Mathematica 11.3 Integration Test Results

Test results for the 397 problems in "4.7.3 (c+d x)^m trig^n trig^p.m"

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

$$\int (c+d x)^4 \operatorname{Cot}[a+b x] \, dx$$

Optimal (type 4, 151 leaves, 7 steps):

$$-\frac{i (c+d x)^5}{5 d}+\frac{(c+d x)^4 \operatorname{Log}\left[1-e^{2 i (a+b x)}\right]}{b}-\frac{2 i d (c+d x)^3 \operatorname{PolyLog}\left[2, e^{2 i (a+b x)}\right]}{b^2}+\frac{3 d^2 (c+d x)^2 \operatorname{PolyLog}\left[3, e^{2 i (a+b x)}\right]}{b^3}+\frac{3 i d^3 (c+d x) \operatorname{PolyLog}\left[4, e^{2 i (a+b x)}\right]}{b^4}-\frac{3 d^4 \operatorname{PolyLog}\left[5, e^{2 i (a+b x)}\right]}{2 b^5}$$

Result (type 4, 527 leaves):

$$\frac{2 i c^3 d \pi x}{b}-2 i c^2 d^2 x^3-i c d^3 x^4-\frac{1}{5} i d^4 x^5-\frac{4 i c^3 d x \operatorname{ArcTan}[\operatorname{Tan}[a]]}{b}+2 c^3 d x^2 \operatorname{Cot}[a]+\frac{2 c^3 d \pi \operatorname{Log}\left[1+e^{-2 i b x}\right]}{b^2}+\frac{6 c^2 d^2 x^2 \operatorname{Log}\left[1-e^{2 i (a+b x)}\right]}{b}+\frac{4 c d^3 x^3 \operatorname{Log}\left[1-e^{2 i (a+b x)}\right]}{b}+\frac{d^4 x^4 \operatorname{Log}\left[1-e^{2 i (a+b x)}\right]}{b}+\frac{4 c^3 d x \operatorname{Log}\left[1-e^{2 i (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]}{b}+\frac{4 c^3 d \operatorname{ArcTan}[\operatorname{Tan}[a]] \operatorname{Log}\left[1-e^{2 i (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]}{b^2}-\frac{2 c^3 d \pi \operatorname{Log}[\operatorname{Cos}[b x]]}{b^2}+\frac{c^4 \operatorname{Log}[\operatorname{Sin}[a+b x]]}{b}-\frac{4 c^3 d \operatorname{ArcTan}[\operatorname{Tan}[a]] \operatorname{Log}[\operatorname{Sin}[b x+\operatorname{ArcTan}[\operatorname{Tan}[a]]]]}{b^2}-\frac{2 i d^2 x \left(3 c^2+3 c d x+d^2 x^2\right) \operatorname{PolyLog}\left[2, e^{2 i (a+b x)}\right]}{b^2}-\frac{2 i c^3 d \operatorname{PolyLog}\left[2, e^{2 i (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]}{b^2}+\frac{3 c^2 d^2 \operatorname{PolyLog}\left[3, e^{2 i (a+b x)}\right]}{b^3}+\frac{6 c d^3 x \operatorname{PolyLog}\left[3, e^{2 i (a+b x)}\right]}{b^3}+\frac{3 d^4 x^2 \operatorname{PolyLog}\left[3, e^{2 i (a+b x)}\right]}{b^3}+\frac{3 i c d^3 \operatorname{PolyLog}\left[4, e^{2 i (a+b x)}\right]}{b^4}+\frac{3 i d^4 x \operatorname{PolyLog}\left[4, e^{2 i (a+b x)}\right]}{b^4}-\frac{3 d^4 \operatorname{PolyLog}\left[5, e^{2 i (a+b x)}\right]}{2 b^5}-2 c^3 d e^{i \operatorname{ArcTan}[\operatorname{Tan}[a]]} x^2 \operatorname{Cot}[a] \sqrt{\operatorname{Sec}[a]^2}$$

Problem 33: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 127 leaves, 6 steps):

$$-\frac{i (c+d x)^4}{4 d}+\frac{(c+d x)^3 \operatorname{Log}\left[1-e^{2 i (a+b x)}\right]}{b}-\frac{3 i d (c+d x)^2 \operatorname{PolyLog}\left[2, e^{2 i (a+b x)}\right]}{2 b^2}+\frac{3 d^2 (c+d x) \operatorname{PolyLog}\left[3, e^{2 i (a+b x)}\right]}{2 b^3}+\frac{3 i d^3 \operatorname{PolyLog}\left[4, e^{2 i (a+b x)}\right]}{4 b^4}$$

Result (type 4, 410 leaves):

$$\frac{1}{4 b^4}\Big(6 i b^3 c^2 d \pi x-4 i b^4 c d^2 x^3-i b^4 d^3 x^4-12 i b^3 c^2 d x \operatorname{ArcTan}[\operatorname{Tan}[a]]+6 b^4 c^2 d x^2 \operatorname{Cot}[a]+6 b^2 c^2 d \pi \operatorname{Log}\left[1+e^{-2 i b x}\right]+12 b^3 c d^2 x^2 \operatorname{Log}\left[1-e^{2 i (a+b x)}\right]+4 b^3 d^3 x^3 \operatorname{Log}\left[1-e^{2 i (a+b x)}\right]+12 b^3 c^2 d x \operatorname{Log}\left[1-e^{2 i (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]+12 b^2 c^2 d \operatorname{ArcTan}[\operatorname{Tan}[a]] \operatorname{Log}\left[1-e^{2 i (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]-6 b^2 c^2 d \pi \operatorname{Log}[\operatorname{Cos}[b x]]+4 b^3 c^3 \operatorname{Log}[\operatorname{Sin}[a+b x]]-12 b^2 c^2 d \operatorname{ArcTan}[\operatorname{Tan}[a]] \operatorname{Log}[\operatorname{Sin}[b x+\operatorname{ArcTan}[\operatorname{Tan}[a]]]]-6 i b^2 d^2 x (2 c+d x) \operatorname{PolyLog}\left[2, e^{2 i (a+b x)}\right]-6 i b^2 c^2 d \operatorname{PolyLog}\left[2, e^{2 i (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]+6 b c d^2 \operatorname{PolyLog}\left[3, e^{2 i (a+b x)}\right]+6 b d^3 x \operatorname{PolyLog}\left[3, e^{2 i (a+b x)}\right]+3 i d^3 \operatorname{PolyLog}\left[4, e^{2 i (a+b x)}\right]-6 b^4 c^2 d e^{i \operatorname{ArcTan}[\operatorname{Tan}[a]]} x^2 \operatorname{Cot}[a] \sqrt{\operatorname{Sec}[a]^2}\Big)$$

Problem 34: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 93 leaves, 5 steps):

$$-\frac{i (c+d x)^3}{3 d}+\frac{(c+d x)^2 \operatorname{Log}\left[1-e^{2 i (a+b x)}\right]}{b}-\frac{i d (c+d x) \operatorname{PolyLog}\left[2, e^{2 i (a+b x)}\right]}{b^2}+\frac{d^2 \operatorname{PolyLog}\left[3, e^{2 i (a+b x)}\right]}{2 b^3}$$

Result (type 4, 287 leaves):

$$\frac{1}{6 b^3}\Big(6 i b^2 c d \pi x-2 i b^3 d^2 x^3-12 i b^2 c d x \operatorname{ArcTan}[\operatorname{Tan}[a]]+6 b^3 c d x^2 \operatorname{Cot}[a]+6 b c d \pi \operatorname{Log}\left[1+e^{-2 i b x}\right]+6 b^2 d^2 x^2 \operatorname{Log}\left[1-e^{2 i (a+b x)}\right]+12 b^2 c d x \operatorname{Log}\left[1-e^{2 i (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]+12 b c d \operatorname{ArcTan}[\operatorname{Tan}[a]] \operatorname{Log}\left[1-e^{2 i (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]-6 b c d \pi \operatorname{Log}[\operatorname{Cos}[b x]]+6 b^2 c^2 \operatorname{Log}[\operatorname{Sin}[a+b x]]-12 b c d \operatorname{ArcTan}[\operatorname{Tan}[a]] \operatorname{Log}[\operatorname{Sin}[b x+\operatorname{ArcTan}[\operatorname{Tan}[a]]]]-6 i b d^2 x \operatorname{PolyLog}\left[2, e^{2 i (a+b x)}\right]-6 i b c d \operatorname{PolyLog}\left[2, e^{2 i (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]+3 d^2 \operatorname{PolyLog}\left[3, e^{2 i (a+b x)}\right]-6 b^3 c d e^{i \operatorname{ArcTan}[\operatorname{Tan}[a]]} x^2 \operatorname{Cot}[a] \sqrt{\operatorname{Sec}[a]^2}\Big)$$

Problem 35: Result more than twice size of optimal antiderivative.

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

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

$$-\frac{i (c+d x)^2}{2 d}+\frac{(c+d x) \operatorname{Log}\left[1-e^{2 i (a+b x)}\right]}{b}-\frac{i d \operatorname{PolyLog}\left[2, e^{2 i (a+b x)}\right]}{2 b^2}$$

Result (type 4, 180 leaves):

$$\frac{1}{2} d x^2 \operatorname{Cot}[a]+\frac{c \operatorname{Log}[\operatorname{Sin}[a+b x]]}{b}-\left(d \operatorname{Csc}[a] \operatorname{Sec}[a] \left(b^2 e^{i \operatorname{ArcTan}[\operatorname{Tan}[a]]} x^2+\frac{1}{\sqrt{1+\operatorname{Tan}[a]^2}}\left(i b x (-\pi+2 \operatorname{ArcTan}[\operatorname{Tan}[a]])-\pi \operatorname{Log}\left[1+e^{-2 i b x}\right]-2 (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]]) \operatorname{Log}\left[1-e^{2 i (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]+\pi \operatorname{Log}[\operatorname{Cos}[b x]]+2 \operatorname{ArcTan}[\operatorname{Tan}[a]] \operatorname{Log}[\operatorname{Sin}[b x+\operatorname{ArcTan}[\operatorname{Tan}[a]]]]+i \operatorname{PolyLog}\left[2, e^{2 i (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]\right) \operatorname{Tan}[a]\right)\right) \Big/ \left(2 b^2 \sqrt{\operatorname{Sec}[a]^2 \left(\operatorname{Cos}[a]^2+\operatorname{Sin}[a]^2\right)}\right)$$

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

$$\int (c+d x)^4 \operatorname{Cot}[a+b x] \operatorname{Csc}[a+b x] \, dx$$

Optimal (type 4, 208 leaves, 10 steps):

$$-\frac{8 d (c+d x)^3 \operatorname{ArcTanh}\left[e^{i (a+b x)}\right]}{b^2}-\frac{(c+d x)^4 \operatorname{Csc}[a+b x]}{b}+\frac{12 i d^2 (c+d x)^2 \operatorname{PolyLog}\left[2,-e^{i (a+b x)}\right]}{b^3}-\frac{12 i d^2 (c+d x)^2 \operatorname{PolyLog}\left[2, e^{i (a+b x)}\right]}{b^3}-\frac{24 d^3 (c+d x) \operatorname{PolyLog}\left[3,-e^{i (a+b x)}\right]}{b^4}+\frac{24 d^3 (c+d x) \operatorname{PolyLog}\left[3, e^{i (a+b x)}\right]}{b^4}-\frac{24 i d^4 \operatorname{PolyLog}\left[4,-e^{i (a+b x)}\right]}{b^5}+\frac{24 i d^4 \operatorname{PolyLog}\left[4, e^{i (a+b x)}\right]}{b^5}$$

Result (type 4, 458 leaves):

$$-\frac{1}{b^5}\left(8 b^3 c^3 d \text{ArcTanh}\left[e^{i (a+b x)}\right]+b^4 c^4 \text{Csc}[a+b x]+4 b^4 c^3 d x \text{Csc}[a+b x]+6 b^4 c^2 d^2 x^2 \text{Csc}[a+b x]+4 b^4 c d^3 x^3 \text{Csc}[a+b x]+b^4 d^4 x^4 \text{Csc}[a+b x]-12 b^3 c^2 d^2 x \text{Log}\left[1-e^{i (a+b x)}\right]-12 b^3 c d^3 x^2 \text{Log}\left[1-e^{i (a+b x)}\right]-4 b^3 d^4 x^3 \text{Log}\left[1-e^{i (a+b x)}\right]+12 b^3 c^2 d^2 x \text{Log}\left[1+e^{i (a+b x)}\right]+12 b^3 c d^3 x^2 \text{Log}\left[1+e^{i (a+b x)}\right]+4 b^3 d^4 x^3 \text{Log}\left[1+e^{i (a+b x)}\right]-12 i b^2 d^2 (c+d x)^2 \text{PolyLog}\left[2,-e^{i (a+b x)}\right]+12 i b^2 d^2 (c+d x)^2 \text{PolyLog}\left[2,e^{i (a+b x)}\right]+24 b c d^3 \text{PolyLog}\left[3,-e^{i (a+b x)}\right]+24 b d^4 x \text{PolyLog}\left[3,-e^{i (a+b x)}\right]-24 b c d^3 \text{PolyLog}\left[3,e^{i (a+b x)}\right]-24 b d^4 x \text{PolyLog}\left[3,e^{i (a+b x)}\right]+24 i d^4 \text{PolyLog}\left[4,-e^{i (a+b x)}\right]-24 i d^4 \text{PolyLog}\left[4,e^{i (a+b x)}\right]\right)$$

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

$$\int (c+d x)^2 \text{Cot}[a+b x] \text{Csc}[a+b x] \, dx$$

Optimal (type 4, 90 leaves, 6 steps):

$$-\frac{4 d (c+d x) \text{ArcTanh}\left[e^{i (a+b x)}\right]}{b^2}-\frac{(c+d x)^2 \text{Csc}[a+b x]}{b}+\frac{2 i d^2 \text{PolyLog}\left[2,-e^{i (a+b x)}\right]}{b^3}-\frac{2 i d^2 \text{PolyLog}\left[2,e^{i (a+b x)}\right]}{b^3}$$

Result (type 4, 234 leaves):

$$\frac{1}{2 b^3}\left(-8 b c d \text{ArcTanh}\left[\text{Cos}[a]-\text{Sin}[a] \text{Tan}\left[\frac{b x}{2}\right]\right]-2 b^2 (c+d x)^2 \text{Csc}[a]+4 d^2 \left(2 \text{ArcTan}[\text{Tan}[a]] \text{ArcTanh}\left[\text{Cos}[a]-\text{Sin}[a] \text{Tan}\left[\frac{b x}{2}\right]\right]+\frac{1}{\sqrt{\text{Sec}[a]^2}}\left((b x+\text{ArcTan}[\text{Tan}[a]]) \left(\text{Log}\left[1-e^{i (b x+\text{ArcTan}[\text{Tan}[a]])}\right]-\text{Log}\left[1+e^{i (b x+\text{ArcTan}[\text{Tan}[a]])}\right]\right)+i \text{PolyLog}\left[2,-e^{i (b x+\text{ArcTan}[\text{Tan}[a]])}\right]-i \text{PolyLog}\left[2,e^{i (b x+\text{ArcTan}[\text{Tan}[a]])}\right]\right) \text{Sec}[a]\right)+b^2 (c+d x)^2 \text{Csc}\left[\frac{a}{2}\right] \text{Csc}\left[\frac{1}{2} (a+b x)\right] \text{Sin}\left[\frac{b x}{2}\right]-b^2 (c+d x)^2 \text{Sec}\left[\frac{a}{2}\right] \text{Sec}\left[\frac{1}{2} (a+b x)\right] \text{Sin}\left[\frac{b x}{2}\right]\right)$$

Problem 42: Result more than twice size of optimal antiderivative.

$$\int (c+d x) \text{Cot}[a+b x] \text{Csc}[a+b x] \, dx$$

Optimal (type 3, 30 leaves, 2 steps):

$$-\frac{d \text{ArcTanh}[\text{Cos}[a+b x]]}{b^2}-\frac{(c+d x) \text{Csc}[a+b x]}{b}$$

Result (type 3, 131 leaves):

$$-\frac{d\,x\,\mathrm{Csc}[a]}{b}-\frac{c\,\mathrm{Csc}[a+b\,x]}{b}-\frac{d\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{a}{2}+\frac{b\,x}{2}\right]\right]}{b^2}+\frac{d\,\mathrm{Log}\left[\mathrm{Sin}\left[\frac{a}{2}+\frac{b\,x}{2}\right]\right]}{b^2}+\frac{d\,x\,\mathrm{Csc}\left[\frac{a}{2}\right]\,\mathrm{Csc}\left[\frac{a}{2}+\frac{b\,x}{2}\right]\,\mathrm{Sin}\left[\frac{b\,x}{2}\right]}{2\,b}-\frac{d\,x\,\mathrm{Sec}\left[\frac{a}{2}\right]\,\mathrm{Sec}\left[\frac{a}{2}+\frac{b\,x}{2}\right]\,\mathrm{Sin}\left[\frac{b\,x}{2}\right]}{2\,b}$$

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

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

Optimal (type 4, 137 leaves, 7 steps):

$$-\frac{2\,i\,d\,(c+d\,x)^3}{b^2}-\frac{2\,d\,(c+d\,x)^3\,\mathrm{Cot}[a+b\,x]}{b^2}-\frac{(c+d\,x)^4\,\mathrm{Csc}[a+b\,x]^2}{2\,b}+\frac{6\,d^2\,(c+d\,x)^2\,\mathrm{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]}{b^3}-\frac{6\,i\,d^3\,(c+d\,x)\,\mathrm{PolyLog}\left[2,\,e^{2\,i\,(a+b\,x)}\right]}{b^4}+\frac{3\,d^4\,\mathrm{PolyLog}\left[3,\,e^{2\,i\,(a+b\,x)}\right]}{b^5}$$

Result (type 4, 412 leaves):

$$-\frac{(c+d\,x)^4\,\mathrm{Csc}[a+b\,x]^2}{2\,b}-\frac{1}{2\,b^5}d^4\,e^{-i\,a}\,\mathrm{Csc}[a]\,\Big(2\,b^2\,x^2\,\left(2\,b\,e^{2\,i\,a}\,x+3\,i\,\left(-1+e^{2\,i\,a}\right)\,\mathrm{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]\right)+6\,b\,\left(-1+e^{2\,i\,a}\right)\,x\,\mathrm{PolyLog}\left[2,\,e^{2\,i\,(a+b\,x)}\right]+3\,i\,\left(-1+e^{2\,i\,a}\right)\,\mathrm{PolyLog}\left[3,\,e^{2\,i\,(a+b\,x)}\right]\Big)+\left(6\,c^2\,d^2\,\mathrm{Csc}[a]\,\left(-b\,x\,\mathrm{Cos}[a]+\mathrm{Log}[\mathrm{Cos}[b\,x]\,\mathrm{Sin}[a]+\mathrm{Cos}[a]\,\mathrm{Sin}[b\,x]]\,\mathrm{Sin}[a]\right)\right)\Big/\left(b^3\,\left(\mathrm{Cos}[a]^2+\mathrm{Sin}[a]^2\right)\right)+\frac{1}{b^2}2\,\mathrm{Csc}[a]\,\mathrm{Csc}[a+b\,x]\,\left(c^3\,d\,\mathrm{Sin}[b\,x]+3\,c^2\,d^2\,x\,\mathrm{Sin}[b\,x]+3\,c\,d^3\,x^2\,\mathrm{Sin}[b\,x]+d^4\,x^3\,\mathrm{Sin}[b\,x]\right)-\left(6\,c\,d^3\,\mathrm{Csc}[a]\,\mathrm{Sec}[a]\,\left(b^2\,e^{i\,\mathrm{ArcTan}[\mathrm{Tan}[a]]}\,x^2+\frac{1}{\sqrt{1+\mathrm{Tan}[a]^2}}\left(i\,b\,x\,\left(-\pi+2\,\mathrm{ArcTan}[\mathrm{Tan}[a]]\right)-\pi\,\mathrm{Log}\left[1+e^{-2\,i\,b\,x}\right]-2\,\left(b\,x+\mathrm{ArcTan}[\mathrm{Tan}[a]]\right)\,\mathrm{Log}\left[1-e^{2\,i\,(b\,x+\mathrm{ArcTan}[\mathrm{Tan}[a]])}\right]+\pi\,\mathrm{Log}[\mathrm{Cos}[b\,x]]+2\,\mathrm{ArcTan}[\mathrm{Tan}[a]]\,\mathrm{Log}[\mathrm{Sin}[b\,x+\mathrm{ArcTan}[\mathrm{Tan}[a]]]]+i\,\mathrm{PolyLog}\left[2,\,e^{2\,i\,(b\,x+\mathrm{ArcTan}[\mathrm{Tan}[a]])}\right]\right)\,\mathrm{Tan}[a]\right)\right)\Big/\left(b^4\,\sqrt{\mathrm{Sec}[a]^2\,\left(\mathrm{Cos}[a]^2+\mathrm{Sin}[a]^2\right)}\right)$$

Problem 47: Result more than twice size of optimal antiderivative.

$$\int (c+d\,x)^3\,\mathrm{Cot}[a+b\,x]\,\mathrm{Csc}[a+b\,x]^2\,dx$$

Optimal (type 4, 115 leaves, 6 steps):

$$-\frac{3\,i\,d\,(c+d\,x)^2}{2\,b^2}-\frac{3\,d\,(c+d\,x)^2\,\text{Cot}[a+b\,x]}{2\,b^2}-\frac{(c+d\,x)^3\,\text{Csc}[a+b\,x]^2}{2\,b}+\frac{3\,d^2\,(c+d\,x)\,\text{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]}{b^3}-\frac{3\,i\,d^3\,\text{PolyLog}\left[2,\,e^{2\,i\,(a+b\,x)}\right]}{2\,b^4}$$

Result (type 4, 277 leaves):

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

Problem 48: Result unnecessarily involves imaginary or complex numbers.

$$\int (c+d\,x)^2\,\text{Cot}[a+b\,x]\,\text{Csc}[a+b\,x]^2\,dx$$

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

$$-\frac{d\,(c+d\,x)\,\text{Cot}[a+b\,x]}{b^2}-\frac{(c+d\,x)^2\,\text{Csc}[a+b\,x]^2}{2\,b}+\frac{d^2\,\text{Log}[\text{Sin}[a+b\,x]]}{b^3}$$

Result (type 3, 94 leaves):

$$\frac{1}{2\,b^3}\left(2\,i\,b\,d^2\,x-2\,i\,d^2\,\text{ArcTan}[\text{Tan}[a+b\,x]]-2\,b\,d^2\,x\,\text{Cot}[a]-b^2\,(c+d\,x)^2\,\text{Csc}[a+b\,x]^2+d^2\,\text{Log}\left[\text{Sin}[a+b\,x]^2\right]+2\,b\,d\,(c+d\,x)\,\text{Csc}[a]\,\text{Csc}[a+b\,x]\,\text{Sin}[b\,x]\right)$$

Problem 98: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 333 leaves, 17 steps):

$$-\frac{2 (c+d x)^4 \text{ArcTanh}\left[e^{i (a+b x)}\right]}{b}+\frac{24 d^4 \text{Cos}[a+b x]}{b^5}-\frac{12 d^2 (c+d x)^2 \text{Cos}[a+b x]}{b^3}+\frac{(c+d x)^4 \text{Cos}[a+b x]}{b}+\frac{4 i d (c+d x)^3 \text{PolyLog}\left[2,-e^{i (a+b x)}\right]}{b^2}-\frac{4 i d (c+d x)^3 \text{PolyLog}\left[2,e^{i (a+b x)}\right]}{b^2}-\frac{12 d^2 (c+d x)^2 \text{PolyLog}\left[3,-e^{i (a+b x)}\right]}{b^3}+\frac{12 d^2 (c+d x)^2 \text{PolyLog}\left[3,e^{i (a+b x)}\right]}{b^3}-\frac{24 i d^3 (c+d x) \text{PolyLog}\left[4,-e^{i (a+b x)}\right]}{b^4}+\frac{24 i d^3 (c+d x) \text{PolyLog}\left[4,e^{i (a+b x)}\right]}{b^4}+\frac{24 d^4 \text{PolyLog}\left[5,-e^{i (a+b x)}\right]}{b^5}-\frac{24 d^4 \text{PolyLog}\left[5,e^{i (a+b x)}\right]}{b^5}+\frac{24 d^3 (c+d x) \text{Sin}[a+b x]}{b^4}-\frac{4 d (c+d x)^3 \text{Sin}[a+b x]}{b^2}$$

Result (type 4, 812 leaves):

$$\frac{1}{b^5}\Big(-2 b^4 c^4 \text{ArcTanh}\left[e^{i (a+b x)}\right]+b^4 c^4 \text{Cos}[a+b x]-12 b^2 c^2 d^2 \text{Cos}[a+b x]+24 d^4 \text{Cos}[a+b x]+4 b^4 c^3 d x \text{Cos}[a+b x]-24 b^2 c d^3 x \text{Cos}[a+b x]+6 b^4 c^2 d^2 x^2 \text{Cos}[a+b x]-12 b^2 d^4 x^2 \text{Cos}[a+b x]+4 b^4 c d^3 x^3 \text{Cos}[a+b x]+b^4 d^4 x^4 \text{Cos}[a+b x]+4 b^4 c^3 d x \text{Log}\left[1-e^{i (a+b x)}\right]+6 b^4 c^2 d^2 x^2 \text{Log}\left[1-e^{i (a+b x)}\right]+4 b^4 c d^3 x^3 \text{Log}\left[1-e^{i (a+b x)}\right]+b^4 d^4 x^4 \text{Log}\left[1-e^{i (a+b x)}\right]-4 b^4 c^3 d x \text{Log}\left[1+e^{i (a+b x)}\right]-6 b^4 c^2 d^2 x^2 \text{Log}\left[1+e^{i (a+b x)}\right]-4 b^4 c d^3 x^3 \text{Log}\left[1+e^{i (a+b x)}\right]-b^4 d^4 x^4 \text{Log}\left[1+e^{i (a+b x)}\right]+4 i b^3 d (c+d x)^3 \text{PolyLog}\left[2,-e^{i (a+b x)}\right]-4 i b^3 d (c+d x)^3 \text{PolyLog}\left[2,e^{i (a+b x)}\right]-12 b^2 c^2 d^2 \text{PolyLog}\left[3,-e^{i (a+b x)}\right]-24 b^2 c d^3 x \text{PolyLog}\left[3,-e^{i (a+b x)}\right]-12 b^2 d^4 x^2 \text{PolyLog}\left[3,-e^{i (a+b x)}\right]+12 b^2 c^2 d^2 \text{PolyLog}\left[3,e^{i (a+b x)}\right]+24 b^2 c d^3 x \text{PolyLog}\left[3,e^{i (a+b x)}\right]+12 b^2 d^4 x^2 \text{PolyLog}\left[3,e^{i (a+b x)}\right]-24 i b c d^3 \text{PolyLog}\left[4,-e^{i (a+b x)}\right]-24 i b d^4 x \text{PolyLog}\left[4,-e^{i (a+b x)}\right]+24 i b c d^3 \text{PolyLog}\left[4,e^{i (a+b x)}\right]+24 i b d^4 x \text{PolyLog}\left[4,e^{i (a+b x)}\right]+24 d^4 \text{PolyLog}\left[5,-e^{i (a+b x)}\right]-24 d^4 \text{PolyLog}\left[5,e^{i (a+b x)}\right]-4 b^3 c^3 d \text{Sin}[a+b x]+24 b c d^3 \text{Sin}[a+b x]-12 b^3 c^2 d^2 x \text{Sin}[a+b x]+24 b d^4 x \text{Sin}[a+b x]-12 b^3 c d^3 x^2 \text{Sin}[a+b x]-4 b^3 d^4 x^3 \text{Sin}[a+b x]\Big)$$

Problem 99: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 254 leaves, 14 steps):

$$-\frac{2(c+dx)^3\,\text{ArcTanh}\left[e^{i(a+bx)}\right]}{b}-\frac{6d^2(c+dx)\,\text{Cos}[a+bx]}{b^3}+\frac{(c+dx)^3\,\text{Cos}[a+bx]}{b}+\frac{3\,i\,d\,(c+dx)^2\,\text{PolyLog}\left[2,-e^{i(a+bx)}\right]}{b^2}-\frac{3\,i\,d\,(c+dx)^2\,\text{PolyLog}\left[2,e^{i(a+bx)}\right]}{b^2}-\frac{6d^2(c+dx)\,\text{PolyLog}\left[3,-e^{i(a+bx)}\right]}{b^3}+\frac{6d^2(c+dx)\,\text{PolyLog}\left[3,e^{i(a+bx)}\right]}{b^3}-\frac{6\,i\,d^3\,\text{PolyLog}\left[4,-e^{i(a+bx)}\right]}{b^4}+\frac{6\,i\,d^3\,\text{PolyLog}\left[4,e^{i(a+bx)}\right]}{b^4}+\frac{6d^3\,\text{Sin}[a+bx]}{b^4}-\frac{3d(c+dx)^2\,\text{Sin}[a+bx]}{b^2}$$

Result (type 4, 512 leaves):

$$\frac{1}{b^4}\Big(-2b^3c^3\,\text{ArcTanh}\left[e^{i(a+bx)}\right]+b^3c^3\,\text{Cos}[a+bx]-6bcd^2\,\text{Cos}[a+bx]+3b^3c^2dx\,\text{Cos}[a+bx]-6bd^3x\,\text{Cos}[a+bx]+3b^3cd^2x^2\,\text{Cos}[a+bx]+b^3d^3x^3\,\text{Cos}[a+bx]+3b^3c^2dx\,\text{Log}\left[1-e^{i(a+bx)}\right]+3b^3cd^2x^2\,\text{Log}\left[1-e^{i(a+bx)}\right]+b^3d^3x^3\,\text{Log}\left[1-e^{i(a+bx)}\right]-3b^3c^2dx\,\text{Log}\left[1+e^{i(a+bx)}\right]-3b^3cd^2x^2\,\text{Log}\left[1+e^{i(a+bx)}\right]-b^3d^3x^3\,\text{Log}\left[1+e^{i(a+bx)}\right]+3\,i\,b^2d(c+dx)^2\,\text{PolyLog}\left[2,-e^{i(a+bx)}\right]-3\,i\,b^2d(c+dx)^2\,\text{PolyLog}\left[2,e^{i(a+bx)}\right]-6bcd^2\,\text{PolyLog}\left[3,-e^{i(a+bx)}\right]-6bd^3x\,\text{PolyLog}\left[3,-e^{i(a+bx)}\right]+6bcd^2\,\text{PolyLog}\left[3,e^{i(a+bx)}\right]+6bd^3x\,\text{PolyLog}\left[3,e^{i(a+bx)}\right]-6\,i\,d^3\,\text{PolyLog}\left[4,-e^{i(a+bx)}\right]+6\,i\,d^3\,\text{PolyLog}\left[4,e^{i(a+bx)}\right]-3b^2c^2d\,\text{Sin}[a+bx]+6d^3\,\text{Sin}[a+bx]-6b^2cd^2x\,\text{Sin}[a+bx]-3b^2d^3x^2\,\text{Sin}[a+bx]\Big)$$

Problem 105: Result more than twice size of optimal antiderivative.

$$\int(c+dx)^4\,\text{Cot}[a+bx]^2\,dx$$

Optimal (type 4, 155 leaves, 8 steps):

$$-\frac{i(c+dx)^4}{b}-\frac{(c+dx)^5}{5d}-\frac{(c+dx)^4\,\text{Cot}[a+bx]}{b}+\frac{4d(c+dx)^3\,\text{Log}\left[1-e^{2i(a+bx)}\right]}{b^2}-\frac{6\,i\,d^2(c+dx)^2\,\text{PolyLog}\left[2,e^{2i(a+bx)}\right]}{b^3}+\frac{6d^3(c+dx)\,\text{PolyLog}\left[3,e^{2i(a+bx)}\right]}{b^4}+\frac{3\,i\,d^4\,\text{PolyLog}\left[4,e^{2i(a+bx)}\right]}{b^5}$$

