(c+d\,x),\,2\Big]\,\sqrt{\text{Sec}[c+d\,x]}\right)\Big/\left(4\,(a-b)^2\,b^3\,(a+b)^3\,d\right)+\frac{a\,\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{2\,(a^2-b^2)\,d\,(b+a\,\text{Sec}[c+d\,x])^2}+\frac{a\,(a^2-7\,b^2)\,\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{4\,b\,(a^2-b^2)^2\,d\,(b+a\,\text{Sec}[c+d\,x])}$$

Result (type 4, 694 leaves):

$$-\frac{1}{16\,(a-b)^2\,b\,(a+b)^2\,d}\Bigg(-\Bigg(\Big(2\,(-8\,a^2\,b-16\,b^3)\,\mathrm{Cos}[c+d\,x]^2\,\mathrm{EllipticPi}\Big[-\frac{a}{b},\,-\mathrm{ArcSin}\Big[\sqrt{\mathrm{Sec}[c+d\,x]}\Big],\,-1\Big]$$

$$(b+a\,\mathrm{Sec}[c+d\,x])\,\sqrt{1-\mathrm{Sec}[c+d\,x]^2}\,\mathrm{Sin}[c+d\,x]\Big)\Big/$$

$$\left(b\,(a+b\,\mathrm{Cos}[c+d\,x])\,(1-\mathrm{Cos}[c+d\,x]^2)\right)\Bigg)+$$

$$\Big(2\,(a^3+5\,a\,b^2)\,\mathrm{Cos}[c+d\,x]^2\,\Big(\mathrm{EllipticF}\Big[\mathrm{ArcSin}\Big[\sqrt{\mathrm{Sec}[c+d\,x]}\Big],\,-1\Big]+$$

$$\mathrm{EllipticPi}\Big[-\frac{a}{b},\,-\mathrm{ArcSin}\Big[\sqrt{\mathrm{Sec}[c+d\,x]}\Big],\,-1\Big]\Big)\,(b+a\,\mathrm{Sec}[c+d\,x])$$

$$\sqrt{1-\mathrm{Sec}[c+d\,x]^2}\,\mathrm{Sin}[c+d\,x]\Big)\Big/\left(a\,(a+b\,\mathrm{Cos}[c+d\,x])\,(1-\mathrm{Cos}[c+d\,x]^2)\right)+$$

$$\Big((3\,a^3-9\,a\,b^2)\,\mathrm{Cos}[2\,(c+d\,x)]\,(b+a\,\mathrm{Sec}[c+d\,x])\,\Big(-4\,a\,b+4\,a\,b\,\mathrm{Sec}[c+d\,x]^2-$$

$$4\,a\,b\,\mathrm{EllipticE}\Big[\mathrm{ArcSin}\Big[\sqrt{\mathrm{Sec}[c+d\,x]}\Big],\,-1\Big]\,\sqrt{\mathrm{Sec}[c+d\,x]}\,\sqrt{1-\mathrm{Sec}[c+d\,x]^2}+$$

$$2\,(2\,a-b)\,b\,\mathrm{EllipticF}\Big[\mathrm{ArcSin}\Big[\sqrt{\mathrm{Sec}[c+d\,x]}\Big],\,-1\Big]\,\sqrt{\mathrm{Sec}[c+d\,x]}\,\sqrt{1-\mathrm{Sec}[c+d\,x]^2}+$$

$$4\,a^2\,\mathrm{EllipticPi}\Big[-\frac{a}{b},\,-\mathrm{ArcSin}\Big[\sqrt{\mathrm{Sec}[c+d\,x]}\Big],\,-1\Big]\,\sqrt{\mathrm{Sec}[c+d\,x]}\,\sqrt{1-\mathrm{Sec}[c+d\,x]^2}-$$

$$2\,b^2\,\mathrm{EllipticPi}\Big[-\frac{a}{b},\,-\mathrm{ArcSin}\Big[\sqrt{\mathrm{Sec}[c+d\,x]}\Big],\,-1\Big]\,\sqrt{\mathrm{Sec}[c+d\,x]}\,\sqrt{1-\mathrm{Sec}[c+d\,x]^2}\Big)$$

$$\mathrm{Sin}[c+d\,x]\Big)\Big/\Big(a\,b^2\,(a+b\,\mathrm{Cos}[c+d\,x])\,(1-\mathrm{Cos}[c+d\,x]^2)$$

$$\sqrt{\mathrm{Sec}[c+d\,x]}\,(2-\mathrm{Sec}[c+d\,x]^2)\Big)\Bigg)+\frac{1}{d}$$

$$\sqrt{\mathrm{Sec}[c+d\,x]}\,\left(\frac{3\,a\,(a^2-3\,b^2)\,\mathrm{Sin}[c+d\,x]}{4\,b^2\,(a^2-b^2)^2}-\frac{a^3\,\mathrm{Sin}[c+d\,x]}{2\,b^2\,(-a^2+b^2)\,(a+b\,\mathrm{Cos}[c+d\,x])^2}+\right.$$

$$\left.\frac{-5\,a^4\,\mathrm{Sin}[c+d\,x]+11\,a^2\,b^2\,\mathrm{Sin}[c+d\,x]}{4\,b^2\,(-a^2+b^2)^2\,(a+b\,\mathrm{Cos}[c+d\,x])}\right)$$

Problem 730: Unable to integrate problem.

$$\int\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\,\mathrm{Sec}[c+d\,x]^{7/2}\,dx$$

Optimal (type 4, 369 leaves, 6 steps):

$$\left(2\,(a-b)\,\sqrt{a+b}\,\left(9\,a^2-2\,b^2\right)\,\sqrt{\text{Cos}[c+d\,x]}\right.$$
$$\text{Csc}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]$$
$$\left.\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\bigg/\left(15\,a^3\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)-$$
$$\left(2\,(a-b)\,\sqrt{a+b}\,(9\,a+2\,b)\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\right.\right.$$
$$\left.\left.\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\bigg/$$
$$\left(15\,a^2\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)+\frac{2\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{15\,a\,d}+$$
$$\frac{2\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{5\,d}$$

Result (type 8, 27 leaves):

$$\int\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{7/2}\,dx$$

Problem 731: Unable to integrate problem.

$$\int\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{5/2}\,dx$$

Optimal (type 4, 311 leaves, 5 steps):

$$\left(2\,(a-b)\,b\,\sqrt{a+b}\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\mathrm{Csc}[c+d\,x]\,\mathrm{EllipticE}\left[\mathrm{ArcSin}\left[\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\mathrm{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\right.$$
$$\left.\sqrt{\frac{a\,(1-\mathrm{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\mathrm{Sec}[c+d\,x])}{a-b}}\right)\bigg/\left(3\,a^2\,d\,\sqrt{\mathrm{Sec}[c+d\,x]}\right)+$$
$$\left(2\,(a-b)\,\sqrt{a+b}\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\mathrm{Csc}[c+d\,x]\,\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\mathrm{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\right.$$
$$\left.\sqrt{\frac{a\,(1-\mathrm{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\mathrm{Sec}[c+d\,x])}{a-b}}\right)\bigg/\left(3\,a\,d\,\sqrt{\mathrm{Sec}[c+d\,x]}\right)+$$
$$\frac{2\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\,\mathrm{Sec}[c+d\,x]^{3/2}\,\mathrm{Sin}[c+d\,x]}{3\,d}$$

Result (type 8, 27 leaves):

$$\int\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\,\mathrm{Sec}[c+d\,x]^{5/2}\,dx$$

Problem 733: Unable to integrate problem.

$$\int\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}\,dx$$

Optimal (type 4, 155 leaves, 2 steps):

$$-\frac{1}{\sqrt{a+b}\,d}2\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\sqrt{\frac{a\,(1-\mathrm{Cos}[c+d\,x])}{a+b\,\mathrm{Cos}[c+d\,x]}}\,\sqrt{\frac{a\,(1+\mathrm{Cos}[c+d\,x])}{a+b\,\mathrm{Cos}[c+d\,x]}}\,(a+b\,\mathrm{Cos}[c+d\,x])$$
$$\mathrm{Csc}[c+d\,x]\,\mathrm{EllipticPi}\left[\frac{b}{a+b},\mathrm{ArcSin}\left[\frac{\sqrt{a+b}\,\sqrt{\mathrm{Cos}[c+d\,x]}}{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}\right],-\frac{a-b}{a+b}\right]\sqrt{\mathrm{Sec}[c+d\,x]}$$

Result (type 8, 27 leaves):

$$\int\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}\,dx$$

Problem 735: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}{\mathrm{Sec}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 4, 498 leaves, 8 steps):

$$-\left(\left((a-b)\sqrt{a+b}\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\right.\right.$$

$$\left.\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\bigg/\left(4\,b\,d\sqrt{\text{Sec}[c+d\,x]}\right)+$$

$$\left(\sqrt{a+b}\,(a+2\,b)\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\right.$$

$$\left.\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\bigg/\left(4\,b\,d\sqrt{\text{Sec}[c+d\,x]}\right)+$$

$$\left(\sqrt{a+b}\,(a^2-4\,b^2)\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[\frac{a+b}{b},\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\sqrt{\text{Cos}[c+d\,x]}}\right],\right.\right.$$

$$\left.\left.-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\bigg/\left(4\,b^2\,d\sqrt{\text{Sec}[c+d\,x]}\right)+$$

$$\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{2\,d\sqrt{\text{Sec}[c+d\,x]}}+\frac{a\sqrt{a+b\,\text{Cos}[c+d\,x]}\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{4\,b\,d}$$

Result (type 4, 1113 leaves):

$$\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[2\,(c+d\,x)]}{4\,d}+$$

$$\left(-a^2\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]-a\,b\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]+\right.$$

$$2\,a\,b\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^3+a^2\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^5-a\,b\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^5-$$

$$2\,i\,a^2\,\text{EllipticPi}\left[\frac{a+b}{a-b},i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right],-\frac{a+b}{a-b}\right]$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}{a+b}}+$$

$$8\,i\,b^2\,\text{EllipticPi}\left[\frac{a+b}{a-b},i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right],-\frac{a+b}{a-b}\right]$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{a+b}}-$$

$$2\,i\,a^2\,\text{EllipticPi}\left[\frac{a+b}{a-b},\,i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],-\frac{a+b}{a-b}\right]\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{a+b}}+$$

$$8\,i\,b^2\,\text{EllipticPi}\left[\frac{a+b}{a-b},\,i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],-\frac{a+b}{a-b}\right]\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{a+b}}-$$

$$i\,a\,(a-b)\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],-\frac{a+b}{a-b}\right]\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}$$

$$\left(1+\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{a+b}}+2\,i\,\left(a^2+a\,b-2\,b^2\right)$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],-\frac{a+b}{a-b}\right]\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}$$

$$\left.\left(1+\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{a+b}}\right)\Big/$$

$$\left(4\,b\,\sqrt{\frac{a-b}{a+b}}\,d\,\sqrt{\frac{1}{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}}\left(-1+\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)\right.$$

$$\left.\left(1+\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)^{3/2}\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{1+\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}}\right)$$

Problem 736: Unable to integrate problem.

$$\int (a+b\,\text{Cos}[c+d x])^{3/2}\,\text{Sec}[c+d x]^{9/2}\,dx$$

Optimal (type 4, 427 leaves, 7 steps):

$$\left(4\,(a-b)\,b\,\sqrt{a+b}\,\left(41\,a^2-3\,b^2\right)\,\sqrt{\text{Cos}[c+d\,x]}\right.$$

$$\text{Csc}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{a+b}{a-b}\right]$$

$$\left.\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(105\,a^3\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)+$$

$$\left(2\,(a-b)\,\sqrt{a+b}\,\left(25\,a^2-57\,a\,b-6\,b^2\right)\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}$$

$$\left.\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(105\,a^2\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)+$$

$$\frac{2\,\left(25\,a^2+3\,b^2\right)\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{105\,a\,d}+$$

$$\frac{16\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{35\,d}+$$

$$\frac{2\,a\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{7/2}\,\text{Sin}[c+d\,x]}{7\,d}$$

Result (type 8, 27 leaves):

$$\int (a+b\,\text{Cos}[c+d\,x])^{3/2}\,\text{Sec}[c+d\,x]^{9/2}\,dx$$

Problem 737: Unable to integrate problem.

$$\int (a+b\,\text{Cos}[c+d\,x])^{3/2}\,\text{Sec}[c+d\,x]^{7/2}\,dx$$

Optimal (type 4, 365 leaves, 6 steps):

$$\left(2\,(a-b)\,\sqrt{a+b}\,\left(3\,a^2+b^2\right)\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{a+b}{a-b}\right]\,\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(5\,a^2\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)-$$

$$\left(2\,(a-b)\,(3\,a-b)\,\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{a+b}{a-b}\right]\,\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/$$

$$\left(5\,a\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)+\frac{4\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{5\,d}+$$

$$\frac{2\,a\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{5\,d}$$

Result (type 8, 27 leaves):

$$\int (a+b\,\text{Cos}[c+d\,x])^{3/2}\,\text{Sec}[c+d\,x]^{7/2}\,dx$$

Problem 738: Unable to integrate problem.

$$\int (a+b\,\text{Cos}[c+d\,x])^{3/2}\,\text{Sec}[c+d\,x]^{5/2}\,dx$$

Optimal (type 4, 317 leaves, 5 steps):

$$\left(8\,(a-b)\,b\,\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{a+b}{a-b}\right]\,\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(3\,a\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)+$$

$$\left(2\,(a-3\,b)\,(a-b)\,\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{a+b}{a-b}\right]\,\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/$$

$$\left(3\,a\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)+\frac{2\,a\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{3\,d}$$

Result (type 8, 27 leaves):

$$\int (a + b\,\text{Cos}[c + d\,x])^{3/2}\,\text{Sec}[c + d\,x]^{5/2}\,dx$$

Problem 743: Attempted integration timed out after 120 seconds.

$$\int (a + b\,\text{Cos}[c + d\,x])^{5/2}\,\text{Sec}[c + d\,x]^{11/2}\,dx$$

Optimal (type 4, 494 leaves, 8 steps):

$$\left(2\,(a-b)\,\sqrt{a+b}\,\left(147\,a^4 + 279\,a^2\,b^2 - 10\,b^4\right)\sqrt{\text{Cos}[c+d\,x]}\;\text{Csc}[c+d\,x]\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(315\,a^3\,d\,\sqrt{\text{Sec}[c+d\,x]}\right) -$$
$$\left(2\,(a-b)\,\sqrt{a+b}\,\left(147\,a^3 - 114\,a^2\,b + 165\,a\,b^2 + 10\,b^3\right)\sqrt{\text{Cos}[c+d\,x]}\;\text{Csc}[c+d\,x]\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(315\,a^2\,d\,\sqrt{\text{Sec}[c+d\,x]}\right) +$$
$$\frac{2\,b\,\left(163\,a^2 + 5\,b^2\right)\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{315\,a\,d} +$$
$$\frac{2\,\left(49\,a^2 + 75\,b^2\right)\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Sec}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{315\,d} +$$
$$\frac{38\,a\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Sec}[c+d\,x]^{7/2}\,\text{Sin}[c+d\,x]}{63\,d} +$$
$$\frac{2\,a^2\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\;\text{Sec}[c+d\,x]^{9/2}\,\text{Sin}[c+d\,x]}{9\,d}$$

Result (type 1, 1 leaves):

???

Problem 744: Unable to integrate problem.

$$\int (a + b\,\text{Cos}[c + d\,x])^{5/2}\,\text{Sec}[c + d\,x]^{9/2}\,dx$$

Optimal (type 4, 427 leaves, 7 steps):

$$\left(2 (a-b) b \sqrt{a+b} \left(29 a^2+3 b^2\right) \sqrt{\text{Cos}[c+d x]}\ \text{Csc}[c+d x]\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \text{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \sqrt{\frac{a (1-\text{Sec}[c+d x])}{a+b}} \sqrt{\frac{a (1+\text{Sec}[c+d x])}{a-b}}\right) \Big/ \left(21 a^2 d \sqrt{\text{Sec}[c+d x]}\right)+\left(2 (a-b) \sqrt{a+b} \left(5 a^2-24 a b+3 b^2\right) \sqrt{\text{Cos}[c+d x]}\ \text{Csc}[c+d x]\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \text{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \sqrt{\frac{a (1-\text{Sec}[c+d x])}{a+b}} \sqrt{\frac{a (1+\text{Sec}[c+d x])}{a-b}}\right) \Big/ \left(21 a d \sqrt{\text{Sec}[c+d x]}\right)+\frac{2 \left(5 a^2+9 b^2\right) \sqrt{a+b \text{Cos}[c+d x]}\ \text{Sec}[c+d x]^{3/2} \text{Sin}[c+d x]}{21 d}+\frac{6 a b \sqrt{a+b \text{Cos}[c+d x]}\ \text{Sec}[c+d x]^{5/2} \text{Sin}[c+d x]}{7 d}+\frac{2 a^2 \sqrt{a+b \text{Cos}[c+d x]}\ \text{Sec}[c+d x]^{7/2} \text{Sin}[c+d x]}{7 d}$$

Result (type 8, 27 leaves):

$$\int (a+b \text{Cos}[c+d x])^{5/2} \text{Sec}[c+d x]^{9/2} \, dx$$

Problem 745: Attempted integration timed out after 120 seconds.

$$\int (a+b \text{Cos}[c+d x])^{5/2} \text{Sec}[c+d x]^{7/2} \, dx$$

Optimal (type 4, 378 leaves, 6 steps):

$$\left(2\,(a-b)\,\sqrt{a+b}\,\left(9\,a^2+23\,b^2\right)\,\sqrt{\text{Cos}[c+d\,x]}\right.$$

$$\text{Csc}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{a+b}{a-b}\right]$$

$$\left.\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(15\,a\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)-$$

$$\left(2\,(a-b)\,\sqrt{a+b}\,\left(9\,a^2-8\,a\,b+15\,b^2\right)\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\right.\right.$$

$$\left.\left.\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],\,-\frac{a+b}{a-b}\right]\,\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/$$

$$\left(15\,a\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)+\frac{22\,a\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{15\,d}+$$

$$\frac{2\,a^2\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{5/2}\,\text{Sin}[c+d\,x]}{5\,d}$$

Result (type 1, 1 leaves):

???

Problem 748: Result more than twice size of optimal antiderivative.

$$\int (a+b\,\text{Cos}[c+d\,x])^{5/2}\,\sqrt{\text{Sec}[c+d\,x]}\,dx$$

Optimal (type 4, 503 leaves, 8 steps):

$$-\left(\left(9\,(a-b)\,b\,\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(4\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)\right)+$$

$$\left(\sqrt{a+b}\,(8\,a^2+9\,a\,b+2\,b^2)\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(4\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)-$$

$$\left(\sqrt{a+b}\,(15\,a^2+4\,b^2)\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[\frac{a+b}{b},\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/$$

$$\left(4\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)+\frac{b^2\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sin}[c+d\,x]}{2\,d\,\sqrt{\text{Sec}[c+d\,x]}}+$$

$$\frac{9\,a\,b\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{4\,d}$$

Result (type 4, 3693 leaves) :

$$\frac{b^2\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[2\,(c+d\,x)]}{4\,d}+$$

$$\left(\left(\frac{3\,a^2\,b}{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}+\frac{b^3}{2\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}+\right.\right.$$

$$\left.\frac{a^3\,\sqrt{\text{Sec}[c+d\,x]}}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\frac{11\,a\,b^2\,\sqrt{\text{Sec}[c+d\,x]}}{8\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\frac{9\,a\,b^2\,\text{Cos}[2\,(c+d\,x)]\,\sqrt{\text{Sec}[c+d\,x]}}{8\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}\right)$$

$$\left(-18\,a\,b\,(a+b)\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\right.$$

$$\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\frac{-a+b}{a+b}\right]-$$

$$4\,(4\,a^3-12\,a^2\,b+a\,b^2-2\,b^3)\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],\frac{-a+b}{a+b}\right]+4 b\left(15 a^2+4 b^2\right)\sqrt{\frac{\text{Cos}[c+d x]}{1+\text{Cos}[c+d x]}}$$

$$\sqrt{\frac{a+b\,\text{Cos}[c+d x]}{(a+b)(1+\text{Cos}[c+d x])}}\ \text{EllipticPi}\left[-1,-\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],\frac{-a+b}{a+b}\right]-$$

$$\left.\left.9 a b\,\text{Cos}[c+d x]\left(a+b\,\text{Cos}[c+d x]\right)\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d x)\right]\right)\right)\Big/$$

$$\left(4 d\sqrt{a+b\,\text{Cos}[c+d x]}\ \sqrt{\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2}\ \sqrt{\text{Cos}\left[\frac{1}{2}(c+d x)\right]^2\text{Sec}[c+d x]}\right.$$

$$\left(-1+\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)$$

$$\left(-\left(\left(\sqrt{\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2}\ \text{Tan}\left[\frac{1}{2}(c+d x)\right]\left(-18 a b(a+b)\sqrt{\frac{\text{Cos}[c+d x]}{1+\text{Cos}[c+d x]}}\right.\right.\right.\right.$$

$$\sqrt{\frac{a+b\,\text{Cos}[c+d x]}{(a+b)(1+\text{Cos}[c+d x])}}\ \text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],\frac{-a+b}{a+b}\right]-$$

$$4\left(4 a^3-12 a^2 b+a b^2-2 b^3\right)\sqrt{\frac{\text{Cos}[c+d x]}{1+\text{Cos}[c+d x]}}\ \sqrt{\frac{a+b\,\text{Cos}[c+d x]}{(a+b)(1+\text{Cos}[c+d x])}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],\frac{-a+b}{a+b}\right]+$$

$$4 b\left(15 a^2+4 b^2\right)\sqrt{\frac{\text{Cos}[c+d x]}{1+\text{Cos}[c+d x]}}\ \sqrt{\frac{a+b\,\text{Cos}[c+d x]}{(a+b)(1+\text{Cos}[c+d x])}}$$

$$\text{EllipticPi}\left[-1,-\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],\frac{-a+b}{a+b}\right]-$$

$$\left.\left.9 a b\,\text{Cos}[c+d x]\left(a+b\,\text{Cos}[c+d x]\right)\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d x)\right]\right)\right)\Big/$$

$$\left.\left.\left(4\sqrt{a+b\,\text{Cos}[c+d x]}\ \sqrt{\text{Cos}\left[\frac{1}{2}(c+d x)\right]^2\text{Sec}[c+d x]}\ \left(-1+\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)^2\right)\right)\right)+$$

$$\left(b\,\text{Sin}[c+d x]\left(-18 a b(a+b)\sqrt{\frac{\text{Cos}[c+d x]}{1+\text{Cos}[c+d x]}}\ \sqrt{\frac{a+b\,\text{Cos}[c+d x]}{(a+b)(1+\text{Cos}[c+d x])}}\right.\right.$$

$$\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\frac{-a+b}{a+b}\right]-$$

$$4\left(4\,a^3-12\,a^2\,b+a\,b^2-2\,b^3\right)\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\left(1+\text{Cos}[c+d\,x]\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\frac{-a+b}{a+b}\right]+4\,b\left(15\,a^2+4\,b^2\right)\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}$$

$$\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\left(1+\text{Cos}[c+d\,x]\right)}}\,\text{EllipticPi}\left[-1,-\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\frac{-a+b}{a+b}\right]-$$

$$\left.\left.9\,a\,b\,\text{Cos}[c+d\,x]\left(a+b\,\text{Cos}[c+d\,x]\right)\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right)\right)\Big/$$

$$\left(8\left(a+b\,\text{Cos}[c+d\,x]\right)^{3/2}\sqrt{\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}\,\sqrt{\text{Cos}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\text{Sec}[c+d\,x]}\right.$$

$$\left.\left(-1+\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right)\right)-$$

$$\left(\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\left(-18\,a\,b\left(a+b\right)\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\left(1+\text{Cos}[c+d\,x]\right)}}\right.\right.$$

$$\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\frac{-a+b}{a+b}\right]-$$

$$4\left(4\,a^3-12\,a^2\,b+a\,b^2-2\,b^3\right)\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\left(1+\text{Cos}[c+d\,x]\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\frac{-a+b}{a+b}\right]+4\,b\left(15\,a^2+4\,b^2\right)\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}$$

$$\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{\left(a+b\right)\left(1+\text{Cos}[c+d\,x]\right)}}\,\text{EllipticPi}\left[-1,-\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\frac{-a+b}{a+b}\right]-$$

$$\left.\left.9\,a\,b\,\text{Cos}[c+d\,x]\left(a+b\,\text{Cos}[c+d\,x]\right)\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right)\right)\Big/$$

$$\left(8\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}\,\sqrt{\text{Cos}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\text{Sec}[c+d\,x]}\right.$$

$$\left.\left(-1+\mathrm{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)\right)+$$

$$\left(-\frac{9}{2}\,a\,b\,\mathrm{Cos}[c+d\,x]\,(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^4-\frac{1}{\sqrt{\frac{\mathrm{Cos}[c+d\,x]}{1+\mathrm{Cos}[c+d\,x]}}}\right.$$

$$9\,a\,b\,(a+b)\,\sqrt{\frac{a+b\,\mathrm{Cos}[c+d\,x]}{(a+b)\,(1+\mathrm{Cos}[c+d\,x])}}\;\mathrm{EllipticE}\left[\mathrm{ArcSin}\left[\mathrm{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]$$

$$\left(\frac{\mathrm{Cos}[c+d\,x]\,\mathrm{Sin}[c+d\,x]}{(1+\mathrm{Cos}[c+d\,x])^2}-\frac{\mathrm{Sin}[c+d\,x]}{1+\mathrm{Cos}[c+d\,x]}\right)-\frac{1}{\sqrt{\frac{\mathrm{Cos}[c+d\,x]}{1+\mathrm{Cos}[c+d\,x]}}}$$

$$2\,\left(4\,a^3-12\,a^2\,b+a\,b^2-2\,b^3\right)\,\sqrt{\frac{a+b\,\mathrm{Cos}[c+d\,x]}{(a+b)\,(1+\mathrm{Cos}[c+d\,x])}}\;\mathrm{EllipticF}\Big[$$

$$\mathrm{ArcSin}\left[\mathrm{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\Big]\,\left(\frac{\mathrm{Cos}[c+d\,x]\,\mathrm{Sin}[c+d\,x]}{(1+\mathrm{Cos}[c+d\,x])^2}-\frac{\mathrm{Sin}[c+d\,x]}{1+\mathrm{Cos}[c+d\,x]}\right)+$$

$$\frac{1}{\sqrt{\frac{\mathrm{Cos}[c+d\,x]}{1+\mathrm{Cos}[c+d\,x]}}}\,2\,b\,\left(15\,a^2+4\,b^2\right)\,\sqrt{\frac{a+b\,\mathrm{Cos}[c+d\,x]}{(a+b)\,(1+\mathrm{Cos}[c+d\,x])}}\;\mathrm{EllipticPi}\Big[-1,$$

$$-\mathrm{ArcSin}\left[\mathrm{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\Big]\,\left(\frac{\mathrm{Cos}[c+d\,x]\,\mathrm{Sin}[c+d\,x]}{(1+\mathrm{Cos}[c+d\,x])^2}-\frac{\mathrm{Sin}[c+d\,x]}{1+\mathrm{Cos}[c+d\,x]}\right)-$$

$$\left(9\,a\,b\,(a+b)\,\sqrt{\frac{\mathrm{Cos}[c+d\,x]}{1+\mathrm{Cos}[c+d\,x]}}\;\mathrm{EllipticE}\left[\mathrm{ArcSin}\left[\mathrm{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]\right.$$

$$\left.\left(-\frac{b\,\mathrm{Sin}[c+d\,x]}{(a+b)\,(1+\mathrm{Cos}[c+d\,x])}+\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Sin}[c+d\,x]}{(a+b)\,(1+\mathrm{Cos}[c+d\,x])^2}\right)\right)\Big/$$

$$\left(\sqrt{\frac{a+b\,\mathrm{Cos}[c+d\,x]}{(a+b)\,(1+\mathrm{Cos}[c+d\,x])}}\right)-\left(2\,\left(4\,a^3-12\,a^2\,b+a\,b^2-2\,b^3\right)\,\sqrt{\frac{\mathrm{Cos}[c+d\,x]}{1+\mathrm{Cos}[c+d\,x]}}\right.$$

$$\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\mathrm{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]\,\left(-\frac{b\,\mathrm{Sin}[c+d\,x]}{(a+b)\,(1+\mathrm{Cos}[c+d\,x])}+\right.$$

$$\left.\left.\frac{(a+b\,\mathrm{Cos}[c+d\,x])\,\mathrm{Sin}[c+d\,x]}{(a+b)\,(1+\mathrm{Cos}[c+d\,x])^2}\right)\right)\Big/\left(\sqrt{\frac{a+b\,\mathrm{Cos}[c+d\,x]}{(a+b)\,(1+\mathrm{Cos}[c+d\,x])}}\right)+$$

$$\left(2\,b\,\left(15\,a^2+4\,b^2\right)\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\;\text{EllipticPi}\left[-1,\,-\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\right.\right.$$

$$\left.\frac{-a+b}{a+b}\right]\,\left(-\frac{b\,\text{Sin}[c+d\,x]}{(a+b)\,\left(1+\text{Cos}[c+d\,x]\right)}+\frac{\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Sin}[c+d\,x]}{(a+b)\,\left(1+\text{Cos}[c+d\,x]\right)^2}\right)\Bigg)\Bigg/$$

$$\left(\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,\left(1+\text{Cos}[c+d\,x]\right)}}\right)+9\,a\,b^2\,\text{Cos}[c+d\,x]\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Sin}[c+d\,x]\,\text{Tan}\Big[$$

$$\frac{1}{2}\,(c+d\,x)\Big]+9\,a\,b\,\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Sin}[c+d\,x]\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]-$$

$$9\,a\,b\,\text{Cos}[c+d\,x]\,\left(a+b\,\text{Cos}[c+d\,x]\right)\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2-$$

$$\left(2\,\left(4\,a^3-12\,a^2\,b+a\,b^2-2\,b^3\right)\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,\left(1+\text{Cos}[c+d\,x]\right)}}\right.$$

$$\left.\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)\Bigg/\left(\sqrt{1-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\,\sqrt{1-\frac{(-a+b)\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a+b}}\right)-$$

$$\left(2\,b\,\left(15\,a^2+4\,b^2\right)\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,\left(1+\text{Cos}[c+d\,x]\right)}}\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)\Bigg/$$

$$\left(\sqrt{1-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\,\left(1+\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)\,\sqrt{1-\frac{(-a+b)\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a+b}}\right)-$$

$$\left(9\,a\,b\,(a+b)\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,\left(1+\text{Cos}[c+d\,x]\right)}}\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right.$$

$$\left.\sqrt{1-\frac{(-a+b)\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a+b}}\right)\Bigg/\left(\sqrt{1-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\right)\Bigg)\Bigg/$$

$$\left(4\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\,\sqrt{\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Sec}[c+d\,x]}\right.$$

$$\left.\left(-1+\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)\right)-$$

$$\left(\left(-18\,a\,b\,(a+b)\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\right.\right.$$

$$\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]-$$

$$4\,\left(4\,a^3-12\,a^2\,b+a\,b^2-2\,b^3\right)\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}\,\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]+4\,b\,\left(15\,a^2+4\,b^2\right)\,\sqrt{\frac{\text{Cos}[c+d\,x]}{1+\text{Cos}[c+d\,x]}}$$

$$\sqrt{\frac{a+b\,\text{Cos}[c+d\,x]}{(a+b)\,(1+\text{Cos}[c+d\,x])}}\,\text{EllipticPi}\left[-1,\,-\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,\frac{-a+b}{a+b}\right]-$$

$$\left.9\,a\,b\,\text{Cos}[c+d\,x]\,(a+b\,\text{Cos}[c+d\,x])\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right)$$

$$\left(-\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\text{Sec}[c+d\,x]\,\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]+\right.$$

$$\left.\left.\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Sec}[c+d\,x]\,\text{Tan}[c+d\,x]\right)\right)\Big/$$

$$\left(8\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\,\text{Sec}[c+d\,x]\right)^{3/2}\right.$$

$$\left.\left.\left(-1+\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)\right)\right)$$

Problem 750: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{(a+b\,\text{Cos}[c+d\,x])^{5/2}}{\text{Sec}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 4, 638 leaves, 10 steps):

$$-\left(\left((a-b)\sqrt{a+b}\left(15a^2+284b^2\right)\sqrt{\text{Cos}[c+d x]}\ \text{Csc}[c+d x]\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d x]}}{\sqrt{a+b}\ \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\left(1-\text{Sec}[c+d x]\right)}{a+b}}\ \sqrt{\frac{a\left(1+\text{Sec}[c+d x]\right)}{a-b}}\right)\Big/\left(192\,b\,d\sqrt{\text{Sec}[c+d x]}\right)\right)+$$

$$\left(\sqrt{a+b}\left(15a^3+118a^2 b+284 a b^2+72 b^3\right)\sqrt{\text{Cos}[c+d x]}\ \text{Csc}[c+d x]\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d x]}}{\sqrt{a+b}\ \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\left(1-\text{Sec}[c+d x]\right)}{a+b}}\ \sqrt{\frac{a\left(1+\text{Sec}[c+d x]\right)}{a-b}}\right)\Big/\left(192\,b\,d\sqrt{\text{Sec}[c+d x]}\right)+$$

$$\left(\sqrt{a+b}\left(5a^4-120a^2 b^2-48b^4\right)\sqrt{\text{Cos}[c+d x]}\ \text{Csc}[c+d x]\ \text{EllipticPi}\left[\frac{a+b}{b},\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d x]}}{\sqrt{a+b}\ \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\left(1-\text{Sec}[c+d x]\right)}{a+b}}\ \sqrt{\frac{a\left(1+\text{Sec}[c+d x]\right)}{a-b}}\right)\Big/$$

$$\left(64\,b^2\,d\sqrt{\text{Sec}[c+d x]}\right)+\frac{b^2\sqrt{a+b\,\text{Cos}[c+d x]}\ \text{Sin}[c+d x]}{4\,d\,\text{Sec}[c+d x]^{5/2}}+$$

$$\frac{17\,a\,b\sqrt{a+b\,\text{Cos}[c+d x]}\ \text{Sin}[c+d x]}{24\,d\,\text{Sec}[c+d x]^{3/2}}+$$

$$\frac{\left(59a^2+36b^2\right)\sqrt{a+b\,\text{Cos}[c+d x]}\ \text{Sin}[c+d x]}{96\,d\sqrt{\text{Sec}[c+d x]}}+$$

$$\frac{a\left(15a^2+284b^2\right)\sqrt{a+b\,\text{Cos}[c+d x]}\ \sqrt{\text{Sec}[c+d x]}\ \text{Sin}[c+d x]}{192\,b\,d}$$

Result (type 4, 1642 leaves):

$$\frac{1}{d}\sqrt{a+b\,\text{Cos}[c+d x]}\ \sqrt{\text{Sec}[c+d x]}\left(\frac{17}{96}a\,b\,\text{Sin}[c+d x]+\frac{1}{192}\left(59a^2+48b^2\right)\text{Sin}\left[2\left(c+d x\right)\right]+\frac{17}{96}a\,b\,\text{Sin}\left[3\left(c+d x\right)\right]+\frac{1}{32}b^2\,\text{Sin}\left[4\left(c+d x\right)\right]\right)+$$

$$\left(-15a^4\sqrt{\frac{a-b}{a+b}}\ \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]-15a^3 b\sqrt{\frac{a-b}{a+b}}\ \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]-\right.$$

$$284\, a^2\, b^2 \sqrt{\frac{a-b}{a+b}}\; \text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right] - 284\, a\, b^3 \sqrt{\frac{a-b}{a+b}}\; \text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right] +$$

$$30\, a^3\, b \sqrt{\frac{a-b}{a+b}}\; \text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^3 + 568\, a\, b^3 \sqrt{\frac{a-b}{a+b}}\; \text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^3 +$$

$$15\, a^4 \sqrt{\frac{a-b}{a+b}}\; \text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^5 - 15\, a^3\, b \sqrt{\frac{a-b}{a+b}}\; \text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^5 +$$

$$284\, a^2\, b^2 \sqrt{\frac{a-b}{a+b}}\; \text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^5 - 284\, a\, b^3 \sqrt{\frac{a-b}{a+b}}\; \text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^5 -$$

$$30\, i\, a^4\, \text{EllipticPi}\left[\frac{a+b}{a-b},\, i\, \text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\; \text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\, -\frac{a+b}{a-b}\right]$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\; \sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2 - b\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a+b}} +$$

$$720\, i\, a^2\, b^2\, \text{EllipticPi}\left[\frac{a+b}{a-b},\, i\, \text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\; \text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\, -\frac{a+b}{a-b}\right]$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\; \sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2 - b\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a+b}} +$$

$$288\, i\, b^4\, \text{EllipticPi}\left[\frac{a+b}{a-b},\, i\, \text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\; \text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\, -\frac{a+b}{a-b}\right]$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\; \sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2 - b\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a+b}} -$$

$$30\, i\, a^4\, \text{EllipticPi}\left[\frac{a+b}{a-b},\, i\, \text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\; \text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\, -\frac{a+b}{a-b}\right]\, \text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\; \sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2 - b\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a+b}} +$$

$$720\, i\, a^2\, b^2\, \text{EllipticPi}\left[\frac{a+b}{a-b},\, i\, \text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\; \text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\, -\frac{a+b}{a-b}\right]$$

$$\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}{a+b}}+$$

$$288\,\text{i}\,b^4\,\text{EllipticPi}\left[\frac{a+b}{a-b},\,\text{i}\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right],\,-\frac{a+b}{a-b}\right]\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}{a+b}}-$$

$$\text{i}\,a\left(15\,a^3-15\,a^2\,b+284\,a\,b^2-284\,b^3\right)\text{EllipticE}\left[\text{i}\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right],\,-\frac{a+b}{a-b}\right]$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}\left(1+\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)$$

$$\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}{a+b}}+$$

$$2\,\text{i}\left(15\,a^4+59\,a^3\,b-38\,a^2\,b^2+36\,a\,b^3-72\,b^4\right)$$

$$\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right],\,-\frac{a+b}{a-b}\right]\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}$$

$$\left.\left(1+\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}{a+b}}\right)\Big/$$

$$\left(192\,b\,\sqrt{\frac{a-b}{a+b}}\,d\,\sqrt{\frac{1}{1-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}}\left(-1+\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)\right.$$

$$\left.\left(1+\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)^{3/2}\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}{1+\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}}\right)$$

Problem 751: Unable to integrate problem.

$$\int\frac{\text{Sec}[c+d\,x]^{5/2}}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 314 leaves, 5 steps):

$$-\left(\left(4\,(a-b)\,b\,\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],\ -\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(3\,a^3\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)\right)+$$

$$\left(2\,\sqrt{a+b}\,(a+2\,b)\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],\ -\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(3\,a^2\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)+$$

$$\frac{2\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{3\,a\,d}$$

Result (type 8, 27 leaves) :

$$\int\frac{\text{Sec}[c+d\,x]^{5/2}}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,dx$$

Problem 752: Unable to integrate problem.

$$\int\frac{\text{Sec}[c+d\,x]^{3/2}}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 4, 264 leaves, 4 steps) :

$$\left(2\,(a-b)\,\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],\ -\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(a^2\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)-$$

$$\left(2\,\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],\ -\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(a\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)$$

Result (type 8, 27 leaves) :

$$\int\frac{\text{Sec}[c+d\,x]^{3/2}}{\sqrt{a+b\,\text{Cos}[c+d\,x]}}\,dx$$

Problem 754: Unable to integrate problem.

$$\int \frac{1}{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}\,dx$$

Optimal (type 4, 136 leaves, 2 steps):

$$-\left(\left(2\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[\frac{a+b}{b},\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],\right.\right.\right.$$
$$\left.\left.\left.-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(b\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)\right)$$

Result (type 8, 27 leaves):

$$\int \frac{1}{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}\,dx$$

Problem 755: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 4, 474 leaves, 9 steps):

$$-\left(\left((a-b)\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\right.\right.$$

$$\left.\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Bigg/\left(a\,b\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)+$$

$$\left(\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\right.$$

$$\left.\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Bigg/\left(b\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)+$$

$$\left(a\,\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticPi}\left[\frac{a+b}{b},\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\right.$$

$$\left.\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Bigg/\left(b^2\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)+$$

$$\frac{\text{Sin}[c+d\,x]}{d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\sqrt{\text{Sec}[c+d\,x]}}+\frac{a\,\sqrt{\text{Sec}[c+d\,x]}\,\text{Sin}[c+d\,x]}{b\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}$$

Result (type 4, 759 leaves) :

$$\frac{1}{b\sqrt{\frac{a-b}{a+b}}\, d\left(1+\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)^{3/2}\sqrt{\frac{a+b+a\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2-b\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}{1+\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}}}$$

$$\sqrt{\frac{1}{1-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}}\,\sqrt{1-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}$$

$$\left(a\sqrt{\frac{a-b}{a+b}}\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]\sqrt{1-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}+b\sqrt{\frac{a-b}{a+b}}\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right.$$

$$\sqrt{1-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}+a\sqrt{\frac{a-b}{a+b}}\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^3\sqrt{1-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}-$$

$$b\sqrt{\frac{a-b}{a+b}}\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^3\sqrt{1-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}+$$

$$2\,i\,a\,\mathrm{EllipticPi}\left[\frac{a+b}{a-b},\,i\,\mathrm{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right],\,-\frac{a+b}{a-b}\right]$$

$$\sqrt{\frac{a+b+a\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2-b\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}{a+b}}+$$

$$2\,i\,a\,\mathrm{EllipticPi}\left[\frac{a+b}{a-b},\,i\,\mathrm{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right],\,-\frac{a+b}{a-b}\right]$$

$$\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\sqrt{\frac{a+b+a\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2-b\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}{a+b}}+$$

$$i\,(a-b)\,\mathrm{EllipticE}\left[i\,\mathrm{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right],\,-\frac{a+b}{a-b}\right]$$

$$\left(1+\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)\sqrt{\frac{a+b+a\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2-b\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}{a+b}}-$$

$$2\,i\,a\,\mathrm{EllipticF}\left[i\,\mathrm{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right],\,-\frac{a+b}{a-b}\right]$$

$$\left.\left(1+\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)\sqrt{\frac{a+b+a\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2-b\,\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}{a+b}}\right)$$

Problem 756: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\;\mathrm{Sec}[c+d\,x]^{5/2}}\,dx$$

Optimal (type 4, 505 leaves, 8 steps):

$$\left(3\,(a-b)\,\sqrt{a+b}\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\mathrm{Csc}[c+d\,x]\,\mathrm{EllipticE}\left[\mathrm{ArcSin}\left[\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\mathrm{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\mathrm{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\mathrm{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(4\,b^2\,d\,\sqrt{\mathrm{Sec}[c+d\,x]}\right)-$$
$$\left((3\,a-2\,b)\,\sqrt{a+b}\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\mathrm{Csc}[c+d\,x]\,\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\mathrm{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\mathrm{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\mathrm{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(4\,b^2\,d\,\sqrt{\mathrm{Sec}[c+d\,x]}\right)-$$
$$\left(\sqrt{a+b}\,(3\,a^2+4\,b^2)\,\sqrt{\mathrm{Cos}[c+d\,x]}\,\mathrm{Csc}[c+d\,x]\,\mathrm{EllipticPi}\left[\frac{a+b}{b},\mathrm{ArcSin}\left[\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\mathrm{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\mathrm{Sec}[c+d\,x])}{a+b}}\,\sqrt{\frac{a\,(1+\mathrm{Sec}[c+d\,x])}{a-b}}\right)\Big/$$
$$\left(4\,b^3\,d\,\sqrt{\mathrm{Sec}[c+d\,x]}\right)+\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{2\,b\,d\,\sqrt{\mathrm{Sec}[c+d\,x]}}-$$
$$\frac{3\,a\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}\,\mathrm{Sin}[c+d\,x]}{4\,b^2\,d}$$

Result (type 4, 1153 leaves):

$$\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}\,\sqrt{\mathrm{Sec}[c+d\,x]}\,\mathrm{Sin}[2\,(c+d\,x)]}{4\,b\,d}-$$
$$\left(\sqrt{\frac{a+b+a\,\mathrm{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2-b\,\mathrm{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{1+\mathrm{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}}\right.$$
$$\left(3\,a^2\,\sqrt{\frac{a-b}{a+b}}\,\mathrm{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]+3\,a\,b\,\sqrt{\frac{a-b}{a+b}}\,\mathrm{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]-6\,a\,b\,\sqrt{\frac{a-b}{a+b}}\right.$$

$$\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^3-3\,a^2\,\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^5+3\,a\,b\,\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^5+$$

$$6\,\mathrm{i}\,a^2\,\text{EllipticPi}\left[\frac{a+b}{a-b},\,\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\,-\frac{a+b}{a-b}\right]$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}\,\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2-b\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a+b}}+$$

$$8\,\mathrm{i}\,b^2\,\text{EllipticPi}\left[\frac{a+b}{a-b},\,\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\,-\frac{a+b}{a-b}\right]$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}\,\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2-b\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a+b}}+$$

$$6\,\mathrm{i}\,a^2\,\text{EllipticPi}\left[\frac{a+b}{a-b},\,\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\,-\frac{a+b}{a-b}\right]\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}\,\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2-b\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a+b}}+$$

$$8\,\mathrm{i}\,b^2\,\text{EllipticPi}\left[\frac{a+b}{a-b},\,\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\,-\frac{a+b}{a-b}\right]\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}\,\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2-b\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a+b}}+$$

$$3\,\mathrm{i}\,a\,\left(a-b\right)\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\,-\frac{a+b}{a-b}\right]$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}\,\left(1+\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right)$$

$$\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2-b\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}{a+b}}-2\,\mathrm{i}\,\left(3\,a^2-a\,b+2\,b^2\right)$$

$$\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right],\,-\frac{a+b}{a-b}\right]\,\sqrt{1-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2}$$

$$\left(1+\operatorname{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)\sqrt{\frac{a+b+a \operatorname{Tan}\left[\frac{1}{2}(c+d x)\right]^2-b \operatorname{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{a+b}}\Bigg)\Bigg)\Bigg/$$

$$\left(4 b^2\sqrt{\frac{a-b}{a+b}}\, d\left(-1+\operatorname{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)\sqrt{\frac{1+\operatorname{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{1-\operatorname{Tan}\left[\frac{1}{2}(c+d x)\right]^2}}\right.$$

$$\left.\left(b\left(-1+\operatorname{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)-a\left(1+\operatorname{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)\right)\right)$$

Problem 757: Unable to integrate problem.

$$\int\frac{\operatorname{Sec}[c+d x]^{5/2}}{(a+b \operatorname{Cos}[c+d x])^{3/2}}\, dx$$

Optimal (type 4, 397 leaves, 6 steps):

$$-\left(\left(2 b\left(5 a^2-8 b^2\right)\sqrt{\operatorname{Cos}[c+d x]}\, \operatorname{Csc}[c+d x]\, \operatorname{EllipticE}\left[\operatorname{ArcSin}\left[\frac{\sqrt{a+b \operatorname{Cos}[c+d x]}}{\sqrt{a+b}\sqrt{\operatorname{Cos}[c+d x]}}\right], -\frac{a+b}{a-b}\right]\right.\right.$$

$$\left.\left.\sqrt{\frac{a(1-\operatorname{Sec}[c+d x])}{a+b}}\sqrt{\frac{a(1+\operatorname{Sec}[c+d x])}{a-b}}\right)\Bigg/\left(3 a^4\sqrt{a+b}\, d\sqrt{\operatorname{Sec}[c+d x]}\right)\right)+$$

$$\left(2(a+2 b)(a+4 b)\sqrt{\operatorname{Cos}[c+d x]}\, \operatorname{Csc}[c+d x]\, \operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\frac{\sqrt{a+b \operatorname{Cos}[c+d x]}}{\sqrt{a+b}\sqrt{\operatorname{Cos}[c+d x]}}\right],\right.\right.$$

$$\left.\left.-\frac{a+b}{a-b}\right]\sqrt{\frac{a(1-\operatorname{Sec}[c+d x])}{a+b}}\sqrt{\frac{a(1+\operatorname{Sec}[c+d x])}{a-b}}\right)\Bigg/$$

$$\left(3 a^3\sqrt{a+b}\, d\sqrt{\operatorname{Sec}[c+d x]}\right)+\frac{2 b^2 \operatorname{Sec}[c+d x]^{3/2} \operatorname{Sin}[c+d x]}{a\left(a^2-b^2\right) d\sqrt{a+b \operatorname{Cos}[c+d x]}}+$$

$$\frac{2\left(a^2-4 b^2\right)\sqrt{a+b \operatorname{Cos}[c+d x]}\, \operatorname{Sec}[c+d x]^{3/2} \operatorname{Sin}[c+d x]}{3 a^2\left(a^2-b^2\right) d}$$

Result (type 8, 27 leaves):

$$\int\frac{\operatorname{Sec}[c+d x]^{5/2}}{(a+b \operatorname{Cos}[c+d x])^{3/2}}\, dx$$

Problem 758: Unable to integrate problem.

$$\int \frac{\text{Sec}[c+d x]^{3/2}}{(a+b \text{Cos}[c+d x])^{3/2}} \, dx$$

Optimal (type 4, 325 leaves, 5 steps):

$$\left(2 \left(a^2-2 b^2\right) \sqrt{\text{Cos}[c+d x]} \text{Csc}[c+d x] \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \text{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \sqrt{\frac{a (1-\text{Sec}[c+d x])}{a+b}} \sqrt{\frac{a (1+\text{Sec}[c+d x])}{a-b}}\right) \Big/ \left(a^3 \sqrt{a+b} \, d \sqrt{\text{Sec}[c+d x]}\right) - \left(2 (a+2 b) \sqrt{\text{Cos}[c+d x]} \text{Csc}[c+d x] \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \text{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \sqrt{\frac{a (1-\text{Sec}[c+d x])}{a+b}} \sqrt{\frac{a (1+\text{Sec}[c+d x])}{a-b}}\right) \Big/ \left(a^2 \sqrt{a+b} \, d \sqrt{\text{Sec}[c+d x]}\right) + \frac{2 b^2 \sqrt{\text{Sec}[c+d x]} \text{Sin}[c+d x]}{a \left(a^2-b^2\right) d \sqrt{a+b \text{Cos}[c+d x]}}$$

Result (type 8, 27 leaves):

$$\int \frac{\text{Sec}[c+d x]^{3/2}}{(a+b \text{Cos}[c+d x])^{3/2}} \, dx$$

Problem 759: Unable to integrate problem.

$$\int \frac{\sqrt{\text{Sec}[c+d x]}}{(a+b \text{Cos}[c+d x])^{3/2}} \, dx$$

Optimal (type 4, 307 leaves, 5 steps):

$$\left(2\,b\,\sqrt{\mathrm{Cos}[c+d\,x]}\;\mathrm{Csc}[c+d\,x]\;\mathrm{EllipticE}\left[\mathrm{ArcSin}\left[\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}{\sqrt{a+b}\;\sqrt{\mathrm{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\right.$$
$$\left.\sqrt{\frac{a\,(1-\mathrm{Sec}[c+d\,x])}{a+b}}\;\sqrt{\frac{a\,(1+\mathrm{Sec}[c+d\,x])}{a-b}}\right)\Bigg/\left(a^2\,\sqrt{a+b}\;d\,\sqrt{\mathrm{Sec}[c+d\,x]}\right)+$$
$$\left(2\,\sqrt{\mathrm{Cos}[c+d\,x]}\;\mathrm{Csc}[c+d\,x]\;\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}{\sqrt{a+b}\;\sqrt{\mathrm{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\right.$$
$$\left.\sqrt{\frac{a\,(1-\mathrm{Sec}[c+d\,x])}{a+b}}\;\sqrt{\frac{a\,(1+\mathrm{Sec}[c+d\,x])}{a-b}}\right)\Bigg/$$
$$\left(a\,\sqrt{a+b}\;d\,\sqrt{\mathrm{Sec}[c+d\,x]}\right)-\frac{2\,b\,\sqrt{\mathrm{Sec}[c+d\,x]}\;\mathrm{Sin}[c+d\,x]}{\left(a^2-b^2\right)\,d\,\sqrt{a+b\,\mathrm{Cos}[c+d\,x]}}$$

Result (type 8, 27 leaves):

$$\int\frac{\sqrt{\mathrm{Sec}[c+d\,x]}}{(a+b\,\mathrm{Cos}[c+d\,x])^{3/2}}\,dx$$

Problem 761: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{(a+b\,\mathrm{Cos}[c+d\,x])^{3/2}\,\mathrm{Sec}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 4, 447 leaves, 7 steps):

$$\left(2\sqrt{\text{Cos}[c+d x]}\ \text{Csc}[c+d x]\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d x]}}{\sqrt{a+b}\ \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right]\right.$$
$$\left.\sqrt{\frac{a\left(1-\text{Sec}[c+d x]\right)}{a+b}}\ \sqrt{\frac{a\left(1+\text{Sec}[c+d x]\right)}{a-b}}\right)\Big/\left(b\sqrt{a+b}\ d\sqrt{\text{Sec}[c+d x]}\right)-$$
$$\left(2\sqrt{\text{Cos}[c+d x]}\ \text{Csc}[c+d x]\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d x]}}{\sqrt{a+b}\ \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right]\right.$$
$$\left.\sqrt{\frac{a\left(1-\text{Sec}[c+d x]\right)}{a+b}}\ \sqrt{\frac{a\left(1+\text{Sec}[c+d x]\right)}{a-b}}\right)\Big/\left(b\sqrt{a+b}\ d\sqrt{\text{Sec}[c+d x]}\right)-$$
$$\left(2\sqrt{a+b}\ \sqrt{\text{Cos}[c+d x]}\ \text{Csc}[c+d x]\ \text{EllipticPi}\left[\frac{a+b}{b},\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d x]}}{\sqrt{a+b}\ \sqrt{\text{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right]\right.$$
$$\left.\sqrt{\frac{a\left(1-\text{Sec}[c+d x]\right)}{a+b}}\ \sqrt{\frac{a\left(1+\text{Sec}[c+d x]\right)}{a-b}}\right)\Big/$$
$$\left(b^2 d\sqrt{\text{Sec}[c+d x]}\right)-\frac{2a^2\sqrt{\text{Sec}[c+d x]}\ \text{Sin}[c+d x]}{b\left(a^2-b^2\right)d\sqrt{a+b\,\text{Cos}[c+d x]}}$$

Result (type 4, 1175 leaves):

$$\frac{\sqrt{a+b\,\text{Cos}[c+d x]}\ \sqrt{\text{Sec}[c+d x]}\ \left(\frac{2a\,\text{Sin}[c+d x]}{b\left(a^2-b^2\right)}+\frac{2a^2\,\text{Sin}[c+d x]}{b\left(-a^2+b^2\right)\left(a+b\,\text{Cos}[c+d x]\right)}\right)}{d}-$$
$$\left(2\left(-a^2\sqrt{\frac{a-b}{a+b}}\ \text{Tan}\left[\frac{1}{2}(c+d x)\right]-a b\sqrt{\frac{a-b}{a+b}}\ \text{Tan}\left[\frac{1}{2}(c+d x)\right]+2 a b\sqrt{\frac{a-b}{a+b}}\ \text{Tan}\left[\frac{1}{2}(c+d x)\right]^3+\right.\right.$$
$$a^2\sqrt{\frac{a-b}{a+b}}\ \text{Tan}\left[\frac{1}{2}(c+d x)\right]^5-a b\sqrt{\frac{a-b}{a+b}}\ \text{Tan}\left[\frac{1}{2}(c+d x)\right]^5-$$
$$2\,\text{i}\,a^2\,\text{EllipticPi}\left[\frac{a+b}{a-b},\text{i}\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\ \text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],-\frac{a+b}{a-b}\right]$$
$$\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}\ \sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{a+b}}+$$
$$2\,\text{i}\,b^2\,\text{EllipticPi}\left[\frac{a+b}{a-b},\text{i}\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\ \text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],-\frac{a+b}{a-b}\right]$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}\ \sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{a+b}}\ -$$

$$2\,\mathrm{i}\,a^2\,\text{EllipticPi}\left[\frac{a+b}{a-b},\,\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\ \text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],\,-\frac{a+b}{a-b}\right]\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}\ \sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{a+b}}\ +$$

$$2\,\mathrm{i}\,b^2\,\text{EllipticPi}\left[\frac{a+b}{a-b},\,\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\ \text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],\,-\frac{a+b}{a-b}\right]\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}\ \sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{a+b}}\ -$$

$$\mathrm{i}\,a\,(a-b)\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\ \text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],\,-\frac{a+b}{a-b}\right]\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}$$

$$\left(1+\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{a+b}}\ +$$

$$\mathrm{i}\,\left(2\,a^2-a\,b-b^2\right)\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\ \text{Tan}\left[\frac{1}{2}(c+d x)\right]\right],\,-\frac{a+b}{a-b}\right]$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}\ \left(1+\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)$$

$$\left.\left.\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{a+b}}\right)\right)\Big/$$

$$\left(b\sqrt{\frac{a-b}{a+b}}\ \left(a^2-b^2\right)d\,\sqrt{\frac{1}{1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}}\ \left(-1+\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)\right.$$

$$\left(1+\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)^{3/2}$$

$$\left.\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}{1+\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}}\right)$$

Problem 763: Unable to integrate problem.

$$\int \frac{\text{Sec}[c+d\,x]^{5/2}}{(a+b\,\text{Cos}[c+d\,x])^{5/2}}\,dx$$

Optimal (type 4, 513 leaves, 7 steps):

$$-\left(\left(8\,b\,\left(2\,a^4-7\,a^2\,b^2+4\,b^4\right)\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(3\,a^5\,(a-b)\,(a+b)^{3/2}\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)\right)+\left(2\,\left(a^4+9\,a^3\,b+16\,a^2\,b^2-12\,a\,b^3-16\,b^4\right)\sqrt{\text{Cos}[c+d\,x]}\,\text{Csc}[c+d\,x]\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\,\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(3\,a^4\,(a-b)\,(a+b)^{3/2}\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)+\frac{2\,b^2\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{3\,a\,\left(a^2-b^2\right)\,d\,(a+b\,\text{Cos}[c+d\,x])^{3/2}}+\frac{4\,b^2\,\left(5\,a^2-3\,b^2\right)\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{3\,a^2\,\left(a^2-b^2\right)^2\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}+\frac{2\,\left(a^4-13\,a^2\,b^2+8\,b^4\right)\sqrt{a+b\,\text{Cos}[c+d\,x]}\,\text{Sec}[c+d\,x]^{3/2}\,\text{Sin}[c+d\,x]}{3\,a^3\,\left(a^2-b^2\right)^2\,d}$$

Result (type 8, 27 leaves):

$$\int \frac{\text{Sec}[c+d\,x]^{5/2}}{(a+b\,\text{Cos}[c+d\,x])^{5/2}}\,dx$$

Problem 764: Unable to integrate problem.

$$\int \frac{\text{Sec}[c+d\,x]^{3/2}}{(a+b\,\text{Cos}[c+d\,x])^{5/2}}\,dx$$

Optimal (type 4, 438 leaves, 6 steps):

$$\left(2\left(3 a^4-15 a^2 b^2+8 b^4\right) \sqrt{\operatorname{Cos}[c+d x]} \operatorname{Csc}[c+d x]\right.$$
$$\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b \operatorname{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\operatorname{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \sqrt{\frac{a(1-\operatorname{Sec}[c+d x])}{a+b}}$$
$$\left.\sqrt{\frac{a(1+\operatorname{Sec}[c+d x])}{a-b}}\right) \Big/ \left(3 a^4(a-b)(a+b)^{3/2} d \sqrt{\operatorname{Sec}[c+d x]}\right)-$$
$$\left(2\left(3 a^3+9 a^2 b-6 a b^2-8 b^3\right) \sqrt{\operatorname{Cos}[c+d x]} \operatorname{Csc}[c+d x] \text{EllipticF}\left[\right.\right.$$
$$\left.\left.\text{ArcSin}\left[\frac{\sqrt{a+b \operatorname{Cos}[c+d x]}}{\sqrt{a+b} \sqrt{\operatorname{Cos}[c+d x]}}\right],-\frac{a+b}{a-b}\right] \sqrt{\frac{a(1-\operatorname{Sec}[c+d x])}{a+b}} \sqrt{\frac{a(1+\operatorname{Sec}[c+d x])}{a-b}}\right) \Big/$$
$$\left(3 a^3(a-b)(a+b)^{3/2} d \sqrt{\operatorname{Sec}[c+d x]}\right)+\frac{2 b^2 \sqrt{\operatorname{Sec}[c+d x]} \operatorname{Sin}[c+d x]}{3 a\left(a^2-b^2\right) d(a+b \operatorname{Cos}[c+d x])^{3/2}}+$$
$$\frac{8 b^2\left(2 a^2-b^2\right) \sqrt{\operatorname{Sec}[c+d x]} \operatorname{Sin}[c+d x]}{3 a^2\left(a^2-b^2\right)^2 d \sqrt{a+b \operatorname{Cos}[c+d x]}}$$

Result (type 8, 27 leaves):

$$\int \frac{\operatorname{Sec}[c+d x]^{3/2}}{(a+b \operatorname{Cos}[c+d x])^{5/2}} \, dx$$

Problem 765: Unable to integrate problem.

$$\int \frac{\sqrt{\operatorname{Sec}[c+d x]}}{(a+b \operatorname{Cos}[c+d x])^{5/2}} \, dx$$

Optimal (type 4, 421 leaves, 6 steps):

$$\left(4\,b\,\left(3\,a^2-b^2\right)\sqrt{\text{Cos}[c+d\,x]}\;\text{Csc}[c+d\,x]\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\;\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\;\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(3\,a^3\,(a-b)\,(a+b)^{3/2}\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)+$$

$$\left(2\,\left(3\,a^2-3\,a\,b-2\,b^2\right)\sqrt{\text{Cos}[c+d\,x]}\;\text{Csc}[c+d\,x]\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\;\sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\;\sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/$$

$$\left(3\,a^2\,(a-b)\,(a+b)^{3/2}\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)+\frac{2\,b^2\,\text{Sin}[c+d\,x]}{3\,a\,\left(a^2-b^2\right)\,d\,(a+b\,\text{Cos}[c+d\,x])^{3/2}\,\sqrt{\text{Sec}[c+d\,x]}}-$$

$$\frac{4\,b\,\left(3\,a^2-b^2\right)\sqrt{\text{Sec}[c+d\,x]}\;\text{Sin}[c+d\,x]}{3\,a\,\left(a^2-b^2\right)^2\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}$$