Result (type 4, 592 leaves):

$$-\frac{1}{5}x\left(5c^4+10c^3dx+10c^2d^2x^2+5cd^3x^3+d^4x^4\right)-\frac{1}{b^4}$$
$$cd^3e^{-ia}\text{Csc}[a]\left(2b^2x^2\left(2be^{2ia}x+3i\left(-1+e^{2ia}\right)\text{Log}\left[1-e^{2i(a+bx)}\right]\right)+\right.$$
$$\left.6b\left(-1+e^{2ia}\right)x\,\text{PolyLog}\left[2,e^{2i(a+bx)}\right]+3i\left(-1+e^{2ia}\right)\text{PolyLog}\left[3,e^{2i(a+bx)}\right]\right)-\frac{1}{b}$$
$$d^4e^{ia}\text{Csc}[a]\left(x^4+\left(-1+e^{-2ia}\right)x^4+\frac{1}{2b^4}e^{-2ia}\left(-1+e^{2ia}\right)\left(2b^4x^4+4ib^3x^3\text{Log}\left[1-e^{2i(a+bx)}\right]+\right.\right.$$
$$\left.\left.6b^2x^2\text{PolyLog}\left[2,e^{2i(a+bx)}\right]+6ibx\,\text{PolyLog}\left[3,e^{2i(a+bx)}\right]-3\text{PolyLog}\left[4,e^{2i(a+bx)}\right]\right)\right)+$$
$$\left(4c^3d\,\text{Csc}[a]\left(-bx\text{Cos}[a]+\text{Log}[\text{Cos}[bx]\text{Sin}[a]+\text{Cos}[a]\text{Sin}[bx]]\text{Sin}[a]\right)\right)/$$
$$\left(b^2\left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)+\frac{1}{b}\text{Csc}[a]\text{Csc}[a+bx]$$
$$\left(c^4\text{Sin}[bx]+4c^3dx\text{Sin}[bx]+6c^2d^2x^2\text{Sin}[bx]+4cd^3x^3\text{Sin}[bx]+d^4x^4\text{Sin}[bx]\right)-$$
$$\left(6c^2d^2\text{Csc}[a]\text{Sec}[a]\left(b^2e^{i\text{ArcTan}[\text{Tan}[a]]}x^2+\frac{1}{\sqrt{1+\text{Tan}[a]^2}}\left(ibx\left(-\pi+2\text{ArcTan}[\text{Tan}[a]]\right)-\right.\right.\right.$$
$$\pi\text{Log}\left[1+e^{-2ibx}\right]-2\left(bx+\text{ArcTan}[\text{Tan}[a]]\right)\text{Log}\left[1-e^{2i(bx+\text{ArcTan}[\text{Tan}[a]])}\right]+$$
$$\pi\text{Log}[\text{Cos}[bx]]+2\text{ArcTan}[\text{Tan}[a]]\text{Log}[\text{Sin}[bx+\text{ArcTan}[\text{Tan}[a]]]]+$$
$$\left.\left.\left.i\,\text{PolyLog}\left[2,e^{2i(bx+\text{ArcTan}[\text{Tan}[a]])}\right]\right)\text{Tan}[a]\right)\right)/\left(b^3\sqrt{\text{Sec}[a]^2\left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)}\right)$$

Problem 106: Result more than twice size of optimal antiderivative.

$$\int(c+dx)^3\text{Cot}[a+bx]^2\,dx$$

Optimal (type 4, 127 leaves, 7 steps):

$$-\frac{i(c+dx)^3}{b}-\frac{(c+dx)^4}{4d}-\frac{(c+dx)^3\text{Cot}[a+bx]}{b}+\frac{3d(c+dx)^2\text{Log}\left[1-e^{2i(a+bx)}\right]}{b^2}-$$
$$\frac{3id^2(c+dx)\text{PolyLog}\left[2,e^{2i(a+bx)}\right]}{b^3}+\frac{3d^3\text{PolyLog}\left[3,e^{2i(a+bx)}\right]}{2b^4}$$

Result (type 4, 418 leaves):

$$-\frac{1}{4} x \left(4 c^3+6 c^2 d x+4 c d^2 x^2+d^3 x^3\right)-\frac{1}{4 b^4}$$
$$d^3 e^{-i a} \text{Csc}[a] \left(2 b^2 x^2 \left(2 b e^{2 i a} x+3 i \left(-1+e^{2 i a}\right) \text{Log}\left[1-e^{2 i (a+b x)}\right]\right)+6 b \left(-1+e^{2 i a}\right) x \,\text{PolyLog}\left[2, e^{2 i (a+b x)}\right]+3 i \left(-1+e^{2 i a}\right) \text{PolyLog}\left[3, e^{2 i (a+b x)}\right]\right)+$$
$$\left(3 c^2 d \,\text{Csc}[a] \left(-b x \,\text{Cos}[a]+\text{Log}[\text{Cos}[b x] \text{Sin}[a]+\text{Cos}[a] \text{Sin}[b x]] \text{Sin}[a]\right)\right) \Big/ \left(b^2 \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)+\frac{1}{b}$$
$$\text{Csc}[a] \,\text{Csc}[a+b x] \left(c^3 \text{Sin}[b x]+3 c^2 d x \,\text{Sin}[b x]+3 c d^2 x^2 \text{Sin}[b x]+d^3 x^3 \text{Sin}[b x]\right)-$$
$$\left(3 c d^2 \,\text{Csc}[a] \,\text{Sec}[a] \left(b^2 e^{i \,\text{ArcTan}[\text{Tan}[a]]} x^2+\frac{1}{\sqrt{1+\text{Tan}[a]^2}} \left(i b x \left(-\pi+2 \,\text{ArcTan}[\text{Tan}[a]]\right)-\pi \,\text{Log}\left[1+e^{-2 i b x}\right]-\right.\right.\right.$$
$$2 \left(b x+\text{ArcTan}[\text{Tan}[a]]\right) \text{Log}\left[1-e^{2 i (b x+\text{ArcTan}[\text{Tan}[a]])}\right]+\pi \,\text{Log}[\text{Cos}[b x]]+$$
$$\left.2 \,\text{ArcTan}[\text{Tan}[a]] \,\text{Log}[\text{Sin}[b x+\text{ArcTan}[\text{Tan}[a]]]]+i \,\text{PolyLog}\left[2, e^{2 i (b x+\text{ArcTan}[\text{Tan}[a]])}\right]\right)$$
$$\left.\left.\text{Tan}[a]\right)\right) \Big/ \left(b^3 \sqrt{\text{Sec}[a]^2 \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)}\right)$$

Problem 107: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 97 leaves, 6 steps):

$$-\frac{i (c+d x)^2}{b}-\frac{(c+d x)^3}{3 d}-\frac{(c+d x)^2 \,\text{Cot}[a+b x]}{b}+\frac{2 d (c+d x) \,\text{Log}\left[1-e^{2 i (a+b x)}\right]}{b^2}-\frac{i d^2 \,\text{PolyLog}\left[2, e^{2 i (a+b x)}\right]}{b^3}$$

Result (type 4, 268 leaves):

$$-\frac{1}{3}x\left(3c^2+3cdx+d^2x^2\right)+$$
$$\left(2cd\,\text{Csc}[a]\left(-bx\,\text{Cos}[a]+\text{Log}[\text{Cos}[bx]\,\text{Sin}[a]+\text{Cos}[a]\,\text{Sin}[bx]]\,\text{Sin}[a]\right)\right)\Big/\left(b^2\left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)+$$
$$\frac{\text{Csc}[a]\,\text{Csc}[a+bx]\left(c^2\,\text{Sin}[bx]+2cdx\,\text{Sin}[bx]+d^2x^2\,\text{Sin}[bx]\right)}{b}-\Bigg(d^2\,\text{Csc}[a]\,\text{Sec}[a]$$
$$\Bigg(b^2\,e^{i\,\text{ArcTan}[\text{Tan}[a]]}x^2+\frac{1}{\sqrt{1+\text{Tan}[a]^2}}\Big(i\,bx\left(-\pi+2\,\text{ArcTan}[\text{Tan}[a]]\right)-\pi\,\text{Log}\left[1+e^{-2ibx}\right]-$$
$$2\left(bx+\text{ArcTan}[\text{Tan}[a]]\right)\text{Log}\left[1-e^{2i(bx+\text{ArcTan}[\text{Tan}[a]])}\right]+\pi\,\text{Log}[\text{Cos}[bx]]+$$
$$2\,\text{ArcTan}[\text{Tan}[a]]\,\text{Log}[\text{Sin}[bx+\text{ArcTan}[\text{Tan}[a]]]]+i\,\text{PolyLog}\left[2,e^{2i(bx+\text{ArcTan}[\text{Tan}[a]])}\right]\Big)$$
$$\text{Tan}[a]\Bigg)\Bigg)\Big/\left(b^3\sqrt{\text{Sec}[a]^2\left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)}\right)$$

Problem 112: Result more than twice size of optimal antiderivative.

$$\int (c+dx)^4\,\text{Cot}[a+bx]^2\,\text{Csc}[a+bx]\,dx$$

Optimal (type 4, 416 leaves, 31 steps):

$$-\frac{12d^2(c+dx)^2\,\text{ArcTanh}\left[e^{i(a+bx)}\right]}{b^3}+\frac{(c+dx)^4\,\text{ArcTanh}\left[e^{i(a+bx)}\right]}{b}-\frac{2d(c+dx)^3\,\text{Csc}[a+bx]}{b^2}-$$
$$\frac{(c+dx)^4\,\text{Cot}[a+bx]\,\text{Csc}[a+bx]}{2b}+\frac{12id^3(c+dx)\,\text{PolyLog}\left[2,-e^{i(a+bx)}\right]}{b^4}-$$
$$\frac{2id(c+dx)^3\,\text{PolyLog}\left[2,-e^{i(a+bx)}\right]}{b^2}-\frac{12id^3(c+dx)\,\text{PolyLog}\left[2,e^{i(a+bx)}\right]}{b^4}+$$
$$\frac{2id(c+dx)^3\,\text{PolyLog}\left[2,e^{i(a+bx)}\right]}{b^2}-\frac{12d^4\,\text{PolyLog}\left[3,-e^{i(a+bx)}\right]}{b^5}+$$
$$\frac{6d^2(c+dx)^2\,\text{PolyLog}\left[3,-e^{i(a+bx)}\right]}{b^3}+\frac{12d^4\,\text{PolyLog}\left[3,e^{i(a+bx)}\right]}{b^5}-$$
$$\frac{6d^2(c+dx)^2\,\text{PolyLog}\left[3,e^{i(a+bx)}\right]}{b^3}+\frac{12id^3(c+dx)\,\text{PolyLog}\left[4,-e^{i(a+bx)}\right]}{b^4}-$$
$$\frac{12id^3(c+dx)\,\text{PolyLog}\left[4,e^{i(a+bx)}\right]}{b^4}-\frac{12d^4\,\text{PolyLog}\left[5,-e^{i(a+bx)}\right]}{b^5}+\frac{12d^4\,\text{PolyLog}\left[5,e^{i(a+bx)}\right]}{b^5}$$

Result (type 4, 966 leaves):

$$\frac{1}{2 b^5} \left(-b^4 c^4 \operatorname{Log}\left[1-e^{i (a+b x)}\right]+12 b^2 c^2 d^2 \operatorname{Log}\left[1-e^{i (a+b x)}\right]-4 b^4 c^3 d x \operatorname{Log}\left[1-e^{i (a+b x)}\right]+ 24 b^2 c d^3 x \operatorname{Log}\left[1-e^{i (a+b x)}\right]-6 b^4 c^2 d^2 x^2 \operatorname{Log}\left[1-e^{i (a+b x)}\right]+12 b^2 d^4 x^2 \operatorname{Log}\left[1-e^{i (a+b x)}\right]- 4 b^4 c d^3 x^3 \operatorname{Log}\left[1-e^{i (a+b x)}\right]-b^4 d^4 x^4 \operatorname{Log}\left[1-e^{i (a+b x)}\right]+b^4 c^4 \operatorname{Log}\left[1+e^{i (a+b x)}\right]- 12 b^2 c^2 d^2 \operatorname{Log}\left[1+e^{i (a+b x)}\right]+4 b^4 c^3 d x \operatorname{Log}\left[1+e^{i (a+b x)}\right]-24 b^2 c d^3 x \operatorname{Log}\left[1+e^{i (a+b x)}\right]+ 6 b^4 c^2 d^2 x^2 \operatorname{Log}\left[1+e^{i (a+b x)}\right]-12 b^2 d^4 x^2 \operatorname{Log}\left[1+e^{i (a+b x)}\right]+4 b^4 c d^3 x^3 \operatorname{Log}\left[1+e^{i (a+b x)}\right]+ b^4 d^4 x^4 \operatorname{Log}\left[1+e^{i (a+b x)}\right]-4 i b d (c+d x)\left(-6 d^2+b^2 (c+d x)^2\right) \operatorname{PolyLog}\left[2,-e^{i (a+b x)}\right]+ 4 i b d (c+d x)\left(-6 d^2+b^2 (c+d x)^2\right) \operatorname{PolyLog}\left[2, e^{i (a+b x)}\right]+12 b^2 c^2 d^2 \operatorname{PolyLog}\left[3,-e^{i (a+b x)}\right]- 24 d^4 \operatorname{PolyLog}\left[3,-e^{i (a+b x)}\right]+24 b^2 c d^3 x \operatorname{PolyLog}\left[3,-e^{i (a+b x)}\right]+ 12 b^2 d^4 x^2 \operatorname{PolyLog}\left[3,-e^{i (a+b x)}\right]-12 b^2 c^2 d^2 \operatorname{PolyLog}\left[3, e^{i (a+b x)}\right]+ 24 d^4 \operatorname{PolyLog}\left[3, e^{i (a+b x)}\right]-24 b^2 c d^3 x \operatorname{PolyLog}\left[3, e^{i (a+b x)}\right]- 12 b^2 d^4 x^2 \operatorname{PolyLog}\left[3, e^{i (a+b x)}\right]+24 i b c d^3 \operatorname{PolyLog}\left[4,-e^{i (a+b x)}\right]+ 24 i b d^4 x \operatorname{PolyLog}\left[4,-e^{i (a+b x)}\right]-24 i b c d^3 \operatorname{PolyLog}\left[4, e^{i (a+b x)}\right]- 24 i b d^4 x \operatorname{PolyLog}\left[4, e^{i (a+b x)}\right]-24 d^4 \operatorname{PolyLog}\left[5,-e^{i (a+b x)}\right]+24 d^4 \operatorname{PolyLog}\left[5, e^{i (a+b x)}\right]\right)-$$

$$\frac{1}{2 b^2} \operatorname{Csc}[a+b x]^2 \left(b c^4 \operatorname{Cos}[a+b x]+4 b c^3 d x \operatorname{Cos}[a+b x]+6 b c^2 d^2 x^2 \operatorname{Cos}[a+b x]+ 4 b c d^3 x^3 \operatorname{Cos}[a+b x]+b d^4 x^4 \operatorname{Cos}[a+b x]+4 c^3 d \operatorname{Sin}[a+b x]+ 12 c^2 d^2 x \operatorname{Sin}[a+b x]+12 c d^3 x^2 \operatorname{Sin}[a+b x]+4 d^4 x^3 \operatorname{Sin}[a+b x]\right)$$

Problem 114: Result more than twice size of optimal antiderivative.

$$\int (c+d x)^2 \operatorname{Cot}[a+b x]^2 \operatorname{Csc}[a+b x] \, dx$$

Optimal (type 4, 179 leaves, 17 steps):

$$\frac{(c+d x)^2 \operatorname{ArcTanh}\left[e^{i (a+b x)}\right]}{b}-\frac{d^2 \operatorname{ArcTanh}[\operatorname{Cos}[a+b x]]}{b^3}-\frac{d (c+d x) \operatorname{Csc}[a+b x]}{b^2}- \frac{(c+d x)^2 \operatorname{Cot}[a+b x] \operatorname{Csc}[a+b x]}{2 b}-\frac{i d (c+d x) \operatorname{PolyLog}\left[2,-e^{i (a+b x)}\right]}{b^2}+ \frac{i d (c+d x) \operatorname{PolyLog}\left[2, e^{i (a+b x)}\right]}{b^2}+\frac{d^2 \operatorname{PolyLog}\left[3,-e^{i (a+b x)}\right]}{b^3}-\frac{d^2 \operatorname{PolyLog}\left[3, e^{i (a+b x)}\right]}{b^3}$$

Result (type 4, 471 leaves):

$$-\frac{d\,(c+d\,x)\,\mathrm{Csc}[a]}{b^2}+\frac{\left(-c^2-2\,c\,d\,x-d^2\,x^2\right)\,\mathrm{Csc}\left[\frac{a}{2}+\frac{b\,x}{2}\right]^2}{8\,b}+$$

$$\frac{1}{2\,b^3}\left(-b^2\,c^2\,\mathrm{Log}\left[1-e^{i\,(a+b\,x)}\right]+2\,d^2\,\mathrm{Log}\left[1-e^{i\,(a+b\,x)}\right]-2\,b^2\,c\,d\,x\,\mathrm{Log}\left[1-e^{i\,(a+b\,x)}\right]-\right.$$
$$b^2\,d^2\,x^2\,\mathrm{Log}\left[1-e^{i\,(a+b\,x)}\right]+b^2\,c^2\,\mathrm{Log}\left[1+e^{i\,(a+b\,x)}\right]-2\,d^2\,\mathrm{Log}\left[1+e^{i\,(a+b\,x)}\right]+$$
$$2\,b^2\,c\,d\,x\,\mathrm{Log}\left[1+e^{i\,(a+b\,x)}\right]+b^2\,d^2\,x^2\,\mathrm{Log}\left[1+e^{i\,(a+b\,x)}\right]-2\,i\,b\,d\,(c+d\,x)\,\mathrm{PolyLog}\left[2,\,-e^{i\,(a+b\,x)}\right]+$$
$$\left.2\,i\,b\,d\,(c+d\,x)\,\mathrm{PolyLog}\left[2,\,e^{i\,(a+b\,x)}\right]+2\,d^2\,\mathrm{PolyLog}\left[3,\,-e^{i\,(a+b\,x)}\right]-2\,d^2\,\mathrm{PolyLog}\left[3,\,e^{i\,(a+b\,x)}\right]\right)+$$

$$\frac{\left(c^2+2\,c\,d\,x+d^2\,x^2\right)\,\mathrm{Sec}\left[\frac{a}{2}+\frac{b\,x}{2}\right]^2}{8\,b}+\frac{\mathrm{Sec}\left[\frac{a}{2}\right]\,\mathrm{Sec}\left[\frac{a}{2}+\frac{b\,x}{2}\right]\,\left(-c\,d\,\mathrm{Sin}\left[\frac{b\,x}{2}\right]-d^2\,x\,\mathrm{Sin}\left[\frac{b\,x}{2}\right]\right)}{2\,b^2}+$$
$$\frac{\mathrm{Csc}\left[\frac{a}{2}\right]\,\mathrm{Csc}\left[\frac{a}{2}+\frac{b\,x}{2}\right]\,\left(c\,d\,\mathrm{Sin}\left[\frac{b\,x}{2}\right]+d^2\,x\,\mathrm{Sin}\left[\frac{b\,x}{2}\right]\right)}{2\,b^2}$$

Problem 115: Result more than twice size of optimal antiderivative.

$$\int (c+d\,x)\,\mathrm{Cot}[a+b\,x]^2\,\mathrm{Csc}[a+b\,x]\,dx$$

Optimal (type 4, 108 leaves, 12 steps):

$$\frac{(c+d\,x)\,\mathrm{ArcTanh}\left[e^{i\,(a+b\,x)}\right]}{b}-\frac{d\,\mathrm{Csc}[a+b\,x]}{2\,b^2}-$$
$$\frac{(c+d\,x)\,\mathrm{Cot}[a+b\,x]\,\mathrm{Csc}[a+b\,x]}{2\,b}-\frac{i\,d\,\mathrm{PolyLog}\left[2,\,-e^{i\,(a+b\,x)}\right]}{2\,b^2}+\frac{i\,d\,\mathrm{PolyLog}\left[2,\,e^{i\,(a+b\,x)}\right]}{2\,b^2}$$

Result (type 4, 260 leaves):

$$-\frac{d\,\mathrm{Cot}\left[\frac{1}{2}\,(a+b\,x)\right]}{4\,b^2}-\frac{c\,\mathrm{Csc}\left[\frac{1}{2}\,(a+b\,x)\right]^2}{8\,b}-\frac{d\,x\,\mathrm{Csc}\left[\frac{1}{2}\,(a+b\,x)\right]^2}{8\,b}+$$
$$\frac{c\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}\,(a+b\,x)\right]\right]}{2\,b}-\frac{c\,\mathrm{Log}\left[\mathrm{Sin}\left[\frac{1}{2}\,(a+b\,x)\right]\right]}{2\,b}+\frac{a\,d\,\mathrm{Log}\left[\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right]}{2\,b^2}-$$
$$\frac{1}{2\,b^2}d\,\left((a+b\,x)\,\left(\mathrm{Log}\left[1-e^{i\,(a+b\,x)}\right]-\mathrm{Log}\left[1+e^{i\,(a+b\,x)}\right]\right)+\right.$$
$$\left.i\,\left(\mathrm{PolyLog}\left[2,\,-e^{i\,(a+b\,x)}\right]-\mathrm{PolyLog}\left[2,\,e^{i\,(a+b\,x)}\right]\right)\right)+$$
$$\frac{c\,\mathrm{Sec}\left[\frac{1}{2}\,(a+b\,x)\right]^2}{8\,b}+\frac{d\,x\,\mathrm{Sec}\left[\frac{1}{2}\,(a+b\,x)\right]^2}{8\,b}-\frac{d\,\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]}{4\,b^2}$$

Problem 130: Result more than twice size of optimal antiderivative.

$$\int (c+d\,x)^{5/2}\,\mathrm{Cos}[a+b\,x]^2\,\mathrm{Sin}[a+b\,x]^3\,dx$$

Optimal (type 4, 615 leaves, 26 steps):

$$\frac{15 d^2 \sqrt{c+d x} \operatorname{Cos}[a+b x]}{32 b^3}-\frac{(c+d x)^{5/2} \operatorname{Cos}[a+b x]}{8 b}+\frac{5 d^2 \sqrt{c+d x} \operatorname{Cos}[3 a+3 b x]}{576 b^3}-\frac{(c+d x)^{5/2} \operatorname{Cos}[3 a+3 b x]}{48 b}-\frac{3 d^2 \sqrt{c+d x} \operatorname{Cos}[5 a+5 b x]}{1600 b^3}+\frac{(c+d x)^{5/2} \operatorname{Cos}[5 a+5 b x]}{80 b}-\frac{15 d^{5/2} \sqrt{\frac{\pi}{2}} \operatorname{Cos}\left[a-\frac{b c}{d}\right] \operatorname{FresnelC}\left[\frac{\sqrt{b} \sqrt{\frac{2}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right]}{32 b^{7/2}}-\frac{5 d^{5/2} \sqrt{\frac{\pi}{6}} \operatorname{Cos}\left[3 a-\frac{3 b c}{d}\right] \operatorname{FresnelC}\left[\frac{\sqrt{b} \sqrt{\frac{6}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right]}{576 b^{7/2}}+\frac{3 d^{5/2} \sqrt{\frac{\pi}{10}} \operatorname{Cos}\left[5 a-\frac{5 b c}{d}\right] \operatorname{FresnelC}\left[\frac{\sqrt{b} \sqrt{\frac{10}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right]}{1600 b^{7/2}}-\frac{3 d^{5/2} \sqrt{\frac{\pi}{10}} \operatorname{FresnelS}\left[\frac{\sqrt{b} \sqrt{\frac{10}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right] \operatorname{Sin}\left[5 a-\frac{5 b c}{d}\right]}{1600 b^{7/2}}+\frac{5 d^{5/2} \sqrt{\frac{\pi}{6}} \operatorname{FresnelS}\left[\frac{\sqrt{b} \sqrt{\frac{6}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right] \operatorname{Sin}\left[3 a-\frac{3 b c}{d}\right]}{576 b^{7/2}}+\frac{15 d^{5/2} \sqrt{\frac{\pi}{2}} \operatorname{FresnelS}\left[\frac{\sqrt{b} \sqrt{\frac{2}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right] \operatorname{Sin}\left[a-\frac{b c}{d}\right]}{32 b^{7/2}}+\frac{5 d (c+d x)^{3/2} \operatorname{Sin}[a+b x]}{16 b^2}+\frac{5 d (c+d x)^{3/2} \operatorname{Sin}[3 a+3 b x]}{288 b^2}-\frac{d (c+d x)^{3/2} \operatorname{Sin}[5 a+5 b x]}{160 b^2}$$

Result (type 4, 4921 leaves):

$$\frac{1}{160 \sqrt{5}\, b \sqrt{\frac{b}{d}}} c^2 \left(2 \sqrt{5} \sqrt{\frac{b}{d}} \sqrt{c+d x} \operatorname{Cos}[5 (a+b x)]-\sqrt{2 \pi} \operatorname{Cos}\left[5 a-\frac{5 b c}{d}\right] \operatorname{FresnelC}\left[\sqrt{\frac{b}{d}} \sqrt{\frac{10}{\pi}} \sqrt{c+d x}\right]+\sqrt{2 \pi} \operatorname{FresnelS}\left[\sqrt{\frac{b}{d}} \sqrt{\frac{10}{\pi}} \sqrt{c+d x}\right] \operatorname{Sin}\left[5 a-\frac{5 b c}{d}\right]\right)-\frac{1}{96 \sqrt{3}\, b \sqrt{\frac{b}{d}}}$$

$$c^2 \left(2\sqrt{3}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\mathrm{Cos}\left[3\,(a+b\,x)\right]-\sqrt{2\,\pi}\,\mathrm{Cos}\left[3\,a-\frac{3\,b\,c}{d}\right]\,\mathrm{FresnelC}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]+\right.$$

$$\left.\sqrt{2\,\pi}\,\mathrm{FresnelS}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]\,\mathrm{Sin}\left[3\,a-\frac{3\,b\,c}{d}\right]\right)-\frac{1}{16\,b\,\sqrt{\frac{b}{d}}}$$

$$c^2 \left(2\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\mathrm{Cos}[a+b\,x]-\sqrt{2\,\pi}\,\mathrm{Cos}\left[a-\frac{b\,c}{d}\right]\,\mathrm{FresnelC}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{2}{\pi}}\,\sqrt{c+d\,x}\right]+\right.$$

$$\left.\sqrt{2\,\pi}\,\mathrm{FresnelS}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{2}{\pi}}\,\sqrt{c+d\,x}\right]\,\mathrm{Sin}\left[a-\frac{b\,c}{d}\right]\right)-\frac{1}{16\,b^3}$$

$$c\,\sqrt{\frac{b}{d}}\,d\left(\sqrt{2\,\pi}\,\mathrm{FresnelS}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{2}{\pi}}\,\sqrt{c+d\,x}\right]\left(3\,d\,\mathrm{Cos}\left[a-\frac{b\,c}{d}\right]-2\,b\,c\,\mathrm{Sin}\left[a-\frac{b\,c}{d}\right]\right)+\right.$$

$$\sqrt{2\,\pi}\,\mathrm{FresnelC}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{2}{\pi}}\,\sqrt{c+d\,x}\right]\left(2\,b\,c\,\mathrm{Cos}\left[a-\frac{b\,c}{d}\right]+3\,d\,\mathrm{Sin}\left[a-\frac{b\,c}{d}\right]\right)+$$

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

$$\left(\sqrt{2\,\pi}\,\mathrm{FresnelC}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{2}{\pi}}\,\sqrt{c+d\,x}\right]\left(\left(4\,b^2\,c^2-15\,d^2\right)\mathrm{Cos}\left[a-\frac{b\,c}{d}\right]+12\,b\,c\,d\,\mathrm{Sin}\left[a-\frac{b\,c}{d}\right]\right)-\right.$$

$$\sqrt{2\,\pi}\,\mathrm{FresnelS}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{2}{\pi}}\,\sqrt{c+d\,x}\right]\left(-12\,b\,c\,d\,\mathrm{Cos}\left[a-\frac{b\,c}{d}\right]+\left(4\,b^2\,c^2-15\,d^2\right)\mathrm{Sin}\left[a-\frac{b\,c}{d}\right]\right)-$$

$$\left.2\,\sqrt{\frac{b}{d}}\,d\,\sqrt{c+d\,x}\,\left(d\left(-15+4\,b^2\,x^2\right)\mathrm{Cos}[a+b\,x]+2\,b\,(c-5\,d\,x)\,\mathrm{Sin}[a+b\,x]\right)\right)-\frac{1}{96\,\sqrt{3}\,b^3}$$

$$c\,\sqrt{\frac{b}{d}}\,d\left(\sqrt{2\,\pi}\,\mathrm{FresnelS}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]\left(d\,\mathrm{Cos}\left[3\,a-\frac{3\,b\,c}{d}\right]-2\,b\,c\,\mathrm{Sin}\left[3\,a-\frac{3\,b\,c}{d}\right]\right)+\right.$$

$$\sqrt{2\,\pi}\,\mathrm{FresnelC}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]\left(2\,b\,c\,\mathrm{Cos}\left[3\,a-\frac{3\,b\,c}{d}\right]+d\,\mathrm{Sin}\left[3\,a-\frac{3\,b\,c}{d}\right]\right)+$$

$$\left.2\sqrt{3}\,\sqrt{\frac{b}{d}}\,d\,\sqrt{c+d\,x}\,\left(2\,b\,x\,\mathrm{Cos}\left[3\,(a+b\,x)\right]-\mathrm{Sin}\left[3\,(a+b\,x)\right]\right)\right)+\frac{1}{800\,\sqrt{5}\,b^3}$$

$$c\sqrt{\frac{b}{d}}\,d\left(\sqrt{2\pi}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]\left(3\,d\,\text{Cos}\left[5\,a-\frac{5\,b\,c}{d}\right]-10\,b\,c\,\text{Sin}\left[5\,a-\frac{5\,b\,c}{d}\right]\right)+\right.$$

$$\sqrt{2\pi}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]\left(10\,b\,c\,\text{Cos}\left[5\,a-\frac{5\,b\,c}{d}\right]+3\,d\,\text{Sin}\left[5\,a-\frac{5\,b\,c}{d}\right]\right)+$$

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

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

$$\left.\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)\text{Sin}\left[\frac{3\,b\,c}{d}\right]+\frac{1}{3\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\text{Cos}\left[\frac{3\,b\,c}{d}\right]$$

$$\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)-$$

$$\frac{1}{9\sqrt{3}\,\left(\frac{b}{d}\right)^{5/2}d^3}2\,c\,\text{Cos}\left[\frac{3\,b\,c}{d}\right]\left(-\frac{3}{2}\left(-\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\right.\right.$$

$$\left.\left.\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)+3\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)-$$

$$\frac{1}{9\sqrt{3}\,\left(\frac{b}{d}\right)^{5/2}d^3}2\,c\,\text{Sin}\left[\frac{3\,b\,c}{d}\right]\left(-3\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\right.$$

$$\left.\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)\right)+$$

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

$$\left(-\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)+$$

$$\left.\left.\left.3\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\Big/\left(27\sqrt{3}\,\left(\frac{b}{d}\right)^{7/2}d^3\right)+$$

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

$$(c+d\,x)^{3/2}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]+\right.$$

$$\left.\left.\left.\left.\left.\sqrt{3}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\right)\Big/\left(27\sqrt{3}\left(\frac{b}{d}\right)^{7/2}d^3\right)\right)+$$