Result (type 8, 27 leaves):

$$\int\frac{\sqrt{\text{Sec}[c+d\,x]}}{(a+b\,\text{Cos}[c+d\,x])^{5/2}}\,dx$$

Problem 766: Unable to integrate problem.

$$\int\frac{1}{(a+b\,\text{Cos}[c+d\,x])^{5/2}\,\sqrt{\text{Sec}[c+d\,x]}}\,dx$$

Optimal (type 4, 399 leaves, 6 steps):

$$-\left(\left(2\left(3a^2+b^2\right)\sqrt{\text{Cos}[c+dx]}\;\text{Csc}[c+dx]\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+dx]}}{\sqrt{a+b}\;\sqrt{\text{Cos}[c+dx]}}\right],-\frac{a+b}{a-b}\right]\right.\right.$$

$$\left.\sqrt{\frac{a\,(1-\text{Sec}[c+dx])}{a+b}}\;\sqrt{\frac{a\,(1+\text{Sec}[c+dx])}{a-b}}\right)\Big/\left(3a^2\,(a-b)\,(a+b)^{3/2}\,d\sqrt{\text{Sec}[c+dx]}\right)+$$

$$\left(2\,(3a-b)\sqrt{\text{Cos}[c+dx]}\;\text{Csc}[c+dx]\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+dx]}}{\sqrt{a+b}\;\sqrt{\text{Cos}[c+dx]}}\right],-\frac{a+b}{a-b}\right]\right.$$

$$\left.\left.\sqrt{\frac{a\,(1-\text{Sec}[c+dx])}{a+b}}\;\sqrt{\frac{a\,(1+\text{Sec}[c+dx])}{a-b}}\right)\Big/\left(3a\,(a-b)\,(a+b)^{3/2}\,d\sqrt{\text{Sec}[c+dx]}\right)\right)-$$

$$\frac{2\,b\,\text{Sin}[c+dx]}{3\left(a^2-b^2\right)d\,(a+b\,\text{Cos}[c+dx])^{3/2}\sqrt{\text{Sec}[c+dx]}}+$$

$$\frac{2\left(3a^2+b^2\right)\sqrt{\text{Sec}[c+dx]}\;\text{Sin}[c+dx]}{3\left(a^2-b^2\right)^2d\sqrt{a+b\,\text{Cos}[c+dx]}}$$

Result (type 8, 27 leaves):

$$\int\frac{1}{(a+b\,\text{Cos}[c+dx])^{5/2}\sqrt{\text{Sec}[c+dx]}}\,dx$$

Problem 767: Unable to integrate problem.

$$\int\frac{1}{(a+b\,\text{Cos}[c+dx])^{5/2}\,\text{Sec}[c+dx]^{3/2}}\,dx$$

Optimal (type 4, 382 leaves, 6 steps):

$$\left(8\,b\,\sqrt{\text{Cos}[c+d\,x]}\ \text{Csc}[c+d\,x]\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\ \sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\right.$$
$$\left.\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\ \sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(3\,a\,(a-b)\,(a+b)^{3/2}\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)+$$
$$\left(2\,(a-3\,b)\,\sqrt{\text{Cos}[c+d\,x]}\ \text{Csc}[c+d\,x]\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+d\,x]}}{\sqrt{a+b}\ \sqrt{\text{Cos}[c+d\,x]}}\right],-\frac{a+b}{a-b}\right]\right.$$
$$\left.\sqrt{\frac{a\,(1-\text{Sec}[c+d\,x])}{a+b}}\ \sqrt{\frac{a\,(1+\text{Sec}[c+d\,x])}{a-b}}\right)\Big/\left(3\,a\,(a-b)\,(a+b)^{3/2}\,d\,\sqrt{\text{Sec}[c+d\,x]}\right)+$$
$$\frac{2\,a\,\text{Sin}[c+d\,x]}{3\,(a^2-b^2)\,d\,(a+b\,\text{Cos}[c+d\,x])^{3/2}\,\sqrt{\text{Sec}[c+d\,x]}}-\frac{8\,a\,b\,\sqrt{\text{Sec}[c+d\,x]}\ \text{Sin}[c+d\,x]}{3\,(a^2-b^2)^2\,d\,\sqrt{a+b\,\text{Cos}[c+d\,x]}}$$

Result (type 8, 27 leaves):

$$\int \frac{1}{(a+b\,\text{Cos}[c+d\,x])^{5/2}\,\text{Sec}[c+d\,x]^{3/2}}\,dx$$

Problem 768: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{(a+b\,\text{Cos}[c+d\,x])^{5/2}\,\text{Sec}[c+d\,x]^{5/2}}\,dx$$

Optimal (type 4, 557 leaves, 8 steps):

$$\left(2\left(3a^2-7b^2\right)\sqrt{\text{Cos}[c+dx]}\ \text{Csc}[c+dx]\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+dx]}}{\sqrt{a+b}\ \sqrt{\text{Cos}[c+dx]}}\right],-\frac{a+b}{a-b}\right]\right.$$
$$\left.\sqrt{\frac{a\left(1-\text{Sec}[c+dx]\right)}{a+b}}\ \sqrt{\frac{a\left(1+\text{Sec}[c+dx]\right)}{a-b}}\right)\Big/$$
$$\left(3\left(a-b\right)b^2\left(a+b\right)^{3/2}d\sqrt{\text{Sec}[c+dx]}\right)-\left(2\left(3a^2+ab-6b^2\right)\sqrt{\text{Cos}[c+dx]}\ \text{Csc}[c+dx]\right.$$
$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+dx]}}{\sqrt{a+b}\ \sqrt{\text{Cos}[c+dx]}}\right],-\frac{a+b}{a-b}\right]\sqrt{\frac{a\left(1-\text{Sec}[c+dx]\right)}{a+b}}$$
$$\left.\sqrt{\frac{a\left(1+\text{Sec}[c+dx]\right)}{a-b}}\right)\Big/\left(3\left(a-b\right)b^2\left(a+b\right)^{3/2}d\sqrt{\text{Sec}[c+dx]}\right)-$$
$$\left(2\sqrt{a+b}\ \sqrt{\text{Cos}[c+dx]}\ \text{Csc}[c+dx]\ \text{EllipticPi}\left[\frac{a+b}{b},\text{ArcSin}\left[\frac{\sqrt{a+b\,\text{Cos}[c+dx]}}{\sqrt{a+b}\ \sqrt{\text{Cos}[c+dx]}}\right],-\frac{a+b}{a-b}\right]\right.$$
$$\left.\sqrt{\frac{a\left(1-\text{Sec}[c+dx]\right)}{a+b}}\ \sqrt{\frac{a\left(1+\text{Sec}[c+dx]\right)}{a-b}}\right)\Big/\left(b^3d\sqrt{\text{Sec}[c+dx]}\right)-$$
$$\frac{2a^2\,\text{Sin}[c+dx]}{3b\left(a^2-b^2\right)d\left(a+b\,\text{Cos}[c+dx]\right)^{3/2}\sqrt{\text{Sec}[c+dx]}}-$$
$$\frac{2a^2\left(3a^2-7b^2\right)\sqrt{\text{Sec}[c+dx]}\ \text{Sin}[c+dx]}{3b^2\left(a^2-b^2\right)^2d\sqrt{a+b\,\text{Cos}[c+dx]}}$$

Result (type 4, 1716 leaves):

$$\frac{1}{d}\sqrt{a+b\,\text{Cos}[c+dx]}\ \sqrt{\text{Sec}[c+dx]}\left(\frac{2a\left(3a^2-7b^2\right)\text{Sin}[c+dx]}{3b^2\left(a^2-b^2\right)^2}-\right.$$
$$\left.\frac{2a^3\,\text{Sin}[c+dx]}{3b^2\left(-a^2+b^2\right)\left(a+b\,\text{Cos}[c+dx]\right)^2}-\frac{8\left(a^4\,\text{Sin}[c+dx]-2a^2b^2\,\text{Sin}[c+dx]\right)}{3b^2\left(-a^2+b^2\right)^2\left(a+b\,\text{Cos}[c+dx]\right)}\right)+$$
$$\left(2\left(3a^4\sqrt{\frac{a-b}{a+b}}\ \text{Tan}\left[\frac{1}{2}\left(c+dx\right)\right]+3a^3b\sqrt{\frac{a-b}{a+b}}\ \text{Tan}\left[\frac{1}{2}\left(c+dx\right)\right]-\right.\right.$$
$$7a^2b^2\sqrt{\frac{a-b}{a+b}}\ \text{Tan}\left[\frac{1}{2}\left(c+dx\right)\right]-7ab^3\sqrt{\frac{a-b}{a+b}}\ \text{Tan}\left[\frac{1}{2}\left(c+dx\right)\right]-$$

$$6\,a^3\,b\,\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^3+14\,a\,b^3\,\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^3-$$

$$3\,a^4\,\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^5+3\,a^3\,b\,\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^5+$$

$$7\,a^2\,b^2\,\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^5-7\,a\,b^3\,\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^5+$$

$$6\,i\,a^4\,\text{EllipticPi}\left[\frac{a+b}{a-b},\,i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,-\frac{a+b}{a-b}\right]$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\,\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a+b}}\,-$$

$$12\,i\,a^2\,b^2\,\text{EllipticPi}\left[\frac{a+b}{a-b},\,i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,-\frac{a+b}{a-b}\right]$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\,\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a+b}}\,+$$

$$6\,i\,b^4\,\text{EllipticPi}\left[\frac{a+b}{a-b},\,i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,-\frac{a+b}{a-b}\right]$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\,\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a+b}}\,+$$

$$6\,i\,a^4\,\text{EllipticPi}\left[\frac{a+b}{a-b},\,i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,-\frac{a+b}{a-b}\right]\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\,\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a+b}}\,-12\,i\,a^2\,b^2$$

$$\text{EllipticPi}\left[\frac{a+b}{a-b},\,i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,-\frac{a+b}{a-b}\right]\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\,\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a+b}}\,+$$

$$6\,i\,b^4\,\text{EllipticPi}\left[\frac{a+b}{a-b},\,i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,-\frac{a+b}{a-b}\right]\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\,\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a+b}}\,+$$

$$i\,a\,\left(3\,a^3-3\,a^2\,b-7\,a\,b^2+7\,b^3\right)\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,-\frac{a+b}{a-b}\right]$$

$$\sqrt{1-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\,\left(1+\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)$$

$$\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a+b}}\,-\,i\,\left(6\,a^4-2\,a^3\,b-13\,a^2\,b^2+6\,a\,b^3+3\,b^4\right)$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a-b}{a+b}}\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\right],\,-\frac{a+b}{a-b}\right]\,\sqrt{1-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}$$

$$\left.\left.\left(1+\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)\,\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{a+b}}\right)\right)\Big/$$

$$\left(3\,b^2\,\sqrt{\frac{a-b}{a+b}}\,\left(a^2-b^2\right)^2\,d\,\sqrt{\frac{1+\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{1-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}}\right.$$

$$\sqrt{\frac{a+b+a\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2-b\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}{1+\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}}$$

$$\left.\left(-1+\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^4\right)\right)$$

Problem 773: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Cos}[c+d\,x]^m}{a+b\,\text{Cos}[c+d\,x]}\,dx$$

Optimal (type 6, 190 leaves, 5 steps):

$$\frac{1}{\left(a^2-b^2\right) d} a\,\text{AppellF1}\left[\frac{1}{2},\frac{1-m}{2},1,\frac{3}{2},\text{Sin}[c+d x]^2,-\frac{b^2\,\text{Sin}[c+d x]^2}{a^2-b^2}\right] \text{Cos}[c+d x]^{-1+m} \left(\text{Cos}[c+d x]^2\right)^{\frac{1-m}{2}} \text{Sin}[c+d x]-\frac{1}{\left(a^2-b^2\right) d} b\,\text{AppellF1}\left[\frac{1}{2},-\frac{m}{2},1,\frac{3}{2},\text{Sin}[c+d x]^2,-\frac{b^2\,\text{Sin}[c+d x]^2}{a^2-b^2}\right] \text{Cos}[c+d x]^m \left(\text{Cos}[c+d x]^2\right)^{-m/2} \text{Sin}[c+d x]$$

Result (type 6, 6355 leaves):

$$\left(3 \left(a^2-b^2\right) \text{Cos}[c+d x]^{-1+m} \text{Sin}[c+d x] \left(1+\text{Tan}[c+d x]^2\right)^{-1-\frac{m}{2}} \left(b+a \sqrt{1+\text{Tan}[c+d x]^2}\right) \left(-\left(\left(a\,\text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right] \sqrt{1+\text{Tan}[c+d x]^2}\right)\Big/\left(-3 \left(a^2-b^2\right) \text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(2 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right) m\,\text{AppellF1}\left[\frac{3}{2},\frac{2+m}{2},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right) \text{Tan}[c+d x]^2\right)\right)+\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{1+m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\Big/\left(-3 \left(a^2-b^2\right) \text{AppellF1}\left[\frac{1}{2},\frac{1+m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(2 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1+m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right) (1+m)\,\text{AppellF1}\left[\frac{3}{2},\frac{3+m}{2},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right) \text{Tan}[c+d x]^2\right)\right)\right)\Big/$$

$$\left(d\left(a+b\,\text{Cos}[c+d x]\right) \left(a+\frac{b}{\sqrt{1+\text{Tan}[c+d x]^2}}\right) \left(-b^2+a^2 \left(1+\text{Tan}[c+d x]^2\right)\right)\right.$$

$$\left(-\frac{1}{\left(a+\frac{b}{\sqrt{1+\text{Tan}[c+d x]^2}}\right) \left(-b^2+a^2 \left(1+\text{Tan}[c+d x]^2\right)\right)^2} 6 a^2 \left(a^2-b^2\right) \text{Sec}[c+d x]^2\,\text{Tan}[c+d x]^2 \left(1+\text{Tan}[c+d x]^2\right)^{-1-\frac{m}{2}} \left(b+a \sqrt{1+\text{Tan}[c+d x]^2}\right) \left(-\left(\left(a\,\text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right] \sqrt{1+\text{Tan}[c+d x]^2}\right)\Big/\left(-3 \left(a^2-b^2\right) \text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.\right.\right.\right.$$

$$\left(2\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{m}{2},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\,m\,\text{AppellF1}\left[\frac{3}{2},\frac{2+m}{2},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\Bigg)\Bigg)+$$

$$\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{1+m}{2},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\Big/\left(-3\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1+m}{2},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(2\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1+m}{2},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)(1+m)\,\text{AppellF1}\left[\frac{3}{2},\frac{3+m}{2},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)\Bigg)+$$

$$\frac{1}{\left(a+\frac{b}{\sqrt{1+\text{Tan}[c+d\,x]^2}}\right)\left(-b^2+a^2\left(1+\text{Tan}[c+d\,x]^2\right)\right)}\,3\,a\left(a^2-b^2\right)\text{Sec}[c+d\,x]^2$$

$$\text{Tan}[c+d\,x]^2\left(1+\text{Tan}[c+d\,x]^2\right)^{-\frac{3}{2}-\frac{m}{2}}$$

$$\Bigg(-\Bigg(\left(a\,\text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\sqrt{1+\text{Tan}[c+d\,x]^2}\right)\Big/$$

$$\left(-3\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(2\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{m}{2},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)m\,\text{AppellF1}\left[\frac{3}{2},\frac{2+m}{2},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)\Bigg)+\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{1+m}{2},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\Big/$$

$$\left(-3\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1+m}{2},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(2\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1+m}{2},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)(1+m)\,\text{AppellF1}\left[\frac{3}{2},\frac{3+m}{2},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)\Bigg)+$$

$$\frac{1}{\left(a+\frac{b}{\sqrt{1+\text{Tan}[c+d\,x]^2}}\right)^2\left(-b^2+a^2\left(1+\text{Tan}[c+d\,x]^2\right)\right)}\,3\,b\left(a^2-b^2\right)\text{Sec}[c+d\,x]^2$$

$$\text{Tan}[c+d\,x]^2\left(1+\text{Tan}[c+d\,x]^2\right)^{-\frac{5}{2}-\frac{m}{2}}$$

$$\left(b+a\sqrt{1+\text{Tan}[c+d\,x]^2}\right)$$

$$\Bigg(-\Bigg(\left(a\,\text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\sqrt{1+\text{Tan}[c+d\,x]^2}\right)\Big/$$

$$\left(-3\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$
$$\left(2 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$
$$\left(a^2-b^2\right) m\,\text{AppellF1}\left[\frac{3}{2},\frac{2+m}{2},1,\frac{5}{2},-\text{Tan}[c+d x]^2,\right.$$
$$\left.\left.\left.-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d x]^2\right)\right)+$$
$$\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{1+m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\Big/$$
$$\left(-3\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1+m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$
$$\left(2 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1+m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)(1+m)\right.$$
$$\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{3+m}{2},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d x]^2\right)\right)+$$
$$\frac{1}{\left(a+\frac{b}{\sqrt{1+\text{Tan}[c+d x]^2}}\right)\left(-b^2+a^2\left(1+\text{Tan}[c+d x]^2\right)\right)}6\left(a^2-b^2\right)\left(-1-\frac{m}{2}\right)\text{Sec}[c+d x]^2$$
$$\text{Tan}[c+d x]^2\left(1+\text{Tan}[c+d x]^2\right)^{-2-\frac{m}{2}}$$
$$\left(b+a\sqrt{1+\text{Tan}[c+d x]^2}\right)$$
$$\left(-\left(\left(a\,\text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\sqrt{1+\text{Tan}[c+d x]^2}\right)\Big/\right.\right.$$
$$\left(-3\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$
$$\left(2 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$
$$\left(a^2-b^2\right) m\,\text{AppellF1}\left[\frac{3}{2},\frac{2+m}{2},1,\frac{5}{2},-\text{Tan}[c+d x]^2,\right.$$
$$\left.\left.\left.-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d x]^2\right)\right)+$$
$$\left(b\,\text{AppellF1}\left[\frac{1}{2},\frac{1+m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\Big/$$
$$\left(-3\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1+m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$
$$\left(2 a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1+m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)(1+m)\right.$$
$$\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{3+m}{2},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d x]^2\right)\right)+$$

$$\frac{1}{\left(a+\frac{b}{\sqrt{1+\mathrm{Tan}[c+d\,x]^2}}\right)\left(-b^2+a^2\left(1+\mathrm{Tan}[c+d\,x]^2\right)\right)}3\left(a^2-b^2\right)\mathrm{Sec}[c+d\,x]^2$$

$$\left(1+\mathrm{Tan}[c+d\,x]^2\right)^{-1-\frac{m}{2}}$$

$$\left(b+a\sqrt{1+\mathrm{Tan}[c+d\,x]^2}\right)$$

$$\left(-\left(\left(a\,\mathrm{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\mathrm{Tan}[c+d\,x]^2,-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\right]\sqrt{1+\mathrm{Tan}[c+d\,x]^2}\right)\right/\right.$$

$$\left(-3\left(a^2-b^2\right)\mathrm{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\mathrm{Tan}[c+d\,x]^2,-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$

$$\left(2\,a^2\,\mathrm{AppellF1}\left[\frac{3}{2},\frac{m}{2},2,\frac{5}{2},-\mathrm{Tan}[c+d\,x]^2,-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$

$$\left(a^2-b^2\right)m\,\mathrm{AppellF1}\left[\frac{3}{2},\frac{2+m}{2},1,\frac{5}{2},-\mathrm{Tan}[c+d\,x]^2,\right.$$

$$\left.\left.\left.\left.-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\mathrm{Tan}[c+d\,x]^2\right)\right)+$$

$$\left(b\,\mathrm{AppellF1}\left[\frac{1}{2},\frac{1+m}{2},1,\frac{3}{2},-\mathrm{Tan}[c+d\,x]^2,-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\Big/$$

$$\left(-3\left(a^2-b^2\right)\mathrm{AppellF1}\left[\frac{1}{2},\frac{1+m}{2},1,\frac{3}{2},-\mathrm{Tan}[c+d\,x]^2,-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$

$$\left(2\,a^2\,\mathrm{AppellF1}\left[\frac{3}{2},\frac{1+m}{2},2,\frac{5}{2},-\mathrm{Tan}[c+d\,x]^2,-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)(1+m)\right.$$

$$\left.\left.\left.\mathrm{AppellF1}\left[\frac{3}{2},\frac{3+m}{2},1,\frac{5}{2},-\mathrm{Tan}[c+d\,x]^2,-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\mathrm{Tan}[c+d\,x]^2\right)\right)+$$

$$\frac{1}{\left(a+\frac{b}{\sqrt{1+\mathrm{Tan}[c+d\,x]^2}}\right)\left(-b^2+a^2\left(1+\mathrm{Tan}[c+d\,x]^2\right)\right)}3\left(a^2-b^2\right)\mathrm{Tan}[c+d\,x]$$

$$\left(1+\mathrm{Tan}[c+d\,x]^2\right)^{-1-\frac{m}{2}}$$

$$\left(b+a\sqrt{1+\mathrm{Tan}[c+d\,x]^2}\right)$$

$$\left(-\left(\left(a\,\mathrm{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\mathrm{Tan}[c+d\,x]^2,-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right.\right.\right.$$

$$\left.\mathrm{Sec}[c+d\,x]^2\,\mathrm{Tan}[c+d\,x]\right)\Big/\left(\sqrt{1+\mathrm{Tan}[c+d\,x]^2}\left(-3\left(a^2-b^2\right)\right.\right.$$

$$\mathrm{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\mathrm{Tan}[c+d\,x]^2,-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(2\,a^2\,\mathrm{AppellF1}\left[\frac{3}{2},\right.\right.$$

$$\left.\frac{m}{2},2,\frac{5}{2},-\mathrm{Tan}[c+d\,x]^2,-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)m\,\mathrm{AppellF1}\left[\frac{3}{2},\right.$$

$$\left.\left.\left.\left.\frac{2+m}{2},1,\frac{5}{2},-\mathrm{Tan}[c+d\,x]^2,-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\mathrm{Tan}[c+d\,x]^2\right)\right)\right)-$$

$$\left(a\left(-\frac{1}{3}m\,\mathrm{AppellF1}\left[\frac{3}{2},1+\frac{m}{2},1,\frac{5}{2},-\mathrm{Tan}[c+d\,x]^2,-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right.\right.$$

$$\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]-\frac{1}{3\left(a^2-b^2\right)}2\,a^2\,\text{AppellF1}\Big[\frac{3}{2},\frac{m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,$$
$$-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\Big]\,\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]\Bigg)\,\sqrt{1+\text{Tan}[c+d x]^2}\Bigg)\Bigg/$$
$$\Bigg(-3\left(a^2-b^2\right)\text{AppellF1}\Big[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\Big]+$$
$$\Bigg(2\,a^2\,\text{AppellF1}\Big[\frac{3}{2},\frac{m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\Big]+\left(a^2-b^2\right)m$$
$$\text{AppellF1}\Big[\frac{3}{2},\frac{2+m}{2},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\Big]\Bigg)\,\text{Tan}[c+d x]^2\Bigg)+$$
$$\Bigg(b\,\Bigg(-\frac{1}{3\left(a^2-b^2\right)}2\,a^2\,\text{AppellF1}\Big[\frac{3}{2},\frac{1+m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\Big]$$
$$\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]-\frac{1}{3}\,(1+m)\,\text{AppellF1}\Big[\frac{3}{2},1+\frac{1+m}{2},1,\frac{5}{2},$$
$$-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\Big]\,\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]\Bigg)\Bigg)\Bigg/$$
$$\Bigg(-3\left(a^2-b^2\right)\text{AppellF1}\Big[\frac{1}{2},\frac{1+m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\Big]+$$
$$\Bigg(2\,a^2\,\text{AppellF1}\Big[\frac{3}{2},\frac{1+m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\Big]+\left(a^2-b^2\right)(1+m)$$
$$\text{AppellF1}\Big[\frac{3}{2},\frac{3+m}{2},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\Big]\Bigg)\,\text{Tan}[c+d x]^2\Bigg)+$$
$$\Bigg(a\,\text{AppellF1}\Big[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\Big]\,\sqrt{1+\text{Tan}[c+d x]^2}$$
$$\Bigg(2\,\Bigg(2\,a^2\,\text{AppellF1}\Big[\frac{3}{2},\frac{m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\Big]+\left(a^2-b^2\right)m$$
$$\text{AppellF1}\Big[\frac{3}{2},\frac{2+m}{2},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\Big]\Bigg)\,\text{Sec}[c+d x]^2$$
$$\text{Tan}[c+d x]-3\left(a^2-b^2\right)\Bigg(-\frac{1}{3}\,m\,\text{AppellF1}\Big[\frac{3}{2},1+\frac{m}{2},1,\frac{5}{2},-\text{Tan}[c+d x]^2,$$
$$-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\Big]\,\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]-\frac{1}{3\left(a^2-b^2\right)}2\,a^2\,\text{AppellF1}\Big[\frac{3}{2},$$
$$\frac{m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\Big]\,\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]\Bigg)+$$
$$\text{Tan}[c+d x]^2\,\Bigg(2\,a^2\,\Bigg(-\frac{3}{5}\,m\,\text{AppellF1}\Big[\frac{5}{2},1+\frac{m}{2},2,\frac{7}{2},-\text{Tan}[c+d x]^2,$$
$$-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\Big]\,\text{Sec}[c+d x]^2\,\text{Tan}[c+d x]-\frac{1}{5\left(a^2-b^2\right)}$$
$$12\,a^2\,\text{AppellF1}\Big[\frac{5}{2},\frac{m}{2},3,\frac{7}{2},-\text{Tan}[c+d x]^2,-\frac{a^2\,\text{Tan}[c+d x]^2}{a^2-b^2}\Big]$$

$$\text{Sec}[c+d x]^2 \text{Tan}[c+d x]\Big)+\left(a^2-b^2\right) m \left(-\frac{1}{5\left(a^2-b^2\right)} 6 a^2 \text{AppellF1}\left[\frac{5}{2},\frac{2+m}{2},2,\frac{7}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]-\frac{3}{5}(2+m) \text{AppellF1}\left[\frac{5}{2},1+\frac{2+m}{2},1,\frac{7}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]\right)\Bigg)\Bigg)\Bigg)\Bigg) \Big/$$

$$\Bigg(-3\left(a^2-b^2\right) \text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(2 a^2 \text{AppellF1}\left[\frac{3}{2},\frac{m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right) m \text{AppellF1}\left[\frac{3}{2},\frac{2+m}{2},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\right) \text{Tan}[c+d x]^2\Bigg)^2-\Bigg(b \text{AppellF1}\left[\frac{1}{2},\frac{1+m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]$$

$$\Bigg(2\Bigg(2 a^2 \text{AppellF1}\left[\frac{3}{2},\frac{1+m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)(1+m) \text{AppellF1}\left[\frac{3}{2},\frac{3+m}{2},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\Bigg) \text{Sec}[c+d x]^2 \text{Tan}[c+d x]-3\left(a^2-b^2\right)\left(-\frac{1}{3\left(a^2-b^2\right)} 2 a^2 \text{AppellF1}\left[\frac{3}{2},\frac{1+m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]-\frac{1}{3}(1+m) \text{AppellF1}\left[\frac{3}{2},1+\frac{1+m}{2},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]\right)+\text{Tan}[c+d x]^2\Bigg(2 a^2\left(-\frac{1}{5\left(a^2-b^2\right)} 12 a^2 \text{AppellF1}\left[\frac{5}{2},\frac{1+m}{2},3,\frac{7}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]-\frac{3}{5}(1+m) \text{AppellF1}\left[\frac{5}{2},1+\frac{1+m}{2},2,\frac{7}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]\right)+\left(a^2-b^2\right)(1+m)\left(-\frac{1}{5\left(a^2-b^2\right)} 6 a^2 \text{AppellF1}\left[\frac{5}{2},\frac{3+m}{2},2,\frac{7}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]-\frac{3}{5}(3+m) \text{AppellF1}\left[\frac{5}{2},1+\frac{3+m}{2},1,\frac{7}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]\right)\Bigg)\Bigg)\Bigg)\Bigg) \Big/$$

$$\Bigg(-3\left(a^2-b^2\right) \text{AppellF1}\left[\frac{1}{2},\frac{1+m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+$$

$$\left(2\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1+m}{2},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\,(1+m)\,\text{AppellF1}\left[\frac{3}{2},\frac{3+m}{2},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\,\text{Tan}[c+d\,x]^2\Bigg)^2\Bigg)\Bigg)$$

Problem 774: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Cos}[c+d\,x]^m}{\left(a+b\,\text{Cos}[c+d\,x]\right)^2}\,dx$$

Optimal (type 6, 294 leaves, 8 steps):

$$\frac{1}{\left(a^2-b^2\right)^2 d}b^2\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}(-1-m),2,\frac{3}{2},\text{Sin}[c+d\,x]^2,-\frac{b^2\,\text{Sin}[c+d\,x]^2}{a^2-b^2}\right]\text{Cos}[c+d\,x]^{1+m}\left(\text{Cos}[c+d\,x]^2\right)^{\frac{1}{2}(-1-m)}\text{Sin}[c+d\,x]+\frac{1}{\left(a^2-b^2\right)^2 d}a^2\,\text{AppellF1}\left[\frac{1}{2},\frac{1-m}{2},2,\frac{3}{2},\text{Sin}[c+d\,x]^2,-\frac{b^2\,\text{Sin}[c+d\,x]^2}{a^2-b^2}\right]\text{Cos}[c+d\,x]^{-1+m}\left(\text{Cos}[c+d\,x]^2\right)^{\frac{1-m}{2}}\text{Sin}[c+d\,x]-\frac{1}{\left(a^2-b^2\right)^2 d}2\,a\,b\,\text{AppellF1}\left[\frac{1}{2},-\frac{m}{2},2,\frac{3}{2},\text{Sin}[c+d\,x]^2,-\frac{b^2\,\text{Sin}[c+d\,x]^2}{a^2-b^2}\right]\text{Cos}[c+d\,x]^m\left(\text{Cos}[c+d\,x]^2\right)^{-m/2}\text{Sin}[c+d\,x]$$

Result (type 6, 7214 leaves):

$$\Bigg(3\left(a^2-b^2\right)\text{Cos}[c+d\,x]^{-1+m}\,\text{Sin}[c+d\,x]\left(1+\text{Tan}[c+d\,x]^2\right)^{-m/2}\Bigg(-\Bigg(\text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\Big/\Bigg(\Bigg(-3\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(\left(a^2-b^2\right)m\,\text{AppellF1}\left[\frac{3}{2},1+\frac{m}{2},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+2\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{m}{2},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\Bigg)\left(-b^2+a^2\left(1+\text{Tan}[c+d\,x]^2\right)\right)\Bigg)\Bigg)+\frac{1}{\left(b^2-a^2\left(1+\text{Tan}[c+d\,x]^2\right)\right)^2}2\,b\Bigg(\Bigg(a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}(-1+m),2,\frac{3}{2},-\text{Tan}[c+d\,x]^2,\frac{a^2\,\text{Tan}[c+d\,x]^2}{-a^2+b^2}\right]\sqrt{1+\text{Tan}[c+d\,x]^2}\Bigg)\Big/\Bigg(-3\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}(-1+m),2,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+$$

$$\left(4 a^2 \text{AppellF1}\left[\frac{3}{2}, \frac{1}{2}(-1+m), 3, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] + \left(a^2-b^2\right) (-1+m) \text{AppellF1}\left[\frac{3}{2}, \frac{1+m}{2}, 2, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\right) \text{Tan}[c+d x]^2\Big) - \left(b \text{AppellF1}\left[\frac{1}{2}, \frac{m}{2}, 2, \frac{3}{2}, -\text{Tan}[c+d x]^2, \frac{a^2 \text{Tan}[c+d x]^2}{-a^2+b^2}\right]\right) \Big/ \left(-3 \left(a^2-b^2\right) \text{AppellF1}\left[\frac{1}{2}, \frac{m}{2}, 2, \frac{3}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] + \left(4 a^2 \text{AppellF1}\left[\frac{3}{2}, \frac{m}{2}, 3, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] + \left(a^2-b^2\right) m \text{AppellF1}\left[\frac{3}{2}, \frac{2+m}{2}, 2, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\right) \text{Tan}[c+d x]^2\right)\Big)\Big)\Big)\Big) \Big/$$

$$\Bigg(d \left(a+b \text{Cos}[c+d x]\right)^2 \Bigg(-3 \left(a^2-b^2\right) m \text{Sec}[c+d x]^2 \text{Tan}[c+d x]^2 \left(1+\text{Tan}[c+d x]^2\right)^{-1-\frac{m}{2}} \Bigg(-\Bigg(\text{AppellF1}\left[\frac{1}{2}, \frac{m}{2}, 1, \frac{3}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \Big/ \Bigg(\Bigg(-3 \left(a^2-b^2\right) \text{AppellF1}\left[\frac{1}{2}, \frac{m}{2}, 1, \frac{3}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] + \left(\left(a^2-b^2\right) m \text{AppellF1}\left[\frac{3}{2}, 1+\frac{m}{2}, 1, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] + 2 a^2 \text{AppellF1}\left[\frac{3}{2}, \frac{m}{2}, 2, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\right) \text{Tan}[c+d x]^2\Bigg) \left(-b^2+a^2 \left(1+\text{Tan}[c+d x]^2\right)\right)\Bigg)\Bigg) + \frac{1}{\left(b^2-a^2 \left(1+\text{Tan}[c+d x]^2\right)\right)^2}$$

$$2 b \Bigg(\Bigg(a \text{AppellF1}\left[\frac{1}{2}, \frac{1}{2}(-1+m), 2, \frac{3}{2}, -\text{Tan}[c+d x]^2, \frac{a^2 \text{Tan}[c+d x]^2}{-a^2+b^2}\right] \sqrt{1+\text{Tan}[c+d x]^2}\Bigg) \Big/ \Bigg(-3 \left(a^2-b^2\right) \text{AppellF1}\left[\frac{1}{2}, \frac{1}{2}(-1+m), 2, \frac{3}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] + \left(4 a^2 \text{AppellF1}\left[\frac{3}{2}, \frac{1}{2}(-1+m), 3, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] + \left(a^2-b^2\right)(-1+m) \text{AppellF1}\left[\frac{3}{2}, \frac{1+m}{2}, 2, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\right) \text{Tan}[c+d x]^2\Bigg) -$$

$$\left(b \text{AppellF1}\left[\frac{1}{2}, \frac{m}{2}, 2, \frac{3}{2}, -\text{Tan}[c+d x]^2, \frac{a^2 \text{Tan}[c+d x]^2}{-a^2+b^2}\right]\right) \Big/ \Bigg(-3 \left(a^2-b^2\right) \text{AppellF1}\left[\frac{1}{2}, \frac{m}{2}, 2, \frac{3}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] + \Bigg(4 a^2 \text{AppellF1}\left[\frac{3}{2}, \frac{m}{2}, 3, \frac{5}{2}, -\text{Tan}[c+d x]^2, -\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] +$$

$$\left(a^2-b^2\right) m \,\text{AppellF1}\left[\frac{3}{2},\frac{2+m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\Big)$$

$$\text{Tan}[c+d x]^2\Big)\Big)\Big)+3\left(a^2-b^2\right) \text{Sec}[c+d x]^2 \left(1+\text{Tan}[c+d x]^2\right)^{-m/2}$$

$$\Bigg(-\Bigg(\text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\Bigg/$$

$$\Bigg(\Bigg(-3\left(a^2-b^2\right) \text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+$$

$$\Bigg(\left(a^2-b^2\right) m \,\text{AppellF1}\left[\frac{3}{2},1+\frac{m}{2},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+$$

$$2 a^2 \text{AppellF1}\left[\frac{3}{2},\frac{m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\Bigg) \text{Tan}[c+d x]^2\Bigg)$$

$$\left(-b^2+a^2\left(1+\text{Tan}[c+d x]^2\right)\right)\Bigg)\Bigg)+\frac{1}{\left(b^2-a^2\left(1+\text{Tan}[c+d x]^2\right)\right)^2}$$

$$2 b\Bigg(\Bigg(a \,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}(-1+m),2,\frac{3}{2},-\text{Tan}[c+d x]^2,\frac{a^2 \text{Tan}[c+d x]^2}{-a^2+b^2}\right]$$

$$\sqrt{1+\text{Tan}[c+d x]^2}\Bigg)\Bigg/\Bigg(-3\left(a^2-b^2\right) \text{AppellF1}\left[\frac{1}{2},\frac{1}{2}(-1+m),2,\frac{3}{2},\right.$$

$$\left.-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+\Bigg(4 a^2 \text{AppellF1}\left[\frac{3}{2},\frac{1}{2}(-1+m),3,\right.$$

$$\left.\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)(-1+m) \,\text{AppellF1}\Big[$$

$$\frac{3}{2},\frac{1+m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\Big]\Bigg) \text{Tan}[c+d x]^2\Bigg)-$$

$$\Bigg(b \,\text{AppellF1}\left[\frac{1}{2},\frac{m}{2},2,\frac{3}{2},-\text{Tan}[c+d x]^2,\frac{a^2 \text{Tan}[c+d x]^2}{-a^2+b^2}\right]\Bigg)\Bigg/\Bigg(-3\left(a^2-b^2\right)$$

$$\text{AppellF1}\left[\frac{1}{2},\frac{m}{2},2,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+\Bigg(4 a^2 \text{AppellF1}\left[\frac{3}{2},\right.$$

$$\left.\frac{m}{2},3,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right) m \,\text{AppellF1}\Big[\frac{3}{2},$$

$$\frac{2+m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\Big]\Bigg) \text{Tan}[c+d x]^2\Bigg)\Bigg)\Bigg)+$$

$$3\left(a^2-b^2\right) \text{Tan}[c+d x] \left(1+\text{Tan}[c+d x]^2\right)^{-m/2}\Bigg(\Bigg(2 a^2 \text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},\right.$$

$$\left.-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]\Bigg)\Bigg/$$

$$\Bigg(\Bigg(-3\left(a^2-b^2\right) \text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+$$

$$\Bigg(\left(a^2-b^2\right) m \,\text{AppellF1}\left[\frac{3}{2},1+\frac{m}{2},1,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+$$

$$2\,a^2\,\text{AppellF1}\left[\frac{3}{2},\,\frac{m}{2},\,2,\,\frac{5}{2},\,-\text{Tan}[c+d\,x]^2,\,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\Bigg)$$

$$\text{Tan}[c+d\,x]^2\Bigg)\,\left(-b^2+a^2\,\left(1+\text{Tan}[c+d\,x]^2\right)\right)^2\Bigg)-$$

$$\Bigg(-\frac{1}{3}\,m\,\text{AppellF1}\left[\frac{3}{2},\,1+\frac{m}{2},\,1,\,\frac{5}{2},\,-\text{Tan}[c+d\,x]^2,\,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]$$

$$\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{1}{3\,\left(a^2-b^2\right)}2\,a^2\,\text{AppellF1}\left[\frac{3}{2},\,\frac{m}{2},\,2,\,\frac{5}{2},\right.$$

$$\left.-\text{Tan}[c+d\,x]^2,\,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\Bigg)\Bigg/$$

$$\Bigg(\Bigg(-3\,\left(a^2-b^2\right)\,\text{AppellF1}\left[\frac{1}{2},\,\frac{m}{2},\,1,\,\frac{3}{2},\,-\text{Tan}[c+d\,x]^2,\,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+$$

$$\Bigg(\left(a^2-b^2\right)\,m\,\text{AppellF1}\left[\frac{3}{2},\,1+\frac{m}{2},\,1,\,\frac{5}{2},\,-\text{Tan}[c+d\,x]^2,\,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+$$

$$2\,a^2\,\text{AppellF1}\left[\frac{3}{2},\,\frac{m}{2},\,2,\,\frac{5}{2},\,-\text{Tan}[c+d\,x]^2,\,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\Bigg)\,\text{Tan}[c+d\,x]^2\Bigg)$$

$$\left(-b^2+a^2\,\left(1+\text{Tan}[c+d\,x]^2\right)\right)\Bigg)+\frac{1}{\left(b^2-a^2\,\left(1+\text{Tan}[c+d\,x]^2\right)\right)^3}$$

$$8\,a^2\,b\,\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\,\Bigg(\Bigg(a\,\text{AppellF1}\left[\frac{1}{2},\,\frac{1}{2}\,(-1+m),\,2,\,\frac{3}{2},\,-\text{Tan}[c+d\,x]^2,\right.$$

$$\left.\frac{a^2\,\text{Tan}[c+d\,x]^2}{-a^2+b^2}\right]\,\sqrt{1+\text{Tan}[c+d\,x]^2}\Bigg)\Bigg/\Bigg(-3\,\left(a^2-b^2\right)\,\text{AppellF1}\left[\frac{1}{2},\,\frac{1}{2}\,(-1+m),\right.$$

$$\left.2,\,\frac{3}{2},\,-\text{Tan}[c+d\,x]^2,\,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\Bigg(4\,a^2\,\text{AppellF1}\left[\frac{3}{2},\,\frac{1}{2}\,(-1+m),\right.$$

$$\left.3,\,\frac{5}{2},\,-\text{Tan}[c+d\,x]^2,\,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\,(-1+m)\,\text{AppellF1}\Big[$$

$$\left.\frac{3}{2},\,\frac{1+m}{2},\,2,\,\frac{5}{2},\,-\text{Tan}[c+d\,x]^2,\,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\Bigg)\,\text{Tan}[c+d\,x]^2\Bigg)-$$

$$\Bigg(b\,\text{AppellF1}\left[\frac{1}{2},\,\frac{m}{2},\,2,\,\frac{3}{2},\,-\text{Tan}[c+d\,x]^2,\,\frac{a^2\,\text{Tan}[c+d\,x]^2}{-a^2+b^2}\right]\Bigg)\Bigg/\Bigg(-3\,\left(a^2-b^2\right)$$

$$\text{AppellF1}\left[\frac{1}{2},\,\frac{m}{2},\,2,\,\frac{3}{2},\,-\text{Tan}[c+d\,x]^2,\,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\Bigg(4\,a^2\,\text{AppellF1}\Big[$$

$$\left.\frac{3}{2},\,\frac{m}{2},\,3,\,\frac{5}{2},\,-\text{Tan}[c+d\,x]^2,\,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\,m\,\text{AppellF1}\Big[$$

$$\left.\frac{3}{2},\,\frac{2+m}{2},\,2,\,\frac{5}{2},\,-\text{Tan}[c+d\,x]^2,\,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\Bigg)\,\text{Tan}[c+d\,x]^2\Bigg)\Bigg)+$$

$$\Bigg(\text{AppellF1}\left[\frac{1}{2},\,\frac{m}{2},\,1,\,\frac{3}{2},\,-\text{Tan}[c+d\,x]^2,\,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]$$

$$\Bigg(2\,\Bigg(\left(a^2-b^2\right)\,m\,\text{AppellF1}\left[\frac{3}{2},\,1+\frac{m}{2},\,1,\,\frac{5}{2},\,-\text{Tan}[c+d\,x]^2,\,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+$$

$$2\,a^2\,\text{AppellF1}\left[\frac{3}{2},\,\frac{m}{2},\,2,\,\frac{5}{2},\,-\text{Tan}[c+d\,x]^2,\,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\Bigg)\,\text{Sec}[c+d\,x]^2$$

$$\text{Tan}[c+d\,x]-3\left(a^2-b^2\right)\left(-\frac{1}{3}\,m\,\text{AppellF1}\left[\frac{3}{2},1+\frac{m}{2},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,\right.\right.$$
$$\left.-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{1}{3\left(a^2-b^2\right)}2\,a^2\,\text{AppellF1}\left[\frac{3}{2},\right.$$
$$\left.\left.\frac{m}{2},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)+$$
$$\text{Tan}[c+d\,x]^2\left(\left(a^2-b^2\right)m\left(-\frac{1}{5\left(a^2-b^2\right)}6\,a^2\,\text{AppellF1}\left[\frac{5}{2},1+\frac{m}{2},2,\frac{7}{2},-\text{Tan}[c+d\,x]^2,\right.\right.\right.$$
$$\left.-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{6}{5}\left(1+\frac{m}{2}\right)\text{AppellF1}\left[\frac{5}{2},2+\right.$$
$$\left.\left.\frac{m}{2},1,\frac{7}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)+$$
$$2\,a^2\left(-\frac{3}{5}\,m\,\text{AppellF1}\left[\frac{5}{2},1+\frac{m}{2},2,\frac{7}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right.$$
$$\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{1}{5\left(a^2-b^2\right)}12\,a^2\,\text{AppellF1}\left[\frac{5}{2},\frac{m}{2},3,\frac{7}{2},\right.$$
$$\left.\left.\left.\left.\left.-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)\right)\right)\right)\Big/$$
$$\left(\left(-3\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{m}{2},1,\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.\right.$$
$$\left(\left(a^2-b^2\right)m\,\text{AppellF1}\left[\frac{3}{2},1+\frac{m}{2},1,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+2\,a^2\right.$$
$$\left.\left.\text{AppellF1}\left[\frac{3}{2},\frac{m}{2},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)^2$$
$$\left.\left(-b^2+a^2\left(1+\text{Tan}[c+d\,x]^2\right)\right)\right)+\frac{1}{\left(b^2-a^2\left(1+\text{Tan}[c+d\,x]^2\right)\right)^2}$$
$$2\,b\left(\left(a\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}\left(-1+m\right),2,\frac{3}{2},-\text{Tan}[c+d\,x]^2,\frac{a^2\,\text{Tan}[c+d\,x]^2}{-a^2+b^2}\right]\text{Sec}[c+d\,x]^2\right.\right.$$
$$\left.\text{Tan}[c+d\,x]\right)\Big/\left(\sqrt{1+\text{Tan}[c+d\,x]^2}\left(-3\left(a^2-b^2\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}\left(-1+m\right),2,\right.\right.\right.$$
$$\left.\frac{3}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(4\,a^2\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}\left(-1+m\right),3,\right.\right.$$
$$\left.\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\left(a^2-b^2\right)\left(-1+m\right)\text{AppellF1}\left[\frac{3}{2},\right.$$
$$\left.\left.\left.\left.\frac{1+m}{2},2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,-\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)\right)+$$
$$\left(a\left(-\frac{1}{3}\left(-1+m\right)\text{AppellF1}\left[\frac{3}{2},1+\frac{1}{2}\left(-1+m\right),2,\frac{5}{2},-\text{Tan}[c+d\,x]^2,\right.\right.\right.$$
$$\left.\frac{a^2\,\text{Tan}[c+d\,x]^2}{-a^2+b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]+\frac{1}{3\left(-a^2+b^2\right)}$$

$$4\,a^2\,\text{AppellF1}\left[\frac{3}{2},\ \frac{1}{2}\,(-1+m),\ 3,\ \frac{5}{2},\ -\text{Tan}[c+d\,x]^2,\ \frac{a^2\,\text{Tan}[c+d\,x]^2}{-a^2+b^2}\right]$$

$$\left.\left.\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)\sqrt{1+\text{Tan}[c+d\,x]^2}\right)\Big/$$

$$\left(-3\,(a^2-b^2)\,\text{AppellF1}\left[\frac{1}{2},\ \frac{1}{2}\,(-1+m),\ 2,\ \frac{3}{2},\ -\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$

$$\left(4\,a^2\,\text{AppellF1}\left[\frac{3}{2},\ \frac{1}{2}\,(-1+m),\ 3,\ \frac{5}{2},\ -\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$

$$(a^2-b^2)\,(-1+m)\,\text{AppellF1}\left[\frac{3}{2},\ \frac{1+m}{2},\ 2,\ \frac{5}{2},\right.$$

$$\left.\left.\left.-\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Tan}[c+d\,x]^2\right)-$$

$$\left(b\left(-\frac{1}{3}\,m\,\text{AppellF1}\left[\frac{3}{2},\ 1+\frac{m}{2},\ 2,\ \frac{5}{2},\ -\text{Tan}[c+d\,x]^2,\ \frac{a^2\,\text{Tan}[c+d\,x]^2}{-a^2+b^2}\right]\right.\right.$$

$$\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]+\frac{1}{3\,(-a^2+b^2)}4\,a^2\,\text{AppellF1}\left[\frac{3}{2},\ \frac{m}{2},\ 3,\ \frac{5}{2},\right.$$

$$\left.\left.\left.-\text{Tan}[c+d\,x]^2,\ \frac{a^2\,\text{Tan}[c+d\,x]^2}{-a^2+b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)\right)\Big/$$

$$\left(-3\,(a^2-b^2)\,\text{AppellF1}\left[\frac{1}{2},\ \frac{m}{2},\ 2,\ \frac{3}{2},\ -\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$

$$\left(4\,a^2\,\text{AppellF1}\left[\frac{3}{2},\ \frac{m}{2},\ 3,\ \frac{5}{2},\ -\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+\right.$$

$$\left.(a^2-b^2)\,m\,\text{AppellF1}\left[\frac{3}{2},\ \frac{2+m}{2},\ 2,\ \frac{5}{2},\ -\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)$$

$$\left.\text{Tan}[c+d\,x]^2\right)-\left(a\,\text{AppellF1}\left[\frac{1}{2},\ \frac{1}{2}\,(-1+m),\ 2,\ \frac{3}{2},\ -\text{Tan}[c+d\,x]^2,\right.\right.$$

$$\left.\frac{a^2\,\text{Tan}[c+d\,x]^2}{-a^2+b^2}\right]\sqrt{1+\text{Tan}[c+d\,x]^2}\,\left(2\left(4\,a^2\,\text{AppellF1}\left[\frac{3}{2},\ \frac{1}{2}\,(-1+m),\ 3,\right.\right.\right.$$

$$\left.\frac{5}{2},\ -\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]+(a^2-b^2)\,(-1+m)\,\text{AppellF1}\Big[$$

$$\left.\left.\frac{3}{2},\ \frac{1+m}{2},\ 2,\ \frac{5}{2},\ -\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\right)\text{Sec}[c+d\,x]^2$$

$$\text{Tan}[c+d\,x]-3\,(a^2-b^2)\,\left(-\frac{1}{3}\,(-1+m)\,\text{AppellF1}\left[\frac{3}{2},\ 1+\frac{1}{2}\,(-1+m),\ 2,\ \frac{5}{2},\right.\right.$$

$$\left.-\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]-\frac{1}{3\,(a^2-b^2)}$$

$$4\,a^2\,\text{AppellF1}\left[\frac{3}{2},\ \frac{1}{2}\,(-1+m),\ 3,\ \frac{5}{2},\ -\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]$$

$$\left.\text{Sec}[c+d\,x]^2\,\text{Tan}[c+d\,x]\right)+\text{Tan}[c+d\,x]^2\,\left(4\,a^2\,\left(-\frac{3}{5}\,(-1+m)\right.\right.$$

$$\text{AppellF1}\left[\frac{5}{2},\ 1+\frac{1}{2}\,(-1+m),\ 3,\ \frac{7}{2},\ -\text{Tan}[c+d\,x]^2,\ -\frac{a^2\,\text{Tan}[c+d\,x]^2}{a^2-b^2}\right]$$

$$\text{Sec}[c+d x]^2 \text{Tan}[c+d x]-\frac{1}{5\left(a^2-b^2\right)} 18 a^2 \text{AppellF1}\left[\frac{5}{2},\frac{1}{2}(-1+m),\right.$$
$$\left.\left.4,\frac{7}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]\right)+$$
$$\left(a^2-b^2\right)(-1+m)\left(-\left(\left(12 a^2 \text{AppellF1}\left[\frac{5}{2},\frac{1+m}{2},3,\frac{7}{2},-\text{Tan}[c+d x]^2,\right.\right.\right.\right.$$
$$\left.\left.\left.-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]\right) \Big/ \left(5\left(a^2-b^2\right)\right)\right)-$$
$$\frac{3}{5}(1+m) \text{AppellF1}\left[\frac{5}{2},1+\frac{1+m}{2},2,\frac{7}{2},-\text{Tan}[c+d x]^2,\right.$$
$$\left.\left.\left.\left.\left.-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]\right)\right)\right)\right) \Big/$$
$$\left(-3\left(a^2-b^2\right) \text{AppellF1}\left[\frac{1}{2},\frac{1}{2}(-1+m),2,\frac{3}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$
$$\left(4 a^2 \text{AppellF1}\left[\frac{3}{2},\frac{1}{2}(-1+m),3,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.$$
$$\left(a^2-b^2\right)(-1+m) \text{AppellF1}\left[\frac{3}{2},\frac{1+m}{2},2,\frac{5}{2},\right.$$
$$\left.\left.\left.-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\right) \text{Tan}[c+d x]^2\right)^2+$$
$$\left(b \text{AppellF1}\left[\frac{1}{2},\frac{m}{2},2,\frac{3}{2},-\text{Tan}[c+d x]^2,\frac{a^2 \text{Tan}[c+d x]^2}{-a^2+b^2}\right]\right.$$
$$\left(2\left(4 a^2 \text{AppellF1}\left[\frac{3}{2},\frac{m}{2},3,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]+\right.\right.$$
$$\left.\left(a^2-b^2\right) m \text{AppellF1}\left[\frac{3}{2},\frac{2+m}{2},2,\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\right)$$
$$\text{Sec}[c+d x]^2 \text{Tan}[c+d x]-3\left(a^2-b^2\right)\left(-\frac{1}{3} m \text{AppellF1}\left[\frac{3}{2},1+\frac{m}{2},2,\right.\right.$$
$$\left.\frac{5}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]-$$
$$\frac{1}{3\left(a^2-b^2\right)} 4 a^2 \text{AppellF1}\left[\frac{3}{2},\frac{m}{2},3,\frac{5}{2},-\text{Tan}[c+d x]^2,\right.$$
$$\left.\left.-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]\right)+\text{Tan}[c+d x]^2$$
$$\left(4 a^2\left(-\frac{3}{5} m \text{AppellF1}\left[\frac{5}{2},1+\frac{m}{2},3,\frac{7}{2},-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right]\right.\right.$$
$$\text{Sec}[c+d x]^2 \text{Tan}[c+d x]-\frac{1}{5\left(a^2-b^2\right)} 18 a^2 \text{AppellF1}\left[\frac{5}{2},\frac{m}{2},4,\frac{7}{2},\right.$$
$$\left.\left.-\text{Tan}[c+d x]^2,-\frac{a^2 \text{Tan}[c+d x]^2}{a^2-b^2}\right] \text{Sec}[c+d x]^2 \text{Tan}[c+d x]\right)+$$
$$\left(a^2-b^2\right) m\left(-\left(\left(12 a^2 \text{AppellF1}\left[\frac{5}{2},\frac{2+m}{2},3,\frac{7}{2},-\text{Tan}[c+d x]^2,\right.\right.\right.\right.$$

$$-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\,\mathrm{Sec}[c+d\,x]^2\,\mathrm{Tan}[c+d\,x]\Big)\Big/\left(5\,\left(a^2-b^2\right)\right)\Big)-$$

$$\frac{3}{5}\,(2+m)\,\mathrm{AppellF1}\Big[\frac{5}{2},1+\frac{2+m}{2},2,\frac{7}{2},-\mathrm{Tan}[c+d\,x]^2,$$

$$-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\,\mathrm{Sec}[c+d\,x]^2\,\mathrm{Tan}[c+d\,x]\Big)\Big)\Big)\Big)\Big/$$

$$\Big(-3\,\left(a^2-b^2\right)\,\mathrm{AppellF1}\Big[\frac{1}{2},\frac{m}{2},2,\frac{3}{2},-\mathrm{Tan}[c+d\,x]^2,-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\Big]+$$

$$\Big(4\,a^2\,\mathrm{AppellF1}\Big[\frac{3}{2},\frac{m}{2},3,\frac{5}{2},-\mathrm{Tan}[c+d\,x]^2,-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\Big]+$$

$$\left(a^2-b^2\right)\,m\,\mathrm{AppellF1}\Big[\frac{3}{2},\frac{2+m}{2},2,\frac{5}{2},-\mathrm{Tan}[c+d\,x]^2,$$

$$-\frac{a^2\,\mathrm{Tan}[c+d\,x]^2}{a^2-b^2}\Big]\Big)\,\mathrm{Tan}[c+d\,x]^2\Big)^2\Big)\Big)\Big)\Big)$$

Problem 778: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{1-\mathrm{Cos}[x]}}{\sqrt{a-\mathrm{Cos}[x]}}\,dx$$

Optimal (type 3, 26 leaves, 2 steps):

$$-2\,\mathrm{ArcTan}\Big[\frac{\mathrm{Sin}[x]}{\sqrt{1-\mathrm{Cos}[x]}\,\sqrt{a-\mathrm{Cos}[x]}}\Big]$$

Result (type 3, 47 leaves):

$$i\,\sqrt{2-2\,\mathrm{Cos}[x]}\,\mathrm{Csc}\Big[\frac{x}{2}\Big]\,\mathrm{Log}\Big[i\,\sqrt{2}\,\mathrm{Cos}\Big[\frac{x}{2}\Big]+\sqrt{a-\mathrm{Cos}[x]}\Big]$$

Problem 788: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{1/3}\,\left(A+B\,\mathrm{Cos}[c+d\,x]\right)\,dx$$

Optimal (type 5, 102 leaves, 3 steps):

$$\frac{3\,B\,\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{1/3}\,\mathrm{Sin}[c+d\,x]}{4\,d}+$$

$$\Big((4\,A+B)\,\left(a+a\,\mathrm{Cos}[c+d\,x]\right)^{1/3}\,\mathrm{Hypergeometric2F1}\Big[\frac{1}{6},\frac{1}{2},\frac{3}{2},\frac{1}{2}\,\left(1-\mathrm{Cos}[c+d\,x]\right)\Big]$$

$$\mathrm{Sin}[c+d\,x]\Big)\Big/\left(2\times 2^{1/6}\,d\,\left(1+\mathrm{Cos}[c+d\,x]\right)^{5/6}\right)$$

Result (type 5, 213 leaves):

$$\frac{1}{32\,d}3\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{1/3}\,\left(-8\,(4\,A+B)\,\text{Cot}\left[\frac{c}{2}\right]+8\,B\,\text{Cos}[d\,x]\,\text{Sin}[c]+\left(2\,(4\,A+B)\,\text{Csc}\left[\frac{c}{4}\right]\,\left(2\,\text{Hypergeometric2F1}\left[-\frac{1}{3},\frac{1}{3},\frac{2}{3},-e^{i\,d\,x}\,\left(\text{Cos}[c]+i\,\text{Sin}[c]\right)\right]+e^{i\,d\,x}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},-e^{i\,d\,x}\,\left(\text{Cos}[c]+i\,\text{Sin}[c]\right)\right]\right)\,\text{Sec}\left[\frac{c}{4}\right]\,\left(1+e^{i\,d\,x}\,\text{Cos}[c]+i\,e^{i\,d\,x}\,\text{Sin}[c]\right)^{1/3}\right)\Big/\left(\left(1+e^{i\,d\,x}\right)\,\text{Cos}\left[\frac{c}{2}\right]+i\,\left(-1+e^{i\,d\,x}\right)\,\text{Sin}\left[\frac{c}{2}\right]\right)+8\,B\,\text{Cos}[c]\,\text{Sin}[d\,x]\right)$$

Problem 790: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{A+B\,\text{Cos}[c+d\,x]}{\left(a+a\,\text{Cos}[c+d\,x]\right)^{2/3}}\,dx$$

Optimal (type 5, 105 leaves, 3 steps):

$$\frac{3\,(A-B)\,\text{Sin}[c+d\,x]}{d\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{2/3}}-\left(2^{5/6}\,\left(A-2\,B\right)\,\left(a+a\,\text{Cos}[c+d\,x]\right)^{1/3}\,\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{2},\frac{3}{2},\frac{1}{2}\,\left(1-\text{Cos}[c+d\,x]\right)\right]\,\text{Sin}[c+d\,x]\right)\Big/\left(a\,d\,\left(1+\text{Cos}[c+d\,x]\right)^{5/6}\right)$$

Result (type 5, 197 leaves):

$$\left(3\,\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]\,\left(-4\,\left(\left(-2\,A+3\,B\right)\,\text{Cos}\left[\frac{d\,x}{2}\right]+B\,\text{Cos}\left[c+\frac{d\,x}{2}\right]\right)\,\text{Csc}\left[\frac{c}{2}\right]-\left(A-2\,B\right)\,e^{-\frac{1}{2}\,i\,d\,x}\,\text{Csc}\left[\frac{c}{4}\right]\,\left(2\,\text{Hypergeometric2F1}\left[-\frac{1}{3},\frac{1}{3},\frac{2}{3},-e^{i\,d\,x}\,\left(\text{Cos}[c]+i\,\text{Sin}[c]\right)\right]+e^{i\,d\,x}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},-e^{i\,d\,x}\,\left(\text{Cos}[c]+i\,\text{Sin}[c]\right)\right]\right)\,\text{Sec}\left[\frac{c}{4}\right]\,\left(1+e^{i\,d\,x}\,\text{Cos}[c]+i\,e^{i\,d\,x}\,\text{Sin}[c]\right)^{1/3}\right)\right)\Big/\left(4\,d\,\left(a\,\left(1+\text{Cos}[c+d\,x]\right)\right)^{2/3}\right)$$

Problem 922: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{\left(b\,\text{Cos}[c+d\,x]\right)^n\,\left(A+B\,\text{Cos}[c+d\,x]\right)}{\sqrt{\text{Cos}[c+d\,x]}}\,dx$$

Optimal (type 5, 163 leaves, 4 steps):

$$-\left(\left(2\,A\,\sqrt{\text{Cos}[c+d\,x]}\,\left(b\,\text{Cos}[c+d\,x]\right)^n\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1}{4}\,(1+2\,n),\frac{1}{4}\,(5+2\,n),\text{Cos}[c+d\,x]^2\right]\,\text{Sin}[c+d\,x]\right)\Big/\left(d\,(1+2\,n)\,\sqrt{\text{Sin}[c+d\,x]^2}\right)\right)-\left(2\,B\,\text{Cos}[c+d\,x]^{3/2}\,\left(b\,\text{Cos}[c+d\,x]\right)^n\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1}{4}\,(3+2\,n),\frac{1}{4}\,(7+2\,n),\text{Cos}[c+d\,x]^2\right]\,\text{Sin}[c+d\,x]\right)\Big/\left(d\,(3+2\,n)\,\sqrt{\text{Sin}[c+d\,x]^2}\right)$$