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

$$\left.\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]\right)-\frac{1}{3\sqrt{3}\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\text{Sin}\left[\frac{3\,b\,c}{d}\right]$$

$$\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]+\sqrt{3}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)+$$

$$\frac{1}{9\sqrt{3}\left(\frac{b}{d}\right)^{5/2}d^3}2\,c\,\text{Sin}\left[\frac{3\,b\,c}{d}\right]\left(-\frac{3}{2}\left(-\sqrt{3}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\right.\right.$$

$$\left.\left.\text{FresnelC}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]\right)+3\sqrt{3}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)-$$

$$\frac{1}{9\sqrt{3}\left(\frac{b}{d}\right)^{5/2}d^3}2\,c\,\text{Cos}\left[\frac{3\,b\,c}{d}\right]\left(-3\sqrt{3}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\right.$$

$$\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]+\sqrt{3}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)+$$

$$\left(\text{Cos}\left[\frac{3\,b\,c}{d}\right]\left(-9\sqrt{3}\left(\frac{b}{d}\right)^{5/2}(c+d\,x)^{5/2}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\frac{5}{2}\left(-\frac{3}{2}\right.\right.\right.$$

$$\left(-\sqrt{3}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]\right)+$$

$$\left.\left.\left.3\sqrt{3}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\Big/\left(27\sqrt{3}\left(\frac{b}{d}\right)^{7/2}d^3\right)-$$

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

$$(c+d x)^{3/2} \text{Cos}\left[\frac{3 b (c+d x)}{d}\right]+\frac{3}{2} \left(-\sqrt{\frac{\pi}{2}} \text{FresnelS}\left[\sqrt{\frac{b}{d}} \sqrt{\frac{6}{\pi}} \sqrt{c+d x}\right]+\right.$$

$$\left.\left.\left.\left.\left.\sqrt{3} \sqrt{\frac{b}{d}} \sqrt{c+d x} \text{Sin}\left[\frac{3 b (c+d x)}{d}\right]\right)\right)\right)\right) \Big/ \left(27 \sqrt{3} \left(\frac{b}{d}\right)^{7/2} d^3\right)\right)\right)-$$

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

$$\left.\sqrt{\frac{\pi}{2}} \text{FresnelC}\left[\sqrt{\frac{b}{d}} \sqrt{\frac{10}{\pi}} \sqrt{c+d x}\right]\right) \text{Sin}\left[\frac{5 b c}{d}\right]+$$

$$\frac{1}{5 \sqrt{5} \left(\frac{b}{d}\right)^{3/2} d^3} c^2 \text{Cos}\left[\frac{5 b c}{d}\right] \left(-\sqrt{\frac{\pi}{2}} \text{FresnelS}\left[\sqrt{\frac{b}{d}} \sqrt{\frac{10}{\pi}} \sqrt{c+d x}\right]+\right.$$

$$\left.\sqrt{5} \sqrt{\frac{b}{d}} \sqrt{c+d x} \text{Sin}\left[\frac{5 b (c+d x)}{d}\right]\right)-\left(2 c \text{Cos}\left[\frac{5 b c}{d}\right]\right.$$

$$\left(-\frac{3}{2} \left(-\sqrt{5} \sqrt{\frac{b}{d}} \sqrt{c+d x} \text{Cos}\left[\frac{5 b (c+d x)}{d}\right]+\sqrt{\frac{\pi}{2}} \text{FresnelC}\left[\sqrt{\frac{b}{d}} \sqrt{\frac{10}{\pi}} \sqrt{c+d x}\right]\right)+\right.$$

$$\left.\left.5 \sqrt{5} \left(\frac{b}{d}\right)^{3/2} (c+d x)^{3/2} \text{Sin}\left[\frac{5 b (c+d x)}{d}\right]\right)\right) \Big/ \left(25 \sqrt{5} \left(\frac{b}{d}\right)^{5/2} d^3\right)-$$

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

$$\left.\left.\left.\text{FresnelS}\left[\sqrt{\frac{b}{d}} \sqrt{\frac{10}{\pi}} \sqrt{c+d x}\right]+\sqrt{5} \sqrt{\frac{b}{d}} \sqrt{c+d x} \text{Sin}\left[\frac{5 b (c+d x)}{d}\right]\right)\right)\right) \Big/$$

$$\left(25 \sqrt{5} \left(\frac{b}{d}\right)^{5/2} d^3\right)+\left(\text{Sin}\left[\frac{5 b c}{d}\right] \left(-25 \sqrt{5} \left(\frac{b}{d}\right)^{5/2} (c+d x)^{5/2} \text{Cos}\left[\frac{5 b (c+d x)}{d}\right]+\right.\right.$$

$$\frac{5}{2} \left(-\frac{3}{2} \left(-\sqrt{5} \sqrt{\frac{b}{d}} \sqrt{c+d x} \text{Cos}\left[\frac{5 b (c+d x)}{d}\right]+\sqrt{\frac{\pi}{2}} \text{FresnelC}\left[\right.\right.\right.$$

$$\sqrt{\frac{b}{d}}\ \sqrt{\frac{10}{\pi}}\ \sqrt{c+d\,x}\,\Big]\Bigg)+5\,\sqrt{5}\,\left(\frac{b}{d}\right)^{3/2}\,(c+d\,x)^{3/2}\,\mathrm{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(125\,\sqrt{5}\,\left(\frac{b}{d}\right)^{7/2}d^3\right)+\Bigg(\mathrm{Cos}\Big[\frac{5\,b\,c}{d}\Big]\,\Bigg(25\,\sqrt{5}\,\left(\frac{b}{d}\right)^{5/2}\,(c+d\,x)^{5/2}\,\mathrm{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]-$$

$$\frac{5}{2}\,\Bigg(-5\,\sqrt{5}\,\left(\frac{b}{d}\right)^{3/2}\,(c+d\,x)^{3/2}\,\mathrm{Cos}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]+\frac{3}{2}\,\Bigg(-\sqrt{\frac{\pi}{2}}\ \mathrm{FresnelS}\Big[$$

$$\sqrt{\frac{b}{d}}\ \sqrt{\frac{10}{\pi}}\ \sqrt{c+d\,x}\,\Big]+\sqrt{5}\,\sqrt{\frac{b}{d}}\ \sqrt{c+d\,x}\ \mathrm{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(125\,\sqrt{5}\,\left(\frac{b}{d}\right)^{7/2}d^3\right)\Bigg)+\mathrm{Cos}[5\,a]\,\Bigg(\frac{1}{5\,\sqrt{5}\,\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\mathrm{Cos}\Big[\frac{5\,b\,c}{d}\Big]$$

$$\Bigg(-\sqrt{5}\,\sqrt{\frac{b}{d}}\ \sqrt{c+d\,x}\ \mathrm{Cos}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]+\sqrt{\frac{\pi}{2}}\ \mathrm{FresnelC}\Big[\sqrt{\frac{b}{d}}\ \sqrt{\frac{10}{\pi}}\ \sqrt{c+d\,x}\,\Big]\Bigg)-$$

$$\frac{1}{5\,\sqrt{5}\,\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\mathrm{Sin}\Big[\frac{5\,b\,c}{d}\Big]\,\Bigg(-\sqrt{\frac{\pi}{2}}\ \mathrm{FresnelS}\Big[\sqrt{\frac{b}{d}}\ \sqrt{\frac{10}{\pi}}\ \sqrt{c+d\,x}\,\Big]+$$

$$\sqrt{5}\,\sqrt{\frac{b}{d}}\ \sqrt{c+d\,x}\ \mathrm{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]\Bigg)+\Bigg(2\,c\,\mathrm{Sin}\Big[\frac{5\,b\,c}{d}\Big]$$

$$\Bigg(-\frac{3}{2}\,\Bigg(-\sqrt{5}\,\sqrt{\frac{b}{d}}\ \sqrt{c+d\,x}\ \mathrm{Cos}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]+\sqrt{\frac{\pi}{2}}\ \mathrm{FresnelC}\Big[\sqrt{\frac{b}{d}}\ \sqrt{\frac{10}{\pi}}\ \sqrt{c+d\,x}\,\Big]\Bigg)+$$

$$5\,\sqrt{5}\,\left(\frac{b}{d}\right)^{3/2}\,(c+d\,x)^{3/2}\,\mathrm{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]\Bigg)\Bigg)\Bigg/\left(25\,\sqrt{5}\,\left(\frac{b}{d}\right)^{5/2}d^3\right)-\Bigg(2\,c\,\mathrm{Cos}\Big[\frac{5\,b\,c}{d}\Big]$$

$$\Bigg(-5\,\sqrt{5}\,\left(\frac{b}{d}\right)^{3/2}\,(c+d\,x)^{3/2}\,\mathrm{Cos}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]+\frac{3}{2}\,\Bigg(-\sqrt{\frac{\pi}{2}}\ \mathrm{FresnelS}\Big[\sqrt{\frac{b}{d}}\ \sqrt{\frac{10}{\pi}}$$

$$\sqrt{c+d\,x}\,\Big]+\sqrt{5}\,\sqrt{\frac{b}{d}}\ \sqrt{c+d\,x}\ \mathrm{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]\Bigg)\Bigg)\Bigg)\Bigg/\left(25\,\sqrt{5}\,\left(\frac{b}{d}\right)^{5/2}d^3\right)+$$

$$\Bigg(\mathrm{Cos}\Big[\frac{5\,b\,c}{d}\Big]\,\Bigg(-25\,\sqrt{5}\,\left(\frac{b}{d}\right)^{5/2}\,(c+d\,x)^{5/2}\,\mathrm{Cos}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]+\frac{5}{2}\,\Bigg(-\frac{3}{2}\,\Bigg(-\sqrt{5}\,\sqrt{\frac{b}{d}}$$

$$\sqrt{c+d\,x}\ \mathrm{Cos}\left[\frac{5\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\ \mathrm{FresnelC}\left[\sqrt{\frac{b}{d}}\ \sqrt{\frac{10}{\pi}}\ \sqrt{c+d\,x}\right]\Bigg)+5$$

$$\sqrt{5}\ \left(\frac{b}{d}\right)^{3/2}\ (c+d\,x)^{3/2}\ \mathrm{Sin}\left[\frac{5\,b\,(c+d\,x)}{d}\right]\Bigg)\Bigg)\Bigg)\Bigg/\left(125\,\sqrt{5}\ \left(\frac{b}{d}\right)^{7/2}\ d^3\right)-$$

$$\Bigg(\mathrm{Sin}\left[\frac{5\,b\,c}{d}\right]\ \Bigg(25\,\sqrt{5}\ \left(\frac{b}{d}\right)^{5/2}\ (c+d\,x)^{5/2}\ \mathrm{Sin}\left[\frac{5\,b\,(c+d\,x)}{d}\right]-\frac{5}{2}\ \Bigg(-5\,\sqrt{5}\ \left(\frac{b}{d}\right)^{3/2}$$

$$(c+d\,x)^{3/2}\ \mathrm{Cos}\left[\frac{5\,b\,(c+d\,x)}{d}\right]+\frac{3}{2}\ \Bigg(-\sqrt{\frac{\pi}{2}}\ \mathrm{FresnelS}\left[\sqrt{\frac{b}{d}}\ \sqrt{\frac{10}{\pi}}\ \sqrt{c+d\,x}\right]+$$

$$\sqrt{5}\ \sqrt{\frac{b}{d}}\ \sqrt{c+d\,x}\ \mathrm{Sin}\left[\frac{5\,b\,(c+d\,x)}{d}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/\left(125\,\sqrt{5}\ \left(\frac{b}{d}\right)^{7/2}\ d^3\right)\Bigg)\Bigg)$$

Problem 135: Result more than twice size of optimal antiderivative.

$$\int (c+d\,x)^{5/2}\ \mathrm{Cos}[a+b\,x]^2\ \mathrm{Sin}[a+b\,x]^3\ dx$$

Optimal (type 4, 615 leaves, 26 steps):

$$\frac{15 d^2 \sqrt{c+d x} \cos[a+b x]}{32 b^3}-\frac{(c+d x)^{5/2} \cos[a+b x]}{8 b}+\frac{5 d^2 \sqrt{c+d x} \cos[3 a+3 b x]}{576 b^3}-\frac{(c+d x)^{5/2} \cos[3 a+3 b x]}{48 b}-\frac{3 d^2 \sqrt{c+d x} \cos[5 a+5 b x]}{1600 b^3}+\frac{(c+d x)^{5/2} \cos[5 a+5 b x]}{80 b}-\frac{15 d^{5/2} \sqrt{\frac{\pi}{2}} \cos\left[a-\frac{b c}{d}\right] \text{FresnelC}\left[\frac{\sqrt{b} \sqrt{\frac{2}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right]}{32 b^{7/2}}-\frac{5 d^{5/2} \sqrt{\frac{\pi}{6}} \cos\left[3 a-\frac{3 b c}{d}\right] \text{FresnelC}\left[\frac{\sqrt{b} \sqrt{\frac{6}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right]}{576 b^{7/2}}+\frac{3 d^{5/2} \sqrt{\frac{\pi}{10}} \cos\left[5 a-\frac{5 b c}{d}\right] \text{FresnelC}\left[\frac{\sqrt{b} \sqrt{\frac{10}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right]}{1600 b^{7/2}}-\frac{3 d^{5/2} \sqrt{\frac{\pi}{10}} \text{FresnelS}\left[\frac{\sqrt{b} \sqrt{\frac{10}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right] \sin\left[5 a-\frac{5 b c}{d}\right]}{1600 b^{7/2}}+\frac{5 d^{5/2} \sqrt{\frac{\pi}{6}} \text{FresnelS}\left[\frac{\sqrt{b} \sqrt{\frac{6}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right] \sin\left[3 a-\frac{3 b c}{d}\right]}{576 b^{7/2}}+\frac{15 d^{5/2} \sqrt{\frac{\pi}{2}} \text{FresnelS}\left[\frac{\sqrt{b} \sqrt{\frac{2}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right] \sin\left[a-\frac{b c}{d}\right]}{32 b^{7/2}}+\frac{5 d (c+d x)^{3/2} \sin[a+b x]}{16 b^2}+\frac{5 d (c+d x)^{3/2} \sin[3 a+3 b x]}{288 b^2}-\frac{d (c+d x)^{3/2} \sin[5 a+5 b x]}{160 b^2}$$

Result (type 4, 4921 leaves):

$$\frac{1}{160 \sqrt{5} b \sqrt{\frac{b}{d}}} c^2 \left(2 \sqrt{5} \sqrt{\frac{b}{d}} \sqrt{c+d x} \cos[5 (a+b x)]-\sqrt{2 \pi} \cos\left[5 a-\frac{5 b c}{d}\right] \text{FresnelC}\left[\sqrt{\frac{b}{d}} \sqrt{\frac{10}{\pi}} \sqrt{c+d x}\right]+\sqrt{2 \pi} \text{FresnelS}\left[\sqrt{\frac{b}{d}} \sqrt{\frac{10}{\pi}} \sqrt{c+d x}\right] \sin\left[5 a-\frac{5 b c}{d}\right]\right)-\frac{1}{96 \sqrt{3} b \sqrt{\frac{b}{d}}}$$

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

$$\left.\sqrt{2\pi}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d x}\right]\text{Sin}\left[3 a-\frac{3 b c}{d}\right]\right)-\frac{1}{16 b\sqrt{\frac{b}{d}}}$$

$$c^2 \left(2\sqrt{\frac{b}{d}}\sqrt{c+d x}\,\text{Cos}[a+b x]-\sqrt{2\pi}\,\text{Cos}\left[a-\frac{b c}{d}\right]\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{2}{\pi}}\sqrt{c+d x}\right]+\right.$$

$$\left.\sqrt{2\pi}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{2}{\pi}}\sqrt{c+d x}\right]\text{Sin}\left[a-\frac{b c}{d}\right]\right)-\frac{1}{16 b^3}$$

$$c\sqrt{\frac{b}{d}}\,d\left(\sqrt{2\pi}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{2}{\pi}}\sqrt{c+d x}\right]\left(3 d\,\text{Cos}\left[a-\frac{b c}{d}\right]-2 b c\,\text{Sin}\left[a-\frac{b c}{d}\right]\right)+\right.$$

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

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

$$\left(\sqrt{2\pi}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{2}{\pi}}\sqrt{c+d x}\right]\left(\left(4 b^2 c^2-15 d^2\right)\text{Cos}\left[a-\frac{b c}{d}\right]+12 b c d\,\text{Sin}\left[a-\frac{b c}{d}\right]\right)-\right.$$

$$\sqrt{2\pi}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{2}{\pi}}\sqrt{c+d x}\right]\left(-12 b c d\,\text{Cos}\left[a-\frac{b c}{d}\right]+\left(4 b^2 c^2-15 d^2\right)\text{Sin}\left[a-\frac{b c}{d}\right]\right)-$$

$$\left.2\sqrt{\frac{b}{d}}\,d\sqrt{c+d x}\left(d\left(-15+4 b^2 x^2\right)\text{Cos}[a+b x]+2 b\left(c-5 d x\right)\text{Sin}[a+b x]\right)\right)-\frac{1}{96\sqrt{3}\,b^3}$$

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

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

$$\left.2\sqrt{3}\sqrt{\frac{b}{d}}\,d\sqrt{c+d x}\left(2 b x\,\text{Cos}\left[3\left(a+b x\right)\right]-\text{Sin}\left[3\left(a+b x\right)\right]\right)\right)+\frac{1}{800\sqrt{5}\,b^3}$$

$$c\sqrt{\frac{b}{d}}\,d\left(\sqrt{2\pi}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]\left(3\,d\,\text{Cos}\left[5\,a-\frac{5\,b\,c}{d}\right]-10\,b\,c\,\text{Sin}\left[5\,a-\frac{5\,b\,c}{d}\right]\right)+\right.$$

$$\sqrt{2\pi}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]\left(10\,b\,c\,\text{Cos}\left[5\,a-\frac{5\,b\,c}{d}\right]+3\,d\,\text{Sin}\left[5\,a-\frac{5\,b\,c}{d}\right]\right)+$$

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

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

$$\left.\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)\text{Sin}\left[\frac{3\,b\,c}{d}\right]+\frac{1}{3\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\text{Cos}\left[\frac{3\,b\,c}{d}\right]$$

$$\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,\left(c+d\,x\right)}{d}\right]\right)-$$

$$\frac{1}{9\sqrt{3}\,\left(\frac{b}{d}\right)^{5/2}d^3}2\,c\,\text{Cos}\left[\frac{3\,b\,c}{d}\right]\left(-\frac{3}{2}\left(-\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{3\,b\,\left(c+d\,x\right)}{d}\right]+\sqrt{\frac{\pi}{2}}\right.\right.$$

$$\left.\left.\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)+3\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}\left(c+d\,x\right)^{3/2}\text{Sin}\left[\frac{3\,b\,\left(c+d\,x\right)}{d}\right]\right)-$$

$$\frac{1}{9\sqrt{3}\,\left(\frac{b}{d}\right)^{5/2}d^3}2\,c\,\text{Sin}\left[\frac{3\,b\,c}{d}\right]\left(-3\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}\left(c+d\,x\right)^{3/2}\text{Cos}\left[\frac{3\,b\,\left(c+d\,x\right)}{d}\right]+\right.$$

$$\left.\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,\left(c+d\,x\right)}{d}\right]\right)\right)+$$

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

$$\left(-\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{3\,b\,\left(c+d\,x\right)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)+$$

$$\left.\left.\left.3\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}\left(c+d\,x\right)^{3/2}\text{Sin}\left[\frac{3\,b\,\left(c+d\,x\right)}{d}\right]\right)\right)\right)\Big/\left(27\sqrt{3}\,\left(\frac{b}{d}\right)^{7/2}d^3\right)+$$

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

$$\left.\left.\left.(c+d\,x)^{3/2}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\right)\Big/\left(27\sqrt{3}\left(\frac{b}{d}\right)^{7/2}d^3\right)\Bigg)+$$

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

$$\left.\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)-\frac{1}{3\sqrt{3}\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\text{Sin}\left[\frac{3\,b\,c}{d}\right]$$

$$\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)+$$

$$\frac{1}{9\sqrt{3}\left(\frac{b}{d}\right)^{5/2}d^3}2\,c\,\text{Sin}\left[\frac{3\,b\,c}{d}\right]\left(-\frac{3}{2}\left(-\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\right.\right.$$

$$\left.\left.\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)+3\sqrt{3}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)-$$

$$\frac{1}{9\sqrt{3}\left(\frac{b}{d}\right)^{5/2}d^3}2\,c\,\text{Cos}\left[\frac{3\,b\,c}{d}\right]\left(-3\sqrt{3}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\right.$$

$$\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)+$$

$$\left(\text{Cos}\left[\frac{3\,b\,c}{d}\right]\left(-9\sqrt{3}\left(\frac{b}{d}\right)^{5/2}(c+d\,x)^{5/2}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\frac{5}{2}\left(-\frac{3}{2}\right.\right.\right.$$

$$\left(-\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)+$$

$$\left.\left.\left.3\sqrt{3}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\Big/\left(27\sqrt{3}\left(\frac{b}{d}\right)^{7/2}d^3\right)-$$

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

$$(c+d\,x)^{3/2}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\right.$$

$$\left.\left.\left.\left.\left.\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\right)\Big/\left(27\sqrt{3}\left(\frac{b}{d}\right)^{7/2}d^3\right)\right)\right)-$$

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

$$\left.\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]\right)\text{Sin}\left[\frac{5\,b\,c}{d}\right]+$$

$$\frac{1}{5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\text{Cos}\left[\frac{5\,b\,c}{d}\right]\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]+\right.$$

$$\left.\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{5\,b\,(c+d\,x)}{d}\right]\right)-\left(2\,c\,\text{Cos}\left[\frac{5\,b\,c}{d}\right]\right.$$

$$\left(-\frac{3}{2}\left(-\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{5\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]\right)+\right.$$

$$\left.\left.5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{5\,b\,(c+d\,x)}{d}\right]\right)\right)\Big/\left(25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}d^3\right)-$$

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

$$\left.\left.\left.\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]+\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{5\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\Big/$$

$$\left(25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}d^3\right)+\left(\text{Sin}\left[\frac{5\,b\,c}{d}\right]\left(-25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}(c+d\,x)^{5/2}\,\text{Cos}\left[\frac{5\,b\,(c+d\,x)}{d}\right]+\right.\right.$$

$$\frac{5}{2}\left(-\frac{3}{2}\left(-\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{5\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\right.\right.\right.$$

$$\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d x}\Big]\Big)+5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}(c+d x)^{3/2}\operatorname{Sin}\Big[\frac{5 b (c+d x)}{d}\Big]\Big)\Big)\Big)\Big/$$

$$\left(125\sqrt{5}\left(\frac{b}{d}\right)^{7/2}d^3\right)+\Big(\operatorname{Cos}\Big[\frac{5 b c}{d}\Big]\Big(25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}(c+d x)^{5/2}\operatorname{Sin}\Big[\frac{5 b (c+d x)}{d}\Big]-$$

$$\frac{5}{2}\Big(-5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}(c+d x)^{3/2}\operatorname{Cos}\Big[\frac{5 b (c+d x)}{d}\Big]+\frac{3}{2}\Big(-\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\Big[$$

$$\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d x}\Big]+\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d x}\operatorname{Sin}\Big[\frac{5 b (c+d x)}{d}\Big]\Big)\Big)\Big)\Big)\Big/$$

$$\left(125\sqrt{5}\left(\frac{b}{d}\right)^{7/2}d^3\right)\Big)+\operatorname{Cos}[5 a]\Big(\frac{1}{5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}d^3}c^2\operatorname{Cos}\Big[\frac{5 b c}{d}\Big]$$

$$\Big(-\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d x}\operatorname{Cos}\Big[\frac{5 b (c+d x)}{d}\Big]+\sqrt{\frac{\pi}{2}}\operatorname{FresnelC}\Big[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d x}\Big]\Big)-$$

$$\frac{1}{5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}d^3}c^2\operatorname{Sin}\Big[\frac{5 b c}{d}\Big]\Big(-\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\Big[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d x}\Big]+$$

$$\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d x}\operatorname{Sin}\Big[\frac{5 b (c+d x)}{d}\Big]\Big)+\Big(2 c\operatorname{Sin}\Big[\frac{5 b c}{d}\Big]$$

$$\Big(-\frac{3}{2}\Big(-\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d x}\operatorname{Cos}\Big[\frac{5 b (c+d x)}{d}\Big]+\sqrt{\frac{\pi}{2}}\operatorname{FresnelC}\Big[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d x}\Big]\Big)+$$

$$5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}(c+d x)^{3/2}\operatorname{Sin}\Big[\frac{5 b (c+d x)}{d}\Big]\Big)\Big)\Big/\left(25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}d^3\right)-\Big(2 c\operatorname{Cos}\Big[\frac{5 b c}{d}\Big]$$

$$\Big(-5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}(c+d x)^{3/2}\operatorname{Cos}\Big[\frac{5 b (c+d x)}{d}\Big]+\frac{3}{2}\Big(-\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\Big[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}$$

$$\sqrt{c+d x}\Big]+\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d x}\operatorname{Sin}\Big[\frac{5 b (c+d x)}{d}\Big]\Big)\Big)\Big)\Big/\left(25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}d^3\right)+$$

$$\Big(\operatorname{Cos}\Big[\frac{5 b c}{d}\Big]\Big(-25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}(c+d x)^{5/2}\operatorname{Cos}\Big[\frac{5 b (c+d x)}{d}\Big]+\frac{5}{2}\Big(-\frac{3}{2}\Big(-\sqrt{5}\sqrt{\frac{b}{d}}$$

$$\sqrt{c+d x}\,\text{Cos}\left[\frac{5 b (c+d x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{10}{\pi}}\,\sqrt{c+d x}\right]\Bigg)+5$$

$$\sqrt{5}\left(\frac{b}{d}\right)^{3/2}(c+d x)^{3/2}\,\text{Sin}\left[\frac{5 b (c+d x)}{d}\right]\Bigg)\Bigg)\Bigg)\Bigg/\left(125\sqrt{5}\left(\frac{b}{d}\right)^{7/2} d^3\right)-$$

$$\Bigg(\text{Sin}\left[\frac{5 b c}{d}\right]\Bigg(25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}(c+d x)^{5/2}\,\text{Sin}\left[\frac{5 b (c+d x)}{d}\right]-\frac{5}{2}\Bigg(-5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}$$

$$(c+d x)^{3/2}\,\text{Cos}\left[\frac{5 b (c+d x)}{d}\right]+\frac{3}{2}\Bigg(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{10}{\pi}}\,\sqrt{c+d x}\right]+$$

$$\sqrt{5}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d x}\,\text{Sin}\left[\frac{5 b (c+d x)}{d}\right]\Bigg)\Bigg)\Bigg)\Bigg/\left(125\sqrt{5}\left(\frac{b}{d}\right)^{7/2} d^3\right)\Bigg)\Bigg)$$

Problem 156: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 181 leaves, 10 steps):

$$\frac{9 d^2 (c+d x)\,\text{Cos}[2 a+2 b x]}{128 b^3}-\frac{3 (c+d x)^3\,\text{Cos}[2 a+2 b x]}{64 b}-\frac{d^2 (c+d x)\,\text{Cos}[6 a+6 b x]}{1152 b^3}+\frac{(c+d x)^3\,\text{Cos}[6 a+6 b x]}{192 b}-\frac{9 d^3\,\text{Sin}[2 a+2 b x]}{256 b^4}+\frac{9 d (c+d x)^2\,\text{Sin}[2 a+2 b x]}{128 b^2}+\frac{d^3\,\text{Sin}[6 a+6 b x]}{6912 b^4}-\frac{d (c+d x)^2\,\text{Sin}[6 a+6 b x]}{384 b^2}$$

Result (type 3, 174 leaves):

$$\frac{1}{6912 b^4}\Big(-162 b (c+d x)\left(-3 d^2+2 b^2 (c+d x)^2\right)\text{Cos}[2 (a+b x)]+6 b (c+d x)\left(-d^2+6 b^2 (c+d x)^2\right)\text{Cos}[6 (a+b x)]-2 d\left(121 d^2-234 b^2 (c+d x)^2+\left(-d^2+18 b^2 (c+d x)^2\right)\text{Cos}[4 (a+b x)]\right)\text{Sin}[2 (a+b x)]\Big)\left(\text{Cos}[6 (a+b x)]-i\,\text{Sin}[6 (a+b x)]\right)\left(\text{Cos}[6 (a+b x)]+i\,\text{Sin}[6 (a+b x)]\right)$$

Problem 162: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 287 leaves, 14 steps):

$$-\frac{b\,\text{Cos}[2a+2bx]}{32d^2(c+dx)^2}+\frac{b\,\text{Cos}[6a+6bx]}{32d^2(c+dx)^2}-\frac{b^3\,\text{Cos}\left[2a-\frac{2bc}{d}\right]\,\text{CosIntegral}\left[\frac{2bc}{d}+2bx\right]}{8d^4}+$$
$$\frac{9b^3\,\text{Cos}\left[6a-\frac{6bc}{d}\right]\,\text{CosIntegral}\left[\frac{6bc}{d}+6bx\right]}{8d^4}-\frac{\text{Sin}[2a+2bx]}{32d(c+dx)^3}+$$
$$\frac{b^2\,\text{Sin}[2a+2bx]}{16d^3(c+dx)}+\frac{\text{Sin}[6a+6bx]}{96d(c+dx)^3}-\frac{3b^2\,\text{Sin}[6a+6bx]}{16d^3(c+dx)}+$$
$$\frac{b^3\,\text{Sin}\left[2a-\frac{2bc}{d}\right]\,\text{SinIntegral}\left[\frac{2bc}{d}+2bx\right]}{8d^4}-\frac{9b^3\,\text{Sin}\left[6a-\frac{6bc}{d}\right]\,\text{SinIntegral}\left[\frac{6bc}{d}+6bx\right]}{8d^4}$$

Result (type 4, 3285 leaves):

$$\frac{1}{8(c+dx)^3}$$
$$\left(\frac{\text{Cos}[6a+6bx]}{24d^4}-\frac{i\,\text{Sin}[6a+6bx]}{24d^4}\right)\left(-18\,i\,b^2c^2d+3bcd^2+i\,d^3-36\,i\,b^2cd^2x+3bd^3x-\right.$$
$$18\,i\,b^2d^3x^2+6\,i\,b^2c^2d\,\text{Cos}[4a+4bx]-3bcd^2\,\text{Cos}[4a+4bx]-$$
$$3\,i\,d^3\,\text{Cos}[4a+4bx]+12\,i\,b^2cd^2x\,\text{Cos}[4a+4bx]-3bd^3x\,\text{Cos}[4a+4bx]+$$
$$6\,i\,b^2d^3x^2\,\text{Cos}[4a+4bx]-6\,i\,b^2c^2d\,\text{Cos}[8a+8bx]-3bcd^2\,\text{Cos}[8a+8bx]+$$
$$3\,i\,d^3\,\text{Cos}[8a+8bx]-12\,i\,b^2cd^2x\,\text{Cos}[8a+8bx]-3bd^3x\,\text{Cos}[8a+8bx]-$$
$$6\,i\,b^2d^3x^2\,\text{Cos}[8a+8bx]+18\,i\,b^2c^2d\,\text{Cos}[12a+12bx]+3bcd^2\,\text{Cos}[12a+12bx]-$$
$$i\,d^3\,\text{Cos}[12a+12bx]+36\,i\,b^2cd^2x\,\text{Cos}[12a+12bx]+3bd^3x\,\text{Cos}[12a+12bx]+$$
$$18\,i\,b^2d^3x^2\,\text{Cos}[12a+12bx]-12b^3c^3\,\text{Cos}\left[8a-\frac{2bc}{d}+6bx\right]\,\text{CosIntegral}\left[\frac{2bc}{d}+2bx\right]-$$
$$36b^3c^2dx\,\text{Cos}\left[8a-\frac{2bc}{d}+6bx\right]\,\text{CosIntegral}\left[\frac{2bc}{d}+2bx\right]-$$
$$36b^3cd^2x^2\,\text{Cos}\left[8a-\frac{2bc}{d}+6bx\right]\,\text{CosIntegral}\left[\frac{2bc}{d}+2bx\right]-$$
$$12b^3d^3x^3\,\text{Cos}\left[8a-\frac{2bc}{d}+6bx\right]\,\text{CosIntegral}\left[\frac{2bc}{d}+2bx\right]-$$
$$12b^3c^3\,\text{Cos}\left[4a+\frac{2bc}{d}+6bx\right]\,\text{CosIntegral}\left[\frac{2bc}{d}+2bx\right]-$$
$$36b^3c^2dx\,\text{Cos}\left[4a+\frac{2bc}{d}+6bx\right]\,\text{CosIntegral}\left[\frac{2bc}{d}+2bx\right]-$$
$$36b^3cd^2x^2\,\text{Cos}\left[4a+\frac{2bc}{d}+6bx\right]\,\text{CosIntegral}\left[\frac{2bc}{d}+2bx\right]-$$
$$12b^3d^3x^3\,\text{Cos}\left[4a+\frac{2bc}{d}+6bx\right]\,\text{CosIntegral}\left[\frac{2bc}{d}+2bx\right]+$$
$$108b^3c^3\,\text{Cos}\left[12a-\frac{6bc}{d}+6bx\right]\,\text{CosIntegral}\left[\frac{6bc}{d}+6bx\right]+$$
$$324b^3c^2dx\,\text{Cos}\left[12a-\frac{6bc}{d}+6bx\right]\,\text{CosIntegral}\left[\frac{6bc}{d}+6bx\right]+$$
$$324b^3cd^2x^2\,\text{Cos}\left[12a-\frac{6bc}{d}+6bx\right]\,\text{CosIntegral}\left[\frac{6bc}{d}+6bx\right]+$$
$$108b^3d^3x^3\,\text{Cos}\left[12a-\frac{6bc}{d}+6bx\right]\,\text{CosIntegral}\left[\frac{6bc}{d}+6bx\right]+$$

$108\, b^3\, c^3 \,\mathrm{Cos}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] \mathrm{CosIntegral}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] +$
$324\, b^3\, c^2\, d\, x\, \mathrm{Cos}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] \mathrm{CosIntegral}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] +$
$324\, b^3\, c\, d^2\, x^2\, \mathrm{Cos}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] \mathrm{CosIntegral}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] +$
$108\, b^3\, d^3\, x^3\, \mathrm{Cos}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] \mathrm{CosIntegral}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] -$
$6\, b^2\, c^2\, d\, \mathrm{Sin}[4\, a + 4\, b\, x] - 3\, i\, b\, c\, d^2\, \mathrm{Sin}[4\, a + 4\, b\, x] + 3\, d^3\, \mathrm{Sin}[4\, a + 4\, b\, x] -$
$12\, b^2\, c\, d^2\, x\, \mathrm{Sin}[4\, a + 4\, b\, x] - 3\, i\, b\, d^3\, x\, \mathrm{Sin}[4\, a + 4\, b\, x] - 6\, b^2\, d^3\, x^2\, \mathrm{Sin}[4\, a + 4\, b\, x] +$
$108\, i\, b^3\, c^3\, \mathrm{CosIntegral}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] \mathrm{Sin}\left[12\, a - \frac{6\, b\, c}{d} + 6\, b\, x\right] +$
$324\, i\, b^3\, c^2\, d\, x\, \mathrm{CosIntegral}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] \mathrm{Sin}\left[12\, a - \frac{6\, b\, c}{d} + 6\, b\, x\right] +$
$324\, i\, b^3\, c\, d^2\, x^2\, \mathrm{CosIntegral}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] \mathrm{Sin}\left[12\, a - \frac{6\, b\, c}{d} + 6\, b\, x\right] +$
$108\, i\, b^3\, d^3\, x^3\, \mathrm{CosIntegral}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] \mathrm{Sin}\left[12\, a - \frac{6\, b\, c}{d} + 6\, b\, x\right] -$
$12\, i\, b^3\, c^3\, \mathrm{CosIntegral}\left[\frac{2\, b\, c}{d} + 2\, b\, x\right] \mathrm{Sin}\left[8\, a - \frac{2\, b\, c}{d} + 6\, b\, x\right] -$
$36\, i\, b^3\, c^2\, d\, x\, \mathrm{CosIntegral}\left[\frac{2\, b\, c}{d} + 2\, b\, x\right] \mathrm{Sin}\left[8\, a - \frac{2\, b\, c}{d} + 6\, b\, x\right] -$
$36\, i\, b^3\, c\, d^2\, x^2\, \mathrm{CosIntegral}\left[\frac{2\, b\, c}{d} + 2\, b\, x\right] \mathrm{Sin}\left[8\, a - \frac{2\, b\, c}{d} + 6\, b\, x\right] -$
$12\, i\, b^3\, d^3\, x^3\, \mathrm{CosIntegral}\left[\frac{2\, b\, c}{d} + 2\, b\, x\right] \mathrm{Sin}\left[8\, a - \frac{2\, b\, c}{d} + 6\, b\, x\right] -$
$12\, i\, b^3\, c^3\, \mathrm{CosIntegral}\left[\frac{2\, b\, c}{d} + 2\, b\, x\right] \mathrm{Sin}\left[4\, a + \frac{2\, b\, c}{d} + 6\, b\, x\right] -$
$36\, i\, b^3\, c^2\, d\, x\, \mathrm{CosIntegral}\left[\frac{2\, b\, c}{d} + 2\, b\, x\right] \mathrm{Sin}\left[4\, a + \frac{2\, b\, c}{d} + 6\, b\, x\right] -$
$36\, i\, b^3\, c\, d^2\, x^2\, \mathrm{CosIntegral}\left[\frac{2\, b\, c}{d} + 2\, b\, x\right] \mathrm{Sin}\left[4\, a + \frac{2\, b\, c}{d} + 6\, b\, x\right] -$
$12\, i\, b^3\, d^3\, x^3\, \mathrm{CosIntegral}\left[\frac{2\, b\, c}{d} + 2\, b\, x\right] \mathrm{Sin}\left[4\, a + \frac{2\, b\, c}{d} + 6\, b\, x\right] +$
$108\, i\, b^3\, c^3\, \mathrm{CosIntegral}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] \mathrm{Sin}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] +$
$324\, i\, b^3\, c^2\, d\, x\, \mathrm{CosIntegral}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] \mathrm{Sin}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] +$
$324\, i\, b^3\, c\, d^2\, x^2\, \mathrm{CosIntegral}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] \mathrm{Sin}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] +$
$108\, i\, b^3\, d^3\, x^3\, \mathrm{CosIntegral}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] \mathrm{Sin}\left[\frac{6\, b\, c}{d} + 6\, b\, x\right] + 6\, b^2\, c^2\, d\, \mathrm{Sin}[8\, a + 8\, b\, x] -$
$3\, i\, b\, c\, d^2\, \mathrm{Sin}[8\, a + 8\, b\, x] - 3\, d^3\, \mathrm{Sin}[8\, a + 8\, b\, x] + 12\, b^2\, c\, d^2\, x\, \mathrm{Sin}[8\, a + 8\, b\, x] -$
$3\, i\, b\, d^3\, x\, \mathrm{Sin}[8\, a + 8\, b\, x] + 6\, b^2\, d^3\, x^2\, \mathrm{Sin}[8\, a + 8\, b\, x] - 18\, b^2\, c^2\, d\, \mathrm{Sin}[12\, a + 12\, b\, x] +$
$3\, i\, b\, c\, d^2\, \mathrm{Sin}[12\, a + 12\, b\, x] + d^3\, \mathrm{Sin}[12\, a + 12\, b\, x] - 36\, b^2\, c\, d^2\, x\, \mathrm{Sin}[12\, a + 12\, b\, x] +$
$3\, i\, b\, d^3\, x\, \mathrm{Sin}[12\, a + 12\, b\, x] - 18\, b^2\, d^3\, x^2\, \mathrm{Sin}[12\, a + 12\, b\, x] -$

$$12\,i\,b^3 c^3 \,\text{Cos}\left[8 a-\frac{2 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{2 b c}{d}+2 b x\right]-$$
$$36\,i\,b^3 c^2 d\,x \,\text{Cos}\left[8 a-\frac{2 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{2 b c}{d}+2 b x\right]-$$
$$36\,i\,b^3 c\,d^2 x^2 \,\text{Cos}\left[8 a-\frac{2 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{2 b c}{d}+2 b x\right]-$$
$$12\,i\,b^3 d^3 x^3 \,\text{Cos}\left[8 a-\frac{2 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{2 b c}{d}+2 b x\right]+$$
$$12\,i\,b^3 c^3 \,\text{Cos}\left[4 a+\frac{2 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{2 b c}{d}+2 b x\right]+$$
$$36\,i\,b^3 c^2 d\,x \,\text{Cos}\left[4 a+\frac{2 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{2 b c}{d}+2 b x\right]+$$
$$36\,i\,b^3 c\,d^2 x^2 \,\text{Cos}\left[4 a+\frac{2 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{2 b c}{d}+2 b x\right]+$$
$$12\,i\,b^3 d^3 x^3 \,\text{Cos}\left[4 a+\frac{2 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{2 b c}{d}+2 b x\right]+$$
$$12\,b^3 c^3 \,\text{Sin}\left[8 a-\frac{2 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{2 b c}{d}+2 b x\right]+$$
$$36\,b^3 c^2 d\,x \,\text{Sin}\left[8 a-\frac{2 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{2 b c}{d}+2 b x\right]+$$
$$36\,b^3 c\,d^2 x^2 \,\text{Sin}\left[8 a-\frac{2 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{2 b c}{d}+2 b x\right]+$$
$$12\,b^3 d^3 x^3 \,\text{Sin}\left[8 a-\frac{2 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{2 b c}{d}+2 b x\right]-$$
$$12\,b^3 c^3 \,\text{Sin}\left[4 a+\frac{2 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{2 b c}{d}+2 b x\right]-$$
$$36\,b^3 c^2 d\,x \,\text{Sin}\left[4 a+\frac{2 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{2 b c}{d}+2 b x\right]-$$
$$36\,b^3 c\,d^2 x^2 \,\text{Sin}\left[4 a+\frac{2 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{2 b c}{d}+2 b x\right]-$$
$$12\,b^3 d^3 x^3 \,\text{Sin}\left[4 a+\frac{2 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{2 b c}{d}+2 b x\right]+$$
$$108\,i\,b^3 c^3 \,\text{Cos}\left[12 a-\frac{6 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{6 b c}{d}+6 b x\right]+$$
$$324\,i\,b^3 c^2 d\,x \,\text{Cos}\left[12 a-\frac{6 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{6 b c}{d}+6 b x\right]+$$
$$324\,i\,b^3 c\,d^2 x^2 \,\text{Cos}\left[12 a-\frac{6 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{6 b c}{d}+6 b x\right]+$$
$$108\,i\,b^3 d^3 x^3 \,\text{Cos}\left[12 a-\frac{6 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{6 b c}{d}+6 b x\right]-$$
$$108\,i\,b^3 c^3 \,\text{Cos}\left[\frac{6 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{6 b c}{d}+6 b x\right]-$$
$$324\,i\,b^3 c^2 d\,x \,\text{Cos}\left[\frac{6 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{6 b c}{d}+6 b x\right]-$$
$$324\,i\,b^3 c\,d^2 x^2 \,\text{Cos}\left[\frac{6 b c}{d}+6 b x\right] \text{SinIntegral}\left[\frac{6 b c}{d}+6 b x\right]-$$

$$108\, i\, b^3 d^3 x^3 \operatorname{Cos}\left[\frac{6 b c}{d}+6 b x\right] \operatorname{SinIntegral}\left[\frac{6 b c}{d}+6 b x\right]-$$
$$108\, b^3 c^3 \operatorname{Sin}\left[12 a-\frac{6 b c}{d}+6 b x\right] \operatorname{SinIntegral}\left[\frac{6 b c}{d}+6 b x\right]-$$
$$324\, b^3 c^2 d x \operatorname{Sin}\left[12 a-\frac{6 b c}{d}+6 b x\right] \operatorname{SinIntegral}\left[\frac{6 b c}{d}+6 b x\right]-$$
$$324\, b^3 c d^2 x^2 \operatorname{Sin}\left[12 a-\frac{6 b c}{d}+6 b x\right] \operatorname{SinIntegral}\left[\frac{6 b c}{d}+6 b x\right]-$$
$$108\, b^3 d^3 x^3 \operatorname{Sin}\left[12 a-\frac{6 b c}{d}+6 b x\right] \operatorname{SinIntegral}\left[\frac{6 b c}{d}+6 b x\right]+$$
$$108\, b^3 c^3 \operatorname{Sin}\left[\frac{6 b c}{d}+6 b x\right] \operatorname{SinIntegral}\left[\frac{6 b c}{d}+6 b x\right]+$$
$$324\, b^3 c^2 d x \operatorname{Sin}\left[\frac{6 b c}{d}+6 b x\right] \operatorname{SinIntegral}\left[\frac{6 b c}{d}+6 b x\right]+$$
$$324\, b^3 c d^2 x^2 \operatorname{Sin}\left[\frac{6 b c}{d}+6 b x\right] \operatorname{SinIntegral}\left[\frac{6 b c}{d}+6 b x\right]+$$
$$108\, b^3 d^3 x^3 \operatorname{Sin}\left[\frac{6 b c}{d}+6 b x\right] \operatorname{SinIntegral}\left[\frac{6 b c}{d}+6 b x\right]\Bigg)$$

Problem 164: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 307 leaves, 13 steps):

$$-\frac{3 c d^3 x}{2 b^3}-\frac{3 d^4 x^2}{4 b^3}+\frac{(c+d x)^4}{4 b}-\frac{i (c+d x)^5}{5 d}+\frac{(c+d x)^4 \operatorname{Log}\left[1-e^{2 i (a+b x)}\right]}{b}-$$
$$\frac{2 i d (c+d x)^3 \operatorname{PolyLog}\left[2, e^{2 i (a+b x)}\right]}{b^2}+\frac{3 d^2 (c+d x)^2 \operatorname{PolyLog}\left[3, e^{2 i (a+b x)}\right]}{b^3}+$$
$$\frac{3 i d^3 (c+d x) \operatorname{PolyLog}\left[4, e^{2 i (a+b x)}\right]}{b^4}-\frac{3 d^4 \operatorname{PolyLog}\left[5, e^{2 i (a+b x)}\right]}{2 b^5}+$$
$$\frac{3 d^3 (c+d x) \operatorname{Cos}[a+b x] \operatorname{Sin}[a+b x]}{2 b^4}-\frac{d (c+d x)^3 \operatorname{Cos}[a+b x] \operatorname{Sin}[a+b x]}{b^2}-$$
$$\frac{3 d^4 \operatorname{Sin}[a+b x]^2}{4 b^5}+\frac{3 d^2 (c+d x)^2 \operatorname{Sin}[a+b x]^2}{2 b^3}-\frac{(c+d x)^4 \operatorname{Sin}[a+b x]^2}{2 b}$$

Result (type 4, 2486 leaves):

$$-\frac{1}{2 b^3} c^2 d^2 e^{-i a} \operatorname{Csc}[a] \left(2 b^2 x^2 \left(2 b e^{2 i a} x+3 i \left(-1+e^{2 i a}\right) \operatorname{Log}\left[1-e^{2 i (a+b x)}\right]\right)+\right.$$
$$\left.6 b \left(-1+e^{2 i a}\right) x \operatorname{PolyLog}\left[2, e^{2 i (a+b x)}\right]+3 i \left(-1+e^{2 i a}\right) \operatorname{PolyLog}\left[3, e^{2 i (a+b x)}\right]\right)-$$
$$c d^3 e^{i a} \operatorname{Csc}[a] \left(x^4+\left(-1+e^{-2 i a}\right) x^4+\frac{1}{2 b^4} e^{-2 i a} \left(-1+e^{2 i a}\right) \left(2 b^4 x^4+4 i b^3 x^3 \operatorname{Log}\left[1-e^{2 i (a+b x)}\right]+\right.\right.$$
$$\left.\left.6 b^2 x^2 \operatorname{PolyLog}\left[2, e^{2 i (a+b x)}\right]+6 i b x \operatorname{PolyLog}\left[3, e^{2 i (a+b x)}\right]-3 \operatorname{PolyLog}\left[4, e^{2 i (a+b x)}\right]\right)\right)-$$
$$\frac{1}{5} d^4 e^{i a} \operatorname{Csc}[a] \left(x^5+\left(-1+e^{-2 i a}\right) x^5+\frac{1}{4 b^5} e^{-2 i a} \left(-1+e^{2 i a}\right)\right.$$

$$\left(4\,b^5\,x^5+10\,i\,b^4\,x^4\,\text{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]+20\,b^3\,x^3\,\text{PolyLog}\left[2,\,e^{2\,i\,(a+b\,x)}\right]+30\,i\,b^2\,x^2\right.$$

$$\left.\text{PolyLog}\left[3,\,e^{2\,i\,(a+b\,x)}\right]-30\,b\,x\,\text{PolyLog}\left[4,\,e^{2\,i\,(a+b\,x)}\right]-15\,i\,\text{PolyLog}\left[5,\,e^{2\,i\,(a+b\,x)}\right]\,]\,)\right)+$$

$$\left(c^4\,\text{Csc}[a]\,\left(-b\,x\,\text{Cos}[a]+\text{Log}[\text{Cos}[b\,x]\,\text{Sin}[a]+\text{Cos}[a]\,\text{Sin}[b\,x]]\,\text{Sin}[a]\right)\right)\Big/$$

$$\left(b\,\left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)+$$

$$\text{Csc}[a]\,\left(\frac{\text{Cos}[2\,a+2\,b\,x]}{160\,b^5}-\frac{i\,\text{Sin}[2\,a+2\,b\,x]}{160\,b^5}\right)$$

$$\Big(80\,b^5\,c^4\,x\,\text{Cos}[a+2\,b\,x]+160\,b^5\,c^3\,d\,x^2\,\text{Cos}[a+2\,b\,x]+160\,b^5\,c^2\,d^2\,x^3\,\text{Cos}[a+2\,b\,x]+$$
$$80\,b^5\,c\,d^3\,x^4\,\text{Cos}[a+2\,b\,x]+16\,b^5\,d^4\,x^5\,\text{Cos}[a+2\,b\,x]+80\,b^5\,c^4\,x\,\text{Cos}[3\,a+2\,b\,x]+$$
$$160\,b^5\,c^3\,d\,x^2\,\text{Cos}[3\,a+2\,b\,x]+160\,b^5\,c^2\,d^2\,x^3\,\text{Cos}[3\,a+2\,b\,x]+80\,b^5\,c\,d^3\,x^4\,\text{Cos}[3\,a+2\,b\,x]+$$
$$16\,b^5\,d^4\,x^5\,\text{Cos}[3\,a+2\,b\,x]+10\,i\,b^4\,c^4\,\text{Cos}[3\,a+4\,b\,x]-20\,b^3\,c^3\,d\,\text{Cos}[3\,a+4\,b\,x]-$$
$$30\,i\,b^2\,c^2\,d^2\,\text{Cos}[3\,a+4\,b\,x]+30\,b\,c\,d^3\,\text{Cos}[3\,a+4\,b\,x]+15\,i\,d^4\,\text{Cos}[3\,a+4\,b\,x]+$$
$$40\,i\,b^4\,c^3\,d\,x\,\text{Cos}[3\,a+4\,b\,x]-60\,b^3\,c^2\,d^2\,x\,\text{Cos}[3\,a+4\,b\,x]-60\,i\,b^2\,c\,d^3\,x\,\text{Cos}[3\,a+4\,b\,x]+$$
$$30\,b\,d^4\,x\,\text{Cos}[3\,a+4\,b\,x]+60\,i\,b^4\,c^2\,d^2\,x^2\,\text{Cos}[3\,a+4\,b\,x]-60\,b^3\,c\,d^3\,x^2\,\text{Cos}[3\,a+4\,b\,x]-$$
$$30\,i\,b^2\,d^4\,x^2\,\text{Cos}[3\,a+4\,b\,x]+40\,i\,b^4\,c\,d^3\,x^3\,\text{Cos}[3\,a+4\,b\,x]-20\,b^3\,d^4\,x^3\,\text{Cos}[3\,a+4\,b\,x]+$$
$$10\,i\,b^4\,d^4\,x^4\,\text{Cos}[3\,a+4\,b\,x]-10\,i\,b^4\,c^4\,\text{Cos}[5\,a+4\,b\,x]+20\,b^3\,c^3\,d\,\text{Cos}[5\,a+4\,b\,x]+$$
$$30\,i\,b^2\,c^2\,d^2\,\text{Cos}[5\,a+4\,b\,x]-30\,b\,c\,d^3\,\text{Cos}[5\,a+4\,b\,x]-15\,i\,d^4\,\text{Cos}[5\,a+4\,b\,x]-$$
$$40\,i\,b^4\,c^3\,d\,x\,\text{Cos}[5\,a+4\,b\,x]+60\,b^3\,c^2\,d^2\,x\,\text{Cos}[5\,a+4\,b\,x]+60\,i\,b^2\,c\,d^3\,x\,\text{Cos}[5\,a+4\,b\,x]-$$
$$30\,b\,d^4\,x\,\text{Cos}[5\,a+4\,b\,x]-60\,i\,b^4\,c^2\,d^2\,x^2\,\text{Cos}[5\,a+4\,b\,x]+60\,b^3\,c\,d^3\,x^2\,\text{Cos}[5\,a+4\,b\,x]+$$
$$30\,i\,b^2\,d^4\,x^2\,\text{Cos}[5\,a+4\,b\,x]-40\,i\,b^4\,c\,d^3\,x^3\,\text{Cos}[5\,a+4\,b\,x]+20\,b^3\,d^4\,x^3\,\text{Cos}[5\,a+4\,b\,x]-$$
$$10\,i\,b^4\,d^4\,x^4\,\text{Cos}[5\,a+4\,b\,x]+20\,b^4\,c^4\,\text{Sin}[a]-40\,i\,b^3\,c^3\,d\,\text{Sin}[a]-60\,b^2\,c^2\,d^2\,\text{Sin}[a]+$$
$$60\,i\,b\,c\,d^3\,\text{Sin}[a]+30\,d^4\,\text{Sin}[a]+80\,b^4\,c^3\,d\,x\,\text{Sin}[a]-120\,i\,b^3\,c^2\,d^2\,x\,\text{Sin}[a]-$$
$$120\,b^2\,c\,d^3\,x\,\text{Sin}[a]+60\,i\,b\,d^4\,x\,\text{Sin}[a]+120\,b^4\,c^2\,d^2\,x^2\,\text{Sin}[a]-120\,i\,b^3\,c\,d^3\,x^2\,\text{Sin}[a]-$$
$$60\,b^2\,d^4\,x^2\,\text{Sin}[a]+80\,b^4\,c\,d^3\,x^3\,\text{Sin}[a]-40\,i\,b^3\,d^4\,x^3\,\text{Sin}[a]+20\,b^4\,d^4\,x^4\,\text{Sin}[a]+$$
$$80\,i\,b^5\,c^4\,x\,\text{Sin}[a+2\,b\,x]+160\,i\,b^5\,c^3\,d\,x^2\,\text{Sin}[a+2\,b\,x]+160\,i\,b^5\,c^2\,d^2\,x^3\,\text{Sin}[a+2\,b\,x]+$$
$$80\,i\,b^5\,c\,d^3\,x^4\,\text{Sin}[a+2\,b\,x]+16\,i\,b^5\,d^4\,x^5\,\text{Sin}[a+2\,b\,x]+80\,i\,b^5\,c^4\,x\,\text{Sin}[3\,a+2\,b\,x]+$$
$$160\,i\,b^5\,c^3\,d\,x^2\,\text{Sin}[3\,a+2\,b\,x]+160\,i\,b^5\,c^2\,d^2\,x^3\,\text{Sin}[3\,a+2\,b\,x]+$$
$$80\,i\,b^5\,c\,d^3\,x^4\,\text{Sin}[3\,a+2\,b\,x]+16\,i\,b^5\,d^4\,x^5\,\text{Sin}[3\,a+2\,b\,x]-10\,b^4\,c^4\,\text{Sin}[3\,a+4\,b\,x]-$$
$$20\,i\,b^3\,c^3\,d\,\text{Sin}[3\,a+4\,b\,x]+30\,b^2\,c^2\,d^2\,\text{Sin}[3\,a+4\,b\,x]+30\,i\,b\,c\,d^3\,\text{Sin}[3\,a+4\,b\,x]-$$
$$15\,d^4\,\text{Sin}[3\,a+4\,b\,x]-40\,b^4\,c^3\,d\,x\,\text{Sin}[3\,a+4\,b\,x]-60\,i\,b^3\,c^2\,d^2\,x\,\text{Sin}[3\,a+4\,b\,x]+$$
$$60\,b^2\,c\,d^3\,x\,\text{Sin}[3\,a+4\,b\,x]+30\,i\,b\,d^4\,x\,\text{Sin}[3\,a+4\,b\,x]-60\,b^4\,c^2\,d^2\,x^2\,\text{Sin}[3\,a+4\,b\,x]-$$
$$60\,i\,b^3\,c\,d^3\,x^2\,\text{Sin}[3\,a+4\,b\,x]+30\,b^2\,d^4\,x^2\,\text{Sin}[3\,a+4\,b\,x]-40\,b^4\,c\,d^3\,x^3\,\text{Sin}[3\,a+4\,b\,x]-$$
$$20\,i\,b^3\,d^4\,x^3\,\text{Sin}[3\,a+4\,b\,x]-10\,b^4\,d^4\,x^4\,\text{Sin}[3\,a+4\,b\,x]+10\,b^4\,c^4\,\text{Sin}[5\,a+4\,b\,x]+$$
$$20\,i\,b^3\,c^3\,d\,\text{Sin}[5\,a+4\,b\,x]-30\,b^2\,c^2\,d^2\,\text{Sin}[5\,a+4\,b\,x]-30\,i\,b\,c\,d^3\,\text{Sin}[5\,a+4\,b\,x]+$$
$$15\,d^4\,\text{Sin}[5\,a+4\,b\,x]+40\,b^4\,c^3\,d\,x\,\text{Sin}[5\,a+4\,b\,x]+60\,i\,b^3\,c^2\,d^2\,x\,\text{Sin}[5\,a+4\,b\,x]-$$
$$60\,b^2\,c\,d^3\,x\,\text{Sin}[5\,a+4\,b\,x]-30\,i\,b\,d^4\,x\,\text{Sin}[5\,a+4\,b\,x]+60\,b^4\,c^2\,d^2\,x^2\,\text{Sin}[5\,a+4\,b\,x]+$$
$$60\,i\,b^3\,c\,d^3\,x^2\,\text{Sin}[5\,a+4\,b\,x]-30\,b^2\,d^4\,x^2\,\text{Sin}[5\,a+4\,b\,x]+$$
$$40\,b^4\,c\,d^3\,x^3\,\text{Sin}[5\,a+4\,b\,x]+20\,i\,b^3\,d^4\,x^3\,\text{Sin}[5\,a+4\,b\,x]+10\,b^4\,d^4\,x^4\,\text{Sin}[5\,a+4\,b\,x]\Big)-$$

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

Problem 165: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 246 leaves, 12 steps):

$$-\frac{3 d^3 x}{8 b^3} + \frac{(c + d x)^3}{4 b} - \frac{i (c + d x)^4}{4 d} + \frac{(c + d x)^3 \operatorname{Log}\left[1 - e^{2 i (a+b x)}\right]}{b} - \frac{3 i d (c + d x)^2 \operatorname{PolyLog}\left[2, e^{2 i (a+b x)}\right]}{2 b^2} + \frac{3 d^2 (c + d x) \operatorname{PolyLog}\left[3, e^{2 i (a+b x)}\right]}{2 b^3} + \frac{3 i d^3 \operatorname{PolyLog}\left[4, e^{2 i (a+b x)}\right]}{4 b^4} + \frac{3 d^3 \operatorname{Cos}[a + b x] \operatorname{Sin}[a + b x]}{8 b^4} - \frac{3 d (c + d x)^2 \operatorname{Cos}[a + b x] \operatorname{Sin}[a + b x]}{4 b^2} + \frac{3 d^2 (c + d x) \operatorname{Sin}[a + b x]^2}{4 b^3} - \frac{(c + d x)^3 \operatorname{Sin}[a + b x]^2}{2 b}$$