Result (type 6, 4951 leaves):

$$\Bigg(2\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)^{\frac{3}{2}+n}\,\text{Cos}[c+d\,x]^{-n}\,\left(b\,\text{Cos}[c+d\,x]\right)^n\,\left(\text{Cos}[c+d\,x]\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)^{-\frac{1}{2}+n}\,\Bigg(\frac{1}{2}\,B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}+A\,\text{Cos}[c+d\,x]^{\frac{3}{2}+n}+\frac{1}{2}\,B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}\,\text{Cos}[2\,(c+d\,x)]+\frac{1}{2}\,\mathrm{i}\,B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}\,\text{Sin}[2\,(c+d\,x)]+\text{Sec}[c+d\,x]\,\Bigg(-\frac{1}{2}\,\mathrm{i}\,B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}\,\text{Cos}[2\,(c+d\,x)]\,\text{Sin}[c+d\,x]+A\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}\,\text{Sin}[c+d\,x]^2+\text{Sin}[c+d\,x]\,\left(-\frac{1}{2}\,\mathrm{i}\,B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}+\frac{1}{2}\,B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}\,\text{Sin}[2\,(c+d\,x)]\right)\Bigg)\Bigg)\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]$$

$$\Bigg(\Bigg(9\,(A+B)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\Bigg)\Big/\Bigg(3\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+\Bigg(-(3+2\,n)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{5}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+(1-2\,n)\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\Bigg)\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\Bigg)+\Bigg(5\,(-A+B)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\Bigg)\Big/\Bigg(-5\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+\Bigg((3+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{2}-n,\frac{5}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+(-1+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\Bigg)\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\Bigg)\Bigg)\Bigg)\Big/$$

$$\Bigg(3\,d\,\Bigg(\frac{1}{3}\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)^{\frac{1}{2}+n}\,\left(\text{Cos}[c+d\,x]\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)^{-\frac{1}{2}+n}\,\Bigg(\Bigg(9\,(A+B)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\Bigg)\Big/$$

$$\left(3\,\text{AppellF1}\left[\frac{1}{2},\,\frac{1}{2}-n,\,\frac{3}{2}+n,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+\right.$$
$$\left(-(3+2\,n)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{1}{2}-n,\,\frac{5}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+\right.$$
$$\left.(1-2\,n)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{3}{2}-n,\,\frac{3}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\right)$$
$$\left.\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)+\left(5\,(-A+B)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{1}{2}-n,\,\frac{3}{2}+n,\,\frac{5}{2},\right.\right.$$
$$\left.\left.\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)\Big/$$
$$\left(-5\,\text{AppellF1}\left[\frac{3}{2},\,\frac{1}{2}-n,\,\frac{3}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+\right.$$
$$\left(\left(3+2\,n\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{1}{2}-n,\,\frac{5}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+\right.$$
$$(-1+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{3}{2}-n,\,\frac{3}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\right.$$
$$\left.\left.\left.-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\right)\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)\right)-$$
$$\frac{2}{3}\,\left(\frac{3}{2}+n\right)\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)^{\frac{1}{2}+n}\,\left(\text{Cos}[c+d\,x]\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)^{-\frac{1}{2}+n}$$
$$\text{Sin}\left[\frac{1}{2}\,(c+d\,x)\right]^2$$
$$\left(\left(9\,(A+B)\,\text{AppellF1}\left[\frac{1}{2},\,\frac{1}{2}-n,\,\frac{3}{2}+n,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\right)\Big/\right.$$
$$\left(3\,\text{AppellF1}\left[\frac{1}{2},\,\frac{1}{2}-n,\,\frac{3}{2}+n,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+\right.$$
$$\left(-(3+2\,n)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{1}{2}-n,\,\frac{5}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+\right.$$
$$\left.(1-2\,n)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{3}{2}-n,\,\frac{3}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\right)$$
$$\left.\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)+\left(5\,(-A+B)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{1}{2}-n,\,\frac{3}{2}+n,\,\frac{5}{2},\right.\right.$$
$$\left.\left.\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)\Big/$$
$$\left(-5\,\text{AppellF1}\left[\frac{3}{2},\,\frac{1}{2}-n,\,\frac{3}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+\right.$$
$$\left(\left(3+2\,n\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{1}{2}-n,\,\frac{5}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+\right.$$
$$(-1+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{3}{2}-n,\,\frac{3}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\right.$$
$$\left.\left.\left.-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\right)\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)\right)+$$
$$\frac{2}{3}\,\left(-\frac{1}{2}+n\right)\,\left(\text{Cos}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)^{\frac{3}{2}+n}\,\left(\text{Cos}[c+d\,x]\,\text{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)^{-\frac{3}{2}+n}$$
$$\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]$$

$$\left(-\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2 \text{Sin}[c+d x]+\text{Cos}[c+d x] \text{Sec}\left[\frac{1}{2}(c+d x)\right]^2 \text{Tan}\left[\frac{1}{2}(c+d x)\right]\right)$$

$$\left(\left(9 (A+B) \text{AppellF1}\left[\frac{1}{2}, \frac{1}{2}-n, \frac{3}{2}+n, \frac{3}{2}, \text{Tan}\left[\frac{1}{2}(c+d x)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\right) \Big/ \right.$$

$$\left(3 \text{AppellF1}\left[\frac{1}{2}, \frac{1}{2}-n, \frac{3}{2}+n, \frac{3}{2}, \text{Tan}\left[\frac{1}{2}(c+d x)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+\right.$$

$$\left(-(3+2 n) \text{AppellF1}\left[\frac{3}{2}, \frac{1}{2}-n, \frac{5}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2}(c+d x)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+\right.$$

$$\left.(1-2 n) \text{AppellF1}\left[\frac{3}{2}, \frac{3}{2}-n, \frac{3}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2}(c+d x)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\right)$$

$$\left.\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)+\left(5 (-A+B) \text{AppellF1}\left[\frac{3}{2}, \frac{1}{2}-n, \frac{3}{2}+n, \frac{5}{2},\right.\right.$$

$$\left.\left.\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right] \text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right) \Big/$$

$$\left(-5 \text{AppellF1}\left[\frac{3}{2}, \frac{1}{2}-n, \frac{3}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2}(c+d x)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+\right.$$

$$\left(\left(3+2 n\right) \text{AppellF1}\left[\frac{5}{2}, \frac{1}{2}-n, \frac{5}{2}+n, \frac{7}{2}, \text{Tan}\left[\frac{1}{2}(c+d x)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+\right.$$

$$(-1+2 n) \text{AppellF1}\left[\frac{5}{2}, \frac{3}{2}-n, \frac{3}{2}+n, \frac{7}{2}, \text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,\right.$$

$$\left.\left.\left.\left.-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\right) \text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)\right)+$$

$$\frac{2}{3}\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]^2\right)^{\frac{3}{2}+n}\left(\text{Cos}[c+d x] \text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\right)^{-\frac{1}{2}+n} \text{Tan}\left[\frac{1}{2}(c+d x)\right]$$

$$\left(\left(9 (A+B)\right.\right.$$

$$\left(-\frac{1}{3}\left(\frac{3}{2}+n\right) \text{AppellF1}\left[\frac{3}{2}, \frac{1}{2}-n, \frac{5}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2}(c+d x)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\right.$$

$$\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2 \text{Tan}\left[\frac{1}{2}(c+d x)\right]+\frac{1}{3}\left(\frac{1}{2}-n\right) \text{AppellF1}\left[\frac{3}{2}, \frac{3}{2}-n, \frac{3}{2}+n, \frac{5}{2},\right.$$

$$\left.\left.\left.\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right] \text{Sec}\left[\frac{1}{2}(c+d x)\right]^2 \text{Tan}\left[\frac{1}{2}(c+d x)\right]\right]\right)\right) \Big/$$

$$\left(3 \text{AppellF1}\left[\frac{1}{2}, \frac{1}{2}-n, \frac{3}{2}+n, \frac{3}{2}, \text{Tan}\left[\frac{1}{2}(c+d x)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+\right.$$

$$\left(-(3+2 n) \text{AppellF1}\left[\frac{3}{2}, \frac{1}{2}-n, \frac{5}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2}(c+d x)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+\right.$$

$$\left.(1-2 n) \text{AppellF1}\left[\frac{3}{2}, \frac{3}{2}-n, \frac{3}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2}(c+d x)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\right)$$

$$\left.\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)+\left(5 (-A+B) \text{AppellF1}\left[\frac{3}{2}, \frac{1}{2}-n, \frac{3}{2}+n, \frac{5}{2},\right.\right.$$

$$\left.\left.\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right] \text{Sec}\left[\frac{1}{2}(c+d x)\right]^2 \text{Tan}\left[\frac{1}{2}(c+d x)\right]\right]\right) \Big/$$

$$\left(-5 \text{AppellF1}\left[\frac{3}{2}, \frac{1}{2}-n, \frac{3}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2}(c+d x)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+\right.$$

$$\left(\left(3+2 n\right) \text{AppellF1}\left[\frac{5}{2}, \frac{1}{2}-n, \frac{5}{2}+n, \frac{7}{2}, \text{Tan}\left[\frac{1}{2}(c+d x)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+\right.$$

$$\left(-1+2n\right) \text{AppellF1}\left[\frac{5}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\Big)$$

$$\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\Big)+\Big(5(-A+B)\,\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2$$

$$\Big(-\frac{3}{5}\left(\frac{3}{2}+n\right)\text{AppellF1}\left[\frac{5}{2},\frac{1}{2}-n,\frac{5}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]$$

$$\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]+\frac{3}{5}\left(\frac{1}{2}-n\right)\text{AppellF1}\left[\frac{5}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{7}{2},\right.$$

$$\left.\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]\Big)\Big)\Big/$$

$$\Big(-5\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+$$

$$\Big(\left(3+2n\right)\text{AppellF1}\left[\frac{5}{2},\frac{1}{2}-n,\frac{5}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+$$

$$\left(-1+2n\right)\text{AppellF1}\left[\frac{5}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,\right.$$

$$\left.-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\Big)\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\Big)-$$

$$\Big(9(A+B)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]$$

$$\Big(\Big(-\left(3+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{5}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+$$

$$\left(1-2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\Big)$$

$$\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]+3\Big(-\frac{1}{3}\left(\frac{3}{2}+n\right)\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{5}{2}+n,\frac{5}{2},\right.$$

$$\left.\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]+$$

$$\frac{1}{3}\left(\frac{1}{2}-n\right)\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]$$

$$\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]\Big)+\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\Big(-\left(3+2n\right)\Big(-\frac{3}{5}\Big(\frac{5}{2}+$$

$$n\Big)\text{AppellF1}\left[\frac{5}{2},\frac{1}{2}-n,\frac{7}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]$$

$$\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]+\frac{3}{5}\left(\frac{1}{2}-n\right)\text{AppellF1}\left[\frac{5}{2},\frac{3}{2}-n,\right.$$

$$\left.\frac{5}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2$$

$$\text{Tan}\left[\frac{1}{2}(c+dx)\right]\Big)+\left(1-2n\right)\Big(-\frac{3}{5}\left(\frac{3}{2}+n\right)\text{AppellF1}\left[\frac{5}{2},\frac{3}{2}-n,\frac{5}{2}+n,\right.$$

$$\left.\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\Big[$$

$$\frac{1}{2}(c+dx)\Big]+\frac{3}{5}\left(\frac{3}{2}-n\right)\text{AppellF1}\left[\frac{5}{2},\frac{5}{2}-n,\frac{3}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,\right.$$

$$\left.-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]\Big)\Big)\Big)\Big)\Big/$$

$$\left(3\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\left(-(3+2\,n)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{5}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+(1-2\,n)\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)^2-$$

$$\left(5\,(-A+B)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\left(\left(\left((3+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{2}-n,\frac{5}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+(-1+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]-5\left(-\frac{3}{5}\left(\frac{3}{2}+n\right)\text{AppellF1}\left[\frac{5}{2},\frac{1}{2}-n,\frac{5}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]+\frac{3}{5}\left(\frac{1}{2}-n\right)\text{AppellF1}\left[\frac{5}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)+\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\left((3+2\,n)\left(-\frac{5}{7}\left(\frac{5}{2}+n\right)\text{AppellF1}\left[\frac{7}{2},\frac{1}{2}-n,\frac{7}{2}+n,\frac{9}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]+\frac{5}{7}\left(\frac{1}{2}-n\right)\text{AppellF1}\left[\frac{7}{2},\frac{3}{2}-n,\frac{5}{2}+n,\frac{9}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)+(-1+2\,n)\left(-\frac{5}{7}\left(\frac{3}{2}+n\right)\text{AppellF1}\left[\frac{7}{2},\frac{3}{2}-n,\frac{5}{2}+n,\frac{9}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]+\frac{5}{7}\left(\frac{3}{2}-n\right)\text{AppellF1}\left[\frac{7}{2},\frac{5}{2}-n,\frac{3}{2}+n,\frac{9}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)\right)\right)\right)\Big/$$

$$\left(-5\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\left((3+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{2}-n,\frac{5}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+(-1+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)^2\right)\right)\right)$$

Problem 923: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{(b\,\text{Cos}[c+d\,x])^n\,(A+B\,\text{Cos}[c+d\,x])}{\text{Cos}[c+d\,x]^{3/2}}\,dx$$

Optimal (type 5, 163 leaves, 4 steps):

$$\left(2\,A\,(b\,\text{Cos}[c+d\,x])^n\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1}{4}(-1+2\,n),\frac{1}{4}(3+2\,n),\text{Cos}[c+d\,x]^2\right]\text{Sin}[c+d\,x]\right)\Big/\left(d\,(1-2\,n)\sqrt{\text{Cos}[c+d\,x]}\,\sqrt{\text{Sin}[c+d\,x]^2}\right)-\left(2\,B\,\sqrt{\text{Cos}[c+d\,x]}\,(b\,\text{Cos}[c+d\,x])^n\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1}{4}(1+2\,n),\frac{1}{4}(5+2\,n),\text{Cos}[c+d\,x]^2\right]\text{Sin}[c+d\,x]\right)\Big/\left(d\,(1+2\,n)\sqrt{\text{Sin}[c+d\,x]^2}\right)$$

Result (type 6, 4842 leaves):

$$\Bigg(6\sqrt{\text{Cos}[c+d\,x]}\,(b\,\text{Cos}[c+d\,x])^n\left(A\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}+\text{Sec}[c+d\,x]\left(\frac{1}{2}B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}+\frac{1}{2}B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}\text{Cos}[2\,(c+d\,x)]+\frac{1}{2}\,i\,B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}\text{Sin}[2\,(c+d\,x)]\right)+\text{Sec}[c+d\,x]^2\left(-\frac{1}{2}\,i\,B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}\text{Cos}[2\,(c+d\,x)]\,\text{Sin}[c+d\,x]+A\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}\text{Sin}[c+d\,x]^2+\text{Sin}[c+d\,x]\left(-\frac{1}{2}\,i\,B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}+\frac{1}{2}B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}\text{Sin}[2\,(c+d\,x)]\right)\right)\right)$$

$$\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\Bigg(\Bigg((A-B)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\left(-1+\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)\Bigg)\Big/$$

$$\Bigg(3\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]-\left((1+2\,n)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+(-1+2\,n)\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Bigg)+$$

$$\left(2\,A\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\Big/$$

$$\Bigg(3\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]-\Bigg((1+2\,n)\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+$$

$$(-3+2n)\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)$$

$$\left.\left.\left.\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)\right)\right)\Big/\left(d\left(-1+\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)^2\right.$$

$$\left(-\frac{1}{\left(-1+\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)^3}12\,\text{Cos}[c+dx]^{\frac{1}{2}+n}\,\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right.$$

$$\left(\left((A-B)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right.\right.$$

$$\left.\left(-1+\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)\right)\Big/\left(3\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,\right.\right.$$

$$-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]-\left(\left(1+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{5}{2},\right.\right.$$

$$\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+(-1+2n)\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\right.$$

$$\left.\left.\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)+$$

$$\left(2\,A\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right)\Big/$$

$$\left(3\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]-\right.$$

$$\left(\left(1+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+\right.$$

$$(-3+2n)\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,\right.$$

$$\left.\left.\left.-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)\right)+$$

$$\frac{1}{\left(-1+\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)^2}3\,\text{Cos}[c+dx]^{\frac{1}{2}+n}\,\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2$$

$$\left(\left((A-B)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right.\right.$$

$$\left.\left(-1+\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)\right)\Big/\left(3\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,\right.\right.$$

$$-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]-\left(\left(1+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{5}{2},\right.\right.$$

$$\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+(-1+2n)\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\right.$$

$$\left.\left.\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)+$$

$$\left(2\,A\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right)\Big/$$

$$\left(3\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]-\right.$$

$$\left(\left(1+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]+\left(-3+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\Big)\Big)-$$

$$\frac{1}{\left(-1+\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right)^2}6\left(\frac{1}{2}+n\right)\text{Cos}\left[c+d\,x\right]^{-\frac{1}{2}+n}\text{Sin}\left[c+d\,x\right]\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]$$

$$\Bigg(\Bigg(\left(A-B\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]\left(-1+\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right)\Bigg)\Big/\Bigg(3\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]-\Bigg(\left(1+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]+\left(-1+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]\Bigg)\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\Bigg)+$$

$$\Bigg(2\,A\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]\Bigg)\Big/\Bigg(3\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]-\Bigg(\left(1+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]+\left(-3+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]\Bigg)\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\Bigg)\Bigg)+$$

$$\frac{1}{\left(-1+\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right)^2}6\,\text{Cos}\left[c+d\,x\right]^{\frac{1}{2}+n}\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]$$

$$\Bigg(\Bigg(\left(A-B\right)\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\Bigg)\Big/$$

$$\Bigg(3\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]-\Bigg(\left(1+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]+\left(-1+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]\Bigg)$$

$$\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\Bigg)+\Bigg(\left(A-B\right)\Bigg(-\frac{1}{3}\left(\frac{1}{2}+n\right)\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]+$$

$$\frac{1}{3}\left(\frac{1}{2}-n\right)\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]$$
$$\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]\Bigg)\left(-1+\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)\Bigg)\Bigg/$$
$$\Bigg(3\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]-$$
$$\Bigg(\left(1+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,\right.$$
$$\left.-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+\left(-1+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{1}{2}+n,\frac{5}{2},\right.$$
$$\left.\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\Bigg)\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\Bigg)+$$
$$\Bigg(2A\left(-\frac{1}{3}\left(\frac{1}{2}+n\right)\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right.$$
$$\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]+\frac{1}{3}\left(\frac{3}{2}-n\right)\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{5}{2},\right.$$
$$\left.\left.\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]\right)\Bigg)\Bigg/$$
$$\Bigg(3\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]-$$
$$\Bigg(\left(1+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+$$
$$\left(-3+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\Bigg)$$
$$\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\Bigg)-\Bigg((A-B)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{2}-n,\frac{1}{2}+n,\frac{3}{2},\right.$$
$$\left.\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\left(-1+\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)$$
$$\Bigg(-\Bigg(\left(1+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+$$
$$\left(-1+2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,\right.$$
$$\left.-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\Bigg)\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]+3\left(-\frac{1}{3}\left(\frac{1}{2}+n\right)\right.$$
$$\text{AppellF1}\left[\frac{3}{2},\frac{1}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]$$
$$\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]+\frac{1}{3}\left(\frac{1}{2}-n\right)\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{1}{2}+n,\frac{5}{2},\right.$$
$$\left.\left.\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]\right)-$$
$$\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\Bigg(\left(1+2n\right)\left(-\frac{3}{5}\left(\frac{3}{2}+n\right)\text{AppellF1}\left[\frac{5}{2},\frac{1}{2}-n,\frac{5}{2}+n,\frac{7}{2},\right.\right.$$
$$\left.\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\Big[$$
$$\frac{1}{2}(c+dx)\Big]+\frac{3}{5}\left(\frac{1}{2}-n\right)\text{AppellF1}\left[\frac{5}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,\right.$$

$$-\text{Tan}[\tfrac{1}{2}(c+d x)]^2]\ \text{Sec}[\tfrac{1}{2}(c+d x)]^2\ \text{Tan}[\tfrac{1}{2}(c+d x)]) +$$

$$(-1+2 n)\ (-\tfrac{3}{5}(\tfrac{1}{2}+n)\ \text{AppellF1}[\tfrac{5}{2}, \tfrac{3}{2}-n, \tfrac{3}{2}+n, \tfrac{7}{2}, \text{Tan}[\tfrac{1}{2}(c+d x)]^2,$$

$$-\text{Tan}[\tfrac{1}{2}(c+d x)]^2]\ \text{Sec}[\tfrac{1}{2}(c+d x)]^2\ \text{Tan}[\tfrac{1}{2}(c+d x)] +$$

$$\tfrac{3}{5}(\tfrac{3}{2}-n)\ \text{AppellF1}[\tfrac{5}{2}, \tfrac{5}{2}-n, \tfrac{1}{2}+n, \tfrac{7}{2}, \text{Tan}[\tfrac{1}{2}(c+d x)]^2,$$

$$-\text{Tan}[\tfrac{1}{2}(c+d x)]^2]\ \text{Sec}[\tfrac{1}{2}(c+d x)]^2\ \text{Tan}[\tfrac{1}{2}(c+d x)])))) \Big/$$

$$(3\ \text{AppellF1}[\tfrac{1}{2}, \tfrac{1}{2}-n, \tfrac{1}{2}+n, \tfrac{3}{2}, \text{Tan}[\tfrac{1}{2}(c+d x)]^2, -\text{Tan}[\tfrac{1}{2}(c+d x)]^2] -$$

$$((1+2 n)\ \text{AppellF1}[\tfrac{3}{2}, \tfrac{1}{2}-n, \tfrac{3}{2}+n, \tfrac{5}{2}, \text{Tan}[\tfrac{1}{2}(c+d x)]^2, -\text{Tan}[\tfrac{1}{2}(c+d x)]^2] +$$

$$(-1+2 n)\ \text{AppellF1}[\tfrac{3}{2}, \tfrac{3}{2}-n, \tfrac{1}{2}+n, \tfrac{5}{2}, \text{Tan}[\tfrac{1}{2}(c+d x)]^2,$$

$$-\text{Tan}[\tfrac{1}{2}(c+d x)]^2])\ \text{Tan}[\tfrac{1}{2}(c+d x)]^2)^2 -$$

$$(2\,A\ \text{AppellF1}[\tfrac{1}{2}, \tfrac{3}{2}-n, \tfrac{1}{2}+n, \tfrac{3}{2}, \text{Tan}[\tfrac{1}{2}(c+d x)]^2, -\text{Tan}[\tfrac{1}{2}(c+d x)]^2]$$

$$(-((1+2 n)\ \text{AppellF1}[\tfrac{3}{2}, \tfrac{3}{2}-n, \tfrac{3}{2}+n, \tfrac{5}{2}, \text{Tan}[\tfrac{1}{2}(c+d x)]^2, -\text{Tan}[\tfrac{1}{2}(c+d x)]^2] +$$

$$(-3+2 n)\ \text{AppellF1}[\tfrac{3}{2}, \tfrac{5}{2}-n, \tfrac{1}{2}+n, \tfrac{5}{2}, \text{Tan}[\tfrac{1}{2}(c+d x)]^2,$$

$$-\text{Tan}[\tfrac{1}{2}(c+d x)]^2])\ \text{Sec}[\tfrac{1}{2}(c+d x)]^2\ \text{Tan}[\tfrac{1}{2}(c+d x)] + 3\ (-\tfrac{1}{3}(\tfrac{1}{2}+n)$$

$$\text{AppellF1}[\tfrac{3}{2}, \tfrac{3}{2}-n, \tfrac{3}{2}+n, \tfrac{5}{2}, \text{Tan}[\tfrac{1}{2}(c+d x)]^2, -\text{Tan}[\tfrac{1}{2}(c+d x)]^2]$$

$$\text{Sec}[\tfrac{1}{2}(c+d x)]^2\ \text{Tan}[\tfrac{1}{2}(c+d x)] + \tfrac{1}{3}(\tfrac{3}{2}-n)\ \text{AppellF1}[\tfrac{3}{2}, \tfrac{5}{2}-n, \tfrac{1}{2}+n, \tfrac{5}{2},$$

$$\text{Tan}[\tfrac{1}{2}(c+d x)]^2, -\text{Tan}[\tfrac{1}{2}(c+d x)]^2]\ \text{Sec}[\tfrac{1}{2}(c+d x)]^2\ \text{Tan}[\tfrac{1}{2}(c+d x)]) -$$

$$\text{Tan}[\tfrac{1}{2}(c+d x)]^2\ ((1+2 n)\ (-\tfrac{3}{5}(\tfrac{3}{2}+n)\ \text{AppellF1}[\tfrac{5}{2}, \tfrac{3}{2}-n, \tfrac{5}{2}+n, \tfrac{7}{2},$$

$$\text{Tan}[\tfrac{1}{2}(c+d x)]^2, -\text{Tan}[\tfrac{1}{2}(c+d x)]^2]\ \text{Sec}[\tfrac{1}{2}(c+d x)]^2\ \text{Tan}[$$

$$\tfrac{1}{2}(c+d x)] + \tfrac{3}{5}(\tfrac{3}{2}-n)\ \text{AppellF1}[\tfrac{5}{2}, \tfrac{5}{2}-n, \tfrac{3}{2}+n, \tfrac{7}{2}, \text{Tan}[\tfrac{1}{2}(c+d x)]^2,$$

$$-\text{Tan}[\tfrac{1}{2}(c+d x)]^2]\ \text{Sec}[\tfrac{1}{2}(c+d x)]^2\ \text{Tan}[\tfrac{1}{2}(c+d x)]) +$$

$$(-3+2 n)\ (-\tfrac{3}{5}(\tfrac{1}{2}+n)\ \text{AppellF1}[\tfrac{5}{2}, \tfrac{5}{2}-n, \tfrac{3}{2}+n, \tfrac{7}{2}, \text{Tan}[\tfrac{1}{2}(c+d x)]^2,$$

$$-\text{Tan}[\tfrac{1}{2}(c+d x)]^2]\ \text{Sec}[\tfrac{1}{2}(c+d x)]^2\ \text{Tan}[\tfrac{1}{2}(c+d x)] +$$

$$\tfrac{3}{5}(\tfrac{5}{2}-n)\ \text{AppellF1}[\tfrac{5}{2}, \tfrac{7}{2}-n, \tfrac{1}{2}+n, \tfrac{7}{2}, \text{Tan}[\tfrac{1}{2}(c+d x)]^2,$$

$$-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\,\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d x)\right]\Big)\Big)\Big)\Big)\Big/$$

$$\Big(3\,\text{AppellF1}\left[\frac{1}{2},\frac{3}{2}-n,\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]-$$
$$\Big(\Big((1+2 n)\,\text{AppellF1}\left[\frac{3}{2},\frac{3}{2}-n,\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+$$
$$(-3+2 n)\,\text{AppellF1}\Big[\frac{3}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,$$
$$-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\Big)\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big)^2\Big)\Big)$$

Problem 924: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{(b\,\text{Cos}[c+d x])^n\,(A+B\,\text{Cos}[c+d x])}{\text{Cos}[c+d x]^{5/2}}\,dx$$

Optimal (type 5, 163 leaves, 4 steps):

$$\Big(2 A\,(b\,\text{Cos}[c+d x])^n\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1}{4}(-3+2 n),\frac{1}{4}(1+2 n),\text{Cos}[c+d x]^2\right]$$
$$\text{Sin}[c+d x]\Big)\Big/\left(d\,(3-2 n)\,\text{Cos}[c+d x]^{3/2}\sqrt{\text{Sin}[c+d x]^2}\right)+$$
$$\Big(2 B\,(b\,\text{Cos}[c+d x])^n\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1}{4}(-1+2 n),\frac{1}{4}(3+2 n),\text{Cos}[c+d x]^2\right]$$
$$\text{Sin}[c+d x]\Big)\Big/\left(d\,(1-2 n)\,\sqrt{\text{Cos}[c+d x]}\,\sqrt{\text{Sin}[c+d x]^2}\right)$$