Result (type 4, 1712 leaves):

$$-\frac{1}{4 b^3} c d^2 e^{-i a} \mathrm{Csc}[a] \left(2 b^2 x^2 \left(2 b e^{2 i a} x + 3 i \left(-1 + e^{2 i a}\right) \mathrm{Log}\left[1 - e^{2 i (a+b x)}\right]\right) + 6 b \left(-1 + e^{2 i a}\right) x \,\mathrm{PolyLog}\left[2, e^{2 i (a+b x)}\right] + 3 i \left(-1 + e^{2 i a}\right) \mathrm{PolyLog}\left[3, e^{2 i (a+b x)}\right]\right) - \frac{1}{4} d^3 e^{i a} \mathrm{Csc}[a] \left(x^4 + \left(-1 + e^{-2 i a}\right) x^4 + \frac{1}{2 b^4} e^{-2 i a} \left(-1 + e^{2 i a}\right) \left(2 b^4 x^4 + 4 i b^3 x^3 \mathrm{Log}\left[1 - e^{2 i (a+b x)}\right] + 6 b^2 x^2 \mathrm{PolyLog}\left[2, e^{2 i (a+b x)}\right] + 6 i b x \,\mathrm{PolyLog}\left[3, e^{2 i (a+b x)}\right] - 3 \mathrm{PolyLog}\left[4, e^{2 i (a+b x)}\right]\right)\right) + \left(c^3 \mathrm{Csc}[a] \left(-b x \mathrm{Cos}[a] + \mathrm{Log}[\mathrm{Cos}[b x] \mathrm{Sin}[a] + \mathrm{Cos}[a] \mathrm{Sin}[b x]] \mathrm{Sin}[a]\right)\right) \Big/ \left(b \left(\mathrm{Cos}[a]^2 + \mathrm{Sin}[a]^2\right)\right) + \mathrm{Csc}[a] \left(\frac{\mathrm{Cos}[2 a + 2 b x]}{64 b^4} - \frac{i \mathrm{Sin}[2 a + 2 b x]}{64 b^4}\right) \left(32 b^4 c^3 x \mathrm{Cos}[a + 2 b x] + 48 b^4 c^2 d x^2 \mathrm{Cos}[a + 2 b x] + 32 b^4 c d^2 x^3 \mathrm{Cos}[a + 2 b x] + 8 b^4 d^3 x^4 \mathrm{Cos}[a + 2 b x] + 32 b^4 c^3 x \mathrm{Cos}[3 a + 2 b x] + 48 b^4 c^2 d x^2 \mathrm{Cos}[3 a + 2 b x] + 32 b^4 c d^2 x^3 \mathrm{Cos}[3 a + 2 b x] + 8 b^4 d^3 x^4 \mathrm{Cos}[3 a + 2 b x] + 4 i b^3 c^3 \mathrm{Cos}[3 a + 4 b x] - 6 b^2 c^2 d \mathrm{Cos}[3 a + 4 b x] - 6 i b c d^2 \mathrm{Cos}[3 a + 4 b x] + 3 d^3 \mathrm{Cos}[3 a + 4 b x] + 12 i b^3 c^2 d x \mathrm{Cos}[3 a + 4 b x] - 12 b^2 c d^2 x \mathrm{Cos}[3 a + 4 b x] - 6 i b d^3 x \mathrm{Cos}[3 a + 4 b x] + 12 i b^3 c d^2 x^2 \mathrm{Cos}[3 a + 4 b x] - 6 b^2 d^3 x^2 \mathrm{Cos}[3 a + 4 b x] + 4 i b^3 d^3 x^3 \mathrm{Cos}[3 a + 4 b x] - 4 i b^3 c^3 \mathrm{Cos}[5 a + 4 b x] + 6 b^2 c^2 d \mathrm{Cos}[5 a + 4 b x] + 6 i b c d^2 \mathrm{Cos}[5 a + 4 b x] - 3 d^3 \mathrm{Cos}[5 a + 4 b x] - 12 i b^3 c^2 d x \mathrm{Cos}[5 a + 4 b x] + 12 b^2 c d^2 x \mathrm{Cos}[5 a + 4 b x] + 6 i b d^3 x \mathrm{Cos}[5 a + 4 b x] - 12 i b^3 c d^2 x^2 \mathrm{Cos}[5 a + 4 b x] + 6 b^2 d^3 x^2 \mathrm{Cos}[5 a + 4 b x] - 4 i b^3 d^3 x^3 \mathrm{Cos}[5 a + 4 b x] + 8 b^3 c^3 \mathrm{Sin}[a] - 12 i b^2 c^2 d \mathrm{Sin}[a] - 12 b c d^2 \mathrm{Sin}[a] + 6 i d^3 \mathrm{Sin}[a] + 24 b^3 c^2 d x \mathrm{Sin}[a] - 24 i b^2 c d^2 x \mathrm{Sin}[a] - 12 b d^3 x \mathrm{Sin}[a] + 24 b^3 c d^2 x^2 \mathrm{Sin}[a] - 12 i b^2 d^3 x^2 \mathrm{Sin}[a] + 8 b^3 d^3 x^3 \mathrm{Sin}[a] + 32 i b^4 c^3 x \mathrm{Sin}[a + 2 b x] + 48 i b^4 c^2 d x^2 \mathrm{Sin}[a + 2 b x] + 32 i b^4 c d^2 x^3 \mathrm{Sin}[a + 2 b x] + 8 i b^4 d^3 x^4 \mathrm{Sin}[a + 2 b x] + 32 i b^4 c^3 x \mathrm{Sin}[3 a + 2 b x] + 48 i b^4 c^2 d x^2 \mathrm{Sin}[3 a + 2 b x] + 32 i b^4 c d^2 x^3 \mathrm{Sin}[3 a + 2 b x] + 8 i b^4 d^3 x^4 \mathrm{Sin}[3 a + 2 b x] - 4 b^3 c^3 \mathrm{Sin}[3 a + 4 b x] - 6 i b^2 c^2 d \mathrm{Sin}[3 a + 4 b x] + 6 b c d^2 \mathrm{Sin}[3 a + 4 b x] + 3 i d^3 \mathrm{Sin}[3 a + 4 b x] - 12 b^3 c^2 d x \mathrm{Sin}[3 a + 4 b x] - 12 i b^2 c d^2 x \mathrm{Sin}[3 a + 4 b x] + 6 b d^3 x \mathrm{Sin}[3 a + 4 b x] - 12 b^3 c d^2 x^2 \mathrm{Sin}[3 a + 4 b x] - 6 i b^2 d^3 x^2 \mathrm{Sin}[3 a + 4 b x] - 4 b^3 d^3 x^3 \mathrm{Sin}[3 a + 4 b x] + 4 b^3 c^3 \mathrm{Sin}[5 a + 4 b x] + 6 i b^2 c^2 d \mathrm{Sin}[5 a + 4 b x] - 6 b c d^2 \mathrm{Sin}[5 a + 4 b x] - 3 i d^3 \mathrm{Sin}[5 a + 4 b x] + 12 b^3 c^2 d x \mathrm{Sin}[5 a + 4 b x] + 12 i b^2 c d^2 x \mathrm{Sin}[5 a + 4 b x] - 6 b d^3 x \mathrm{Sin}[5 a + 4 b x] + 12 b^3 c d^2 x^2 \mathrm{Sin}[5 a + 4 b x] + 6 i b^2 d^3 x^2 \mathrm{Sin}[5 a + 4 b x] + 4 b^3 d^3 x^3 \mathrm{Sin}[5 a + 4 b x]\right) - \left(3 c^2 d \mathrm{Csc}[a] \mathrm{Sec}[a] \left(b^2 e^{i \mathrm{ArcTan}[\mathrm{Tan}[a]]} x^2 + \frac{1}{\sqrt{1 + \mathrm{Tan}[a]^2}} \left(i b x \left(-\pi + 2 \mathrm{ArcTan}[\mathrm{Tan}[a]]\right) - \pi \mathrm{Log}\left[1 + e^{-2 i b x}\right] - 2 \left(b x + \mathrm{ArcTan}[\mathrm{Tan}[a]]\right) \mathrm{Log}\left[1 - e^{2 i (b x + \mathrm{ArcTan}[\mathrm{Tan}[a]])}\right] + \pi \mathrm{Log}[\mathrm{Cos}[b x]] + 2 \mathrm{ArcTan}[\mathrm{Tan}[a]] \mathrm{Log}[\mathrm{Sin}[b x + \mathrm{ArcTan}[\mathrm{Tan}[a]]]] + i \mathrm{PolyLog}\left[2, e^{2 i (b x + \mathrm{ArcTan}[\mathrm{Tan}[a]])}\right]\right) \mathrm{Tan}[a]\right)\right) \Big/ \left(2 b^2 \sqrt{\mathrm{Sec}[a]^2 \left(\mathrm{Cos}[a]^2 + \mathrm{Sin}[a]^2\right)}\right)$$

Problem 166: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 181 leaves, 9 steps):

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

Result (type 4, 511 leaves):

$$\frac{1}{3}\,x\,\left(3\,c^2+3\,c\,d\,x+d^2\,x^2\right)\,\mathrm{Cot}[a]-\frac{1}{12\,b^3}d^2\,e^{-i\,a}\,\mathrm{Csc}[a]\,\left(2\,b^2\,x^2\,\left(2\,b\,e^{2\,i\,a}\,x+3\,i\,\left(-1+e^{2\,i\,a}\right)\,\mathrm{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]\right)+6\,b\,\left(-1+e^{2\,i\,a}\right)\,x\,\mathrm{PolyLog}\left[2,\,e^{2\,i\,(a+b\,x)}\right]+3\,i\,\left(-1+e^{2\,i\,a}\right)\,\mathrm{PolyLog}\left[3,\,e^{2\,i\,(a+b\,x)}\right]\right)+\left(c^2\,\mathrm{Csc}[a]\,\left(-b\,x\,\mathrm{Cos}[a]+\mathrm{Log}[\mathrm{Cos}[b\,x]\,\mathrm{Sin}[a]+\mathrm{Cos}[a]\,\mathrm{Sin}[b\,x]]\,\mathrm{Sin}[a]\right)\right)\Big/\left(b\,\left(\mathrm{Cos}[a]^2+\mathrm{Sin}[a]^2\right)\right)+\frac{1}{8\,b^3}\mathrm{Cos}[2\,b\,x]\,\left(2\,b^2\,c^2\,\mathrm{Cos}[2\,a]-d^2\,\mathrm{Cos}[2\,a]+4\,b^2\,c\,d\,x\,\mathrm{Cos}[2\,a]+2\,b^2\,d^2\,x^2\,\mathrm{Cos}[2\,a]-2\,b\,c\,d\,\mathrm{Sin}[2\,a]-2\,b\,d^2\,x\,\mathrm{Sin}[2\,a]\right)-\frac{1}{8\,b^3}\left(2\,b\,c\,d\,\mathrm{Cos}[2\,a]+2\,b\,d^2\,x\,\mathrm{Cos}[2\,a]+2\,b^2\,c^2\,\mathrm{Sin}[2\,a]-d^2\,\mathrm{Sin}[2\,a]+4\,b^2\,c\,d\,x\,\mathrm{Sin}[2\,a]+2\,b^2\,d^2\,x^2\,\mathrm{Sin}[2\,a]\right)\,\mathrm{Sin}[2\,b\,x]-\left(c\,d\,\mathrm{Csc}[a]\,\mathrm{Sec}[a]\,\left(b^2\,e^{i\,\mathrm{ArcTan}[\mathrm{Tan}[a]]}\,x^2+\frac{1}{\sqrt{1+\mathrm{Tan}[a]^2}}\left(i\,b\,x\,\left(-\pi+2\,\mathrm{ArcTan}[\mathrm{Tan}[a]]\right)-\pi\,\mathrm{Log}\left[1+e^{-2\,i\,b\,x}\right]-2\,\left(b\,x+\mathrm{ArcTan}[\mathrm{Tan}[a]]\right)\,\mathrm{Log}\left[1-e^{2\,i\,(b\,x+\mathrm{ArcTan}[\mathrm{Tan}[a]])}\right]+\pi\,\mathrm{Log}[\mathrm{Cos}[b\,x]]+2\,\mathrm{ArcTan}[\mathrm{Tan}[a]]\,\mathrm{Log}[\mathrm{Sin}[b\,x+\mathrm{ArcTan}[\mathrm{Tan}[a]]]]+i\,\mathrm{PolyLog}\left[2,\,e^{2\,i\,(b\,x+\mathrm{ArcTan}[\mathrm{Tan}[a]])}\right]\right)\,\mathrm{Tan}[a]\right)\right)\Big/\left(b^2\,\sqrt{\mathrm{Sec}[a]^2\,\left(\mathrm{Cos}[a]^2+\mathrm{Sin}[a]^2\right)}\right)$$

Problem 171: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 299 leaves, 16 steps):

$$-\frac{8\,d\,(c+d\,x)^3\,\text{ArcTanh}\left[e^{i\,(a+b\,x)}\right]}{b^2}+\frac{24\,d^3\,(c+d\,x)\,\text{Cos}[a+b\,x]}{b^4}-\frac{4\,d\,(c+d\,x)^3\,\text{Cos}[a+b\,x]}{b^2}-\frac{(c+d\,x)^4\,\text{Csc}[a+b\,x]}{b}+\frac{12\,i\,d^2\,(c+d\,x)^2\,\text{PolyLog}\left[2,-e^{i\,(a+b\,x)}\right]}{b^3}-\frac{12\,i\,d^2\,(c+d\,x)^2\,\text{PolyLog}\left[2,e^{i\,(a+b\,x)}\right]}{b^3}-\frac{24\,d^3\,(c+d\,x)\,\text{PolyLog}\left[3,-e^{i\,(a+b\,x)}\right]}{b^4}+\frac{24\,d^3\,(c+d\,x)\,\text{PolyLog}\left[3,e^{i\,(a+b\,x)}\right]}{b^4}-\frac{24\,i\,d^4\,\text{PolyLog}\left[4,-e^{i\,(a+b\,x)}\right]}{b^5}+\frac{24\,i\,d^4\,\text{PolyLog}\left[4,e^{i\,(a+b\,x)}\right]}{b^5}-\frac{24\,d^4\,\text{Sin}[a+b\,x]}{b^5}+\frac{12\,d^2\,(c+d\,x)^2\,\text{Sin}[a+b\,x]}{b^3}-\frac{(c+d\,x)^4\,\text{Sin}[a+b\,x]}{b}$$

Result (type 4, 833 leaves):

$$\frac{1}{2\,b^5}\text{Csc}[a+b\,x]\Big(-3\,b^4\,c^4+12\,b^2\,c^2\,d^2-24\,d^4-12\,b^4\,c^3\,d\,x+24\,b^2\,c\,d^3\,x-18\,b^4\,c^2\,d^2\,x^2+12\,b^2\,d^4\,x^2-12\,b^4\,c\,d^3\,x^3-3\,b^4\,d^4\,x^4+b^4\,c^4\,\text{Cos}[2\,(a+b\,x)]-12\,b^2\,c^2\,d^2\,\text{Cos}[2\,(a+b\,x)]+24\,d^4\,\text{Cos}[2\,(a+b\,x)]+4\,b^4\,c^3\,d\,x\,\text{Cos}[2\,(a+b\,x)]-24\,b^2\,c\,d^3\,x\,\text{Cos}[2\,(a+b\,x)]+6\,b^4\,c^2\,d^2\,x^2\,\text{Cos}[2\,(a+b\,x)]-12\,b^2\,d^4\,x^2\,\text{Cos}[2\,(a+b\,x)]+4\,b^4\,c\,d^3\,x^3\,\text{Cos}[2\,(a+b\,x)]+b^4\,d^4\,x^4\,\text{Cos}[2\,(a+b\,x)]-16\,b^3\,c^3\,d\,\text{ArcTanh}\left[e^{i\,(a+b\,x)}\right]\text{Sin}[a+b\,x]+24\,b^3\,c^2\,d^2\,x\,\text{Log}\left[1-e^{i\,(a+b\,x)}\right]\text{Sin}[a+b\,x]+24\,b^3\,c\,d^3\,x^2\,\text{Log}\left[1-e^{i\,(a+b\,x)}\right]\text{Sin}[a+b\,x]+8\,b^3\,d^4\,x^3\,\text{Log}\left[1-e^{i\,(a+b\,x)}\right]\text{Sin}[a+b\,x]-24\,b^3\,c^2\,d^2\,x\,\text{Log}\left[1+e^{i\,(a+b\,x)}\right]\text{Sin}[a+b\,x]-24\,b^3\,c\,d^3\,x^2\,\text{Log}\left[1+e^{i\,(a+b\,x)}\right]\text{Sin}[a+b\,x]-8\,b^3\,d^4\,x^3\,\text{Log}\left[1+e^{i\,(a+b\,x)}\right]\text{Sin}[a+b\,x]+24\,i\,b^2\,d^2\,(c+d\,x)^2\,\text{PolyLog}\left[2,-e^{i\,(a+b\,x)}\right]\text{Sin}[a+b\,x]-24\,i\,b^2\,d^2\,(c+d\,x)^2\,\text{PolyLog}\left[2,e^{i\,(a+b\,x)}\right]\text{Sin}[a+b\,x]-48\,b\,c\,d^3\,\text{PolyLog}\left[3,-e^{i\,(a+b\,x)}\right]\text{Sin}[a+b\,x]-48\,b\,d^4\,x\,\text{PolyLog}\left[3,-e^{i\,(a+b\,x)}\right]\text{Sin}[a+b\,x]+48\,b\,c\,d^3\,\text{PolyLog}\left[3,e^{i\,(a+b\,x)}\right]\text{Sin}[a+b\,x]+48\,b\,d^4\,x\,\text{PolyLog}\left[3,e^{i\,(a+b\,x)}\right]\text{Sin}[a+b\,x]-48\,i\,d^4\,\text{PolyLog}\left[4,-e^{i\,(a+b\,x)}\right]\text{Sin}[a+b\,x]+48\,i\,d^4\,\text{PolyLog}\left[4,e^{i\,(a+b\,x)}\right]\text{Sin}[a+b\,x]-4\,b^3\,c^3\,d\,\text{Sin}[2\,(a+b\,x)]+24\,b\,c\,d^3\,\text{Sin}[2\,(a+b\,x)]-12\,b^3\,c^2\,d^2\,x\,\text{Sin}[2\,(a+b\,x)]+24\,b\,d^4\,x\,\text{Sin}[2\,(a+b\,x)]-12\,b^3\,c\,d^3\,x^2\,\text{Sin}[2\,(a+b\,x)]-4\,b^3\,d^4\,x^3\,\text{Sin}[2\,(a+b\,x)]\Big)$$

Problem 172: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 216 leaves, 13 steps):

$$-\frac{6 d (c+d x)^2 \text{ArcTanh}\left[e^{i (a+b x)}\right]}{b^2}+\frac{6 d^3 \text{Cos}[a+b x]}{b^4}-\frac{3 d (c+d x)^2 \text{Cos}[a+b x]}{b^2}-\frac{(c+d x)^3 \text{Csc}[a+b x]}{b}+\frac{6 i d^2 (c+d x) \text{PolyLog}\left[2,-e^{i (a+b x)}\right]}{b^3}-\frac{6 i d^2 (c+d x) \text{PolyLog}\left[2,e^{i (a+b x)}\right]}{b^3}-\frac{6 d^3 \text{PolyLog}\left[3,-e^{i (a+b x)}\right]}{b^4}+\frac{6 d^3 \text{PolyLog}\left[3,e^{i (a+b x)}\right]}{b^4}+\frac{6 d^2 (c+d x) \text{Sin}[a+b x]}{b^3}-\frac{(c+d x)^3 \text{Sin}[a+b x]}{b}$$

Result (type 4, 506 leaves):

$$\frac{1}{2 b^4}\text{Csc}[a+b x] \left(-3 b^3 c^3+6 b c d^2-9 b^3 c^2 d x+6 b d^3 x-9 b^3 c d^2 x^2-3 b^3 d^3 x^3+b^3 c^3 \text{Cos}[2 (a+b x)]-6 b c d^2 \text{Cos}[2 (a+b x)]+3 b^3 c^2 d x \text{Cos}[2 (a+b x)]-6 b d^3 x \text{Cos}[2 (a+b x)]+3 b^3 c d^2 x^2 \text{Cos}[2 (a+b x)]+b^3 d^3 x^3 \text{Cos}[2 (a+b x)]-12 b^2 c^2 d \text{ArcTanh}\left[e^{i (a+b x)}\right] \text{Sin}[a+b x]+12 b^2 c d^2 x \text{Log}\left[1-e^{i (a+b x)}\right] \text{Sin}[a+b x]+6 b^2 d^3 x^2 \text{Log}\left[1-e^{i (a+b x)}\right] \text{Sin}[a+b x]-12 b^2 c d^2 x \text{Log}\left[1+e^{i (a+b x)}\right] \text{Sin}[a+b x]-6 b^2 d^3 x^2 \text{Log}\left[1+e^{i (a+b x)}\right] \text{Sin}[a+b x]+12 i b d^2 (c+d x) \text{PolyLog}\left[2,-e^{i (a+b x)}\right] \text{Sin}[a+b x]-12 i b d^2 (c+d x) \text{PolyLog}\left[2,e^{i (a+b x)}\right] \text{Sin}[a+b x]-12 d^3 \text{PolyLog}\left[3,-e^{i (a+b x)}\right] \text{Sin}[a+b x]+12 d^3 \text{PolyLog}\left[3,e^{i (a+b x)}\right] \text{Sin}[a+b x]-3 b^2 c^2 d \text{Sin}[2 (a+b x)]+6 d^3 \text{Sin}[2 (a+b x)]-6 b^2 c d^2 x \text{Sin}[2 (a+b x)]-3 b^2 d^3 x^2 \text{Sin}[2 (a+b x)]\right)$$

Problem 173: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 139 leaves, 10 steps):

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

Result (type 4, 485 leaves):

$$-\frac{(c+d\,x)^2\,\mathrm{Csc}[a]}{b}-\frac{1}{b^3}\mathrm{Cos}[b\,x]\left(2\,b\,c\,d\,\mathrm{Cos}[a]+2\,b\,d^2\,x\,\mathrm{Cos}[a]+b^2\,c^2\,\mathrm{Sin}[a]-2\,d^2\,\mathrm{Sin}[a]+2\,b^2\,c\,d\,x\,\mathrm{Sin}[a]+b^2\,d^2\,x^2\,\mathrm{Sin}[a]\right)+$$
$$\frac{4\,i\,c\,d\,\mathrm{ArcTan}\left[\frac{i\,\mathrm{Cos}[a]-i\,\mathrm{Sin}[a]\,\mathrm{Tan}\left[\frac{b\,x}{2}\right]}{\sqrt{\mathrm{Cos}[a]^2+\mathrm{Sin}[a]^2}}\right]}{b^2\,\sqrt{\mathrm{Cos}[a]^2+\mathrm{Sin}[a]^2}}+$$
$$\frac{\mathrm{Sec}\left[\frac{a}{2}\right]\,\mathrm{Sec}\left[\frac{a}{2}+\frac{b\,x}{2}\right]\left(-c^2\,\mathrm{Sin}\left[\frac{b\,x}{2}\right]-2\,c\,d\,x\,\mathrm{Sin}\left[\frac{b\,x}{2}\right]-d^2\,x^2\,\mathrm{Sin}\left[\frac{b\,x}{2}\right]\right)}{2\,b}+$$
$$\frac{\mathrm{Csc}\left[\frac{a}{2}\right]\,\mathrm{Csc}\left[\frac{a}{2}+\frac{b\,x}{2}\right]\left(c^2\,\mathrm{Sin}\left[\frac{b\,x}{2}\right]+2\,c\,d\,x\,\mathrm{Sin}\left[\frac{b\,x}{2}\right]+d^2\,x^2\,\mathrm{Sin}\left[\frac{b\,x}{2}\right]\right)}{2\,b}-\frac{1}{b^3}$$
$$\left(b^2\,c^2\,\mathrm{Cos}[a]-2\,d^2\,\mathrm{Cos}[a]+2\,b^2\,c\,d\,x\,\mathrm{Cos}[a]+b^2\,d^2\,x^2\,\mathrm{Cos}[a]-2\,b\,c\,d\,\mathrm{Sin}[a]-2\,b\,d^2\,x\,\mathrm{Sin}[a]\right)$$
$$\mathrm{Sin}[b\,x]+\frac{1}{b^3}2\,d^2\left(-\frac{2\,\mathrm{ArcTan}[\mathrm{Tan}[a]]\,\mathrm{ArcTanh}\left[\frac{-\mathrm{Cos}[a]+\mathrm{Sin}[a]\,\mathrm{Tan}\left[\frac{b\,x}{2}\right]}{\sqrt{\mathrm{Cos}[a]^2+\mathrm{Sin}[a]^2}}\right]}{\sqrt{\mathrm{Cos}[a]^2+\mathrm{Sin}[a]^2}}+\frac{1}{\sqrt{1+\mathrm{Tan}[a]^2}}\right.$$
$$\left(\left(b\,x+\mathrm{ArcTan}[\mathrm{Tan}[a]]\right)\left(\mathrm{Log}\left[1-e^{i\,(b\,x+\mathrm{ArcTan}[\mathrm{Tan}[a]])}\right]-\mathrm{Log}\left[1+e^{i\,(b\,x+\mathrm{ArcTan}[\mathrm{Tan}[a]])}\right]\right)+\right.$$
$$\left.\left.i\left(\mathrm{PolyLog}\left[2,-e^{i\,(b\,x+\mathrm{ArcTan}[\mathrm{Tan}[a]])}\right]-\mathrm{PolyLog}\left[2,e^{i\,(b\,x+\mathrm{ArcTan}[\mathrm{Tan}[a]])}\right]\right)\right)\mathrm{Sec}[a]\right)$$

Problem 178: Result more than twice size of optimal antiderivative.

$$\int (c+d\,x)^4\,\mathrm{Cot}[a+b\,x]^3\,dx$$

Optimal (type 4, 302 leaves, 15 steps):

$$-\frac{2\,i\,d\,(c+d\,x)^3}{b^2}-\frac{(c+d\,x)^4}{2\,b}+\frac{i\,(c+d\,x)^5}{5\,d}-\frac{2\,d\,(c+d\,x)^3\,\mathrm{Cot}[a+b\,x]}{b^2}-$$
$$\frac{(c+d\,x)^4\,\mathrm{Cot}[a+b\,x]^2}{2\,b}+\frac{6\,d^2\,(c+d\,x)^2\,\mathrm{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]}{b^3}-\frac{(c+d\,x)^4\,\mathrm{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]}{b}-$$
$$\frac{6\,i\,d^3\,(c+d\,x)\,\mathrm{PolyLog}\left[2,e^{2\,i\,(a+b\,x)}\right]}{b^4}+\frac{2\,i\,d\,(c+d\,x)^3\,\mathrm{PolyLog}\left[2,e^{2\,i\,(a+b\,x)}\right]}{b^2}+$$
$$\frac{3\,d^4\,\mathrm{PolyLog}\left[3,e^{2\,i\,(a+b\,x)}\right]}{b^5}-\frac{3\,d^2\,(c+d\,x)^2\,\mathrm{PolyLog}\left[3,e^{2\,i\,(a+b\,x)}\right]}{b^3}-$$
$$\frac{3\,i\,d^3\,(c+d\,x)\,\mathrm{PolyLog}\left[4,e^{2\,i\,(a+b\,x)}\right]}{b^4}+\frac{3\,d^4\,\mathrm{PolyLog}\left[5,e^{2\,i\,(a+b\,x)}\right]}{2\,b^5}$$

Result (type 4, 1101 leaves):

$$-\frac{1}{5} x \left(5 c^4+10 c^3 d x+10 c^2 d^2 x^2+5 c d^3 x^3+d^4 x^4\right) \text{Cot}[a]-\frac{(c+d x)^4 \text{Csc}[a+b x]^2}{2 b}+$$
$$\frac{1}{2 b^3} c^2 d^2 e^{-i a} \text{Csc}[a] \left(2 b^2 x^2 \left(2 b e^{2 i a} x+3 i \left(-1+e^{2 i a}\right) \text{Log}\left[1-e^{2 i (a+b x)}\right]\right)+\right.$$
$$\left.6 b \left(-1+e^{2 i a}\right) x \text{PolyLog}\left[2, e^{2 i (a+b x)}\right]+3 i \left(-1+e^{2 i a}\right) \text{PolyLog}\left[3, e^{2 i (a+b x)}\right]\right)-$$
$$\frac{1}{2 b^5} d^4 e^{-i a} \text{Csc}[a] \left(2 b^2 x^2 \left(2 b e^{2 i a} x+3 i \left(-1+e^{2 i a}\right) \text{Log}\left[1-e^{2 i (a+b x)}\right]\right)+\right.$$
$$\left.6 b \left(-1+e^{2 i a}\right) x \text{PolyLog}\left[2, e^{2 i (a+b x)}\right]+3 i \left(-1+e^{2 i a}\right) \text{PolyLog}\left[3, e^{2 i (a+b x)}\right]\right)+$$
$$c d^3 e^{i a} \text{Csc}[a] \left(x^4+\left(-1+e^{-2 i a}\right) x^4+\frac{1}{2 b^4} e^{-2 i a} \left(-1+e^{2 i a}\right) \left(2 b^4 x^4+4 i b^3 x^3 \text{Log}\left[1-e^{2 i (a+b x)}\right]+\right.\right.$$
$$\left.\left.6 b^2 x^2 \text{PolyLog}\left[2, e^{2 i (a+b x)}\right]+6 i b x \text{PolyLog}\left[3, e^{2 i (a+b x)}\right]-3 \text{PolyLog}\left[4, e^{2 i (a+b x)}\right]\right)\right)+$$
$$\frac{1}{5} d^4 e^{i a} \text{Csc}[a] \left(x^5+\left(-1+e^{-2 i a}\right) x^5+\frac{1}{4 b^5} e^{-2 i a} \left(-1+e^{2 i a}\right)\right.$$
$$\left(4 b^5 x^5+10 i b^4 x^4 \text{Log}\left[1-e^{2 i (a+b x)}\right]+20 b^3 x^3 \text{PolyLog}\left[2, e^{2 i (a+b x)}\right]+30 i b^2 x^2\right.$$
$$\left.\left.\text{PolyLog}\left[3, e^{2 i (a+b x)}\right]-30 b x \text{PolyLog}\left[4, e^{2 i (a+b x)}\right]-15 i \text{PolyLog}\left[5, e^{2 i (a+b x)}\right]\right)\right)-$$
$$\left(c^4 \text{Csc}[a] \left(-b x \text{Cos}[a]+\text{Log}[\text{Cos}[b x] \text{Sin}[a]+\text{Cos}[a] \text{Sin}[b x]] \text{Sin}[a]\right)\right) \Big/$$
$$\left(b \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)+$$
$$\left(6 c^2 d^2 \text{Csc}[a] \left(-b x \text{Cos}[a]+\text{Log}[\text{Cos}[b x] \text{Sin}[a]+\text{Cos}[a] \text{Sin}[b x]] \text{Sin}[a]\right)\right) \Big/$$
$$\left(b^3 \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)+\frac{1}{b^2}$$
$$2 \text{Csc}[a] \text{Csc}[a+b x] \left(c^3 d \text{Sin}[b x]+3 c^2 d^2 x \text{Sin}[b x]+3 c d^3 x^2 \text{Sin}[b x]+d^4 x^3 \text{Sin}[b x]\right)+$$
$$\left(2 c^3 d \text{Csc}[a] \text{Sec}[a] \left(b^2 e^{i \text{ArcTan}[\text{Tan}[a]]} x^2+\frac{1}{\sqrt{1+\text{Tan}[a]^2}}\right.\right.$$
$$\left(i b x \left(-\pi+2 \text{ArcTan}[\text{Tan}[a]]\right)-\pi \text{Log}\left[1+e^{-2 i b x}\right]-2 \left(b x+\text{ArcTan}[\text{Tan}[a]]\right)\right.$$
$$\text{Log}\left[1-e^{2 i (b x+\text{ArcTan}[\text{Tan}[a]])}\right]+\pi \text{Log}[\text{Cos}[b x]]+2 \text{ArcTan}[\text{Tan}[a]]$$
$$\left.\left.\left.\text{Log}[\text{Sin}[b x+\text{ArcTan}[\text{Tan}[a]]]]+i \text{PolyLog}\left[2, e^{2 i (b x+\text{ArcTan}[\text{Tan}[a]])}\right]\right) \text{Tan}[a]\right)\right) \Big/$$
$$\left(b^2 \sqrt{\text{Sec}[a]^2 \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)}\right)-\left(6 c d^3 \text{Csc}[a] \text{Sec}[a]\right.$$
$$\left(b^2 e^{i \text{ArcTan}[\text{Tan}[a]]} x^2+\frac{1}{\sqrt{1+\text{Tan}[a]^2}} \left(i b x \left(-\pi+2 \text{ArcTan}[\text{Tan}[a]]\right)-\pi \text{Log}\left[1+e^{-2 i b x}\right]-\right.\right.$$
$$2 \left(b x+\text{ArcTan}[\text{Tan}[a]]\right) \text{Log}\left[1-e^{2 i (b x+\text{ArcTan}[\text{Tan}[a]])}\right]+\pi \text{Log}[\text{Cos}[b x]]+$$
$$\left.2 \text{ArcTan}[\text{Tan}[a]] \text{Log}[\text{Sin}[b x+\text{ArcTan}[\text{Tan}[a]]]]+i \text{PolyLog}\left[2, e^{2 i (b x+\text{ArcTan}[\text{Tan}[a]])}\right]\right)$$
$$\left.\left.\text{Tan}[a]\right)\right) \Big/ \left(b^4 \sqrt{\text{Sec}[a]^2 \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)}\right)$$

Problem 179: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 256 leaves, 13 steps):

$$-\frac{3 i d (c+d x)^2}{2 b^2}-\frac{(c+d x)^3}{2 b}+\frac{i (c+d x)^4}{4 d}-\frac{3 d (c+d x)^2 \operatorname{Cot}[a+b x]}{2 b^2}-\frac{(c+d x)^3 \operatorname{Cot}[a+b x]^2}{2 b}+\frac{3 d^2 (c+d x) \operatorname{Log}\left[1-e^{2 i (a+b x)}\right]}{b^3}-\frac{(c+d x)^3 \operatorname{Log}\left[1-e^{2 i (a+b x)}\right]}{b}-\frac{3 i d^3 \operatorname{PolyLog}\left[2, e^{2 i (a+b x)}\right]}{2 b^4}+\frac{3 i d (c+d x)^2 \operatorname{PolyLog}\left[2, e^{2 i (a+b x)}\right]}{2 b^2}-\frac{3 d^2 (c+d x) \operatorname{PolyLog}\left[3, e^{2 i (a+b x)}\right]}{2 b^3}-\frac{3 i d^3 \operatorname{PolyLog}\left[4, e^{2 i (a+b x)}\right]}{4 b^4}$$