Result (type 6, 4948 leaves):

$$\Big(2\,\text{Cos}[c+d x]^{-n}\,(b\,\text{Cos}[c+d x])^n$$
$$\Big(A\,\text{Cos}[c+d x]^{-\frac{1}{2}+n}+\text{Sec}[c+d x]^2\left(\frac{1}{2}B\,\text{Cos}[c+d x]^{\frac{1}{2}+n}+\frac{1}{2}B\,\text{Cos}[c+d x]^{\frac{1}{2}+n}\,\text{Cos}[2(c+d x)]+\right.$$
$$\left.\frac{1}{2}\,i\,B\,\text{Cos}[c+d x]^{\frac{1}{2}+n}\,\text{Sin}[2(c+d x)]\right)+\text{Sec}[c+d x]^3$$
$$\Big(-\frac{1}{2}\,i\,B\,\text{Cos}[c+d x]^{\frac{1}{2}+n}\,\text{Cos}[2(c+d x)]\,\text{Sin}[c+d x]+A\,\text{Cos}[c+d x]^{\frac{1}{2}+n}\,\text{Sin}[c+d x]^2+$$
$$\text{Sin}[c+d x]\left(-\frac{1}{2}\,i\,B\,\text{Cos}[c+d x]^{\frac{1}{2}+n}+\frac{1}{2}B\,\text{Cos}[c+d x]^{\frac{1}{2}+n}\,\text{Sin}[2(c+d x)]\right)\Big)\Big)$$

$$\text{Tan}\left[\frac{1}{2}(c+d x)\right]\left(1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)^{-\frac{5}{2}+n}\left(\frac{1}{1+\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}\right)^{-\frac{1}{2}+n}$$

$$\Big(\Big(9\,(A+B)\,\text{AppellF1}\left[\frac{1}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\Big)\Big/$$

$$\left(3\,\text{AppellF1}\left[\frac{1}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\left((1-2\,n)\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+(5-2\,n)\,\text{AppellF1}\left[\frac{3}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)+\left(5\,(-A+B)\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)\Big/\left(-5\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\left((-1+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+(-5+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)\right)\Big/$$

$$\left(3\,d\left(-\frac{2}{3}\left(-\frac{5}{2}+n\right)\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\left(1-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)^{-\frac{7}{2}+n}\right.\right.$$

$$\left(\frac{1}{1+\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}\right)^{-\frac{1}{2}+n}$$

$$\left(\left(9\,(A+B)\,\text{AppellF1}\left[\frac{1}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\Big/\left(3\,\text{AppellF1}\left[\frac{1}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\left((1-2\,n)\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+(5-2\,n)\,\text{AppellF1}\left[\frac{3}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)+\left(5\,(-A+B)\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)\Big/\left(-5\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\left((-1+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+(-5+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)\right)+$$

$$\frac{1}{3}\operatorname{Sec}\left[\frac{1}{2}(c+dx)\right]^2\left(1-\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)^{-\frac{5}{2}+n}\left(\frac{1}{1+\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2}\right)^{-\frac{1}{2}+n}$$

$$\left(\left(9(A+B)\,\text{AppellF1}\left[\frac{1}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{3}{2},\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right)\Big/\right.$$

$$\left(3\,\text{AppellF1}\left[\frac{1}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{3}{2},\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+\right.$$

$$\left(\left(1-2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{5}{2},\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+\right.$$

$$\left.\left(5-2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right)$$

$$\left.\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)+\left(5(-A+B)\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\right.\right.$$

$$\left.\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\Big)\Big/$$

$$\left(-5\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+\right.$$

$$\left(\left(-1+2n\right)\text{AppellF1}\left[\frac{5}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{7}{2},\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+\right.$$

$$\left(-5+2n\right)\text{AppellF1}\left[\frac{5}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{7}{2},\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2,\right.$$

$$\left.\left.\left.\left.-\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right)\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)\right)-$$

$$\frac{2}{3}\left(-\frac{1}{2}+n\right)\operatorname{Sec}\left[\frac{1}{2}(c+dx)\right]^2\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\left(1-\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)^{-\frac{5}{2}+n}$$

$$\left(\frac{1}{1+\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2}\right)^{\frac{1}{2}+n}$$

$$\left(\left(9(A+B)\,\text{AppellF1}\left[\frac{1}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{3}{2},\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right)\Big/\right.$$

$$\left(3\,\text{AppellF1}\left[\frac{1}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{3}{2},\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+\right.$$

$$\left(\left(1-2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{5}{2},\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+\right.$$

$$\left.\left(5-2n\right)\text{AppellF1}\left[\frac{3}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right)$$

$$\left.\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)+\left(5(-A+B)\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\right.\right.$$

$$\left.\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\Big)\Big/$$

$$\left(-5\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+\right.$$

$$\left(\left(-1+2n\right)\text{AppellF1}\left[\frac{5}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{7}{2},\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+\right.$$

$$\left(-5+2\,n\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{7}{2}-n,\,-\frac{1}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.$$
$$\left.\left.\left.-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)\right)+$$

$$\frac{2}{3}\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\left(1-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)^{-\frac{5}{2}+n}\,\left(\frac{1}{1+\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2}\right)^{-\frac{1}{2}+n}$$

$$\left(\left(\left(9\,\left(A+B\right)\right.\right.\right.$$
$$\left(-\frac{1}{3}\,\left(-\frac{1}{2}+n\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{5}{2}-n,\,\frac{1}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right.$$
$$\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]+\frac{1}{3}\,\left(\frac{5}{2}-n\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{7}{2}-n,\,-\frac{1}{2}+n,\,\frac{5}{2},\right.$$
$$\left.\left.\left.\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right)\right)\Big/$$
$$\left(3\,\text{AppellF1}\left[\frac{1}{2},\,\frac{5}{2}-n,\,-\frac{1}{2}+n,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$
$$\left(\left(1-2\,n\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{5}{2}-n,\,\frac{1}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$
$$\left.\left(5-2\,n\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{7}{2}-n,\,-\frac{1}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)$$
$$\left.\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)+\left(5\,\left(-A+B\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{5}{2}-n,\,-\frac{1}{2}+n,\,\frac{5}{2},\right.\right.$$
$$\left.\left.\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right)\Big/$$
$$\left(-5\,\text{AppellF1}\left[\frac{3}{2},\,\frac{5}{2}-n,\,-\frac{1}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$
$$\left(\left(-1+2\,n\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{5}{2}-n,\,\frac{1}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$
$$\left(-5+2\,n\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{7}{2}-n,\,-\frac{1}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.$$
$$\left.\left.\left.-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)+\left(5\,\left(-A+B\right)\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right.$$
$$\left(-\frac{3}{5}\,\left(-\frac{1}{2}+n\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{5}{2}-n,\,\frac{1}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right.$$
$$\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]+\frac{3}{5}\,\left(\frac{5}{2}-n\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{7}{2}-n,\,-\frac{1}{2}+n,\,\frac{7}{2},\right.$$
$$\left.\left.\left.\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right)\right)\Big/$$
$$\left(-5\,\text{AppellF1}\left[\frac{3}{2},\,\frac{5}{2}-n,\,-\frac{1}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$
$$\left(\left(-1+2\,n\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{5}{2}-n,\,\frac{1}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$
$$\left(-5+2\,n\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{7}{2}-n,\,-\frac{1}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.$$

$$-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\Big)\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big)-$$

$$\Big(9(A+B)\,\text{AppellF1}\left[\frac{1}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]$$

$$\Big(\Big(\Big((1-2n)\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+$$

$$(5-2n)\,\text{AppellF1}\Big[\frac{3}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,$$

$$-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\Big)\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d x)\right]+3\left(-\frac{1}{3}\left(-\frac{1}{2}+n\right)\right.$$

$$\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]$$

$$\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d x)\right]+\frac{1}{3}\left(\frac{5}{2}-n\right)\text{AppellF1}\Big[\frac{3}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{5}{2},$$

$$\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d x)\right]\Big)+$$

$$\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big((1-2n)\left(-\frac{3}{5}\left(\frac{1}{2}+n\right)\text{AppellF1}\Big[\frac{5}{2},\frac{5}{2}-n,\frac{3}{2}+n,\frac{7}{2},\right.$$

$$\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\text{Tan}\Big[$$

$$\frac{1}{2}(c+d x)\Big]+\frac{3}{5}\left(\frac{5}{2}-n\right)\text{AppellF1}\Big[\frac{5}{2},\frac{7}{2}-n,\frac{1}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,$$

$$-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d x)\right]\Big)+$$

$$(5-2n)\left(-\frac{3}{5}\left(-\frac{1}{2}+n\right)\text{AppellF1}\Big[\frac{5}{2},\frac{7}{2}-n,\frac{1}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,\right.$$

$$-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d x)\right]+$$

$$\frac{3}{5}\left(\frac{7}{2}-n\right)\text{AppellF1}\Big[\frac{5}{2},\frac{9}{2}-n,-\frac{1}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,$$

$$-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d x)\right]\Big)\Big)\Big)\Big)\Big/$$

$$\Big(3\,\text{AppellF1}\left[\frac{1}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+$$

$$\Big((1-2n)\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+$$

$$(5-2n)\,\text{AppellF1}\Big[\frac{3}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,$$

$$-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\Big)\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big)^2-$$

$$\Big(5(-A+B)\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]$$

$$\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2$$

$$\Big(\Big(\Big((-1+2n)\,\text{AppellF1}\left[\frac{5}{2},\frac{5}{2}-n,\frac{1}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+$$

$$\left(-5+2\,n\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{7}{2}-n,\,-\frac{1}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.$$

$$\left.\left.-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]-5\,\left(-\frac{3}{5}\,\left(-\frac{1}{2}+n\right)\right.$$

$$\text{AppellF1}\left[\frac{5}{2},\,\frac{5}{2}-n,\,\frac{1}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]$$

$$\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]+\frac{3}{5}\,\left(\frac{5}{2}-n\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{7}{2}-n,\,-\frac{1}{2}+n,\,\frac{7}{2},\right.$$

$$\left.\left.\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right)+$$

$$\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\left(\left(-1+2\,n\right)\,\left(-\frac{5}{7}\,\left(\frac{1}{2}+n\right)\,\text{AppellF1}\left[\frac{7}{2},\,\frac{5}{2}-n,\,\frac{3}{2}+n,\right.\right.\right.$$

$$\frac{9}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\Big]\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Tan}\Big[$$

$$\frac{1}{2}\,\left(c+d\,x\right)\Big]+\frac{5}{7}\,\left(\frac{5}{2}-n\right)\,\text{AppellF1}\left[\frac{7}{2},\,\frac{7}{2}-n,\,\frac{1}{2}+n,\,\frac{9}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.$$

$$\left.\left.-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right)+$$

$$\left(-5+2\,n\right)\,\left(-\frac{5}{7}\,\left(-\frac{1}{2}+n\right)\,\text{AppellF1}\left[\frac{7}{2},\,\frac{7}{2}-n,\,\frac{1}{2}+n,\,\frac{9}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.\right.$$

$$\left.-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]+$$

$$\frac{5}{7}\,\left(\frac{7}{2}-n\right)\,\text{AppellF1}\left[\frac{7}{2},\,\frac{9}{2}-n,\,-\frac{1}{2}+n,\,\frac{9}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.$$

$$\left.\left.\left.\left.\left.-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right)\right)\right)\right)\Big/$$

$$\left(-5\,\text{AppellF1}\left[\frac{3}{2},\,\frac{5}{2}-n,\,-\frac{1}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$

$$\left(\left(-1+2\,n\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{5}{2}-n,\,\frac{1}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$

$$\left(-5+2\,n\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{7}{2}-n,\,-\frac{1}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.$$

$$\left.\left.\left.-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)^2\Bigg)\Bigg)$$

Problem 925: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{\left(b\,\text{Cos}\left[c+d\,x\right]\right)^n\,\left(A+B\,\text{Cos}\left[c+d\,x\right]\right)}{\text{Cos}\left[c+d\,x\right]^{7/2}}\,dx$$

Optimal (type 5, 163 leaves, 4 steps):

$$\left(2\,A\,\left(b\,\text{Cos}[c+d\,x]\right)^n\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{1}{4}\,(-5+2\,n),\,\frac{1}{4}\,(-1+2\,n),\,\text{Cos}[c+d\,x]^2\right]\,\text{Sin}[c+d\,x]\right)\Big/\left(d\,(5-2\,n)\,\text{Cos}[c+d\,x]^{5/2}\,\sqrt{\text{Sin}[c+d\,x]^2}\right)+\left(2\,B\,\left(b\,\text{Cos}[c+d\,x]\right)^n\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{1}{4}\,(-3+2\,n),\,\frac{1}{4}\,(1+2\,n),\,\text{Cos}[c+d\,x]^2\right]\,\text{Sin}[c+d\,x]\right)\Big/\left(d\,(3-2\,n)\,\text{Cos}[c+d\,x]^{3/2}\,\sqrt{\text{Sin}[c+d\,x]^2}\right)$$

Result (type 6, 4948 leaves):

$$\Bigg(2\,\text{Cos}[c+d\,x]^{-n}\,\left(b\,\text{Cos}[c+d\,x]\right)^n\,\Bigg(A\,\text{Cos}[c+d\,x]^{-\frac{3}{2}+n}+\text{Sec}[c+d\,x]^3\,\left(\frac{1}{2}\,B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}+\frac{1}{2}\,B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}\,\text{Cos}[2\,(c+d\,x)]+\frac{1}{2}\,i\,B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}\,\text{Sin}[2\,(c+d\,x)]\right)+\text{Sec}[c+d\,x]^4\,\left(-\frac{1}{2}\,i\,B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}\,\text{Cos}[2\,(c+d\,x)]\,\text{Sin}[c+d\,x]+A\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}\,\text{Sin}[c+d\,x]^2+\text{Sin}[c+d\,x]\,\left(-\frac{1}{2}\,i\,B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}+\frac{1}{2}\,B\,\text{Cos}[c+d\,x]^{\frac{1}{2}+n}\,\text{Sin}[2\,(c+d\,x)]\right)\right)\Bigg)\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]\,\left(1-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)^{-\frac{7}{2}+n}\,\left(\frac{1}{1+\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\right)^{-\frac{3}{2}+n}$$

$$\Bigg(\left(9\,(A+B)\,\text{AppellF1}\left[\frac{1}{2},\,\frac{7}{2}-n,\,-\frac{3}{2}+n,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\right)\Big/\Bigg(3\,\text{AppellF1}\left[\frac{1}{2},\,\frac{7}{2}-n,\,-\frac{3}{2}+n,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+\Bigg((3-2\,n)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{7}{2}-n,\,-\frac{1}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+(7-2\,n)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{9}{2}-n,\,-\frac{3}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\Bigg)\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\Bigg)+\left(5\,(-A+B)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{7}{2}-n,\,-\frac{3}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)\Big/\Bigg(-5\,\text{AppellF1}\left[\frac{3}{2},\,\frac{7}{2}-n,\,-\frac{3}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+\Bigg((-3+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{7}{2}-n,\,-\frac{1}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+(-7+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{9}{2}-n,\,-\frac{3}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\Bigg)\,\text{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\Bigg)\Bigg)\Bigg/$$

$$\Bigg(3\,d\,\Bigg(-\frac{2}{3}\left(-\frac{7}{2}+n\right)\operatorname{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\left(1-\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)^{-\frac{9}{2}+n}$$

$$\left(\frac{1}{1+\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\right)^{-\frac{3}{2}+n}$$

$$\Bigg(\Bigg(9\,(A+B)\,\operatorname{AppellF1}\left[\frac{1}{2},\frac{7}{2}-n,-\frac{3}{2}+n,\frac{3}{2},\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\Bigg)\Big/$$

$$\Bigg(3\,\operatorname{AppellF1}\left[\frac{1}{2},\frac{7}{2}-n,-\frac{3}{2}+n,\frac{3}{2},\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+$$

$$\Bigg(\left(3-2\,n\right)\operatorname{AppellF1}\left[\frac{3}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+$$

$$\left(7-2\,n\right)\operatorname{AppellF1}\left[\frac{3}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{5}{2},\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\Bigg)$$

$$\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\Bigg)+\Bigg(5\,(-A+B)\,\operatorname{AppellF1}\left[\frac{3}{2},\frac{7}{2}-n,-\frac{3}{2}+n,\frac{5}{2},\right.$$

$$\left.\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\Bigg)\Big/$$

$$\Bigg(-5\,\operatorname{AppellF1}\left[\frac{3}{2},\frac{7}{2}-n,-\frac{3}{2}+n,\frac{5}{2},\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+$$

$$\Bigg(\left(-3+2\,n\right)\operatorname{AppellF1}\left[\frac{5}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{7}{2},\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+$$

$$\left(-7+2\,n\right)\operatorname{AppellF1}\left[\frac{5}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{7}{2},\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,\right.$$

$$\left.-\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\Bigg)\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\Bigg)\Bigg)+$$

$$\frac{1}{3}\operatorname{Sec}\left[\frac{1}{2}\,(c+d\,x)\right]^2\left(1-\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right)^{-\frac{7}{2}+n}\left(\frac{1}{1+\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2}\right)^{-\frac{3}{2}+n}$$

$$\Bigg(\Bigg(9\,(A+B)\,\operatorname{AppellF1}\left[\frac{1}{2},\frac{7}{2}-n,-\frac{3}{2}+n,\frac{3}{2},\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\Bigg)\Big/$$

$$\Bigg(3\,\operatorname{AppellF1}\left[\frac{1}{2},\frac{7}{2}-n,-\frac{3}{2}+n,\frac{3}{2},\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+$$

$$\Bigg(\left(3-2\,n\right)\operatorname{AppellF1}\left[\frac{3}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+$$

$$\left(7-2\,n\right)\operatorname{AppellF1}\left[\frac{3}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{5}{2},\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\Bigg)$$

$$\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\Bigg)+\Bigg(5\,(-A+B)\,\operatorname{AppellF1}\left[\frac{3}{2},\frac{7}{2}-n,-\frac{3}{2}+n,\frac{5}{2},\right.$$

$$\left.\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\Bigg)\Big/$$

$$\Bigg(-5\,\operatorname{AppellF1}\left[\frac{3}{2},\frac{7}{2}-n,-\frac{3}{2}+n,\frac{5}{2},\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+$$

$$\Bigg(\left(-3+2\,n\right)\operatorname{AppellF1}\left[\frac{5}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{7}{2},\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2,-\operatorname{Tan}\left[\frac{1}{2}\,(c+d\,x)\right]^2\right]+$$

$$\left(-7+2\,n\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{9}{2}-n,\,-\frac{3}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.$$
$$\left.\left.\left.-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)\right)-$$

$$\frac{2}{3}\,\left(-\frac{3}{2}+n\right)\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\left(1-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)^{-\frac{7}{2}+n}$$
$$\left(\frac{1}{1+\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2}\right)^{-\frac{1}{2}+n}$$
$$\left(\left(9\,(A+B)\,\text{AppellF1}\left[\frac{1}{2},\,\frac{7}{2}-n,\,-\frac{3}{2}+n,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)\right/$$
$$\left(3\,\text{AppellF1}\left[\frac{1}{2},\,\frac{7}{2}-n,\,-\frac{3}{2}+n,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$
$$\left(\left(3-2\,n\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{7}{2}-n,\,-\frac{1}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$
$$\left.\left(7-2\,n\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{9}{2}-n,\,-\frac{3}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)$$
$$\left.\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)+\left(5\,(-A+B)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{7}{2}-n,\,-\frac{3}{2}+n,\,\frac{5}{2},\right.\right.$$
$$\left.\left.\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)\right/$$
$$\left(-5\,\text{AppellF1}\left[\frac{3}{2},\,\frac{7}{2}-n,\,-\frac{3}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$
$$\left(\left(-3+2\,n\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{7}{2}-n,\,-\frac{1}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$
$$\left(-7+2\,n\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{9}{2}-n,\,-\frac{3}{2}+n,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.$$
$$\left.\left.\left.-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)\right)+$$

$$\frac{2}{3}\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\left(1-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)^{-\frac{7}{2}+n}\,\left(\frac{1}{1+\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2}\right)^{-\frac{3}{2}+n}$$
$$\left(\left(9\,(A+B)\right.\right.$$
$$\left(-\frac{1}{3}\,\left(-\frac{3}{2}+n\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{7}{2}-n,\,-\frac{1}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right.$$
$$\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]+\frac{1}{3}\,\left(\frac{7}{2}-n\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{9}{2}-n,\,-\frac{3}{2}+n,\,\frac{5}{2},\right.$$
$$\left.\left.\left.\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right)\right)\right/$$
$$\left(3\,\text{AppellF1}\left[\frac{1}{2},\,\frac{7}{2}-n,\,-\frac{3}{2}+n,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$
$$\left(\left(3-2\,n\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{7}{2}-n,\,-\frac{1}{2}+n,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$

$$\left(7-2 n\right) \text{AppellF1}\left[\frac{3}{2}, \frac{9}{2}-n, -\frac{3}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right]\right)$$

$$\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right)+\left(5\ (-A+B)\ \text{AppellF1}\left[\frac{3}{2}, \frac{7}{2}-n, -\frac{3}{2}+n, \frac{5}{2},\right.\right.$$

$$\left.\left.\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right] \text{Sec}\left[\frac{1}{2}\left(c+d x\right)\right]^2 \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]\right)\Big/$$

$$\left(-5\,\text{AppellF1}\left[\frac{3}{2}, \frac{7}{2}-n, -\frac{3}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right]+\right.$$

$$\left(\left(-3+2 n\right) \text{AppellF1}\left[\frac{5}{2}, \frac{7}{2}-n, -\frac{1}{2}+n, \frac{7}{2}, \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right]+\right.$$

$$\left(-7+2 n\right) \text{AppellF1}\left[\frac{5}{2}, \frac{9}{2}-n, -\frac{3}{2}+n, \frac{7}{2}, \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2,\right.$$

$$\left.\left.-\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right]\right) \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right)+\left(5\ (-A+B)\ \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right.$$

$$\left(-\frac{3}{5}\left(-\frac{3}{2}+n\right) \text{AppellF1}\left[\frac{5}{2}, \frac{7}{2}-n, -\frac{1}{2}+n, \frac{7}{2}, \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right]\right.$$

$$\text{Sec}\left[\frac{1}{2}\left(c+d x\right)\right]^2 \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]+\frac{3}{5}\left(\frac{7}{2}-n\right) \text{AppellF1}\left[\frac{5}{2}, \frac{9}{2}-n, -\frac{3}{2}+n, \frac{7}{2},\right.$$

$$\left.\left.\left.\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right] \text{Sec}\left[\frac{1}{2}\left(c+d x\right)\right]^2 \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]\right)\right)\Big/$$

$$\left(-5\,\text{AppellF1}\left[\frac{3}{2}, \frac{7}{2}-n, -\frac{3}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right]+\right.$$

$$\left(\left(-3+2 n\right) \text{AppellF1}\left[\frac{5}{2}, \frac{7}{2}-n, -\frac{1}{2}+n, \frac{7}{2}, \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right]+\right.$$

$$\left(-7+2 n\right) \text{AppellF1}\left[\frac{5}{2}, \frac{9}{2}-n, -\frac{3}{2}+n, \frac{7}{2}, \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2,\right.$$

$$\left.\left.-\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right]\right) \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right)-$$

$$\left(9\ (A+B)\ \text{AppellF1}\left[\frac{1}{2}, \frac{7}{2}-n, -\frac{3}{2}+n, \frac{3}{2}, \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right]\right.$$

$$\left(\left(\left(3-2 n\right) \text{AppellF1}\left[\frac{3}{2}, \frac{7}{2}-n, -\frac{1}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right]+\right.\right.$$

$$\left(7-2 n\right) \text{AppellF1}\left[\frac{3}{2}, \frac{9}{2}-n, -\frac{3}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2,\right.$$

$$\left.\left.-\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right]\right) \text{Sec}\left[\frac{1}{2}\left(c+d x\right)\right]^2 \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]+3\left(-\frac{1}{3}\left(-\frac{3}{2}+n\right)\right.$$

$$\text{AppellF1}\left[\frac{3}{2}, \frac{7}{2}-n, -\frac{1}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right]$$

$$\text{Sec}\left[\frac{1}{2}\left(c+d x\right)\right]^2 \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]+\frac{1}{3}\left(\frac{7}{2}-n\right) \text{AppellF1}\left[\frac{3}{2}, \frac{9}{2}-n, -\frac{3}{2}+n, \frac{5}{2},\right.$$

$$\left.\left.\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right] \text{Sec}\left[\frac{1}{2}\left(c+d x\right)\right]^2 \text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]\right)+$$

$$\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\left(\left(3-2 n\right)\left(-\frac{3}{5}\left(-\frac{1}{2}+n\right) \text{AppellF1}\left[\frac{5}{2}, \frac{7}{2}-n, \frac{1}{2}+n, \frac{7}{2},\right.\right.\right.$$

$$\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2}\left(c+d x\right)\right]^2\right] \text{Sec}\left[\frac{1}{2}\left(c+d x\right)\right]^2 \text{Tan}\left[\frac{1}{2}\right.$$

$$\left(c+d\,x\right)\Big]+\frac{3}{5}\left(\frac{7}{2}-n\right)\text{AppellF1}\Big[\frac{5}{2},\frac{9}{2}-n,-\frac{1}{2}+n,\frac{7}{2},\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]\bigg)+$$

$$\left(7-2\,n\right)\left(-\frac{3}{5}\left(-\frac{3}{2}+n\right)\text{AppellF1}\Big[\frac{5}{2},\frac{9}{2}-n,-\frac{1}{2}+n,\frac{7}{2},\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2,\right.$$

$$-\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]+$$

$$\frac{3}{5}\left(\frac{9}{2}-n\right)\text{AppellF1}\Big[\frac{5}{2},\frac{11}{2}-n,-\frac{3}{2}+n,\frac{7}{2},\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2,$$

$$\left.-\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]\right)\bigg)\bigg)\bigg)\bigg/$$

$$\bigg(3\,\text{AppellF1}\Big[\frac{1}{2},\frac{7}{2}-n,-\frac{3}{2}+n,\frac{3}{2},\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2,-\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\Big]+$$

$$\bigg(\left(3-2\,n\right)\text{AppellF1}\Big[\frac{3}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{5}{2},\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2,-\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\Big]+$$

$$\left(7-2\,n\right)\text{AppellF1}\Big[\frac{3}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{5}{2},\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\Big]\bigg)\,\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\bigg)^2-$$

$$\bigg(5\,\left(-A+B\right)\text{AppellF1}\Big[\frac{3}{2},\frac{7}{2}-n,-\frac{3}{2}+n,\frac{5}{2},\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2,-\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\Big]$$

$$\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2$$

$$\bigg(\bigg(\bigg(\left(-3+2\,n\right)\text{AppellF1}\Big[\frac{5}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{7}{2},\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2,-\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\Big]+$$

$$\left(-7+2\,n\right)\text{AppellF1}\Big[\frac{5}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{7}{2},\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\Big]\bigg)\,\text{Sec}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]-5\left(-\frac{3}{5}\left(-\frac{3}{2}+n\right)\right.$$

$$\text{AppellF1}\Big[\frac{5}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{7}{2},\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2,-\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\Big]$$

$$\text{Sec}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]+\frac{3}{5}\left(\frac{7}{2}-n\right)\text{AppellF1}\Big[\frac{5}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{7}{2},$$

$$\left.\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2,-\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]\right)+$$

$$\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\bigg(\left(-3+2\,n\right)\left(-\frac{5}{7}\left(-\frac{1}{2}+n\right)\text{AppellF1}\Big[\frac{7}{2},\frac{7}{2}-n,\frac{1}{2}+n,\right.$$

$$\frac{9}{2},\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2,-\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\,\text{Tan}\Big[\frac{1}{2}$$

$$\left(c+d\,x\right)\Big]+\frac{5}{7}\left(\frac{7}{2}-n\right)\text{AppellF1}\Big[\frac{7}{2},\frac{9}{2}-n,-\frac{1}{2}+n,\frac{9}{2},\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2,$$

$$\left.-\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]\right)+$$

$$\left(-7+2\,n\right)\left(-\frac{5}{7}\left(-\frac{3}{2}+n\right)\text{AppellF1}\Big[\frac{7}{2},\frac{9}{2}-n,-\frac{1}{2}+n,\frac{9}{2},\text{Tan}\Big[\frac{1}{2}\left(c+d\,x\right)\Big]^2,\right.$$

$$-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\ \text{Sec}\left[\frac{1}{2}(c+d x)\right]^2 \text{Tan}\left[\frac{1}{2}(c+d x)\right]+$$
$$\frac{5}{7}\left(\frac{9}{2}-n\right)\text{AppellF1}\left[\frac{7}{2},\frac{11}{2}-n,-\frac{3}{2}+n,\frac{9}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,\right.$$
$$\left.-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d x)\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$
$$\Bigg(-5\,\text{AppellF1}\left[\frac{3}{2},\frac{7}{2}-n,-\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+$$
$$\Bigg((-3+2n)\,\text{AppellF1}\left[\frac{5}{2},\frac{7}{2}-n,-\frac{1}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+$$
$$(-7+2n)\,\text{AppellF1}\left[\frac{5}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,\right.$$
$$\left.\left.-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Bigg)^2\Bigg)\Bigg)$$

Problem 926: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{(b\,\text{Cos}[c+d x])^n\,(A+B\,\text{Cos}[c+d x])}{\text{Cos}[c+d x]^{9/2}}\,dx$$

Optimal (type 5, 163 leaves, 4 steps):

$$\Bigg(2A\,(b\,\text{Cos}[c+d x])^n\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1}{4}(-7+2n),\frac{1}{4}(-3+2n),\text{Cos}[c+d x]^2\right]$$
$$\text{Sin}[c+d x]\Bigg)\Bigg/\left(d\,(7-2n)\,\text{Cos}[c+d x]^{7/2}\sqrt{\text{Sin}[c+d x]^2}\right)+$$
$$\Bigg(2B\,(b\,\text{Cos}[c+d x])^n\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1}{4}(-5+2n),\frac{1}{4}(-1+2n),\text{Cos}[c+d x]^2\right]$$
$$\text{Sin}[c+d x]\Bigg)\Bigg/\left(d\,(5-2n)\,\text{Cos}[c+d x]^{5/2}\sqrt{\text{Sin}[c+d x]^2}\right)$$

Result (type 6, 4948 leaves):

$$\Bigg(2\,\text{Cos}[c+d x]^{-n}\,(b\,\text{Cos}[c+d x])^n$$
$$\Bigg(A\,\text{Cos}[c+d x]^{-\frac{5}{2}+n}+\text{Sec}[c+d x]^4\left(\frac{1}{2}B\,\text{Cos}[c+d x]^{\frac{1}{2}+n}+\frac{1}{2}B\,\text{Cos}[c+d x]^{\frac{1}{2}+n}\,\text{Cos}[2(c+d x)]+\right.$$
$$\left.\frac{1}{2}\,i\,B\,\text{Cos}[c+d x]^{\frac{1}{2}+n}\,\text{Sin}[2(c+d x)]\right)+\text{Sec}[c+d x]^5$$
$$\Bigg(-\frac{1}{2}\,i\,B\,\text{Cos}[c+d x]^{\frac{1}{2}+n}\,\text{Cos}[2(c+d x)]\,\text{Sin}[c+d x]+A\,\text{Cos}[c+d x]^{\frac{1}{2}+n}\,\text{Sin}[c+d x]^2+$$
$$\text{Sin}[c+d x]\left(-\frac{1}{2}\,i\,B\,\text{Cos}[c+d x]^{\frac{1}{2}+n}+\frac{1}{2}B\,\text{Cos}[c+d x]^{\frac{1}{2}+n}\,\text{Sin}[2(c+d x)]\right)\Bigg)\Bigg)$$

$$
\begin{aligned}
&\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]\left(1-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)^{-\frac{9}{2}+n}\left(\frac{1}{1+\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}\right)^{-\frac{5}{2}+n}\\
&\quad\left(\left(9\,(A+B)\,\mathrm{AppellF1}\left[\frac{1}{2},\frac{9}{2}-n,-\frac{5}{2}+n,\frac{3}{2},\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\Big/\right.\\
&\quad\left(3\,\mathrm{AppellF1}\left[\frac{1}{2},\frac{9}{2}-n,-\frac{5}{2}+n,\frac{3}{2},\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\right.\\
&\quad\left(\left(5-2\,n\right)\mathrm{AppellF1}\left[\frac{3}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{5}{2},\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\right.\\
&\quad\left.\left(9-2\,n\right)\mathrm{AppellF1}\left[\frac{3}{2},\frac{11}{2}-n,-\frac{5}{2}+n,\frac{5}{2},\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\\
&\quad\left.\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)+\left(5\,(-A+B)\,\mathrm{AppellF1}\left[\frac{3}{2},\frac{9}{2}-n,-\frac{5}{2}+n,\frac{5}{2},\right.\right.\\
&\quad\left.\left.\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)\Big/\\
&\quad\left(-5\,\mathrm{AppellF1}\left[\frac{3}{2},\frac{9}{2}-n,-\frac{5}{2}+n,\frac{5}{2},\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\right.\\
&\quad\left(\left(-5+2\,n\right)\mathrm{AppellF1}\left[\frac{5}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{7}{2},\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\right.\\
&\quad\left(-9+2\,n\right)\mathrm{AppellF1}\left[\frac{5}{2},\frac{11}{2}-n,-\frac{5}{2}+n,\frac{7}{2},\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\right.\\
&\quad\left.\left.\left.\left.-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)\right)\right)\Big/\\
&\left(3\,d\left(-\frac{2}{3}\left(-\frac{9}{2}+n\right)\mathrm{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\left(1-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)^{-\frac{11}{2}+n}\right.\right.\\
&\quad\left(\frac{1}{1+\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2}\right)^{-\frac{5}{2}+n}\\
&\quad\left(\left(9\,(A+B)\,\mathrm{AppellF1}\left[\frac{1}{2},\frac{9}{2}-n,-\frac{5}{2}+n,\frac{3}{2},\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\Big/\right.\\
&\quad\left(3\,\mathrm{AppellF1}\left[\frac{1}{2},\frac{9}{2}-n,-\frac{5}{2}+n,\frac{3}{2},\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\right.\\
&\quad\left(\left(5-2\,n\right)\mathrm{AppellF1}\left[\frac{3}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{5}{2},\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\right.\\
&\quad\left.\left(9-2\,n\right)\mathrm{AppellF1}\left[\frac{3}{2},\frac{11}{2}-n,-\frac{5}{2}+n,\frac{5}{2},\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\\
&\quad\left.\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)+\left(5\,(-A+B)\,\mathrm{AppellF1}\left[\frac{3}{2},\frac{9}{2}-n,-\frac{5}{2}+n,\frac{5}{2},\right.\right.\\
&\quad\left.\left.\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)\Big/\\
&\quad\left(-5\,\mathrm{AppellF1}\left[\frac{3}{2},\frac{9}{2}-n,-\frac{5}{2}+n,\frac{5}{2},\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\mathrm{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\right.
\end{aligned}
$$

$$\left(\left(-5+2 n\right) \text{AppellF1}\left[\frac{5}{2}, \frac{9}{2}-n, -\frac{3}{2}+n, \frac{7}{2}, \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\right]+\left(-9+2 n\right) \text{AppellF1}\left[\frac{5}{2}, \frac{11}{2}-n, -\frac{5}{2}+n, \frac{7}{2}, \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\right]\right) \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\bigg)\bigg)+$$