Result (type 4, 788 leaves):

$$-\frac{1}{4} x \left(4 c^3+6 c^2 d x+4 c d^2 x^2+d^3 x^3\right) \text{Cot}[a]-\frac{(c+d x)^3 \text{Csc}[a+b x]^2}{2 b}+$$
$$\frac{1}{4 b^3} c\, d^2 e^{-i a} \text{Csc}[a] \left(2 b^2 x^2 \left(2 b e^{2 i a} x+3 i \left(-1+e^{2 i a}\right) \text{Log}\left[1-e^{2 i (a+b x)}\right]\right)+\right.$$
$$\left.6 b \left(-1+e^{2 i a}\right) x\, \text{PolyLog}\left[2, e^{2 i (a+b x)}\right]+3 i \left(-1+e^{2 i a}\right) \text{PolyLog}\left[3, e^{2 i (a+b x)}\right]\right)+$$
$$\frac{1}{4} d^3 e^{i a} \text{Csc}[a] \left(x^4+\left(-1+e^{-2 i a}\right) x^4+\frac{1}{2 b^4} e^{-2 i a} \left(-1+e^{2 i a}\right) \left(2 b^4 x^4+4 i b^3 x^3 \text{Log}\left[1-e^{2 i (a+b x)}\right]+\right.\right.$$
$$\left.\left.6 b^2 x^2 \text{PolyLog}\left[2, e^{2 i (a+b x)}\right]+6 i b x\, \text{PolyLog}\left[3, e^{2 i (a+b x)}\right]-3\, \text{PolyLog}\left[4, e^{2 i (a+b x)}\right]\right)\right)-$$
$$\left(c^3 \text{Csc}[a] \left(-b x \text{Cos}[a]+\text{Log}[\text{Cos}[b x] \text{Sin}[a]+\text{Cos}[a] \text{Sin}[b x]] \text{Sin}[a]\right)\right)\Big/$$
$$\left(b \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)+$$
$$\left(3 c\, d^2 \text{Csc}[a] \left(-b x \text{Cos}[a]+\text{Log}[\text{Cos}[b x] \text{Sin}[a]+\text{Cos}[a] \text{Sin}[b x]] \text{Sin}[a]\right)\right)\Big/$$
$$\left(b^3 \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)+\frac{1}{2 b^2}$$
$$3\, \text{Csc}[a] \text{Csc}[a+b x] \left(c^2 d\, \text{Sin}[b x]+2 c\, d^2 x\, \text{Sin}[b x]+d^3 x^2 \text{Sin}[b x]\right)+$$
$$\left(3 c^2 d\, \text{Csc}[a] \text{Sec}[a]\right.$$
$$\left(b^2 e^{i \text{ArcTan}[\text{Tan}[a]]} x^2+\frac{1}{\sqrt{1+\text{Tan}[a]^2}} \left(i b x (-\pi+2 \text{ArcTan}[\text{Tan}[a]])-\pi \text{Log}\left[1+e^{-2 i b x}\right]-\right.\right.$$
$$2 (b x+\text{ArcTan}[\text{Tan}[a]]) \text{Log}\left[1-e^{2 i (b x+\text{ArcTan}[\text{Tan}[a]])}\right]+\pi \text{Log}[\text{Cos}[b x]]+$$
$$\left.2 \text{ArcTan}[\text{Tan}[a]] \text{Log}[\text{Sin}[b x+\text{ArcTan}[\text{Tan}[a]]]]+i\, \text{PolyLog}\left[2, e^{2 i (b x+\text{ArcTan}[\text{Tan}[a]])}\right]\right)$$
$$\left.\left.\text{Tan}[a]\right)\right)\Big/\left(2 b^2 \sqrt{\text{Sec}[a]^2 \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)}\right)-$$
$$\left(3 d^3 \text{Csc}[a] \text{Sec}[a] \left(b^2 e^{i \text{ArcTan}[\text{Tan}[a]]} x^2+\frac{1}{\sqrt{1+\text{Tan}[a]^2}} \left(i b x (-\pi+2 \text{ArcTan}[\text{Tan}[a]])-\right.\right.\right.$$
$$\pi \text{Log}\left[1+e^{-2 i b x}\right]-2 (b x+\text{ArcTan}[\text{Tan}[a]]) \text{Log}\left[1-e^{2 i (b x+\text{ArcTan}[\text{Tan}[a]])}\right]+$$
$$\pi \text{Log}[\text{Cos}[b x]]+2 \text{ArcTan}[\text{Tan}[a]] \text{Log}[\text{Sin}[b x+\text{ArcTan}[\text{Tan}[a]]]]+$$
$$\left.\left.\left.i\, \text{PolyLog}\left[2, e^{2 i (b x+\text{ArcTan}[\text{Tan}[a]])}\right]\right) \text{Tan}[a]\right)\right)\Big/\left(2 b^4 \sqrt{\text{Sec}[a]^2 \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)}\right)$$

Problem 180: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 168 leaves, 9 steps):

$$-\frac{c\,d\,x}{b}-\frac{d^2 x^2}{2\,b}+\frac{i\,(c+d\,x)^3}{3\,d}-\frac{d\,(c+d\,x)\,\text{Cot}[a+b\,x]}{b^2}-\frac{(c+d\,x)^2\,\text{Cot}[a+b\,x]^2}{2\,b}-\frac{(c+d\,x)^2\,\text{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]}{b}+\frac{d^2\,\text{Log}[\text{Sin}[a+b\,x]]}{b^3}+\frac{i\,d\,(c+d\,x)\,\text{PolyLog}\left[2,\,e^{2\,i\,(a+b\,x)}\right]}{b^2}-\frac{d^2\,\text{PolyLog}\left[3,\,e^{2\,i\,(a+b\,x)}\right]}{2\,b^3}$$

Result (type 4, 446 leaves):

$$-\frac{1}{3}\,x\,\left(3\,c^2+3\,c\,d\,x+d^2\,x^2\right)\,\text{Cot}[a]-\frac{(c+d\,x)^2\,\text{Csc}[a+b\,x]^2}{2\,b}+\frac{1}{12\,b^3}d^2\,e^{-i\,a}\,\text{Csc}[a]\,\Big(2\,b^2\,x^2\,\left(2\,b\,e^{2\,i\,a}\,x+3\,i\,\left(-1+e^{2\,i\,a}\right)\,\text{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]\right)+6\,b\,\left(-1+e^{2\,i\,a}\right)\,x\,\text{PolyLog}\left[2,\,e^{2\,i\,(a+b\,x)}\right]+3\,i\,\left(-1+e^{2\,i\,a}\right)\,\text{PolyLog}\left[3,\,e^{2\,i\,(a+b\,x)}\right]\Big)-\left(c^2\,\text{Csc}[a]\,\left(-b\,x\,\text{Cos}[a]+\text{Log}[\text{Cos}[b\,x]\,\text{Sin}[a]+\text{Cos}[a]\,\text{Sin}[b\,x]]\,\text{Sin}[a]\right)\right)\Big/\left(b\,\left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)+\left(d^2\,\text{Csc}[a]\,\left(-b\,x\,\text{Cos}[a]+\text{Log}[\text{Cos}[b\,x]\,\text{Sin}[a]+\text{Cos}[a]\,\text{Sin}[b\,x]]\,\text{Sin}[a]\right)\right)\Big/\left(b^3\,\left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)+\frac{\text{Csc}[a]\,\text{Csc}[a+b\,x]\,\left(c\,d\,\text{Sin}[b\,x]+d^2\,x\,\text{Sin}[b\,x]\right)}{b^2}+\left(c\,d\,\text{Csc}[a]\,\text{Sec}[a]\,\left(b^2\,e^{i\,\text{ArcTan}[\text{Tan}[a]]}\,x^2+\frac{1}{\sqrt{1+\text{Tan}[a]^2}}\left(i\,b\,x\,\left(-\pi+2\,\text{ArcTan}[\text{Tan}[a]]\right)-\pi\,\text{Log}\left[1+e^{-2\,i\,b\,x}\right]-2\,\left(b\,x+\text{ArcTan}[\text{Tan}[a]]\right)\,\text{Log}\left[1-e^{2\,i\,(b\,x+\text{ArcTan}[\text{Tan}[a]])}\right]+\pi\,\text{Log}[\text{Cos}[b\,x]]+2\,\text{ArcTan}[\text{Tan}[a]]\,\text{Log}[\text{Sin}[b\,x+\text{ArcTan}[\text{Tan}[a]]]]+i\,\text{PolyLog}\left[2,\,e^{2\,i\,(b\,x+\text{ArcTan}[\text{Tan}[a]])}\right]\right)\,\text{Tan}[a]\right)\right)\Big/\left(b^2\,\sqrt{\text{Sec}[a]^2\,\left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)}\right)$$

Problem 181: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 109 leaves, 7 steps):

$$-\frac{d\,x}{2\,b}+\frac{i\,(c+d\,x)^2}{2\,d}-\frac{d\,\text{Cot}[a+b\,x]}{2\,b^2}-\frac{(c+d\,x)\,\text{Cot}[a+b\,x]^2}{2\,b}-\frac{(c+d\,x)\,\text{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]}{b}+\frac{i\,d\,\text{PolyLog}\left[2,\,e^{2\,i\,(a+b\,x)}\right]}{2\,b^2}$$

Result (type 4, 234 leaves):

$$-\frac{1}{2} d x^2 \operatorname{Cot}[a] - \frac{c \operatorname{Csc}[a+b x]^2}{2 b} - \frac{d x \operatorname{Csc}[a+b x]^2}{2 b} - \frac{c \operatorname{Log}[\operatorname{Sin}[a+b x]]}{b} + \frac{d \operatorname{Csc}[a] \operatorname{Csc}[a+b x] \operatorname{Sin}[b x]}{2 b^2} + \left(d \operatorname{Csc}[a] \operatorname{Sec}[a] \left(b^2 e^{i \operatorname{ArcTan}[\operatorname{Tan}[a]]} x^2 + \frac{1}{\sqrt{1+\operatorname{Tan}[a]^2}} \left(i b x \left(-\pi + 2 \operatorname{ArcTan}[\operatorname{Tan}[a]]\right) - \pi \operatorname{Log}\left[1+e^{-2 i b x}\right] - 2 \left(b x + \operatorname{ArcTan}[\operatorname{Tan}[a]]\right) \operatorname{Log}\left[1-e^{2 i (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right] + \pi \operatorname{Log}[\operatorname{Cos}[b x]] + 2 \operatorname{ArcTan}[\operatorname{Tan}[a]] \operatorname{Log}[\operatorname{Sin}[b x + \operatorname{ArcTan}[\operatorname{Tan}[a]]]] + i \operatorname{PolyLog}\left[2, e^{2 i (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]\right) \operatorname{Tan}[a]\right)\right) \Big/ \left(2 b^2 \sqrt{\operatorname{Sec}[a]^2 \left(\operatorname{Cos}[a]^2 + \operatorname{Sin}[a]^2\right)}\right)$$

Problem 190: Result more than twice size of optimal antiderivative.

$$\int (c+d x)^{5/2} \operatorname{Cos}[a+b x]^3 \operatorname{Sin}[a+b x]^2 \, dx$$

Optimal (type 4, 615 leaves, 26 steps):

$$\frac{5 d (c+d x)^{3/2} \text{Cos}[a+b x]}{16 b^2}-\frac{5 d (c+d x)^{3/2} \text{Cos}[3 a+3 b x]}{288 b^2}-$$

$$\frac{d (c+d x)^{3/2} \text{Cos}[5 a+5 b x]}{160 b^2}+\frac{15 d^{5/2} \sqrt{\frac{\pi}{2}} \text{Cos}\left[a-\frac{b c}{d}\right] \text{FresnelS}\left[\frac{\sqrt{b} \sqrt{\frac{2}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right]}{32 b^{7/2}}-$$

$$\frac{5 d^{5/2} \sqrt{\frac{\pi}{6}} \text{Cos}\left[3 a-\frac{3 b c}{d}\right] \text{FresnelS}\left[\frac{\sqrt{b} \sqrt{\frac{6}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right]}{576 b^{7/2}}-$$

$$\frac{3 d^{5/2} \sqrt{\frac{\pi}{10}} \text{Cos}\left[5 a-\frac{5 b c}{d}\right] \text{FresnelS}\left[\frac{\sqrt{b} \sqrt{\frac{10}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right]}{1600 b^{7/2}}-$$

$$\frac{3 d^{5/2} \sqrt{\frac{\pi}{10}} \text{FresnelC}\left[\frac{\sqrt{b} \sqrt{\frac{10}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right] \text{Sin}\left[5 a-\frac{5 b c}{d}\right]}{1600 b^{7/2}}-$$

$$\frac{5 d^{5/2} \sqrt{\frac{\pi}{6}} \text{FresnelC}\left[\frac{\sqrt{b} \sqrt{\frac{6}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right] \text{Sin}\left[3 a-\frac{3 b c}{d}\right]}{576 b^{7/2}}+$$

$$\frac{15 d^{5/2} \sqrt{\frac{\pi}{2}} \text{FresnelC}\left[\frac{\sqrt{b} \sqrt{\frac{2}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right] \text{Sin}\left[a-\frac{b c}{d}\right]}{32 b^{7/2}}-\frac{15 d^2 \sqrt{c+d x} \text{Sin}[a+b x]}{32 b^3}+$$

$$\frac{(c+d x)^{5/2} \text{Sin}[a+b x]}{8 b}+\frac{5 d^2 \sqrt{c+d x} \text{Sin}[3 a+3 b x]}{576 b^3}-\frac{(c+d x)^{5/2} \text{Sin}[3 a+3 b x]}{48 b}+$$

$$\frac{3 d^2 \sqrt{c+d x} \text{Sin}[5 a+5 b x]}{1600 b^3}-\frac{(c+d x)^{5/2} \text{Sin}[5 a+5 b x]}{80 b}$$

Result (type 4, 4926 leaves):

$$\frac{1}{16 b \sqrt{\frac{b}{d}}} c^2 \left(-\sqrt{2 \pi} \text{Cos}\left[a-\frac{b c}{d}\right] \text{FresnelS}\left[\sqrt{\frac{b}{d}} \sqrt{\frac{2}{\pi}} \sqrt{c+d x}\right]-\right.$$

$$\left.\sqrt{2 \pi} \text{FresnelC}\left[\sqrt{\frac{b}{d}} \sqrt{\frac{2}{\pi}} \sqrt{c+d x}\right] \text{Sin}\left[a-\frac{b c}{d}\right]+2 \sqrt{\frac{b}{d}} \sqrt{c+d x} \text{Sin}[a+b x]\right)+\frac{1}{16 b^3}$$

$$c d \left(\sqrt{\frac{b}{d}} \sqrt{2 \pi} \text{FresnelC}\left[\sqrt{\frac{b}{d}} \sqrt{\frac{2}{\pi}} \sqrt{c+d x}\right] \left(-3 d \text{Cos}\left[a-\frac{b c}{d}\right]+2 b c \text{Sin}\left[a-\frac{b c}{d}\right]\right)+\right.$$

$$\sqrt{\frac{b}{d}} \sqrt{2 \pi} \text{FresnelS}\left[\sqrt{\frac{b}{d}} \sqrt{\frac{2}{\pi}} \sqrt{c+d x}\right] \left(2 b c \text{Cos}\left[a-\frac{b c}{d}\right]+3 d \text{Sin}\left[a-\frac{b c}{d}\right]\right)+$$

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

$$\Bigg(-\sqrt{2\,\pi}\,\text{FresnelS}\Big[\sqrt{\frac{b}{d}}\,\sqrt{\frac{2}{\pi}}\,\sqrt{c+d\,x}\Big]\left(\left(4\,b^2\,c^2-15\,d^2\right)\text{Cos}\Big[a-\frac{b\,c}{d}\Big]+12\,b\,c\,d\,\text{Sin}\Big[a-\frac{b\,c}{d}\Big]\right)-$$

$$\sqrt{2\,\pi}\,\text{FresnelC}\Big[\sqrt{\frac{b}{d}}\,\sqrt{\frac{2}{\pi}}\,\sqrt{c+d\,x}\Big]\left(-12\,b\,c\,d\,\text{Cos}\Big[a-\frac{b\,c}{d}\Big]+\left(4\,b^2\,c^2-15\,d^2\right)\text{Sin}\Big[a-\frac{b\,c}{d}\Big]\right)+$$

$$2\,\sqrt{\frac{b}{d}}\,d\,\sqrt{c+d\,x}\,\left(-2\,b\,\left(c-5\,d\,x\right)\text{Cos}[a+b\,x]+d\,\left(-15+4\,b^2\,x^2\right)\text{Sin}[a+b\,x]\right)\Bigg)-\frac{1}{96\,\sqrt{3}\,b\,\sqrt{\frac{b}{d}}}$$

$$c^2\,\Bigg(-\sqrt{2\,\pi}\,\text{Cos}\Big[3\,a-\frac{3\,b\,c}{d}\Big]\,\text{FresnelS}\Big[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\Big]-\sqrt{2\,\pi}\,\text{FresnelC}\Big[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\Big]$$

$$\text{Sin}\Big[3\,a-\frac{3\,b\,c}{d}\Big]+2\,\sqrt{3}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Sin}\big[3\,\left(a+b\,x\right)\big]\Bigg)-\frac{1}{96\,\sqrt{3}\,b^3}$$

$$c\,d\,\Bigg(\sqrt{\frac{b}{d}}\,\sqrt{2\,\pi}\,\text{FresnelC}\Big[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\Big]\left(-d\,\text{Cos}\Big[3\,a-\frac{3\,b\,c}{d}\Big]+2\,b\,c\,\text{Sin}\Big[3\,a-\frac{3\,b\,c}{d}\Big]\right)+$$

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

$$2\,\sqrt{3}\,b\,\sqrt{c+d\,x}\,\left(\text{Cos}\big[3\,\left(a+b\,x\right)\big]+2\,b\,x\,\text{Sin}\big[3\,\left(a+b\,x\right)\big]\right)\Bigg)-$$

$$\frac{1}{160\,\sqrt{5}\,b\,\sqrt{\frac{b}{d}}}c^2\,\Bigg(-\sqrt{2\,\pi}\,\text{Cos}\Big[5\,a-\frac{5\,b\,c}{d}\Big]\,\text{FresnelS}\Big[\sqrt{\frac{b}{d}}\,\sqrt{\frac{10}{\pi}}\,\sqrt{c+d\,x}\Big]-$$

$$\sqrt{2\,\pi}\,\text{FresnelC}\Big[\sqrt{\frac{b}{d}}\,\sqrt{\frac{10}{\pi}}\,\sqrt{c+d\,x}\Big]\,\text{Sin}\Big[5\,a-\frac{5\,b\,c}{d}\Big]+$$

$$2\,\sqrt{5}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Sin}\big[5\,\left(a+b\,x\right)\big]\Bigg)-\frac{1}{800\,\sqrt{5}\,b^3}$$

$$c\,d\left(\sqrt{\frac{b}{d}}\,\sqrt{2\pi}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{10}{\pi}}\,\sqrt{c+d\,x}\right]\left(-3\,d\,\text{Cos}\left[5\,a-\frac{5\,b\,c}{d}\right]+10\,b\,c\,\text{Sin}\left[5\,a-\frac{5\,b\,c}{d}\right]\right)+\right.$$

$$\sqrt{\frac{b}{d}}\,\sqrt{2\pi}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{10}{\pi}}\,\sqrt{c+d\,x}\right]\left(10\,b\,c\,\text{Cos}\left[5\,a-\frac{5\,b\,c}{d}\right]+3\,d\,\text{Sin}\left[5\,a-\frac{5\,b\,c}{d}\right]\right)+$$

$$\left.2\,\sqrt{5}\,b\,\sqrt{c+d\,x}\,\left(3\,\text{Cos}\left[5\,(a+b\,x)\right]+10\,b\,x\,\text{Sin}\left[5\,(a+b\,x)\right]\right)\right)-$$

$$\frac{1}{16}\,d^2\left(\text{Cos}[3\,a]\left(\frac{1}{3\,\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}\,d^3}c^2\left(-\sqrt{3}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\right.\right.\right.$$

$$\left.\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]\right)\text{Sin}\left[\frac{3\,b\,c}{d}\right]+\frac{1}{3\,\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}\,d^3}c^2\,\text{Cos}\left[\frac{3\,b\,c}{d}\right]$$

$$\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]+\sqrt{3}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)-$$

$$\frac{1}{9\,\sqrt{3}\,\left(\frac{b}{d}\right)^{5/2}\,d^3}2\,c\,\text{Cos}\left[\frac{3\,b\,c}{d}\right]\left(-\frac{3}{2}\left(-\sqrt{3}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\right.\right.$$

$$\left.\left.\text{FresnelC}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]\right)+3\,\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}\,(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)-$$

$$\frac{1}{9\,\sqrt{3}\,\left(\frac{b}{d}\right)^{5/2}\,d^3}2\,c\,\text{Sin}\left[\frac{3\,b\,c}{d}\right]\left(-3\,\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}\,(c+d\,x)^{3/2}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\right.$$

$$\left.\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]+\sqrt{3}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)\right)+$$

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

$$\left(-\sqrt{3}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]\right)+$$

$$\left.\left.\left.3\,\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}\,(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\Big/\left(27\,\sqrt{3}\,\left(\frac{b}{d}\right)^{7/2}\,d^3\right)+$$

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

$$(c+d\,x)^{3/2}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\right.$$

$$\left.\left.\left.\left.\left.\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\right)\Big/\left(27\sqrt{3}\left(\frac{b}{d}\right)^{7/2}d^3\right)\right)-$$

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

$$\left.\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)-\frac{1}{3\sqrt{3}\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\text{Sin}\left[\frac{3\,b\,c}{d}\right]$$

$$\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)+$$

$$\frac{1}{9\sqrt{3}\left(\frac{b}{d}\right)^{5/2}d^3}2\,c\,\text{Sin}\left[\frac{3\,b\,c}{d}\right]\left(-\frac{3}{2}\left(-\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\right.\right.$$

$$\left.\left.\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)+3\sqrt{3}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)-$$

$$\frac{1}{9\sqrt{3}\left(\frac{b}{d}\right)^{5/2}d^3}2\,c\,\text{Cos}\left[\frac{3\,b\,c}{d}\right]\left(-3\sqrt{3}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\right.$$

$$\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)+$$

$$\left(\text{Cos}\left[\frac{3\,b\,c}{d}\right]\left(-9\sqrt{3}\left(\frac{b}{d}\right)^{5/2}(c+d\,x)^{5/2}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\frac{5}{2}\left(-\frac{3}{2}\right.\right.\right.$$

$$\left(-\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)+$$

$$\left.\left.\left.3\sqrt{3}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\Big/\left(27\sqrt{3}\left(\frac{b}{d}\right)^{7/2}d^3\right)-$$

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

$$(c+d\,x)^{3/2}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\right.$$

$$\left.\left.\left.\left.\left.\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\right)\Big/\left(27\sqrt{3}\left(\frac{b}{d}\right)^{7/2}d^3\right)\right)\right)-$$

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

$$\left.\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]\right)\text{Sin}\left[\frac{5\,b\,c}{d}\right]+$$

$$\frac{1}{5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\text{Cos}\left[\frac{5\,b\,c}{d}\right]\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]+\right.$$

$$\left.\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{5\,b\,(c+d\,x)}{d}\right]\right)-\left(2\,c\,\text{Cos}\left[\frac{5\,b\,c}{d}\right]\right.$$

$$\left(-\frac{3}{2}\left(-\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{5\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]\right)+\right.$$

$$\left.\left.5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{5\,b\,(c+d\,x)}{d}\right]\right)\right)\Big/\left(25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}d^3\right)-$$

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

$$\left.\left.\left.\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]+\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{5\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\Big/$$

$$\left(25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}d^3\right)+\left(\text{Sin}\left[\frac{5\,b\,c}{d}\right]\left(-25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}(c+d\,x)^{5/2}\,\text{Cos}\left[\frac{5\,b\,(c+d\,x)}{d}\right]+\right.\right.$$

$$\frac{5}{2}\left(-\frac{3}{2}\left(-\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{5\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\right.\right.\right.$$

$$\sqrt{\frac{b}{d}}\ \sqrt{\frac{10}{\pi}}\ \sqrt{c+d\,x}\,\Big]\Bigg)+5\,\sqrt{5}\,\left(\frac{b}{d}\right)^{3/2}\,(c+d\,x)^{3/2}\,\text{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(125\,\sqrt{5}\,\left(\frac{b}{d}\right)^{7/2}\,d^3\right)+\Bigg(\text{Cos}\Big[\frac{5\,b\,c}{d}\Big]\,\Bigg(25\,\sqrt{5}\,\left(\frac{b}{d}\right)^{5/2}\,(c+d\,x)^{5/2}\,\text{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]-$$

$$\frac{5}{2}\,\Bigg(-5\,\sqrt{5}\,\left(\frac{b}{d}\right)^{3/2}\,(c+d\,x)^{3/2}\,\text{Cos}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]+\frac{3}{2}\,\Bigg(-\sqrt{\frac{\pi}{2}}\ \text{FresnelS}\Big[$$

$$\sqrt{\frac{b}{d}}\ \sqrt{\frac{10}{\pi}}\ \sqrt{c+d\,x}\,\Big]+\sqrt{5}\,\sqrt{\frac{b}{d}}\ \sqrt{c+d\,x}\ \text{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(125\,\sqrt{5}\,\left(\frac{b}{d}\right)^{7/2}\,d^3\right)\Bigg)-\text{Sin}[5\,a]\,\Bigg(\frac{1}{5\,\sqrt{5}\,\left(\frac{b}{d}\right)^{3/2}\,d^3}c^2\,\text{Cos}\Big[\frac{5\,b\,c}{d}\Big]$$

$$\Bigg(-\sqrt{5}\,\sqrt{\frac{b}{d}}\ \sqrt{c+d\,x}\ \text{Cos}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]+\sqrt{\frac{\pi}{2}}\ \text{FresnelC}\Big[\sqrt{\frac{b}{d}}\ \sqrt{\frac{10}{\pi}}\ \sqrt{c+d\,x}\,\Big]\Bigg)-$$

$$\frac{1}{5\,\sqrt{5}\,\left(\frac{b}{d}\right)^{3/2}\,d^3}c^2\,\text{Sin}\Big[\frac{5\,b\,c}{d}\Big]\,\Bigg(-\sqrt{\frac{\pi}{2}}\ \text{FresnelS}\Big[\sqrt{\frac{b}{d}}\ \sqrt{\frac{10}{\pi}}\ \sqrt{c+d\,x}\,\Big]+$$

$$\sqrt{5}\,\sqrt{\frac{b}{d}}\ \sqrt{c+d\,x}\ \text{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]\Bigg)+\Bigg(2\,c\,\text{Sin}\Big[\frac{5\,b\,c}{d}\Big]$$

$$\Bigg(-\frac{3}{2}\,\Bigg(-\sqrt{5}\,\sqrt{\frac{b}{d}}\ \sqrt{c+d\,x}\ \text{Cos}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]+\sqrt{\frac{\pi}{2}}\ \text{FresnelC}\Big[\sqrt{\frac{b}{d}}\ \sqrt{\frac{10}{\pi}}\ \sqrt{c+d\,x}\,\Big]\Bigg)+$$

$$5\,\sqrt{5}\,\left(\frac{b}{d}\right)^{3/2}\,(c+d\,x)^{3/2}\,\text{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]\Bigg)\Bigg)\Bigg/\left(25\,\sqrt{5}\,\left(\frac{b}{d}\right)^{5/2}\,d^3\right)-\Bigg(2\,c\,\text{Cos}\Big[\frac{5\,b\,c}{d}\Big]$$

$$\Bigg(-5\,\sqrt{5}\,\left(\frac{b}{d}\right)^{3/2}\,(c+d\,x)^{3/2}\,\text{Cos}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]+\frac{3}{2}\,\Bigg(-\sqrt{\frac{\pi}{2}}\ \text{FresnelS}\Big[\sqrt{\frac{b}{d}}\ \sqrt{\frac{10}{\pi}}$$

$$\sqrt{c+d\,x}\,\Big]+\sqrt{5}\,\sqrt{\frac{b}{d}}\ \sqrt{c+d\,x}\ \text{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]\Bigg)\Bigg)\Bigg)\Bigg/\left(25\,\sqrt{5}\,\left(\frac{b}{d}\right)^{5/2}\,d^3\right)+$$

$$\Bigg(\text{Cos}\Big[\frac{5\,b\,c}{d}\Big]\,\Bigg(-25\,\sqrt{5}\,\left(\frac{b}{d}\right)^{5/2}\,(c+d\,x)^{5/2}\,\text{Cos}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]+\frac{5}{2}\,\Bigg(-\frac{3}{2}\,\Bigg(-\sqrt{5}\,\sqrt{\frac{b}{d}}$$

$$\sqrt{c+d\,x}\;\text{Cos}\left[\frac{5\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\;\text{FresnelC}\left[\sqrt{\frac{b}{d}}\;\sqrt{\frac{10}{\pi}}\;\sqrt{c+d\,x}\right]\Bigg)+5$$

$$\sqrt{5}\;\left(\frac{b}{d}\right)^{3/2}\;(c+d\,x)^{3/2}\;\text{Sin}\left[\frac{5\,b\,(c+d\,x)}{d}\right]\Bigg)\Bigg)\Bigg)\Bigg/\;\left(125\;\sqrt{5}\;\left(\frac{b}{d}\right)^{7/2}\;d^3\right)-$$

$$\Bigg(\text{Sin}\left[\frac{5\,b\,c}{d}\right]\;\Bigg(25\;\sqrt{5}\;\left(\frac{b}{d}\right)^{5/2}\;(c+d\,x)^{5/2}\;\text{Sin}\left[\frac{5\,b\,(c+d\,x)}{d}\right]-\frac{5}{2}\;\Bigg(-5\;\sqrt{5}\;\left(\frac{b}{d}\right)^{3/2}$$

$$(c+d\,x)^{3/2}\;\text{Cos}\left[\frac{5\,b\,(c+d\,x)}{d}\right]+\frac{3}{2}\;\Bigg(-\sqrt{\frac{\pi}{2}}\;\text{FresnelS}\left[\sqrt{\frac{b}{d}}\;\sqrt{\frac{10}{\pi}}\;\sqrt{c+d\,x}\right]+$$

$$\sqrt{5}\;\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}\;\text{Sin}\left[\frac{5\,b\,(c+d\,x)}{d}\right]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/\;\left(125\;\sqrt{5}\;\left(\frac{b}{d}\right)^{7/2}\;d^3\right)\Bigg)\Bigg)$$

Problem 195: Result more than twice size of optimal antiderivative.

$$\int (c+d\,x)^{5/2}\;\text{Cos}[a+b\,x]^3\;\text{Sin}[a+b\,x]^2\,dx$$

Optimal (type 4, 615 leaves, 26 steps):

$$\frac{5 d (c+d x)^{3/2} \text{Cos}[a+b x]}{16 b^2}-\frac{5 d (c+d x)^{3/2} \text{Cos}[3 a+3 b x]}{288 b^2}-$$

$$\frac{d (c+d x)^{3/2} \text{Cos}[5 a+5 b x]}{160 b^2}+\frac{15 d^{5/2} \sqrt{\frac{\pi}{2}} \text{Cos}\left[a-\frac{b c}{d}\right] \text{FresnelS}\left[\frac{\sqrt{b} \sqrt{\frac{2}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right]}{32 b^{7/2}}-$$

$$\frac{5 d^{5/2} \sqrt{\frac{\pi}{6}} \text{Cos}\left[3 a-\frac{3 b c}{d}\right] \text{FresnelS}\left[\frac{\sqrt{b} \sqrt{\frac{6}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right]}{576 b^{7/2}}-$$

$$\frac{3 d^{5/2} \sqrt{\frac{\pi}{10}} \text{Cos}\left[5 a-\frac{5 b c}{d}\right] \text{FresnelS}\left[\frac{\sqrt{b} \sqrt{\frac{10}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right]}{1600 b^{7/2}}-$$

$$\frac{3 d^{5/2} \sqrt{\frac{\pi}{10}} \text{FresnelC}\left[\frac{\sqrt{b} \sqrt{\frac{10}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right] \text{Sin}\left[5 a-\frac{5 b c}{d}\right]}{1600 b^{7/2}}-$$

$$\frac{5 d^{5/2} \sqrt{\frac{\pi}{6}} \text{FresnelC}\left[\frac{\sqrt{b} \sqrt{\frac{6}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right] \text{Sin}\left[3 a-\frac{3 b c}{d}\right]}{576 b^{7/2}}+$$

$$\frac{15 d^{5/2} \sqrt{\frac{\pi}{2}} \text{FresnelC}\left[\frac{\sqrt{b} \sqrt{\frac{2}{\pi}} \sqrt{c+d x}}{\sqrt{d}}\right] \text{Sin}\left[a-\frac{b c}{d}\right]}{32 b^{7/2}}-\frac{15 d^2 \sqrt{c+d x} \text{Sin}[a+b x]}{32 b^3}+$$

$$\frac{(c+d x)^{5/2} \text{Sin}[a+b x]}{8 b}+\frac{5 d^2 \sqrt{c+d x} \text{Sin}[3 a+3 b x]}{576 b^3}-\frac{(c+d x)^{5/2} \text{Sin}[3 a+3 b x]}{48 b}+$$

$$\frac{3 d^2 \sqrt{c+d x} \text{Sin}[5 a+5 b x]}{1600 b^3}-\frac{(c+d x)^{5/2} \text{Sin}[5 a+5 b x]}{80 b}$$

Result (type 4, 4926 leaves) :

$$\frac{1}{16 b \sqrt{\frac{b}{d}}} c^2 \left(-\sqrt{2 \pi} \text{Cos}\left[a-\frac{b c}{d}\right] \text{FresnelS}\left[\sqrt{\frac{b}{d}} \sqrt{\frac{2}{\pi}} \sqrt{c+d x}\right]-\right.$$

$$\left.\sqrt{2 \pi} \text{FresnelC}\left[\sqrt{\frac{b}{d}} \sqrt{\frac{2}{\pi}} \sqrt{c+d x}\right] \text{Sin}\left[a-\frac{b c}{d}\right]+2 \sqrt{\frac{b}{d}} \sqrt{c+d x} \text{Sin}[a+b x]\right)+\frac{1}{16 b^3}$$

$$c d \left(\sqrt{\frac{b}{d}} \sqrt{2 \pi} \text{FresnelC}\left[\sqrt{\frac{b}{d}} \sqrt{\frac{2}{\pi}} \sqrt{c+d x}\right] \left(-3 d \text{Cos}\left[a-\frac{b c}{d}\right]+2 b c \text{Sin}\left[a-\frac{b c}{d}\right]\right)+\right.$$

$$\sqrt{\frac{b}{d}} \sqrt{2 \pi} \text{FresnelS}\left[\sqrt{\frac{b}{d}} \sqrt{\frac{2}{\pi}} \sqrt{c+d x}\right] \left(2 b c \text{Cos}\left[a-\frac{b c}{d}\right]+3 d \text{Sin}\left[a-\frac{b c}{d}\right]\right)+$$

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

$$\left(-\sqrt{2\,\pi}\;\mathrm{FresnelS}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{2}{\pi}}\,\sqrt{c+d\,x}\right]\left(\left(4\,b^2\,c^2-15\,d^2\right)\mathrm{Cos}\left[a-\frac{b\,c}{d}\right]+12\,b\,c\,d\,\mathrm{Sin}\left[a-\frac{b\,c}{d}\right]\right)-\right.$$

$$\sqrt{2\,\pi}\;\mathrm{FresnelC}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{2}{\pi}}\,\sqrt{c+d\,x}\right]\left(-12\,b\,c\,d\,\mathrm{Cos}\left[a-\frac{b\,c}{d}\right]+\left(4\,b^2\,c^2-15\,d^2\right)\mathrm{Sin}\left[a-\frac{b\,c}{d}\right]\right)+$$

$$\left.2\,\sqrt{\frac{b}{d}}\,d\,\sqrt{c+d\,x}\,\left(-2\,b\,(c-5\,d\,x)\,\mathrm{Cos}[a+b\,x]+d\,\left(-15+4\,b^2\,x^2\right)\mathrm{Sin}[a+b\,x]\right)\right)-\frac{1}{96\,\sqrt{3}\,b\,\sqrt{\frac{b}{d}}}$$

$$c^2\left(-\sqrt{2\,\pi}\;\mathrm{Cos}\left[3\,a-\frac{3\,b\,c}{d}\right]\mathrm{FresnelS}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]-\sqrt{2\,\pi}\;\mathrm{FresnelC}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]\right.$$

$$\left.\mathrm{Sin}\left[3\,a-\frac{3\,b\,c}{d}\right]+2\,\sqrt{3}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\mathrm{Sin}[3\,(a+b\,x)]\right)-\frac{1}{96\,\sqrt{3}\,b^3}$$

$$c\,d\left(\sqrt{\frac{b}{d}}\,\sqrt{2\,\pi}\;\mathrm{FresnelC}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]\left(-d\,\mathrm{Cos}\left[3\,a-\frac{3\,b\,c}{d}\right]+2\,b\,c\,\mathrm{Sin}\left[3\,a-\frac{3\,b\,c}{d}\right]\right)+\right.$$

$$\sqrt{\frac{b}{d}}\,\sqrt{2\,\pi}\;\mathrm{FresnelS}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{6}{\pi}}\,\sqrt{c+d\,x}\right]\left(2\,b\,c\,\mathrm{Cos}\left[3\,a-\frac{3\,b\,c}{d}\right]+d\,\mathrm{Sin}\left[3\,a-\frac{3\,b\,c}{d}\right]\right)+$$

$$\left.2\,\sqrt{3}\,b\,\sqrt{c+d\,x}\,\left(\mathrm{Cos}[3\,(a+b\,x)]+2\,b\,x\,\mathrm{Sin}[3\,(a+b\,x)]\right)\right)-$$

$$\frac{1}{160\,\sqrt{5}\,b\,\sqrt{\frac{b}{d}}}c^2\left(-\sqrt{2\,\pi}\;\mathrm{Cos}\left[5\,a-\frac{5\,b\,c}{d}\right]\mathrm{FresnelS}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{10}{\pi}}\,\sqrt{c+d\,x}\right]-\right.$$

$$\sqrt{2\,\pi}\;\mathrm{FresnelC}\left[\sqrt{\frac{b}{d}}\,\sqrt{\frac{10}{\pi}}\,\sqrt{c+d\,x}\right]\mathrm{Sin}\left[5\,a-\frac{5\,b\,c}{d}\right]+$$

$$\left.2\,\sqrt{5}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\mathrm{Sin}[5\,(a+b\,x)]\right)-\frac{1}{800\,\sqrt{5}\,b^3}$$

$$c\,d\left(\sqrt{\frac{b}{d}}\sqrt{2\pi}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]\left(-3\,d\,\text{Cos}\left[5\,a-\frac{5\,b\,c}{d}\right]+10\,b\,c\,\text{Sin}\left[5\,a-\frac{5\,b\,c}{d}\right]\right)+\right.$$

$$\sqrt{\frac{b}{d}}\sqrt{2\pi}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]\left(10\,b\,c\,\text{Cos}\left[5\,a-\frac{5\,b\,c}{d}\right]+3\,d\,\text{Sin}\left[5\,a-\frac{5\,b\,c}{d}\right]\right)+$$

$$\left.2\sqrt{5}\,b\sqrt{c+d\,x}\,\left(3\,\text{Cos}\left[5\,\left(a+b\,x\right)\right]+10\,b\,x\,\text{Sin}\left[5\,\left(a+b\,x\right)\right]\right)\right)-$$

$$\frac{1}{16}d^2\left(\text{Cos}[3\,a]\left(\frac{1}{3\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}d^3}c^2\left(-\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\right.\right.\right.$$

$$\left.\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)\text{Sin}\left[\frac{3\,b\,c}{d}\right]+\frac{1}{3\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\text{Cos}\left[\frac{3\,b\,c}{d}\right]$$

$$\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)-$$

$$\frac{1}{9\sqrt{3}\,\left(\frac{b}{d}\right)^{5/2}d^3}2\,c\,\text{Cos}\left[\frac{3\,b\,c}{d}\right]\left(-\frac{3}{2}\left(-\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\right.\right.$$

$$\left.\left.\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)+3\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}\left(c+d\,x\right)^{3/2}\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)-$$

$$\frac{1}{9\sqrt{3}\,\left(\frac{b}{d}\right)^{5/2}d^3}2\,c\,\text{Sin}\left[\frac{3\,b\,c}{d}\right]\left(-3\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}\left(c+d\,x\right)^{3/2}\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\right.$$

$$\left.\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)\right)+$$

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

$$\left(-\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)+$$

$$\left.\left.\left.3\sqrt{3}\,\left(\frac{b}{d}\right)^{3/2}\left(c+d\,x\right)^{3/2}\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\Big/\left(27\sqrt{3}\,\left(\frac{b}{d}\right)^{7/2}d^3\right)+$$

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

$$(c+d\,x)^{3/2}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\;\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\right.$$

$$\left.\left.\left.\left.\left.\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\;\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\right)\Big/\left(27\sqrt{3}\left(\frac{b}{d}\right)^{7/2}d^3\right)\right)-$$

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

$$\left.\sqrt{\frac{\pi}{2}}\;\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)-\frac{1}{3\sqrt{3}\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\text{Sin}\left[\frac{3\,b\,c}{d}\right]$$

$$\left(-\sqrt{\frac{\pi}{2}}\;\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\;\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)+$$

$$\frac{1}{9\sqrt{3}\left(\frac{b}{d}\right)^{5/2}d^3}2\,c\,\text{Sin}\left[\frac{3\,b\,c}{d}\right]\left(-\frac{3}{2}\left(-\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\;\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\right.\right.$$

$$\left.\left.\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)+3\sqrt{3}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)-$$

$$\frac{1}{9\sqrt{3}\left(\frac{b}{d}\right)^{5/2}d^3}2\,c\,\text{Cos}\left[\frac{3\,b\,c}{d}\right]\left(-3\sqrt{3}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\right.$$

$$\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\;\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\;\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)+$$

$$\left(\text{Cos}\left[\frac{3\,b\,c}{d}\right]\left(-9\sqrt{3}\left(\frac{b}{d}\right)^{5/2}(c+d\,x)^{5/2}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\frac{5}{2}\left(-\frac{3}{2}\right.\right.\right.$$

$$\left(-\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\;\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\;\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]\right)+$$

$$\left.\left.\left.3\sqrt{3}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\Big/\left(27\sqrt{3}\left(\frac{b}{d}\right)^{7/2}d^3\right)-$$

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

$$(c+d\,x)^{3/2}\,\text{Cos}\left[\frac{3\,b\,(c+d\,x)}{d}\right]+\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{6}{\pi}}\sqrt{c+d\,x}\right]+\right.$$

$$\left.\left.\left.\left.\left.\sqrt{3}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{3\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\right)\Big/\left(27\sqrt{3}\left(\frac{b}{d}\right)^{7/2}d^3\right)\right)-$$

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

$$\left.\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]\right)\text{Sin}\left[\frac{5\,b\,c}{d}\right]+$$

$$\frac{1}{5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\text{Cos}\left[\frac{5\,b\,c}{d}\right]\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]+\right.$$

$$\left.\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{5\,b\,(c+d\,x)}{d}\right]\right)-\left(2\,c\,\text{Cos}\left[\frac{5\,b\,c}{d}\right]\right.$$

$$\left(-\frac{3}{2}\left(-\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{5\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]\right)+\right.$$

$$\left.\left.5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{5\,b\,(c+d\,x)}{d}\right]\right)\right)\Big/\left(25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}d^3\right)-$$

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

$$\left.\left.\left.\text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\right]+\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{5\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\Big/$$

$$\left(25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}d^3\right)+\left(\text{Sin}\left[\frac{5\,b\,c}{d}\right]\left(-25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}(c+d\,x)^{5/2}\,\text{Cos}\left[\frac{5\,b\,(c+d\,x)}{d}\right]+\right.\right.$$

$$\frac{5}{2}\left(-\frac{3}{2}\left(-\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{5\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\right.\right.\right.$$

$$\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\,\Big]\Bigg)+5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\mathrm{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(125\sqrt{5}\left(\frac{b}{d}\right)^{7/2}d^3\right)+\Bigg(\mathrm{Cos}\Big[\frac{5\,b\,c}{d}\Big]\Bigg(25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}(c+d\,x)^{5/2}\,\mathrm{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]-$$

$$\frac{5}{2}\Bigg(-5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\mathrm{Cos}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]+\frac{3}{2}\Bigg(-\sqrt{\frac{\pi}{2}}\,\mathrm{FresnelS}\Big[$$

$$\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\,\Big]+\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\mathrm{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(125\sqrt{5}\left(\frac{b}{d}\right)^{7/2}d^3\right)\Bigg)-\mathrm{Sin}[5\,a]\Bigg(\frac{1}{5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\mathrm{Cos}\Big[\frac{5\,b\,c}{d}\Big]$$

$$\Bigg(-\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\mathrm{Cos}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]+\sqrt{\frac{\pi}{2}}\,\mathrm{FresnelC}\Big[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\,\Big]\Bigg)-$$

$$\frac{1}{5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\mathrm{Sin}\Big[\frac{5\,b\,c}{d}\Big]\Bigg(-\sqrt{\frac{\pi}{2}}\,\mathrm{FresnelS}\Big[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\,\Big]+$$

$$\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\mathrm{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]\Bigg)+\Bigg(2\,c\,\mathrm{Sin}\Big[\frac{5\,b\,c}{d}\Big]$$

$$\Bigg(-\frac{3}{2}\Bigg(-\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\mathrm{Cos}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]+\sqrt{\frac{\pi}{2}}\,\mathrm{FresnelC}\Big[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d\,x}\,\Big]\Bigg)+$$

$$5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\mathrm{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]\Bigg)\Bigg)\Bigg/\left(25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}d^3\right)-\Bigg(2\,c\,\mathrm{Cos}\Big[\frac{5\,b\,c}{d}\Big]$$

$$\Bigg(-5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\mathrm{Cos}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]+\frac{3}{2}\Bigg(-\sqrt{\frac{\pi}{2}}\,\mathrm{FresnelS}\Big[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}$$

$$\sqrt{c+d\,x}\,\Big]+\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\mathrm{Sin}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]\Bigg)\Bigg)\Bigg)\Bigg/\left(25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}d^3\right)+$$

$$\Bigg(\mathrm{Cos}\Big[\frac{5\,b\,c}{d}\Big]\Bigg(-25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}(c+d\,x)^{5/2}\,\mathrm{Cos}\Big[\frac{5\,b\,(c+d\,x)}{d}\Big]+\frac{5}{2}\Bigg(-\frac{3}{2}\Bigg(-\sqrt{5}\sqrt{\frac{b}{d}}$$

$$\sqrt{c+d x}\ \text{Cos}\left[\frac{5 b (c+d x)}{d}\right]+\sqrt{\frac{\pi}{2}}\ \text{FresnelC}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d x}\right]\Bigg)+5$$

$$\sqrt{5}\left(\frac{b}{d}\right)^{3/2}(c+d x)^{3/2}\ \text{Sin}\left[\frac{5 b (c+d x)}{d}\right]\Bigg)\Bigg)\Bigg)\Bigg/\left(125\sqrt{5}\left(\frac{b}{d}\right)^{7/2} d^3\right)-$$

$$\Bigg(\text{Sin}\left[\frac{5 b c}{d}\right]\Bigg(25\sqrt{5}\left(\frac{b}{d}\right)^{5/2}(c+d x)^{5/2}\ \text{Sin}\left[\frac{5 b (c+d x)}{d}\right]-\frac{5}{2}\Bigg(-5\sqrt{5}\left(\frac{b}{d}\right)^{3/2}$$

$$(c+d x)^{3/2}\ \text{Cos}\left[\frac{5 b (c+d x)}{d}\right]+\frac{3}{2}\Bigg(-\sqrt{\frac{\pi}{2}}\ \text{FresnelS}\left[\sqrt{\frac{b}{d}}\sqrt{\frac{10}{\pi}}\sqrt{c+d x}\right]+$$

$$\sqrt{5}\sqrt{\frac{b}{d}}\sqrt{c+d x}\ \text{Sin}\left[\frac{5 b (c+d x)}{d}\right]\Bigg)\Bigg)\Bigg)\Bigg/\left(125\sqrt{5}\left(\frac{b}{d}\right)^{7/2} d^3\right)\Bigg)\Bigg)$$

Problem 196: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 407 leaves, 18 steps):

$$\frac{45 d^2\sqrt{c+d x}\ \text{Cos}[2 a+2 b x]}{1024 b^3}-\frac{3 (c+d x)^{5/2}\ \text{Cos}[2 a+2 b x]}{64 b}-\frac{5 d^2\sqrt{c+d x}\ \text{Cos}[6 a+6 b x]}{9216 b^3}+$$

$$\frac{(c+d x)^{5/2}\ \text{Cos}[6 a+6 b x]}{192 b}+\frac{5 d^{5/2}\sqrt{\frac{\pi}{3}}\ \text{Cos}\left[6 a-\frac{6 b c}{d}\right]\ \text{FresnelC}\left[\frac{2\sqrt{b}\sqrt{\frac{3}{\pi}}\sqrt{c+d x}}{\sqrt{d}}\right]}{18432\, b^{7/2}}-$$

$$\frac{45 d^{5/2}\sqrt{\pi}\ \text{Cos}\left[2 a-\frac{2 b c}{d}\right]\ \text{FresnelC}\left[\frac{2\sqrt{b}\sqrt{c+d x}}{\sqrt{d}\sqrt{\pi}}\right]}{2048\, b^{7/2}}-$$

$$\frac{5 d^{5/2}\sqrt{\frac{\pi}{3}}\ \text{FresnelS}\left[\frac{2\sqrt{b}\sqrt{\frac{3}{\pi}}\sqrt{c+d x}}{\sqrt{d}}\right]\ \text{Sin}\left[6 a-\frac{6 b c}{d}\right]}{18432\, b^{7/2}}+$$

$$\frac{45 d^{5/2}\sqrt{\pi}\ \text{FresnelS}\left[\frac{2\sqrt{b}\sqrt{c+d x}}{\sqrt{d}\sqrt{\pi}}\right]\ \text{Sin}\left[2 a-\frac{2 b c}{d}\right]}{2048\, b^{7/2}}+$$

$$\frac{15 d (c+d x)^{3/2}\ \text{Sin}[2 a+2 b x]}{256 b^2}-\frac{5 d (c+d x)^{3/2}\ \text{Sin}[6 a+6 b x]}{2304 b^2}$$

Result (type 4, 6763 leaves):

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

$$\left.\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d\,x}}{\sqrt{\pi}}\right]\right)\text{Sin}\left[\frac{b\,c}{d}\right]+\frac{1}{2\sqrt{2}\left(\frac{b}{d}\right)^{3/2}d}$$

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

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

$$\left(\frac{1}{2\sqrt{2}\left(\frac{b}{d}\right)^{3/2}d}\left(-\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{2b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d\,x}}{\sqrt{\pi}}\right]\right)\right.$$

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

$$\left.\left.\text{Sin}\left[\frac{2b\,c}{d}\right]\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d\,x}}{\sqrt{\pi}}\right]+\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{2b\,(c+d\,x)}{d}\right]\right)\right)\right)+$$

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

$$\left.\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d\,x}}{\sqrt{\pi}}\right]\right)\text{Sin}\left[\frac{b\,c}{d}\right]-\frac{1}{2\sqrt{2}\left(\frac{b}{d}\right)^{3/2}d^2}$$

$$c\,\text{Cos}\left[\frac{2\,b\,c}{d}\right]\left(-\sqrt{\frac{\pi}{2}}\;\text{FresnelS}\left[\frac{2\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}}{\sqrt{\pi}}\right]+\sqrt{2}\;\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}\;\text{Sin}\left[\frac{2\,b\,(c+d\,x)}{d}\right]\right)+$$

$$\frac{1}{4\sqrt{2}\;\left(\frac{b}{d}\right)^{5/2}d^2}\text{Cos}\left[\frac{2\,b\,c}{d}\right]$$

$$\left(-\frac{3}{2}\left(-\sqrt{2}\;\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}\;\text{Cos}\left[\frac{2\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\;\text{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}}{\sqrt{\pi}}\right]\right)+\right.$$

$$\left.2\sqrt{2}\;\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{2\,b\,(c+d\,x)}{d}\right]\right)+\frac{1}{2\sqrt{2}\;\left(\frac{b}{d}\right)^{5/2}d^2}$$

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

$$\left.\left.\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\;\text{FresnelS}\left[\frac{2\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}}{\sqrt{\pi}}\right]+\sqrt{2}\;\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}\;\text{Sin}\left[\frac{2\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\right)+$$

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

$$c\left(-\sqrt{2}\;\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}\;\text{Cos}\left[\frac{2\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\;\text{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}}{\sqrt{\pi}}\right]\right)$$

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

$$c \operatorname{Sin}\left[\frac{2 b c}{d}\right] \left(-\sqrt{\frac{\pi}{2}} \operatorname{FresnelS}\left[\frac{2 \sqrt{\frac{b}{d}} \sqrt{c+d x}}{\sqrt{\pi}}\right] + \sqrt{2} \sqrt{\frac{b}{d}} \sqrt{c+d x} \operatorname{Sin}\left[\frac{2 b (c+d x)}{d}\right]\right) -$$

$$\frac{1}{4 \sqrt{2} \left(\frac{b}{d}\right)^{5/2} d^2} \operatorname{Sin}\left[\frac{2 b c}{d}\right]$$

$$\left(-\frac{3}{2} \left(-\sqrt{2} \sqrt{\frac{b}{d}} \sqrt{c+d x} \operatorname{Cos}\left[\frac{2 b (c+d x)}{d}\right] + \sqrt{\frac{\pi}{2}} \operatorname{FresnelC}\left[\frac{2 \sqrt{\frac{b}{d}} \sqrt{c+d x}}{\sqrt{\pi}}\right]\right) +\right.$$

$$\left. 2 \sqrt{2} \left(\frac{b}{d}\right)^{3/2} (c+d x)^{3/2} \operatorname{Sin}\left[\frac{2 b (c+d x)}{d}\right]\right) + \frac{1}{4 \sqrt{2} \left(\frac{b}{d}\right)^{5/2} d^2} \left(\operatorname{Cos}\left[\frac{b c}{d}\right] - \operatorname{Sin}\left[\frac{b c}{d}\right]\right)$$

$$\left(\operatorname{Cos}\left[\frac{b c}{d}\right] + \operatorname{Sin}\left[\frac{b c}{d}\right]\right) \left(-2 \sqrt{2} \left(\frac{b}{d}\right)^{3/2} (c+d x)^{3/2} \operatorname{Cos}\left[\frac{2 b (c+d x)}{d}\right] +\right.$$

$$\left.\left.\left. \frac{3}{2} \left(-\sqrt{\frac{\pi}{2}} \operatorname{FresnelS}\left[\frac{2 \sqrt{\frac{b}{d}} \sqrt{c+d x}}{\sqrt{\pi}}\right] + \sqrt{2} \sqrt{\frac{b}{d}} \sqrt{c+d x} \operatorname{Sin}\left[\frac{2 b (c+d x)}{d}\right]\right)\right)\right)\right) +$$

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

$$\left. \sqrt{\frac{\pi}{2}} \operatorname{FresnelC}\left[\frac{2 \sqrt{\frac{b}{d}} \sqrt{c+d x}}{\sqrt{\pi}}\right]\right) \operatorname{Sin}\left[\frac{b c}{d}\right] + \frac{1}{2 \sqrt{2} \left(\frac{b}{d}\right)^{3/2} d^3}$$

$$c^2 \operatorname{Cos}\left[\frac{2 b c}{d}\right] \left(-\sqrt{\frac{\pi}{2}} \operatorname{FresnelS}\left[\frac{2 \sqrt{\frac{b}{d}} \sqrt{c+d x}}{\sqrt{\pi}}\right] + \sqrt{2} \sqrt{\frac{b}{d}} \sqrt{c+d x} \operatorname{Sin}\left[\frac{2 b (c+d x)}{d}\right]\right) -$$

$$\frac{1}{2\sqrt{2}\left(\frac{b}{d}\right)^{5/2} d^3} c \,\text{Cos}\left[\frac{2 b c}{d}\right]$$

$$\left(-\frac{3}{2}\left(-\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d x}\,\text{Cos}\left[\frac{2 b (c+d x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d x}}{\sqrt{\pi}}\right]\right)+\right.$$

$$\left.2\sqrt{2}\left(\frac{b}{d}\right)^{3/2}(c+d x)^{3/2}\,\text{Sin}\left[\frac{2 b (c+d x)}{d}\right]\right)-\frac{1}{\sqrt{2}\left(\frac{b}{d}\right)^{5/2} d^3}$$

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

$$\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d x}}{\sqrt{\pi}}\right]+\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d x}\,\text{Sin}\left[\frac{2 b (c+d x)}{d}\right]\right)\right)+$$

$$\frac{1}{4\sqrt{2}\left(\frac{b}{d}\right)^{7/2} d^3}\text{Cos}\left[\frac{b c}{d}\right]\text{Sin}\left[\frac{b c}{d}\right]\left(-4\sqrt{2}\left(\frac{b}{d}\right)^{5/2}(c+d x)^{5/2}\,\text{Cos}\left[\frac{2 b (c+d x)}{d}\right]+\right.$$

$$\frac{5}{2}\left(-\frac{3}{2}\left(-\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d x}\,\text{Cos}\left[\frac{2 b (c+d x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d x}}{\sqrt{\pi}}\right]\right)+\right.$$

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

$$\frac{1}{8\sqrt{2}\left(\frac{b}{d}\right)^{7/2} d^3}\text{Cos}\left[\frac{2 b c}{d}\right]\left(4\sqrt{2}\left(\frac{b}{d}\right)^{5/2}(c+d x)^{5/2}\,\text{Sin}\left[\frac{2 b (c+d x)}{d}\right]-\right.$$

$$\frac{5}{2}\left(-2\sqrt{2}\left(\frac{b}{d}\right)^{3/2}(c+d x)^{3/2}\,\mathrm{Cos}\left[\frac{2 b (c+d x)}{d}\right]+\right.$$

$$\left.\left.\left.\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\mathrm{FresnelS}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d x}}{\sqrt{\pi}}\right]+\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d x}\,\mathrm{Sin}\left[\frac{2 b (c+d x)}{d}\right]\right)\right)\right)\right)+$$

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

$$c^2\left(-\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d x}\,\mathrm{Cos}\left[\frac{2 b (c+d x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\mathrm{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d x}}{\sqrt{\pi}}\right]\right)$$

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

$$c^2\,\mathrm{Sin}\left[\frac{2 b c}{d}\right]\left(-\sqrt{\frac{\pi}{2}}\,\mathrm{FresnelS}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d x}}{\sqrt{\pi}}\right]+\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d x}\,\mathrm{Sin}\left[\frac{2 b (c+d x)}{d}\right]\right)+$$

$$\frac{1}{2\sqrt{2}\left(\frac{b}{d}\right)^{5/2}d^3}c\,\mathrm{Sin}\left[\frac{2 b c}{d}\right]$$

$$\left(-\frac{3}{2}\left(-\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d x}\,\mathrm{Cos}\left[\frac{2 b (c+d x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\mathrm{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d x}}{\sqrt{\pi}}\right]\right)+\right.$$

$$\left.2\sqrt{2}\left(\frac{b}{d}\right)^{3/2}(c+d x)^{3/2}\,\mathrm{Sin}\left[\frac{2 b (c+d x)}{d}\right]\right)-\frac{1}{2\sqrt{2}\left(\frac{b}{d}\right)^{5/2}d^3}c\left(\mathrm{Cos}\left[\frac{b c}{d}\right]-\mathrm{Sin}\left[\frac{b c}{d}\right]\right)$$

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

$$\left.\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\frac{2\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}}{\sqrt{\pi}}\right]+\sqrt{2}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Sin}\left[\frac{2\,b\,(c+d\,x)}{d}\right]\right)\right)\right)+$$

$$\frac{1}{8\sqrt{2}\left(\frac{b}{d}\right)^{7/2}d^3}\left(\text{Cos}\left[\frac{b\,c}{d}\right]-\text{Sin}\left[\frac{b\,c}{d}\right]\right)\left(\text{Cos}\left[\frac{b\,c}{d}\right]+\text{Sin}\left[\frac{b\,c}{d}\right]\right)$$

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

$$\frac{5}{2}\left(-\frac{3}{2}\left(-\sqrt{2}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Cos}\left[\frac{2\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}}{\sqrt{\pi}}\right]\right)+\right.$$

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

$$\frac{1}{8\sqrt{2}\left(\frac{b}{d}\right)^{7/2}d^3}\text{Sin}\left[\frac{2\,b\,c}{d}\right]\left(4\sqrt{2}\left(\frac{b}{d}\right)^{5/2}(c+d\,x)^{5/2}\,\text{Sin}\left[\frac{2\,b\,(c+d\,x)}{d}\right]-\right.$$

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

$$\left.\left.\left.\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\frac{2\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}}{\sqrt{\pi}}\right]+\sqrt{2}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Sin}\left[\frac{2\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\right)\right)-$$

$$\frac{1}{4} c^2 \operatorname{Sin}[6 a] \left(\frac{1}{6 \sqrt{6} \left(\frac{b}{d}\right)^{3/2} d}\left(-\sqrt{6} \sqrt{\frac{b}{d}} \sqrt{c+d x} \operatorname{Cos}\left[\frac{6 b (c+d x)}{d}\right]+\right.\right.$$

$$\left.\sqrt{\frac{\pi}{2}} \operatorname{FresnelC}\left[2 \sqrt{\frac{b}{d}} \sqrt{\frac{3}{\pi}} \sqrt{c+d x}\right]\right) \operatorname{Sin}\left[\frac{6 b c}{d}\right]+\frac{1}{6 \sqrt{6} \left(\frac{b}{d}\right)^{3/2} d} \operatorname{Cos}\left[\frac{6 b c}{d}\right]$$

$$\left.\left(-\sqrt{\frac{\pi}{2}} \operatorname{FresnelS}\left[2 \sqrt{\frac{b}{d}} \sqrt{\frac{3}{\pi}} \sqrt{c+d x}\right]+\sqrt{6} \sqrt{\frac{b}{d}} \sqrt{c+d x} \operatorname{Sin}\left[\frac{6 b (c+d x)}{d}\right]\right)\right)-$$

$$\frac{1}{4} c^2 \operatorname{Cos}[6 a] \left(\frac{1}{6 \sqrt{6} \left(\frac{b}{d}\right)^{3/2} d} \operatorname{Cos}\left[\frac{6 b c}{d}\right]\left(-\sqrt{6} \sqrt{\frac{b}{d}} \sqrt{c+d x} \operatorname{Cos}\left[\frac{6 b (c+d x)}{d}\right]+\right.\right.$$

$$\left.\sqrt{\frac{\pi}{2}} \operatorname{FresnelC}\left[2 \sqrt{\frac{b}{d}} \sqrt{\frac{3}{\pi}} \sqrt{c+d x}\right]\right)-\frac{1}{6 \sqrt{6} \left(\frac{b}{d}\right)^{3/2} d} \operatorname{Sin}\left[\frac{6 b c}{d}\right]$$

$$\left.\left(-\sqrt{\frac{\pi}{2}} \operatorname{FresnelS}\left[2 \sqrt{\frac{b}{d}} \sqrt{\frac{3}{\pi}} \sqrt{c+d x}\right]+\sqrt{6} \sqrt{\frac{b}{d}} \sqrt{c+d x} \operatorname{Sin}\left[\frac{6 b (c+d x)}{d}\right]\right)\right)-$$

$$\frac{1}{2} c\, d \operatorname{Cos}[6 a] \left(-\frac{1}{6 \sqrt{6} \left(\frac{b}{d}\right)^{3/2} d^2} c \operatorname{Cos}\left[\frac{6 b c}{d}\right]\right.$$

$$\left(-\sqrt{6} \sqrt{\frac{b}{d}} \sqrt{c+d x} \operatorname{Cos}\left[\frac{6 b (c+d x)}{d}\right]+\sqrt{\frac{\pi}{2}} \operatorname{FresnelC}\left[2 \sqrt{\frac{b}{d}} \sqrt{\frac{3}{\pi}} \sqrt{c+d x}\right]\right)+$$

$$\frac{1}{6 \sqrt{6} \left(\frac{b}{d}\right)^{3/2} d^2} c \operatorname{Sin}\left[\frac{6 b c}{d}\right]\left(-\sqrt{\frac{\pi}{2}} \operatorname{FresnelS}\left[2 \sqrt{\frac{b}{d}} \sqrt{\frac{3}{\pi}} \sqrt{c+d x}\right]+\right.$$

$$\left.\sqrt{6} \sqrt{\frac{b}{d}} \sqrt{c+d x} \operatorname{Sin}\left[\frac{6 b (c+d x)}{d}\right]\right)-\left(\operatorname{Sin}\left[\frac{6 b c}{d}\right]\right.$$

$$\left(-\frac{3}{2}\left(-\sqrt{6} \sqrt{\frac{b}{d}} \sqrt{c+d x} \operatorname{Cos}\left[\frac{6 b (c+d x)}{d}\right]+\sqrt{\frac{\pi}{2}} \operatorname{FresnelC}\left[2 \sqrt{\frac{b}{d}} \sqrt{\frac{3}{\pi}} \sqrt{c+d x}\right]\right)+\right.$$

$$\left.\left.6 \sqrt{6} \left(\frac{b}{d}\right)^{3/2} (c+d x)^{3/2} \operatorname{Sin}\left[\frac{6 b (c+d x)}{d}\right]\right)\right) \Big/ \left(36 \sqrt{6} \left(\frac{b}{d}\right)^{5/2} d^2\right)+$$

$$\left(\operatorname{Cos}\left[\frac{6 b c}{d}\right]\left(-6 \sqrt{6} \left(\frac{b}{d}\right)^{3/2} (c+d x)^{3/2} \operatorname{Cos}\left[\frac{6 b (c+d x)}{d}\right]+\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}} \operatorname{FresnelS}\left[2 \sqrt{\frac{b}{d}} \sqrt{\frac{3}{\pi}}\right.\right.\right.\right.$$

$$\sqrt{c+d\,x}\,\Big] + \sqrt{6}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Sin}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]\Bigg)\Bigg)\Bigg)\Bigg/\left(36\,\sqrt{6}\,\left(\frac{b}{d}\right)^{5/2} d^2\right)\Bigg) -$$