$$\frac{1}{3} \text{Sec}\left[\frac{1}{2} \left(c+d x\right)\right]^2 \left(1-\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\right)^{-\frac{9}{2}+n} \left(\frac{1}{1+\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2}\right)^{-\frac{5}{2}+n}$$

$$\Bigg(\Bigg(9 \left(A+B\right) \text{AppellF1}\left[\frac{1}{2}, \frac{9}{2}-n, -\frac{5}{2}+n, \frac{3}{2}, \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\right]\Bigg)\Big/ \Bigg(3 \text{AppellF1}\left[\frac{1}{2}, \frac{9}{2}-n, -\frac{5}{2}+n, \frac{3}{2}, \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\right]+\left(\left(5-2 n\right) \text{AppellF1}\left[\frac{3}{2}, \frac{9}{2}-n, -\frac{3}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\right]+\left(9-2 n\right) \text{AppellF1}\left[\frac{3}{2}, \frac{11}{2}-n, -\frac{5}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\right]\right) \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\Bigg)+\Bigg(5 \left(-A+B\right) \text{AppellF1}\left[\frac{3}{2}, \frac{9}{2}-n, -\frac{5}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\right] \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\Bigg)\Big/ \Bigg(-5 \text{AppellF1}\left[\frac{3}{2}, \frac{9}{2}-n, -\frac{5}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\right]+\left(\left(-5+2 n\right) \text{AppellF1}\left[\frac{5}{2}, \frac{9}{2}-n, -\frac{3}{2}+n, \frac{7}{2}, \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\right]+\left(-9+2 n\right) \text{AppellF1}\left[\frac{5}{2}, \frac{11}{2}-n, -\frac{5}{2}+n, \frac{7}{2}, \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\right]\right) \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\Bigg)\Bigg)-$$

$$\frac{2}{3} \left(-\frac{5}{2}+n\right) \text{Sec}\left[\frac{1}{2} \left(c+d x\right)\right]^2 \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2 \left(1-\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\right)^{-\frac{9}{2}+n} \left(\frac{1}{1+\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2}\right)^{-\frac{3}{2}+n}$$

$$\Bigg(\Bigg(9 \left(A+B\right) \text{AppellF1}\left[\frac{1}{2}, \frac{9}{2}-n, -\frac{5}{2}+n, \frac{3}{2}, \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\right]\Bigg)\Big/ \Bigg(3 \text{AppellF1}\left[\frac{1}{2}, \frac{9}{2}-n, -\frac{5}{2}+n, \frac{3}{2}, \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\right]+\left(\left(5-2 n\right) \text{AppellF1}\left[\frac{3}{2}, \frac{9}{2}-n, -\frac{3}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\right]+\left(9-2 n\right) \text{AppellF1}\left[\frac{3}{2}, \frac{11}{2}-n, -\frac{5}{2}+n, \frac{5}{2}, \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2, -\text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\right]\right) \text{Tan}\left[\frac{1}{2} \left(c+d x\right)\right]^2\Bigg)+\Bigg(5 \left(-A+B\right) \text{AppellF1}\left[\frac{3}{2}, \frac{9}{2}-n, -\frac{5}{2}+n, \frac{5}{2},$$

$$\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big)\Big/$$

$$\Big(-5\,\text{AppellF1}\Big[\frac{3}{2},\frac{9}{2}-n,-\frac{5}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]+$$

$$\Big(\Big((-5+2 n)\,\text{AppellF1}\Big[\frac{5}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]+$$

$$(-9+2 n)\,\text{AppellF1}\Big[\frac{5}{2},\frac{11}{2}-n,-\frac{5}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,$$

$$-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\Big)\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big)\Big)+$$

$$\frac{2}{3}\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]\left(1-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)^{-\frac{9}{2}+n}\left(\frac{1}{1+\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2}\right)^{-\frac{5}{2}+n}$$

$$\Big(\Big(9\,(A+B)$$

$$\Big(-\frac{1}{3}\left(-\frac{5}{2}+n\right)\text{AppellF1}\Big[\frac{3}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]$$

$$\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d x)\right]+\frac{1}{3}\left(\frac{9}{2}-n\right)\text{AppellF1}\Big[\frac{3}{2},\frac{11}{2}-n,-\frac{5}{2}+n,\frac{5}{2},$$

$$\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\,\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d x)\right]\Big)\Big)\Big/$$

$$\Big(3\,\text{AppellF1}\Big[\frac{1}{2},\frac{9}{2}-n,-\frac{5}{2}+n,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]+$$

$$\Big(\Big((5-2 n)\,\text{AppellF1}\Big[\frac{3}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]+$$

$$(9-2 n)\,\text{AppellF1}\Big[\frac{3}{2},\frac{11}{2}-n,-\frac{5}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\Big)$$

$$\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big)+\Big(5\,(-A+B)\,\text{AppellF1}\Big[\frac{3}{2},\frac{9}{2}-n,-\frac{5}{2}+n,\frac{5}{2},$$

$$\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\,\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d x)\right]\Big)\Big/$$

$$\Big(-5\,\text{AppellF1}\Big[\frac{3}{2},\frac{9}{2}-n,-\frac{5}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]+$$

$$\Big(\Big((-5+2 n)\,\text{AppellF1}\Big[\frac{5}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]+$$

$$(-9+2 n)\,\text{AppellF1}\Big[\frac{5}{2},\frac{11}{2}-n,-\frac{5}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,$$

$$-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\Big)\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big)+\Big(5\,(-A+B)\,\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2$$

$$\Big(-\frac{3}{5}\left(-\frac{5}{2}+n\right)\text{AppellF1}\Big[\frac{5}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]$$

$$\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d x)\right]+\frac{3}{5}\left(\frac{9}{2}-n\right)\text{AppellF1}\Big[\frac{5}{2},\frac{11}{2}-n,-\frac{5}{2}+n,\frac{7}{2},$$

$$\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big]\,\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d x)\right]\Big)\Big)\Big/$$

$$\Bigg(-5\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{9}{2}-n,\,-\frac{5}{2}+n,\,\frac{5}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]+$$

$$\Bigg(\Big((-5+2\,n)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{9}{2}-n,\,-\frac{3}{2}+n,\,\frac{7}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]+$$

$$(-9+2\,n)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{11}{2}-n,\,-\frac{5}{2}+n,\,\frac{7}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\Big)\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Bigg)-$$

$$\Bigg(9\,(A+B)\,\text{AppellF1}\Big[\frac{1}{2},\,\frac{9}{2}-n,\,-\frac{5}{2}+n,\,\frac{3}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]$$

$$\Bigg(\Bigg(\Big((5-2\,n)\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{9}{2}-n,\,-\frac{3}{2}+n,\,\frac{5}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]+$$

$$(9-2\,n)\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{11}{2}-n,\,-\frac{5}{2}+n,\,\frac{5}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\Big)\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]+3\,\Bigg(-\frac{1}{3}\,\Big(-\frac{5}{2}+n\Big)$$

$$\text{AppellF1}\Big[\frac{3}{2},\,\frac{9}{2}-n,\,-\frac{3}{2}+n,\,\frac{5}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]$$

$$\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]+\frac{1}{3}\,\Big(\frac{9}{2}-n\Big)\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{11}{2}-n,\,-\frac{5}{2}+n,\,\frac{5}{2},$$

$$\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Bigg)+$$

$$\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\Bigg((5-2\,n)\,\Bigg(-\frac{3}{5}\,\Big(-\frac{3}{2}+n\Big)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{9}{2}-n,\,-\frac{1}{2}+n,\,\frac{7}{2},\,\text{Tan}\Big[$$

$$\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]+$$

$$\frac{3}{5}\,\Big(\frac{9}{2}-n\Big)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{11}{2}-n,\,-\frac{3}{2}+n,\,\frac{7}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Bigg)+$$

$$(9-2\,n)\,\Bigg(-\frac{3}{5}\,\Big(-\frac{5}{2}+n\Big)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{11}{2}-n,\,-\frac{3}{2}+n,\,\frac{7}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]+$$

$$\frac{3}{5}\,\Big(\frac{11}{2}-n\Big)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{13}{2}-n,\,-\frac{5}{2}+n,\,\frac{7}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\Bigg(3\,\text{AppellF1}\Big[\frac{1}{2},\,\frac{9}{2}-n,\,-\frac{5}{2}+n,\,\frac{3}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]+$$

$$\Big((5-2\,n)\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{9}{2}-n,\,-\frac{3}{2}+n,\,\frac{5}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]+$$

$$(9-2\,n)\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{11}{2}-n,\,-\frac{5}{2}+n,\,\frac{5}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\Big)\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Bigg)^2-$$

$$\left(5\,(-A+B)\,\text{AppellF1}\left[\frac{3}{2},\frac{9}{2}-n,-\frac{5}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right.$$
$$\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2$$
$$\left(\left(\left((-5+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\right.\right.\right.$$
$$(-9+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\frac{11}{2}-n,-\frac{5}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\right.$$
$$\left.\left.-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]-5\left(-\frac{3}{5}\left(-\frac{5}{2}+n\right)\right.$$
$$\text{AppellF1}\left[\frac{5}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]$$
$$\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]+\frac{3}{5}\left(\frac{9}{2}-n\right)\text{AppellF1}\left[\frac{5}{2},\frac{11}{2}-n,-\frac{5}{2}+n,\frac{7}{2},\right.$$
$$\left.\left.\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)+$$
$$\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\left((-5+2\,n)\left(-\frac{5}{7}\left(-\frac{3}{2}+n\right)\text{AppellF1}\left[\frac{7}{2},\frac{9}{2}-n,-\frac{1}{2}+n,\frac{9}{2},\text{Tan}\left[\right.\right.\right.\right.$$
$$\left.\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]+$$
$$\frac{5}{7}\left(\frac{9}{2}-n\right)\text{AppellF1}\left[\frac{7}{2},\frac{11}{2}-n,-\frac{3}{2}+n,\frac{9}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\right.$$
$$\left.\left.-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)+$$
$$(-9+2\,n)\left(-\frac{5}{7}\left(-\frac{5}{2}+n\right)\text{AppellF1}\left[\frac{7}{2},\frac{11}{2}-n,-\frac{3}{2}+n,\frac{9}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\right.\right.$$
$$\left.-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]+$$
$$\frac{5}{7}\left(\frac{11}{2}-n\right)\text{AppellF1}\left[\frac{7}{2},\frac{13}{2}-n,-\frac{5}{2}+n,\frac{9}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\right.$$
$$\left.\left.\left.\left.\left.-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)\right)\right)\right)\Big/$$
$$\left(-5\,\text{AppellF1}\left[\frac{3}{2},\frac{9}{2}-n,-\frac{5}{2}+n,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\right.$$
$$\left((-5+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\frac{9}{2}-n,-\frac{3}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\right.$$
$$(-9+2\,n)\,\text{AppellF1}\left[\frac{5}{2},\frac{11}{2}-n,-\frac{5}{2}+n,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\right.$$
$$\left.\left.\left.\left.-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)^2\right)\right)$$

Problem 930: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\text{Cos}[c+d\,x]^m\,(A+B\,\text{Cos}[c+d\,x])}{(b\,\text{Cos}[c+d\,x])^{1/3}}\,dx$$

Optimal (type 5, 167 leaves, 4 steps):

$$-\left(\left(3\,A\,\text{Cos}[c+d\,x]^{1+m}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{1}{6}\,(2+3\,m),\,\frac{1}{6}\,(8+3\,m),\,\text{Cos}[c+d\,x]^2\right]\,\text{Sin}[c+d\,x]\right)\Big/\left(d\,(2+3\,m)\,(b\,\text{Cos}[c+d\,x])^{1/3}\,\sqrt{\text{Sin}[c+d\,x]^2}\right)\right)-\left(3\,B\,\text{Cos}[c+d\,x]^{2+m}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\,\frac{1}{6}\,(5+3\,m),\,\frac{1}{6}\,(11+3\,m),\,\text{Cos}[c+d\,x]^2\right]\,\text{Sin}[c+d\,x]\right)\Big/\left(d\,(5+3\,m)\,(b\,\text{Cos}[c+d\,x])^{1/3}\,\sqrt{\text{Sin}[c+d\,x]^2}\right)$$

Result (type 6, 4959 leaves):

$$\left(2\left(\text{Cos}\left[\frac{1}{2}(c+d\,x)\right]^2\right)^{\frac{5}{3}+m}\text{Cos}[c+d\,x]^{1/3}\left(\text{Cos}[c+d\,x]\,\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\right)^{-\frac{1}{3}+m}\left(\frac{1}{2}\,B\,\text{Cos}[c+d\,x]^{\frac{2}{3}+m}+A\,\text{Cos}[c+d\,x]^{\frac{5}{3}+m}+\frac{1}{2}\,B\,\text{Cos}[c+d\,x]^{\frac{2}{3}+m}\,\text{Cos}[2\,(c+d\,x)]+\frac{1}{2}\,i\,B\,\text{Cos}[c+d\,x]^{\frac{2}{3}+m}\,\text{Sin}[2\,(c+d\,x)]+\text{Sec}[c+d\,x]\left(-\frac{1}{2}\,i\,B\,\text{Cos}[c+d\,x]^{\frac{2}{3}+m}\,\text{Cos}[2\,(c+d\,x)]\,\text{Sin}[c+d\,x]+A\,\text{Cos}[c+d\,x]^{\frac{2}{3}+m}\,\text{Sin}[c+d\,x]^2+\text{Sin}[c+d\,x]\left(-\frac{1}{2}\,i\,B\,\text{Cos}[c+d\,x]^{\frac{2}{3}+m}+\frac{1}{2}\,B\,\text{Cos}[c+d\,x]^{\frac{2}{3}+m}\,\text{Sin}[2\,(c+d\,x)]\right)\right)\right)\right)\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]$$

$$\left(\left(9\,(A+B)\,\text{AppellF1}\left[\frac{1}{2},\,\frac{1}{3}-m,\,\frac{5}{3}+m,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\Big/\left(9\,\text{AppellF1}\left[\frac{1}{2},\,\frac{1}{3}-m,\,\frac{5}{3}+m,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+2\left(-(5+3\,m)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{1}{3}-m,\,\frac{8}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+(1-3\,m)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{4}{3}-m,\,\frac{5}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)+\left(5\,(-A+B)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{1}{3}-m,\,\frac{5}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)\Big/\left(-15\,\text{AppellF1}\left[\frac{3}{2},\,\frac{1}{3}-m,\,\frac{5}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+2\left((5+3\,m)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{1}{3}-m,\,\frac{8}{3}+m,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+(-1+3\,m)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{4}{3}-m,\,\frac{5}{3}+m,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)\right)\Big/$$

$$\Bigg(d\,(b\,\text{Cos}[c+d\,x])^{1/3}\,\Bigg(\left(\text{Cos}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right)^{\frac{2}{3}+m}\left(\text{Cos}[c+d\,x]\,\text{Sec}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right)^{-\frac{1}{3}+m}$$

$$\Bigg(\Bigg(9\,(A+B)\,\text{AppellF1}\left[\tfrac{1}{2},\tfrac{1}{3}-m,\tfrac{5}{3}+m,\tfrac{3}{2},\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right]\Bigg)\Bigg/$$

$$\Bigg(9\,\text{AppellF1}\left[\tfrac{1}{2},\tfrac{1}{3}-m,\tfrac{5}{3}+m,\tfrac{3}{2},\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right]+$$

$$2\,\Bigg(-(5+3\,m)\,\text{AppellF1}\left[\tfrac{3}{2},\tfrac{1}{3}-m,\tfrac{8}{3}+m,\tfrac{5}{2},\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right]+$$

$$(1-3\,m)\,\text{AppellF1}\left[\tfrac{3}{2},\tfrac{4}{3}-m,\tfrac{5}{3}+m,\tfrac{5}{2},\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right]\Bigg)$$

$$\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\Bigg)+\Bigg(5\,(-A+B)\,\text{AppellF1}\left[\tfrac{3}{2},\tfrac{1}{3}-m,\tfrac{5}{3}+m,\tfrac{5}{2},\right.$$

$$\left.\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right]\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\Bigg)\Bigg/$$

$$\Bigg(-15\,\text{AppellF1}\left[\tfrac{3}{2},\tfrac{1}{3}-m,\tfrac{5}{3}+m,\tfrac{5}{2},\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right]+$$

$$2\,\Bigg((5+3\,m)\,\text{AppellF1}\left[\tfrac{5}{2},\tfrac{1}{3}-m,\tfrac{8}{3}+m,\tfrac{7}{2},\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right]+$$

$$(-1+3\,m)\,\text{AppellF1}\left[\tfrac{5}{2},\tfrac{4}{3}-m,\tfrac{5}{3}+m,\tfrac{7}{2},\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2,\right.$$

$$\left.-\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right]\Bigg)\,\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\Bigg)\Bigg)-$$

$$2\left(\tfrac{5}{3}+m\right)\left(\text{Cos}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right)^{\frac{2}{3}+m}\left(\text{Cos}[c+d\,x]\,\text{Sec}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right)^{-\frac{1}{3}+m}$$

$$\text{Sin}\left[\tfrac{1}{2}(c+d\,x)\right]^2$$

$$\Bigg(\Bigg(9\,(A+B)\,\text{AppellF1}\left[\tfrac{1}{2},\tfrac{1}{3}-m,\tfrac{5}{3}+m,\tfrac{3}{2},\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right]\Bigg)\Bigg/$$

$$\Bigg(9\,\text{AppellF1}\left[\tfrac{1}{2},\tfrac{1}{3}-m,\tfrac{5}{3}+m,\tfrac{3}{2},\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right]+$$

$$2\,\Bigg(-(5+3\,m)\,\text{AppellF1}\left[\tfrac{3}{2},\tfrac{1}{3}-m,\tfrac{8}{3}+m,\tfrac{5}{2},\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right]+$$

$$(1-3\,m)\,\text{AppellF1}\left[\tfrac{3}{2},\tfrac{4}{3}-m,\tfrac{5}{3}+m,\tfrac{5}{2},\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right]\Bigg)$$

$$\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\Bigg)+\Bigg(5\,(-A+B)\,\text{AppellF1}\left[\tfrac{3}{2},\tfrac{1}{3}-m,\tfrac{5}{3}+m,\tfrac{5}{2},\right.$$

$$\left.\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right]\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\Bigg)\Bigg/$$

$$\Bigg(-15\,\text{AppellF1}\left[\tfrac{3}{2},\tfrac{1}{3}-m,\tfrac{5}{3}+m,\tfrac{5}{2},\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right]+$$

$$2\,\Bigg((5+3\,m)\,\text{AppellF1}\left[\tfrac{5}{2},\tfrac{1}{3}-m,\tfrac{8}{3}+m,\tfrac{7}{2},\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right]+$$

$$(-1+3\,m)\,\text{AppellF1}\left[\tfrac{5}{2},\tfrac{4}{3}-m,\tfrac{5}{3}+m,\tfrac{7}{2},\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2,\right.$$

$$\left.-\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\right]\Bigg)\,\text{Tan}\left[\tfrac{1}{2}(c+d\,x)\right]^2\Bigg)\Bigg)+$$

$$2\left(-\frac{1}{3}+m\right)\left(\text{Cos}\left[\frac{1}{2}(c+dx)\right]^2\right)^{\frac{5}{3}+m}\left(\text{Cos}[c+dx]\,\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\right)^{-\frac{4}{3}+m}$$
$$\text{Tan}\left[\frac{1}{2}(c+dx)\right]$$
$$\left(-\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Sin}[c+dx]+\text{Cos}[c+dx]\,\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]\right)$$
$$\left(\left(9(A+B)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right)\Big/\right.$$
$$\left(9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+\right.$$
$$2\left(-(5+3m)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3}-m,\frac{8}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+\right.$$
$$\left.(1-3m)\,\text{AppellF1}\left[\frac{3}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right)$$
$$\left.\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)+\left(5(-A+B)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{5}{2},\right.\right.$$
$$\left.\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\Big)\Big/$$
$$\left(-15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+\right.$$
$$2\left((5+3m)\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{3}-m,\frac{8}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+\right.$$
$$(-1+3m)\,\text{AppellF1}\left[\frac{5}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,\right.$$
$$\left.\left.\left.-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)\right)+$$
$$2\left(\text{Cos}\left[\frac{1}{2}(c+dx)\right]^2\right)^{\frac{5}{3}+m}\left(\text{Cos}[c+dx]\,\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\right)^{-\frac{1}{3}+m}\text{Tan}\left[\frac{1}{2}(c+dx)\right]$$
$$\left(\left(9(A+B)\right.\right.$$
$$\left(-\frac{1}{3}\left(\frac{5}{3}+m\right)\text{AppellF1}\left[\frac{3}{2},\frac{1}{3}-m,\frac{8}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right.$$
$$\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]+\frac{1}{3}\left(\frac{1}{3}-m\right)\text{AppellF1}\left[\frac{3}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{5}{2},\right.$$
$$\left.\left.\left.\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]\right]\right)\right)\Big/$$
$$\left(9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+\right.$$
$$2\left(-(5+3m)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3}-m,\frac{8}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+\right.$$
$$\left.(1-3m)\,\text{AppellF1}\left[\frac{3}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right)$$
$$\left.\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)+\left(5(-A+B)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{5}{2},\right.\right.$$
$$\left.\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]\Big)\Big/$$

$$\left(-15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\right.$$
$$2\left((5+3\,m)\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{3}-m,\frac{8}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\right.$$
$$\left.(-1+3\,m)\,\text{AppellF1}\left[\frac{5}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)$$
$$\left.\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)+\left(5\,(-A+B)\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right.$$
$$\left(-\frac{3}{5}\left(\frac{5}{3}+m\right)\text{AppellF1}\left[\frac{5}{2},\frac{1}{3}-m,\frac{8}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right.$$
$$\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]+\frac{3}{5}\left(\frac{1}{3}-m\right)\text{AppellF1}\left[\frac{5}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{7}{2},\right.$$
$$\left.\left.\left.\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)\right)\Big/$$
$$\left(-15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\right.$$
$$2\left((5+3\,m)\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{3}-m,\frac{8}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\right.$$
$$(-1+3\,m)\,\text{AppellF1}\left[\frac{5}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\right.$$
$$\left.\left.\left.-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)-$$
$$\left(9\,(A+B)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right.$$
$$\left(2\left(-(5+3\,m)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3}-m,\frac{8}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\right.\right.$$
$$\left.(1-3\,m)\,\text{AppellF1}\left[\frac{3}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)$$
$$\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]+9\left(-\frac{1}{3}\left(\frac{5}{3}+m\right)\text{AppellF1}\left[\frac{3}{2},\frac{1}{3}-m,\frac{8}{3}+m,\frac{5}{2},\right.\right.$$
$$\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]+$$
$$\frac{1}{3}\left(\frac{1}{3}-m\right)\text{AppellF1}\left[\frac{3}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\right.$$
$$\left.\left.-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)+$$
$$2\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\left(-(5+3\,m)\left(-\frac{3}{5}\left(\frac{8}{3}+m\right)\text{AppellF1}\left[\frac{5}{2},\frac{1}{3}-m,\frac{11}{3}+m,\right.\right.\right.$$
$$\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\Big[$$
$$\left.\frac{1}{2}(c+d\,x)\Big]+\frac{3}{5}\left(\frac{1}{3}-m\right)\text{AppellF1}\left[\frac{5}{2},\frac{4}{3}-m,\frac{8}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\right.$$
$$\left.-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)+$$
$$(1-3\,m)\left(-\frac{3}{5}\left(\frac{5}{3}+m\right)\text{AppellF1}\left[\frac{5}{2},\frac{4}{3}-m,\frac{8}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\right.\right.$$

$$-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\Big]\,\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\,\text{Tan}\left[\frac{1}{2}(c+dx)\right]+$$

$$\frac{3}{5}\left(\frac{4}{3}-m\right)\text{AppellF1}\left[\frac{5}{2},\frac{7}{3}-m,\frac{5}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,\right.$$

$$\left.-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\Bigg(9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+$$

$$2\Bigg(-(5+3m)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3}-m,\frac{8}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,\right.$$

$$\left.-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+(1-3m)\,\text{AppellF1}\left[\frac{3}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{5}{2},\right.$$

$$\left.\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\Bigg)\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\Bigg)^2-$$

$$\Bigg(5\,(-A+B)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]$$

$$\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2$$

$$\Bigg(2\Bigg((5+3m)\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{3}-m,\frac{8}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]+$$

$$(-1+3m)\,\text{AppellF1}\left[\frac{5}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,\right.$$

$$\left.-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\Bigg)\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]-15\left(-\frac{3}{5}\left(\frac{5}{3}+m\right)\right.$$

$$\text{AppellF1}\left[\frac{5}{2},\frac{1}{3}-m,\frac{8}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]$$

$$\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]+\frac{3}{5}\left(\frac{1}{3}-m\right)\text{AppellF1}\left[\frac{5}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{7}{2},\right.$$

$$\left.\left.\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]\right)+$$

$$2\,\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\Bigg((5+3m)\left(-\frac{5}{7}\left(\frac{8}{3}+m\right)\text{AppellF1}\left[\frac{7}{2},\frac{1}{3}-m,\frac{11}{3}+m,\right.\right.$$

$$\left.\frac{9}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\Big[$$

$$\frac{1}{2}(c+dx)\Big]+\frac{5}{7}\left(\frac{1}{3}-m\right)\text{AppellF1}\left[\frac{7}{2},\frac{4}{3}-m,\frac{8}{3}+m,\frac{9}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,\right.$$

$$\left.\left.-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]\right)+$$

$$(-1+3m)\left(-\frac{5}{7}\left(\frac{5}{3}+m\right)\text{AppellF1}\left[\frac{7}{2},\frac{4}{3}-m,\frac{8}{3}+m,\frac{9}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,\right.\right.$$

$$\left.-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]+$$

$$\frac{5}{7}\left(\frac{4}{3}-m\right)\text{AppellF1}\left[\frac{7}{2},\frac{7}{3}-m,\frac{5}{3}+m,\frac{9}{2},\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2,\right.$$

$$\left.-\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+dx)\right]^2\text{Tan}\left[\frac{1}{2}(c+dx)\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(-15\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+\right.$$
$$2\left((5+3 m)\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{3}-m,\frac{8}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+\right.$$
$$(-1+3 m)\,\text{AppellF1}\left[\frac{5}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,\right.$$
$$\left.\left.\left.-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right)\right)\right)$$

Problem 931: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\text{Cos}[c+d x]^m\,(A+B\,\text{Cos}[c+d x])}{(b\,\text{Cos}[c+d x])^{2/3}}\,dx$$

Optimal (type 5, 167 leaves, 4 steps):

$$-\left(\left(3\,A\,\text{Cos}[c+d x]^{1+m}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1}{6}(1+3 m),\frac{1}{6}(7+3 m),\text{Cos}[c+d x]^2\right]\text{Sin}[c+d x]\right)\Big/\right.$$
$$\left.\left(d\,(1+3 m)\,(b\,\text{Cos}[c+d x])^{2/3}\sqrt{\text{Sin}[c+d x]^2}\right)\right)-$$
$$\left(3\,B\,\text{Cos}[c+d x]^{2+m}\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1}{6}(4+3 m),\frac{1}{6}(10+3 m),\text{Cos}[c+d x]^2\right]\text{Sin}[c+d x]\right)\Big/$$
$$\left(d\,(4+3 m)\,(b\,\text{Cos}[c+d x])^{2/3}\sqrt{\text{Sin}[c+d x]^2}\right)$$

Result (type 6, 4951 leaves):

$$\left(2\left(\text{Cos}\left[\frac{1}{2}(c+d x)\right]^2\right)^{\frac{4}{3}+m}\text{Cos}[c+d x]^{2/3}\right.$$
$$\left(\text{Cos}[c+d x]\,\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\right)^{-\frac{2}{3}+m}\left(\frac{1}{2}B\,\text{Cos}[c+d x]^{\frac{1}{3}+m}+A\,\text{Cos}[c+d x]^{\frac{4}{3}+m}+\right.$$
$$\frac{1}{2}B\,\text{Cos}[c+d x]^{\frac{1}{3}+m}\,\text{Cos}[2(c+d x)]+\frac{1}{2}\,i\,B\,\text{Cos}[c+d x]^{\frac{1}{3}+m}\,\text{Sin}[2(c+d x)]+\text{Sec}[c+d x]$$
$$\left(-\frac{1}{2}\,i\,B\,\text{Cos}[c+d x]^{\frac{1}{3}+m}\,\text{Cos}[2(c+d x)]\,\text{Sin}[c+d x]+A\,\text{Cos}[c+d x]^{\frac{1}{3}+m}\,\text{Sin}[c+d x]^2+\text{Sin}[c+\right.$$
$$\left.\left.d x]\left(-\frac{1}{2}\,i\,B\,\text{Cos}[c+d x]^{\frac{1}{3}+m}+\frac{1}{2}B\,\text{Cos}[c+d x]^{\frac{1}{3}+m}\,\text{Sin}[2(c+d x)]\right)\right)\right)\text{Tan}\left[\frac{1}{2}(c+d x)\right]$$
$$\left(\left(9\,(A+B)\,\text{AppellF1}\left[\frac{1}{2},\frac{2}{3}-m,\frac{4}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\right)\Big/\right.$$
$$\left(9\,\text{AppellF1}\left[\frac{1}{2},\frac{2}{3}-m,\frac{4}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]-\right.$$
$$2\left((4+3 m)\,\text{AppellF1}\left[\frac{3}{2},\frac{2}{3}-m,\frac{7}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+\right.$$
$$(-2+3 m)\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{3}-m,\frac{4}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\right)$$

$$\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big)+\Big(5(A-B)\,\text{AppellF1}\left[\frac{3}{2},\frac{2}{3}-m,\frac{4}{3}+m,\frac{5}{2},\right.$$
$$\left.\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big)\Big/$$
$$\Big(15\,\text{AppellF1}\left[\frac{3}{2},\frac{2}{3}-m,\frac{4}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]-$$
$$2\Big((4+3m)\,\text{AppellF1}\left[\frac{5}{2},\frac{2}{3}-m,\frac{7}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+$$
$$(-2+3m)\,\text{AppellF1}\left[\frac{5}{2},\frac{5}{3}-m,\frac{4}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,\right.$$
$$\left.-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\Big)\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big)\Big)\Big)\Big/$$
$$\Big(d\,(b\,\text{Cos}[c+d x])^{2/3}\Big(\Big(\text{Cos}\left[\frac{1}{2}(c+d x)\right]^2\Big)^{\frac{1}{3}+m}\Big(\text{Cos}[c+d x]\,\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\Big)^{-\frac{2}{3}+m}$$
$$\Big(\Big(9(A+B)\,\text{AppellF1}\left[\frac{1}{2},\frac{2}{3}-m,\frac{4}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\Big)\Big/$$
$$\Big(9\,\text{AppellF1}\left[\frac{1}{2},\frac{2}{3}-m,\frac{4}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]-$$
$$2\Big((4+3m)\,\text{AppellF1}\left[\frac{3}{2},\frac{2}{3}-m,\frac{7}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+$$
$$(-2+3m)\,\text{AppellF1}\left[\frac{3}{2},\frac{5}{3}-m,\frac{4}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\Big)$$
$$\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big)+\Big(5(A-B)\,\text{AppellF1}\left[\frac{3}{2},\frac{2}{3}-m,\frac{4}{3}+m,\frac{5}{2},\right.$$
$$\left.\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big)\Big/$$
$$\Big(15\,\text{AppellF1}\left[\frac{3}{2},\frac{2}{3}-m,\frac{4}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]-$$
$$2\Big((4+3m)\,\text{AppellF1}\left[\frac{5}{2},\frac{2}{3}-m,\frac{7}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+$$
$$(-2+3m)\,\text{AppellF1}\left[\frac{5}{2},\frac{5}{3}-m,\frac{4}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,\right.$$
$$\left.-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\Big)\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\Big)\Big)-$$
$$2\left(\frac{4}{3}+m\right)\Big(\text{Cos}\left[\frac{1}{2}(c+d x)\right]^2\Big)^{\frac{1}{3}+m}\Big(\text{Cos}[c+d x]\,\text{Sec}\left[\frac{1}{2}(c+d x)\right]^2\Big)^{-\frac{2}{3}+m}$$
$$\text{Sin}\left[\frac{1}{2}(c+d x)\right]^2$$
$$\Big(\Big(9(A+B)\,\text{AppellF1}\left[\frac{1}{2},\frac{2}{3}-m,\frac{4}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]\Big)\Big/$$
$$\Big(9\,\text{AppellF1}\left[\frac{1}{2},\frac{2}{3}-m,\frac{4}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]-$$
$$2\Big((4+3m)\,\text{AppellF1}\left[\frac{3}{2},\frac{2}{3}-m,\frac{7}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d x)\right]^2\right]+$$

$$\left(-2+3\,m\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{5}{3}-m,\,\frac{4}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\Bigg)$$

$$\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\Bigg)+\Bigg(5\,(A-B)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{2}{3}-m,\,\frac{4}{3}+m,\,\frac{5}{2},\right.$$

$$\left.\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\Bigg)\Bigg/$$

$$\Bigg(15\,\text{AppellF1}\left[\frac{3}{2},\,\frac{2}{3}-m,\,\frac{4}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]-$$

$$2\,\Bigg(\left(4+3\,m\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{2}{3}-m,\,\frac{7}{3}+m,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+$$

$$\left(-2+3\,m\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{5}{3}-m,\,\frac{4}{3}+m,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.$$

$$\left.-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\Bigg)\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\Bigg)\Bigg)+$$

$$2\,\left(-\frac{2}{3}+m\right)\,\left(\text{Cos}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)^{\frac{4}{3}+m}\,\left(\text{Cos}\left[c+d\,x\right]\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)^{-\frac{5}{3}+m}$$

$$\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]$$

$$\left(-\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Sin}\left[c+d\,x\right]+\text{Cos}\left[c+d\,x\right]\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\right)$$

$$\Bigg(\Bigg(9\,(A+B)\,\text{AppellF1}\left[\frac{1}{2},\,\frac{2}{3}-m,\,\frac{4}{3}+m,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\Bigg)\Bigg/$$

$$\Bigg(9\,\text{AppellF1}\left[\frac{1}{2},\,\frac{2}{3}-m,\,\frac{4}{3}+m,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]-$$

$$2\,\Bigg(\left(4+3\,m\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{2}{3}-m,\,\frac{7}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+$$

$$\left(-2+3\,m\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{5}{3}-m,\,\frac{4}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\Bigg)$$

$$\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\Bigg)+\Bigg(5\,(A-B)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{2}{3}-m,\,\frac{4}{3}+m,\,\frac{5}{2},\right.$$

$$\left.\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\Bigg)\Bigg/$$

$$\Bigg(15\,\text{AppellF1}\left[\frac{3}{2},\,\frac{2}{3}-m,\,\frac{4}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]-$$

$$2\,\Bigg(\left(4+3\,m\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{2}{3}-m,\,\frac{7}{3}+m,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+$$

$$\left(-2+3\,m\right)\,\text{AppellF1}\left[\frac{5}{2},\,\frac{5}{3}-m,\,\frac{4}{3}+m,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.$$

$$\left.-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\Bigg)\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\Bigg)\Bigg)+$$

$$2\,\left(\text{Cos}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)^{\frac{4}{3}+m}\,\left(\text{Cos}\left[c+d\,x\right]\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)^{-\frac{2}{3}+m}\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]$$

$$\Bigg(\Bigg(9\,(A+B)$$

$$\left(-\frac{1}{3}\,\left(\frac{4}{3}+m\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{2}{3}-m,\,\frac{7}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right.$$

$$\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]+\frac{1}{3}\,\Big(\frac{2}{3}-m\Big)\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{5}{3}-m,\,\frac{4}{3}+m,\,\frac{5}{2},$$

$$\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Big]\Big)\Big)\Big/$$

$$\Big(9\,\text{AppellF1}\Big[\frac{1}{2},\,\frac{2}{3}-m,\,\frac{4}{3}+m,\,\frac{3}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]-$$

$$2\,\Big((4+3\,m)\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{2}{3}-m,\,\frac{7}{3}+m,\,\frac{5}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]+$$

$$(-2+3\,m)\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{5}{3}-m,\,\frac{4}{3}+m,\,\frac{5}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\Big)$$

$$\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big)+\Big(5\,(A-B)\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{2}{3}-m,\,\frac{4}{3}+m,\,\frac{5}{2},$$

$$\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Big)\Big/$$

$$\Big(15\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{2}{3}-m,\,\frac{4}{3}+m,\,\frac{5}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]-$$

$$2\,\Big((4+3\,m)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{2}{3}-m,\,\frac{7}{3}+m,\,\frac{7}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]+$$

$$(-2+3\,m)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{5}{3}-m,\,\frac{4}{3}+m,\,\frac{7}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\Big)$$

$$\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big)+\Big(5\,(A-B)\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2$$

$$\Big(-\frac{3}{5}\,\Big(\frac{4}{3}+m\Big)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{2}{3}-m,\,\frac{7}{3}+m,\,\frac{7}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]$$

$$\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]+\frac{3}{5}\,\Big(\frac{2}{3}-m\Big)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{5}{3}-m,\,\frac{4}{3}+m,\,\frac{7}{2},$$

$$\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Big]\Big)\Big)\Big/$$

$$\Big(15\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{2}{3}-m,\,\frac{4}{3}+m,\,\frac{5}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]-$$

$$2\,\Big((4+3\,m)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{2}{3}-m,\,\frac{7}{3}+m,\,\frac{7}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]+$$

$$(-2+3\,m)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{5}{3}-m,\,\frac{4}{3}+m,\,\frac{7}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\Big)\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big)-$$

$$\Big(9\,(A+B)\,\text{AppellF1}\Big[\frac{1}{2},\,\frac{2}{3}-m,\,\frac{4}{3}+m,\,\frac{3}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]$$

$$\Big(-2\,\Big((4+3\,m)\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{2}{3}-m,\,\frac{7}{3}+m,\,\frac{5}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]+$$

$$(-2+3\,m)\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{5}{3}-m,\,\frac{4}{3}+m,\,\frac{5}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\Big)\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]+9$$

$$\Big(-\frac{1}{3}\,\Big(\frac{4}{3}+m\Big)\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{2}{3}-m,\,\frac{7}{3}+m,\,\frac{5}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]$$

$$\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]+\frac{1}{3}\,\Big(\frac{2}{3}-m\Big)\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{5}{3}-m,\,\frac{4}{3}+m,\,\frac{5}{2},$$

$$\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Big)-$$

$$2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\Big(\,(4+3\,m)\,\Big(-\frac{3}{5}\,\Big(\frac{7}{3}+m\Big)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{2}{3}-m,\,\frac{10}{3}+m,$$

$$\frac{7}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[$$

$$\frac{1}{2}\,(c+d\,x)\Big]+\frac{3}{5}\,\Big(\frac{2}{3}-m\Big)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{5}{3}-m,\,\frac{7}{3}+m,\,\frac{7}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Big)+$$

$$(-2+3\,m)\,\Big(-\frac{3}{5}\,\Big(\frac{4}{3}+m\Big)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{5}{3}-m,\,\frac{7}{3}+m,\,\frac{7}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]+$$

$$\frac{3}{5}\,\Big(\frac{5}{3}-m\Big)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{8}{3}-m,\,\frac{4}{3}+m,\,\frac{7}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Big)\Big)\Big)\Big)\Big/$$

$$\Big(9\,\text{AppellF1}\Big[\frac{1}{2},\,\frac{2}{3}-m,\,\frac{4}{3}+m,\,\frac{3}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]-$$

$$2\,\Big(\,(4+3\,m)\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{2}{3}-m,\,\frac{7}{3}+m,\,\frac{5}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]+$$

$$(-2+3\,m)\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{5}{3}-m,\,\frac{4}{3}+m,\,\frac{5}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\Big)\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big)^2-$$

$$\Big(5\,(A-B)\,\text{AppellF1}\Big[\frac{3}{2},\,\frac{2}{3}-m,\,\frac{4}{3}+m,\,\frac{5}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]$$

$$\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2$$

$$\Big(-2\,\Big(\,(4+3\,m)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{2}{3}-m,\,\frac{7}{3}+m,\,\frac{7}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]+$$

$$(-2+3\,m)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{5}{3}-m,\,\frac{4}{3}+m,\,\frac{7}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,$$

$$-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\Big)\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]+15\,\Big(-\frac{3}{5}\,\Big(\frac{4}{3}+m\Big)$$

$$\text{AppellF1}\Big[\frac{5}{2},\,\frac{2}{3}-m,\,\frac{7}{3}+m,\,\frac{7}{2},\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]$$

$$\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]+\frac{3}{5}\,\Big(\frac{2}{3}-m\Big)\,\text{AppellF1}\Big[\frac{5}{2},\,\frac{5}{3}-m,\,\frac{4}{3}+m,\,\frac{7}{2},$$

$$\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2,\,-\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\Big]\,\text{Sec}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]\Big)-$$

$$2\,\text{Tan}\Big[\frac{1}{2}\,(c+d\,x)\Big]^2\,\Big(\,(4+3\,m)\,\Big(-\frac{5}{7}\,\Big(\frac{7}{3}+m\Big)\,\text{AppellF1}\Big[\frac{7}{2},\,\frac{2}{3}-m,\,\frac{10}{3}+m,$$

$$\frac{9}{2}, \text{Tan}\left[\frac{1}{2}(c+dx)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right] \text{Sec}\left[\frac{1}{2}(c+dx)\right]^2 \text{Tan}\left[\frac{1}{2}(c+dx)\right] + \frac{5}{7}\left(\frac{2}{3}-m\right) \text{AppellF1}\left[\frac{7}{2}, \frac{5}{3}-m, \frac{7}{3}+m, \frac{9}{2}, \text{Tan}\left[\frac{1}{2}(c+dx)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right] \text{Sec}\left[\frac{1}{2}(c+dx)\right]^2 \text{Tan}\left[\frac{1}{2}(c+dx)\right]\Bigg) + (-2+3m)\left(-\frac{5}{7}\left(\frac{4}{3}+m\right) \text{AppellF1}\left[\frac{7}{2}, \frac{5}{3}-m, \frac{7}{3}+m, \frac{9}{2}, \text{Tan}\left[\frac{1}{2}(c+dx)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right] \text{Sec}\left[\frac{1}{2}(c+dx)\right]^2 \text{Tan}\left[\frac{1}{2}(c+dx)\right] + \frac{5}{7}\left(\frac{5}{3}-m\right) \text{AppellF1}\left[\frac{7}{2}, \frac{8}{3}-m, \frac{4}{3}+m, \frac{9}{2}, \text{Tan}\left[\frac{1}{2}(c+dx)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right] \text{Sec}\left[\frac{1}{2}(c+dx)\right]^2 \text{Tan}\left[\frac{1}{2}(c+dx)\right]\right)\Bigg)\Bigg)\Bigg)\Bigg) \Bigg/ \left(15\, \text{AppellF1}\left[\frac{3}{2}, \frac{2}{3}-m, \frac{4}{3}+m, \frac{5}{2}, \text{Tan}\left[\frac{1}{2}(c+dx)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right] - 2\left((4+3m) \text{AppellF1}\left[\frac{5}{2}, \frac{2}{3}-m, \frac{7}{3}+m, \frac{7}{2}, \text{Tan}\left[\frac{1}{2}(c+dx)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right] + (-2+3m) \text{AppellF1}\left[\frac{5}{2}, \frac{5}{3}-m, \frac{4}{3}+m, \frac{7}{2}, \text{Tan}\left[\frac{1}{2}(c+dx)\right]^2, -\text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right]\right) \text{Tan}\left[\frac{1}{2}(c+dx)\right]^2\right)^2\Bigg)\Bigg)$$

Problem 932: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\text{Cos}[c+dx]^m (A+B\,\text{Cos}[c+dx])}{(b\,\text{Cos}[c+dx])^{4/3}}\, dx$$

Optimal (type 5, 171 leaves, 4 steps):

$$\left(3 A\, \text{Cos}[c+dx]^m\, \text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{1}{6}(-1+3m), \frac{1}{6}(5+3m), \text{Cos}[c+dx]^2\right] \text{Sin}[c+dx]\right) \Bigg/ \left(b d (1-3m) (b\,\text{Cos}[c+dx])^{1/3} \sqrt{\text{Sin}[c+dx]^2}\right) - \left(3 B\, \text{Cos}[c+dx]^{1+m}\, \text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{1}{6}(2+3m), \frac{1}{6}(8+3m), \text{Cos}[c+dx]^2\right] \text{Sin}[c+dx]\right) \Bigg/ \left(b d (2+3m) (b\,\text{Cos}[c+dx])^{1/3} \sqrt{\text{Sin}[c+dx]^2}\right)$$

Result (type 6, 4853 leaves):

$$\Bigg(18\, \text{Cos}[c+dx]^{2+m} \left(A\, \text{Cos}[c+dx]^{\frac{2}{3}+m} + \text{Sec}[c+dx]\left(\frac{1}{2} B\, \text{Cos}[c+dx]^{\frac{2}{3}+m} + \frac{1}{2} B\, \text{Cos}[c+dx]^{\frac{2}{3}+m} \text{Cos}[2(c+dx)] + \frac{1}{2} i B\, \text{Cos}[c+dx]^{\frac{2}{3}+m} \text{Sin}[2(c+dx)]\right) + \text{Sec}[c+dx]^2$$

$$\left(-\frac{1}{2}\,\mathrm{i}\,B\,\mathrm{Cos}[c+d\,x]^{\frac{2}{3}+m}\,\mathrm{Cos}\left[2\,\left(c+d\,x\right)\right]\,\mathrm{Sin}[c+d\,x]+A\,\mathrm{Cos}[c+d\,x]^{\frac{2}{3}+m}\,\mathrm{Sin}[c+d\,x]^2+\right.$$

$$\left.\left.\left.\mathrm{Sin}[c+d\,x]\,\left(-\frac{1}{2}\,\mathrm{i}\,B\,\mathrm{Cos}[c+d\,x]^{\frac{2}{3}+m}+\frac{1}{2}\,B\,\mathrm{Cos}[c+d\,x]^{\frac{2}{3}+m}\,\mathrm{Sin}\left[2\,\left(c+d\,x\right)\right]\right)\right)\right)\right)$$

$$\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]\,\left(\left(\left(A-B\right)\,\mathrm{AppellF1}\left[\frac{1}{2},\,\frac{1}{3}-m,\,\frac{2}{3}+m,\,\frac{3}{2},\,\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.\right.\right.$$

$$\left.\left.-\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\,\left(-1+\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)\right)\Big/$$

$$\left(9\,\mathrm{AppellF1}\left[\frac{1}{2},\,\frac{1}{3}-m,\,\frac{2}{3}+m,\,\frac{3}{2},\,\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$

$$2\,\left(-\left(2+3\,m\right)\,\mathrm{AppellF1}\left[\frac{3}{2},\,\frac{1}{3}-m,\,\frac{5}{3}+m,\,\frac{5}{2},\,\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$

$$\left(1-3\,m\right)\,\mathrm{AppellF1}\left[\frac{3}{2},\,\frac{4}{3}-m,\,\frac{2}{3}+m,\,\frac{5}{2},\,\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.$$

$$\left.\left.\left.-\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)\,\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)+$$

$$\left(2\,A\,\mathrm{AppellF1}\left[\frac{1}{2},\,\frac{4}{3}-m,\,\frac{2}{3}+m,\,\frac{3}{2},\,\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)\Big/$$

$$\left(9\,\mathrm{AppellF1}\left[\frac{1}{2},\,\frac{4}{3}-m,\,\frac{2}{3}+m,\,\frac{3}{2},\,\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]-\right.$$

$$2\,\left(\left(2+3\,m\right)\,\mathrm{AppellF1}\left[\frac{3}{2},\,\frac{4}{3}-m,\,\frac{5}{3}+m,\,\frac{5}{2},\,\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$

$$\left.\left(-4+3\,m\right)\,\mathrm{AppellF1}\left[\frac{3}{2},\,\frac{7}{3}-m,\,\frac{2}{3}+m,\,\frac{5}{2},\,\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)$$

$$\left.\left.\left.\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)\right)\right)\Big/\left(d\,\left(b\,\mathrm{Cos}[c+d\,x]\right)^{4/3}\,\left(-1+\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)^2\right.$$

$$\left(-\frac{1}{\left(-1+\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)^3}\,36\,\mathrm{Cos}[c+d\,x]^{\frac{2}{3}+m}\,\mathrm{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\,\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right.$$

$$\left(\left(\left(A-B\right)\,\mathrm{AppellF1}\left[\frac{1}{2},\,\frac{1}{3}-m,\,\frac{2}{3}+m,\,\frac{3}{2},\,\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right.\right.$$

$$\left.\left(-1+\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)\right)\Big/\left(9\,\mathrm{AppellF1}\left[\frac{1}{2},\,\frac{1}{3}-m,\,\frac{2}{3}+m,\,\frac{3}{2},\,\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.\right.$$

$$\left.-\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+2\,\left(-\left(2+3\,m\right)\,\mathrm{AppellF1}\left[\frac{3}{2},\,\frac{1}{3}-m,\,\frac{5}{3}+m,\,\frac{5}{2},\right.\right.$$

$$\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\left(1-3\,m\right)\,\mathrm{AppellF1}\left[\frac{3}{2},\,\frac{4}{3}-m,\right.$$

$$\left.\left.\left.\frac{2}{3}+m,\,\frac{5}{2},\,\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)\,\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)+$$

$$\left(2\,A\,\mathrm{AppellF1}\left[\frac{1}{2},\,\frac{4}{3}-m,\,\frac{2}{3}+m,\,\frac{3}{2},\,\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)\Big/$$

$$\left(9\,\mathrm{AppellF1}\left[\frac{1}{2},\,\frac{4}{3}-m,\,\frac{2}{3}+m,\,\frac{3}{2},\,\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]-\right.$$

$$2\,\left(\left(2+3\,m\right)\,\mathrm{AppellF1}\left[\frac{3}{2},\,\frac{4}{3}-m,\,\frac{5}{3}+m,\,\frac{5}{2},\,\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\mathrm{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\right.$$

$$\left(-4+3\,m\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{7}{3}-m,\,\frac{2}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.$$
$$\left.\left.\left.-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)\right)+$$
$$\frac{1}{\left(-1+\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)^2}\,9\,\text{Cos}\left[c+d\,x\right]^{\frac{2}{3}+m}\,\text{Sec}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2$$
$$\left(\left(\left(A-B\right)\,\text{AppellF1}\left[\frac{1}{2},\,\frac{1}{3}-m,\,\frac{2}{3}+m,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right.\right.$$
$$\left.\left.\left(-1+\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)\right)\Big/\left(9\,\text{AppellF1}\left[\frac{1}{2},\,\frac{1}{3}-m,\,\frac{2}{3}+m,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.\right.$$
$$\left.-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+2\,\left(-\left(2+3\,m\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{1}{3}-m,\,\frac{5}{3}+m,\,\frac{5}{2},\right.\right.$$
$$\left.\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\left(1-3\,m\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{4}{3}-m,\right.$$
$$\left.\left.\left.\frac{2}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)+$$
$$\left(2\,A\,\text{AppellF1}\left[\frac{1}{2},\,\frac{4}{3}-m,\,\frac{2}{3}+m,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)\Big/$$
$$\left(9\,\text{AppellF1}\left[\frac{1}{2},\,\frac{4}{3}-m,\,\frac{2}{3}+m,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]-\right.$$
$$2\,\left(\left(2+3\,m\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{4}{3}-m,\,\frac{5}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.\right.$$
$$\left.-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\left(-4+3\,m\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{7}{3}-m,\,\frac{2}{3}+m,\,\frac{5}{2},\right.$$
$$\left.\left.\left.\left.\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)\right)-$$
$$\frac{1}{\left(-1+\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)^2}\,18\,\left(\frac{2}{3}+m\right)\,\text{Cos}\left[c+d\,x\right]^{-\frac{1}{3}+m}\,\text{Sin}\left[c+d\,x\right]\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]$$
$$\left(\left(\left(A-B\right)\,\text{AppellF1}\left[\frac{1}{2},\,\frac{1}{3}-m,\,\frac{2}{3}+m,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right.\right.$$
$$\left.\left.\left(-1+\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)\right)\Big/\left(9\,\text{AppellF1}\left[\frac{1}{2},\,\frac{1}{3}-m,\,\frac{2}{3}+m,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.\right.$$
$$\left.-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+2\,\left(-\left(2+3\,m\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{1}{3}-m,\,\frac{5}{3}+m,\,\frac{5}{2},\right.\right.$$
$$\left.\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]+\left(1-3\,m\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{4}{3}-m,\right.$$
$$\left.\left.\left.\frac{2}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right)+$$
$$\left(2\,A\,\text{AppellF1}\left[\frac{1}{2},\,\frac{4}{3}-m,\,\frac{2}{3}+m,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]\right)\Big/$$
$$\left(9\,\text{AppellF1}\left[\frac{1}{2},\,\frac{4}{3}-m,\,\frac{2}{3}+m,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2\right]-\right.$$
$$2\,\left(\left(2+3\,m\right)\,\text{AppellF1}\left[\frac{3}{2},\,\frac{4}{3}-m,\,\frac{5}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\,\left(c+d\,x\right)\right]^2,\right.$$

$$-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big]+(-4+3\,m)\,\text{AppellF1}\Big[\frac{3}{2},\frac{7}{3}-m,\frac{2}{3}+m,\frac{5}{2},$$
$$\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big]\Big)\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big)\Big)+$$
$$\frac{1}{\left(-1+\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)^2}\,18\,\text{Cos}[c+d\,x]^{\frac{2}{3}+m}\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]$$
$$\Bigg(\Bigg(\Big((A-B)\,\text{AppellF1}\Big[\frac{1}{2},\frac{1}{3}-m,\frac{2}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big]$$
$$\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\Big)\Big/$$
$$\Big(9\,\text{AppellF1}\Big[\frac{1}{2},\frac{1}{3}-m,\frac{2}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big]+$$
$$2\Big(-(2+3\,m)\,\text{AppellF1}\Big[\frac{3}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big]+$$
$$(1-3\,m)\,\text{AppellF1}\Big[\frac{3}{2},\frac{4}{3}-m,\frac{2}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big]\Big)$$
$$\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big)+\Big((A-B)\,\Big(-\frac{1}{3}\left(\frac{2}{3}+m\right)\text{AppellF1}\Big[\frac{3}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{5}{2},$$
$$\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big]\,\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]+$$
$$\frac{1}{3}\left(\frac{1}{3}-m\right)\text{AppellF1}\Big[\frac{3}{2},\frac{4}{3}-m,\frac{2}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big]$$
$$\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\Big)\,\left(-1+\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)\Big)\Big/$$
$$\Big(9\,\text{AppellF1}\Big[\frac{1}{2},\frac{1}{3}-m,\frac{2}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big]+$$
$$2\Big(-(2+3\,m)\,\text{AppellF1}\Big[\frac{3}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,$$
$$-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big]+(1-3\,m)\,\text{AppellF1}\Big[\frac{3}{2},\frac{4}{3}-m,\frac{2}{3}+m,\frac{5}{2},$$
$$\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big]\Big)\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big)+$$
$$\Big(2\,A\,\Big(-\frac{1}{3}\left(\frac{2}{3}+m\right)\text{AppellF1}\Big[\frac{3}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big]$$
$$\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]+\frac{1}{3}\left(\frac{4}{3}-m\right)\text{AppellF1}\Big[\frac{3}{2},\frac{7}{3}-m,\frac{2}{3}+m,\frac{5}{2},$$
$$\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big]\,\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\Big)\Big)\Big/$$
$$\Big(9\,\text{AppellF1}\Big[\frac{1}{2},\frac{4}{3}-m,\frac{2}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big]-$$
$$2\Big((2+3\,m)\,\text{AppellF1}\Big[\frac{3}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,$$
$$-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big]+(-4+3\,m)\,\text{AppellF1}\Big[\frac{3}{2},\frac{7}{3}-m,\frac{2}{3}+m,\frac{5}{2},$$
$$\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big]\Big)\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\Big)-$$

$$\left((A-B)\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3}-m,\frac{2}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right.$$
$$\left(-1+\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)\left(2\left(-(2+3\,m)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{5}{2},\right.\right.\right.$$
$$\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+(1-3\,m)\,\text{AppellF1}\left[\frac{3}{2},\frac{4}{3}-m,$$
$$\left.\frac{2}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2$$
$$\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]+9\left(-\frac{1}{3}\left(\frac{2}{3}+m\right)\text{AppellF1}\left[\frac{3}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{5}{2},\right.\right.$$
$$\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]+$$
$$\frac{1}{3}\left(\frac{1}{3}-m\right)\text{AppellF1}\left[\frac{3}{2},\frac{4}{3}-m,\frac{2}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\right.$$
$$\left.\left.-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)+$$
$$2\,\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\left(-(2+3\,m)\left(-\frac{3}{5}\left(\frac{5}{3}+m\right)\text{AppellF1}\left[\frac{5}{2},\frac{1}{3}-m,\frac{8}{3}+m,\right.\right.\right.$$
$$\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[$$
$$\frac{1}{2}(c+d\,x)\right]+\frac{3}{5}\left(\frac{1}{3}-m\right)\text{AppellF1}\left[\frac{5}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\right.$$
$$\left.\left.-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)+$$
$$(1-3\,m)\left(-\frac{3}{5}\left(\frac{2}{3}+m\right)\text{AppellF1}\left[\frac{5}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\right.\right.$$
$$-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]+$$
$$\frac{3}{5}\left(\frac{4}{3}-m\right)\text{AppellF1}\left[\frac{5}{2},\frac{7}{3}-m,\frac{2}{3}+m,\frac{7}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\right.$$
$$\left.\left.\left.\left.\left.-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\text{Sec}\left[\frac{1}{2}(c+d\,x)\right]^2\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]\right)\right)\right)\right)\Big/$$
$$\left(9\,\text{AppellF1}\left[\frac{1}{2},\frac{1}{3}-m,\frac{2}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\right.$$
$$2\left(-(2+3\,m)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{3}-m,\frac{5}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,\right.\right.$$
$$-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+(1-3\,m)\,\text{AppellF1}\left[\frac{3}{2},\frac{4}{3}-m,\frac{2}{3}+m,\frac{5}{2},$$
$$\left.\left.\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\right)\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right)^2-$$
$$\left(2\,A\,\text{AppellF1}\left[\frac{1}{2},\frac{4}{3}-m,\frac{2}{3}+m,\frac{3}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]\left(-2\right.\right.$$
$$\left((2+3\,m)\,\text{AppellF1}\left[\frac{3}{2},\frac{4}{3}-m,\frac{5}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,-\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2\right]+\right.$$
$$(-4+3\,m)\,\text{AppellF1}\left[\frac{3}{2},\frac{7}{3}-m,\frac{2}{3}+m,\frac{5}{2},\text{Tan}\left[\frac{1}{2}(c+d\,x)\right]^2,$$

$$-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\Big]\Big)\,\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]+9\left(-\frac{1}{3}\left(\frac{2}{3}+m\right)\right.$$

$$\text{AppellF1}\left[\frac{3}{2},\,\frac{4}{3}-m,\,\frac{5}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]$$

$$\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]+\frac{1}{3}\left(\frac{4}{3}-m\right)\text{AppellF1}\left[\frac{3}{2},\,\frac{7}{3}-m,\,\frac{2}{3}+m,\,\frac{5}{2},\right.$$

$$\left.\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\Big)-$$

$$2\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\left(\left(2+3\,m\right)\left(-\frac{3}{5}\left(\frac{5}{3}+m\right)\text{AppellF1}\left[\frac{5}{2},\,\frac{4}{3}-m,\,\frac{8}{3}+m,\right.\right.\right.$$

$$\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\Big]\,\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\text{Tan}\Big[$$

$$\frac{1}{2}\left(c+d\,x\right)\Big]+\frac{3}{5}\left(\frac{4}{3}-m\right)\text{AppellF1}\left[\frac{5}{2},\,\frac{7}{3}-m,\,\frac{5}{3}+m,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,\right.$$

$$\left.\left.-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right)+$$

$$\left(-4+3\,m\right)\left(-\frac{3}{5}\left(\frac{2}{3}+m\right)\text{AppellF1}\left[\frac{5}{2},\,\frac{7}{3}-m,\,\frac{5}{3}+m,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,\right.\right.$$

$$\left.-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]+$$

$$\frac{3}{5}\left(\frac{7}{3}-m\right)\text{AppellF1}\left[\frac{5}{2},\,\frac{10}{3}-m,\,\frac{2}{3}+m,\,\frac{7}{2},\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,\right.$$

$$\left.\left.\left.\left.-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]\text{Sec}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]\right)\right)\right)\right)\Big/$$

$$\left(9\,\text{AppellF1}\left[\frac{1}{2},\,\frac{4}{3}-m,\,\frac{2}{3}+m,\,\frac{3}{2},\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]-\right.$$

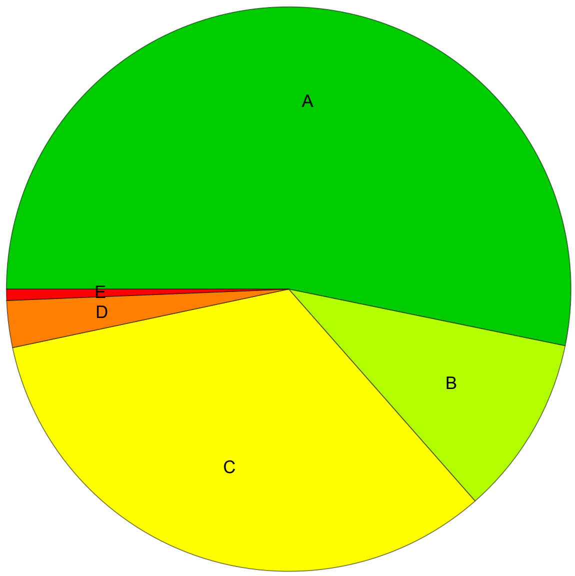
$$2\left(\left(2+3\,m\right)\text{AppellF1}\left[\frac{3}{2},\,\frac{4}{3}-m,\,\frac{5}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,\,-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]+\right.$$

$$\left(-4+3\,m\right)\text{AppellF1}\left[\frac{3}{2},\,\frac{7}{3}-m,\,\frac{2}{3}+m,\,\frac{5}{2},\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2,\right.$$

$$\left.\left.\left.-\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\right]\Big)\,\text{Tan}\left[\frac{1}{2}\left(c+d\,x\right)\right]^2\Big)^2\right)\right)$$

Summary of Integration Test Results

932 integration problems



A - 496 optimal antiderivatives

B - 96 more than twice size of optimal antiderivatives

C - 309 unnecessarily complex antiderivatives

D - 25 unable to integrate problems

E - 6 integration timeouts