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

$$\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\Big[2\,\sqrt{\frac{b}{d}}\,\sqrt{\frac{3}{\pi}}\,\sqrt{c+d\,x}\,\Big]\Bigg)\,\text{Sin}\Big[\frac{6\,b\,c}{d}\Big] - \frac{1}{6\,\sqrt{6}\,\left(\frac{b}{d}\right)^{3/2} d^2}c\,\text{Cos}\Big[\frac{6\,b\,c}{d}\Big]$$

$$\Bigg(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\Big[2\,\sqrt{\frac{b}{d}}\,\sqrt{\frac{3}{\pi}}\,\sqrt{c+d\,x}\,\Big] + \sqrt{6}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Sin}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]\Bigg) +$$

$$\Bigg(\text{Cos}\Big[\frac{6\,b\,c}{d}\Big]\,\Bigg(-\frac{3}{2}\Bigg(-\sqrt{6}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Cos}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big] + \sqrt{\frac{\pi}{2}}\,\text{FresnelC}\Big[$$

$$2\,\sqrt{\frac{b}{d}}\,\sqrt{\frac{3}{\pi}}\,\sqrt{c+d\,x}\,\Big]\Bigg) + 6\,\sqrt{6}\,\left(\frac{b}{d}\right)^{3/2}\,(c+d\,x)^{3/2}\,\text{Sin}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]\Bigg)\Bigg)\Bigg/$$

$$\left(36\,\sqrt{6}\,\left(\frac{b}{d}\right)^{5/2} d^2\right) + \Bigg(\text{Sin}\Big[\frac{6\,b\,c}{d}\Big]\,\Bigg(-6\,\sqrt{6}\,\left(\frac{b}{d}\right)^{3/2}\,(c+d\,x)^{3/2}\,\text{Cos}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big] + \frac{3}{2}$$

$$\Bigg(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\Big[2\,\sqrt{\frac{b}{d}}\,\sqrt{\frac{3}{\pi}}\,\sqrt{c+d\,x}\,\Big] + \sqrt{6}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Sin}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(36\,\sqrt{6}\,\left(\frac{b}{d}\right)^{5/2} d^2\right)\Bigg) - \frac{1}{4}\,d^2\,\text{Sin}[6\,a]\,\Bigg(\frac{1}{6\,\sqrt{6}\,\left(\frac{b}{d}\right)^{3/2} d^3}$$

$$c^2\,\Bigg(-\sqrt{6}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Cos}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big] + \sqrt{\frac{\pi}{2}}\,\text{FresnelC}\Big[2\,\sqrt{\frac{b}{d}}\,\sqrt{\frac{3}{\pi}}\,\sqrt{c+d\,x}\,\Big]\Bigg)$$

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

$$\Bigg(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\Big[2\,\sqrt{\frac{b}{d}}\,\sqrt{\frac{3}{\pi}}\,\sqrt{c+d\,x}\,\Big] + \sqrt{6}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Sin}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]\Bigg) -$$

$$\Bigg(c\,\text{Cos}\Big[\frac{6\,b\,c}{d}\Big]\,\Bigg(-\frac{3}{2}\Bigg(-\sqrt{6}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\,\text{Cos}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big] + \sqrt{\frac{\pi}{2}}\,\text{FresnelC}\Big[$$

$$2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+dx}\Big]\Bigg)+6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}(c+dx)^{3/2}\,\text{Sin}\Big[\frac{6b(c+dx)}{d}\Big]\Bigg)\Bigg)\Big/$$

$$\left(18\sqrt{6}\left(\frac{b}{d}\right)^{5/2}d^3\right)-\Bigg(c\,\text{Sin}\Big[\frac{6bc}{d}\Big]\Bigg(-6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}(c+dx)^{3/2}\,\text{Cos}\Big[\frac{6b(c+dx)}{d}\Big]+\frac{3}{2}$$

$$\Bigg(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\Big[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+dx}\Big]+\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+dx}\,\text{Sin}\Big[\frac{6b(c+dx)}{d}\Big]\Bigg)\Bigg)\Bigg)\Big/$$

$$\left(18\sqrt{6}\left(\frac{b}{d}\right)^{5/2}d^3\right)+\Bigg(\text{Sin}\Big[\frac{6bc}{d}\Big]\Bigg(-36\sqrt{6}\left(\frac{b}{d}\right)^{5/2}(c+dx)^{5/2}\,\text{Cos}\Big[\frac{6b(c+dx)}{d}\Big]+$$

$$\frac{5}{2}\Bigg(-\frac{3}{2}\Bigg(-\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+dx}\,\text{Cos}\Big[\frac{6b(c+dx)}{d}\Big]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\Big[$$

$$2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+dx}\Big]\Bigg)+6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}(c+dx)^{3/2}\,\text{Sin}\Big[\frac{6b(c+dx)}{d}\Big]\Bigg)\Bigg)\Bigg)\Big/$$

$$\left(216\sqrt{6}\left(\frac{b}{d}\right)^{7/2}d^3\right)+\Bigg(\text{Cos}\Big[\frac{6bc}{d}\Big]\Bigg(36\sqrt{6}\left(\frac{b}{d}\right)^{5/2}(c+dx)^{5/2}\,\text{Sin}\Big[\frac{6b(c+dx)}{d}\Big]-$$

$$\frac{5}{2}\Bigg(-6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}(c+dx)^{3/2}\,\text{Cos}\Big[\frac{6b(c+dx)}{d}\Big]+\frac{3}{2}\Bigg(-\sqrt{\frac{\pi}{2}}$$

$$\text{FresnelS}\Big[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+dx}\Big]+\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+dx}\,\text{Sin}\Big[\frac{6b(c+dx)}{d}\Big]\Bigg)\Bigg)\Bigg)\Bigg)\Big/$$

$$\left(216\sqrt{6}\left(\frac{b}{d}\right)^{7/2}d^3\right)\Bigg)-\frac{1}{4}d^2\,\text{Cos}[6a]\Bigg(\frac{1}{6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\text{Cos}\Big[\frac{6bc}{d}\Big]$$

$$\Bigg(-\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+dx}\,\text{Cos}\Big[\frac{6b(c+dx)}{d}\Big]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\Big[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+dx}\Big]\Bigg)-$$

$$\frac{1}{6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\text{Sin}\Big[\frac{6bc}{d}\Big]\Bigg(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\Big[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+dx}\Big]+$$

$$\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+dx}\,\text{Sin}\Big[\frac{6b(c+dx)}{d}\Big]\Bigg)+\Bigg(c\,\text{Sin}\Big[\frac{6bc}{d}\Big]$$

$$\left(-\frac{3}{2}\left(-\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+d x}\,\text{Cos}\left[\frac{6 b (c+d x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+d x}\right]\right)+6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}(c+d x)^{3/2}\,\text{Sin}\left[\frac{6 b (c+d x)}{d}\right]\right)\right)\Big/\left(18\sqrt{6}\left(\frac{b}{d}\right)^{5/2} d^3\right)-$$

$$\left(c\,\text{Cos}\left[\frac{6 b c}{d}\right]\left(-6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}(c+d x)^{3/2}\,\text{Cos}\left[\frac{6 b (c+d x)}{d}\right]+\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+d x}\right]+\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+d x}\,\text{Sin}\left[\frac{6 b (c+d x)}{d}\right]\right)\right)\right)\Big/$$

$$\left(18\sqrt{6}\left(\frac{b}{d}\right)^{5/2} d^3\right)+\left(\text{Cos}\left[\frac{6 b c}{d}\right]\left(-36\sqrt{6}\left(\frac{b}{d}\right)^{5/2}(c+d x)^{5/2}\,\text{Cos}\left[\frac{6 b (c+d x)}{d}\right]+\frac{5}{2}\left(-\frac{3}{2}\left(-\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+d x}\,\text{Cos}\left[\frac{6 b (c+d x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+d x}\right]\right)+6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}(c+d x)^{3/2}\,\text{Sin}\left[\frac{6 b (c+d x)}{d}\right]\right)\right)\right)\Big/$$

$$\left(216\sqrt{6}\left(\frac{b}{d}\right)^{7/2} d^3\right)-\left(\text{Sin}\left[\frac{6 b c}{d}\right]\left(36\sqrt{6}\left(\frac{b}{d}\right)^{5/2}(c+d x)^{5/2}\,\text{Sin}\left[\frac{6 b (c+d x)}{d}\right]-\frac{5}{2}\left(-6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}(c+d x)^{3/2}\,\text{Cos}\left[\frac{6 b (c+d x)}{d}\right]+\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+d x}\right]+\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+d x}\,\text{Sin}\left[\frac{6 b (c+d x)}{d}\right]\right)\right)\right)\right)\Big/\left(216\sqrt{6}\left(\frac{b}{d}\right)^{7/2} d^3\right)\right)$$

Problem 201: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 407 leaves, 18 steps) :

$$\frac{45\, d^2 \sqrt{c+d\,x}\ \mathrm{Cos}[2\,a+2\,b\,x]}{1024\, b^3} - \frac{3\,(c+d\,x)^{5/2}\ \mathrm{Cos}[2\,a+2\,b\,x]}{64\, b} - \frac{5\, d^2 \sqrt{c+d\,x}\ \mathrm{Cos}[6\,a+6\,b\,x]}{9216\, b^3} +$$

$$\frac{(c+d\,x)^{5/2}\ \mathrm{Cos}[6\,a+6\,b\,x]}{192\, b} + \frac{5\, d^{5/2} \sqrt{\frac{\pi}{3}}\ \mathrm{Cos}\left[6\,a-\frac{6\,b\,c}{d}\right]\ \mathrm{FresnelC}\left[\frac{2\sqrt{b}\sqrt{\frac{3}{\pi}}\sqrt{c+d\,x}}{\sqrt{d}}\right]}{18\,432\, b^{7/2}} -$$

$$\frac{45\, d^{5/2}\sqrt{\pi}\ \mathrm{Cos}\left[2\,a-\frac{2\,b\,c}{d}\right]\ \mathrm{FresnelC}\left[\frac{2\sqrt{b}\sqrt{c+d\,x}}{\sqrt{d}\sqrt{\pi}}\right]}{2048\, b^{7/2}} -$$

$$\frac{5\, d^{5/2}\sqrt{\frac{\pi}{3}}\ \mathrm{FresnelS}\left[\frac{2\sqrt{b}\sqrt{\frac{3}{\pi}}\sqrt{c+d\,x}}{\sqrt{d}}\right]\ \mathrm{Sin}\left[6\,a-\frac{6\,b\,c}{d}\right]}{18\,432\, b^{7/2}} +$$

$$\frac{45\, d^{5/2}\sqrt{\pi}\ \mathrm{FresnelS}\left[\frac{2\sqrt{b}\sqrt{c+d\,x}}{\sqrt{d}\sqrt{\pi}}\right]\ \mathrm{Sin}\left[2\,a-\frac{2\,b\,c}{d}\right]}{2048\, b^{7/2}} +$$

$$\frac{15\, d\,(c+d\,x)^{3/2}\ \mathrm{Sin}[2\,a+2\,b\,x]}{256\, b^2} - \frac{5\, d\,(c+d\,x)^{3/2}\ \mathrm{Sin}[6\,a+6\,b\,x]}{2304\, b^2}$$

Result (type 4, 6763 leaves) :

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

$$\left.\sqrt{\frac{\pi}{2}}\ \mathrm{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d\,x}}{\sqrt{\pi}}\right]\right)\mathrm{Sin}\left[\frac{b\,c}{d}\right] + \frac{1}{2\sqrt{2}\left(\frac{b}{d}\right)^{3/2} d}$$

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

$$\frac{3}{4} c^2\ (\mathrm{Cos}[a]-\mathrm{Sin}[a])\ (\mathrm{Cos}[a]+\mathrm{Sin}[a])$$

$$\left(\frac{1}{2\sqrt{2}\left(\frac{b}{d}\right)^{3/2} d}\left(-\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\ \mathrm{Cos}\left[\frac{2\,b\,(c+d\,x)}{d}\right] + \sqrt{\frac{\pi}{2}}\ \mathrm{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d\,x}}{\sqrt{\pi}}\right]\right)\right.$$

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

$$\text{Sin}\left[\frac{2\,b\,c}{d}\right]\left(-\sqrt{\frac{\pi}{2}}\;\text{FresnelS}\left[\frac{2\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}}{\sqrt{\pi}}\right]+\sqrt{2}\;\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}\;\text{Sin}\left[\frac{2\,b\,(c+d\,x)}{d}\right]\right)\Bigg)+$$

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

$$\left.\sqrt{\frac{\pi}{2}}\;\text{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}}{\sqrt{\pi}}\right]\right)\text{Sin}\left[\frac{b\,c}{d}\right]-\frac{1}{2\sqrt{2}\,\left(\frac{b}{d}\right)^{3/2}d^2}$$

$$c\,\text{Cos}\left[\frac{2\,b\,c}{d}\right]\left(-\sqrt{\frac{\pi}{2}}\;\text{FresnelS}\left[\frac{2\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}}{\sqrt{\pi}}\right]+\sqrt{2}\;\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}\;\text{Sin}\left[\frac{2\,b\,(c+d\,x)}{d}\right]\right)+$$

$$\frac{1}{4\sqrt{2}\,\left(\frac{b}{d}\right)^{5/2}d^2}\text{Cos}\left[\frac{2\,b\,c}{d}\right]$$

$$\left(-\frac{3}{2}\left(-\sqrt{2}\;\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}\;\text{Cos}\left[\frac{2\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\;\text{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}}{\sqrt{\pi}}\right]\right)+\right.$$

$$\left.2\sqrt{2}\;\left(\frac{b}{d}\right)^{3/2}\;(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{2\,b\,(c+d\,x)}{d}\right]\right)+\frac{1}{2\sqrt{2}\,\left(\frac{b}{d}\right)^{5/2}d^2}$$

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

$$\left.\left.\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\;\text{FresnelS}\left[\frac{2\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}}{\sqrt{\pi}}\right]+\sqrt{2}\;\sqrt{\frac{b}{d}}\;\sqrt{c+d\,x}\;\text{Sin}\left[\frac{2\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\right)+$$

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

$$c\left(-\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{2\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d\,x}}{\sqrt{\pi}}\right]\right)$$

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

$$c\,\text{Sin}\left[\frac{2\,b\,c}{d}\right]\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d\,x}}{\sqrt{\pi}}\right]+\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{2\,b\,(c+d\,x)}{d}\right]\right)-$$

$$\frac{1}{4\sqrt{2}\left(\frac{b}{d}\right)^{5/2} d^2}\text{Sin}\left[\frac{2\,b\,c}{d}\right]$$

$$\left(-\frac{3}{2}\left(-\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{2\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d\,x}}{\sqrt{\pi}}\right]\right)+\right.$$

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

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

$$\left.\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d\,x}}{\sqrt{\pi}}\right]+\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{2\,b\,(c+d\,x)}{d}\right]\right)\right)\right)+$$

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

$$c^2 \text{Cos}\left[\frac{2 b c}{d}\right] \left(-\sqrt{\frac{\pi}{2}} \text{FresnelS}\left[\frac{2 \sqrt{\frac{b}{d}} \sqrt{c + d x}}{\sqrt{\pi}}\right] + \sqrt{2} \sqrt{\frac{b}{d}} \sqrt{c + d x} \text{Sin}\left[\frac{2 b (c + d x)}{d}\right]\right) -$$

$$\frac{1}{2 \sqrt{2} \left(\frac{b}{d}\right)^{5/2} d^3} c \text{Cos}\left[\frac{2 b c}{d}\right]$$

$$\left(-\frac{3}{2} \left(-\sqrt{2} \sqrt{\frac{b}{d}} \sqrt{c + d x} \text{Cos}\left[\frac{2 b (c + d x)}{d}\right] + \sqrt{\frac{\pi}{2}} \text{FresnelC}\left[\frac{2 \sqrt{\frac{b}{d}} \sqrt{c + d x}}{\sqrt{\pi}}\right]\right) +\right.$$

$$\left.2 \sqrt{2} \left(\frac{b}{d}\right)^{3/2} (c + d x)^{3/2} \text{Sin}\left[\frac{2 b (c + d x)}{d}\right]\right) - \frac{1}{\sqrt{2} \left(\frac{b}{d}\right)^{5/2} d^3}$$

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

$$\left.\left.\frac{3}{2} \left(-\sqrt{\frac{\pi}{2}} \text{FresnelS}\left[\frac{2 \sqrt{\frac{b}{d}} \sqrt{c + d x}}{\sqrt{\pi}}\right] + \sqrt{2} \sqrt{\frac{b}{d}} \sqrt{c + d x} \text{Sin}\left[\frac{2 b (c + d x)}{d}\right]\right)\right) +$$

$$\frac{1}{4 \sqrt{2} \left(\frac{b}{d}\right)^{7/2} d^3} \text{Cos}\left[\frac{b c}{d}\right] \text{Sin}\left[\frac{b c}{d}\right] \left(-4 \sqrt{2} \left(\frac{b}{d}\right)^{5/2} (c + d x)^{5/2} \text{Cos}\left[\frac{2 b (c + d x)}{d}\right] +\right.$$

$$\frac{5}{2}\left(-\frac{3}{2}\left(-\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\mathrm{Cos}\left[\frac{2\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\mathrm{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d\,x}}{\sqrt{\pi}}\right]\right)+\right.$$

$$\left.\left.2\sqrt{2}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\mathrm{Sin}\left[\frac{2\,b\,(c+d\,x)}{d}\right]\right)\right)+$$

$$\frac{1}{8\sqrt{2}\left(\frac{b}{d}\right)^{7/2}d^3}\mathrm{Cos}\left[\frac{2\,b\,c}{d}\right]\left(4\sqrt{2}\left(\frac{b}{d}\right)^{5/2}(c+d\,x)^{5/2}\,\mathrm{Sin}\left[\frac{2\,b\,(c+d\,x)}{d}\right]-\right.$$

$$\frac{5}{2}\left(-2\sqrt{2}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\mathrm{Cos}\left[\frac{2\,b\,(c+d\,x)}{d}\right]+\right.$$

$$\left.\left.\left.\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\mathrm{FresnelS}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d\,x}}{\sqrt{\pi}}\right]+\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\mathrm{Sin}\left[\frac{2\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\right)\right)+$$

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

$$c^2\left(-\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\mathrm{Cos}\left[\frac{2\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\mathrm{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d\,x}}{\sqrt{\pi}}\right]\right)$$

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

$$c^2\,\mathrm{Sin}\left[\frac{2\,b\,c}{d}\right]\left(-\sqrt{\frac{\pi}{2}}\,\mathrm{FresnelS}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d\,x}}{\sqrt{\pi}}\right]+\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\mathrm{Sin}\left[\frac{2\,b\,(c+d\,x)}{d}\right]\right)+$$

$$\frac{1}{2\sqrt{2}\left(\frac{b}{d}\right)^{5/2} d^3} c \operatorname{Sin}\left[\frac{2 b c}{d}\right]$$

$$\left(-\frac{3}{2}\left(-\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d x}\operatorname{Cos}\left[\frac{2 b (c+d x)}{d}\right]+\sqrt{\frac{\pi}{2}}\operatorname{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d x}}{\sqrt{\pi}}\right]\right)+\right.$$

$$\left.2\sqrt{2}\left(\frac{b}{d}\right)^{3/2}(c+d x)^{3/2}\operatorname{Sin}\left[\frac{2 b (c+d x)}{d}\right]\right)-\frac{1}{2\sqrt{2}\left(\frac{b}{d}\right)^{5/2} d^3} c \left(\operatorname{Cos}\left[\frac{b c}{d}\right]-\operatorname{Sin}\left[\frac{b c}{d}\right]\right)$$

$$\left(\operatorname{Cos}\left[\frac{b c}{d}\right]+\operatorname{Sin}\left[\frac{b c}{d}\right]\right)\left(-2\sqrt{2}\left(\frac{b}{d}\right)^{3/2}(c+d x)^{3/2}\operatorname{Cos}\left[\frac{2 b (c+d x)}{d}\right]+\right.$$

$$\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\operatorname{FresnelS}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d x}}{\sqrt{\pi}}\right]+\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d x}\operatorname{Sin}\left[\frac{2 b (c+d x)}{d}\right]\right)\right)+$$

$$\frac{1}{8\sqrt{2}\left(\frac{b}{d}\right)^{7/2} d^3}\left(\operatorname{Cos}\left[\frac{b c}{d}\right]-\operatorname{Sin}\left[\frac{b c}{d}\right]\right)\left(\operatorname{Cos}\left[\frac{b c}{d}\right]+\operatorname{Sin}\left[\frac{b c}{d}\right]\right)$$

$$\left(-4\sqrt{2}\left(\frac{b}{d}\right)^{5/2}(c+d x)^{5/2}\operatorname{Cos}\left[\frac{2 b (c+d x)}{d}\right]+\right.$$

$$\frac{5}{2}\left(-\frac{3}{2}\left(-\sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c+d x}\operatorname{Cos}\left[\frac{2 b (c+d x)}{d}\right]+\sqrt{\frac{\pi}{2}}\operatorname{FresnelC}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c+d x}}{\sqrt{\pi}}\right]\right)+\right.$$

$$\left.\left.2\sqrt{2}\left(\frac{b}{d}\right)^{3/2}(c+d x)^{3/2}\operatorname{Sin}\left[\frac{2 b (c+d x)}{d}\right]\right)\right)-$$

$$\frac{1}{8\sqrt{2}\left(\frac{b}{d}\right)^{7/2} d^3} \text{Sin}\left[\frac{2 b c}{d}\right] \left(4\sqrt{2}\left(\frac{b}{d}\right)^{5/2} (c + d x)^{5/2} \text{Sin}\left[\frac{2 b (c + d x)}{d}\right] - \right.$$

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

$$\left.\left.\left.\left.\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}} \text{FresnelS}\left[\frac{2\sqrt{\frac{b}{d}}\sqrt{c + d x}}{\sqrt{\pi}}\right] + \sqrt{2}\sqrt{\frac{b}{d}}\sqrt{c + d x} \text{Sin}\left[\frac{2 b (c + d x)}{d}\right]\right)\right)\right)\right) -$$

$$\frac{1}{4} c^2 \text{Sin}[6 a] \left(\frac{1}{6\sqrt{6}\left(\frac{b}{d}\right)^{3/2} d}\left(-\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c + d x} \text{Cos}\left[\frac{6 b (c + d x)}{d}\right] + \right.\right.$$

$$\left.\sqrt{\frac{\pi}{2}} \text{FresnelC}\left[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c + d x}\right]\right) \text{Sin}\left[\frac{6 b c}{d}\right] + \frac{1}{6\sqrt{6}\left(\frac{b}{d}\right)^{3/2} d} \text{Cos}\left[\frac{6 b c}{d}\right]$$

$$\left.\left(-\sqrt{\frac{\pi}{2}} \text{FresnelS}\left[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c + d x}\right] + \sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c + d x} \text{Sin}\left[\frac{6 b (c + d x)}{d}\right]\right)\right) -$$

$$\frac{1}{4} c^2 \text{Cos}[6 a] \left(\frac{1}{6\sqrt{6}\left(\frac{b}{d}\right)^{3/2} d} \text{Cos}\left[\frac{6 b c}{d}\right] \left(-\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c + d x} \text{Cos}\left[\frac{6 b (c + d x)}{d}\right] + \right.\right.$$

$$\left.\sqrt{\frac{\pi}{2}} \text{FresnelC}\left[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c + d x}\right]\right) - \frac{1}{6\sqrt{6}\left(\frac{b}{d}\right)^{3/2} d} \text{Sin}\left[\frac{6 b c}{d}\right]$$

$$\left.\left(-\sqrt{\frac{\pi}{2}} \text{FresnelS}\left[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c + d x}\right] + \sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c + d x} \text{Sin}\left[\frac{6 b (c + d x)}{d}\right]\right)\right) -$$

$$\frac{1}{2} c d \text{Cos}[6 a] \left(-\frac{1}{6\sqrt{6}\left(\frac{b}{d}\right)^{3/2} d^2} c \text{Cos}\left[\frac{6 b c}{d}\right]\right.$$

$$\left(-\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c + d x} \text{Cos}\left[\frac{6 b (c + d x)}{d}\right] + \sqrt{\frac{\pi}{2}} \text{FresnelC}\left[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c + d x}\right]\right) +$$

$$\frac{1}{6\sqrt{6}\,\left(\frac{b}{d}\right)^{3/2} d^2} c\,\text{Sin}\Big[\frac{6\,b\,c}{d}\Big]\,\Big(-\sqrt{\frac{\pi}{2}}\;\text{FresnelS}\Big[2\sqrt{\frac{b}{d}}\,\sqrt{\frac{3}{\pi}}\,\sqrt{c+d\,x}\Big]+$$

$$\sqrt{6}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\;\text{Sin}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]\Big)-\Big(\text{Sin}\Big[\frac{6\,b\,c}{d}\Big]$$

$$\Big(-\frac{3}{2}\Big(-\sqrt{6}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\;\text{Cos}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]+\sqrt{\frac{\pi}{2}}\;\text{FresnelC}\Big[2\sqrt{\frac{b}{d}}\,\sqrt{\frac{3}{\pi}}\,\sqrt{c+d\,x}\Big]\Big)+$$

$$6\sqrt{6}\,\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]\Big)\Big)\Big/\Big(36\sqrt{6}\,\left(\frac{b}{d}\right)^{5/2} d^2\Big)+$$

$$\Big(\text{Cos}\Big[\frac{6\,b\,c}{d}\Big]\,\Big(-6\sqrt{6}\,\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Cos}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]+\frac{3}{2}\Big(-\sqrt{\frac{\pi}{2}}\;\text{FresnelS}\Big[2\sqrt{\frac{b}{d}}\,\sqrt{\frac{3}{\pi}}$$

$$\sqrt{c+d\,x}\Big]+\sqrt{6}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\;\text{Sin}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]\Big)\Big)\Big)\Big/\Big(36\sqrt{6}\,\left(\frac{b}{d}\right)^{5/2} d^2\Big)-$$

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

$$\sqrt{\frac{\pi}{2}}\;\text{FresnelC}\Big[2\sqrt{\frac{b}{d}}\,\sqrt{\frac{3}{\pi}}\,\sqrt{c+d\,x}\Big]\Big)\,\text{Sin}\Big[\frac{6\,b\,c}{d}\Big]-\frac{1}{6\sqrt{6}\,\left(\frac{b}{d}\right)^{3/2} d^2} c\,\text{Cos}\Big[\frac{6\,b\,c}{d}\Big]$$

$$\Big(-\sqrt{\frac{\pi}{2}}\;\text{FresnelS}\Big[2\sqrt{\frac{b}{d}}\,\sqrt{\frac{3}{\pi}}\,\sqrt{c+d\,x}\Big]+\sqrt{6}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\;\text{Sin}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]\Big)+$$

$$\Big(\text{Cos}\Big[\frac{6\,b\,c}{d}\Big]\,\Big(-\frac{3}{2}\Big(-\sqrt{6}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\;\text{Cos}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]+\sqrt{\frac{\pi}{2}}\;\text{FresnelC}\Big[$$

$$2\sqrt{\frac{b}{d}}\,\sqrt{\frac{3}{\pi}}\,\sqrt{c+d\,x}\Big]\Big)+6\sqrt{6}\,\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]\Big)\Big)\Big/$$

$$\Big(36\sqrt{6}\,\left(\frac{b}{d}\right)^{5/2} d^2\Big)+\Big(\text{Sin}\Big[\frac{6\,b\,c}{d}\Big]\,\Big(-6\sqrt{6}\,\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Cos}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]+\frac{3}{2}$$

$$\Big(-\sqrt{\frac{\pi}{2}}\;\text{FresnelS}\Big[2\sqrt{\frac{b}{d}}\,\sqrt{\frac{3}{\pi}}\,\sqrt{c+d\,x}\Big]+\sqrt{6}\,\sqrt{\frac{b}{d}}\,\sqrt{c+d\,x}\;\text{Sin}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]\Big)\Big)\Big)\Big/$$

$$\left(36\sqrt{6}\left(\frac{b}{d}\right)^{5/2}d^2\right)\Bigg)-\frac{1}{4}d^2\,\text{Sin}[6\,a]\left(\frac{1}{6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}d^3}\right.$$

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

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

$$\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+d\,x}\right]+\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{6\,b\,(c+d\,x)}{d}\right]\right)-$$

$$\left(c\,\text{Cos}\left[\frac{6\,b\,c}{d}\right]\left(-\frac{3}{2}\left(-\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{6\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\right[\right.\right.\right.$$

$$\left.\left.\left.2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+d\,x}\,\right]\right)+6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{6\,b\,(c+d\,x)}{d}\right]\right)\Bigg)\Big/$$

$$\left(18\sqrt{6}\left(\frac{b}{d}\right)^{5/2}d^3\right)-\left(c\,\text{Sin}\left[\frac{6\,b\,c}{d}\right]\left(-6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Cos}\left[\frac{6\,b\,(c+d\,x)}{d}\right]+\frac{3}{2}\right.\right.$$

$$\left.\left.\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+d\,x}\right]+\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\left[\frac{6\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\Big/$$

$$\left(18\sqrt{6}\left(\frac{b}{d}\right)^{5/2}d^3\right)+\left(\text{Sin}\left[\frac{6\,b\,c}{d}\right]\left(-36\sqrt{6}\left(\frac{b}{d}\right)^{5/2}(c+d\,x)^{5/2}\,\text{Cos}\left[\frac{6\,b\,(c+d\,x)}{d}\right]+\right.\right.$$

$$\frac{5}{2}\left(-\frac{3}{2}\left(-\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\left[\frac{6\,b\,(c+d\,x)}{d}\right]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\right[\right.\right.$$

$$\left.\left.\left.\left.2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+d\,x}\,\right]\right)+6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\left[\frac{6\,b\,(c+d\,x)}{d}\right]\right)\right)\right)\Big/$$

$$\left(216\sqrt{6}\left(\frac{b}{d}\right)^{7/2}d^3\right)+\left(\text{Cos}\left[\frac{6\,b\,c}{d}\right]\left(36\sqrt{6}\left(\frac{b}{d}\right)^{5/2}(c+d\,x)^{5/2}\,\text{Sin}\left[\frac{6\,b\,(c+d\,x)}{d}\right]-\right.\right.$$

$$\frac{5}{2}\left(-6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Cos}\left[\frac{6\,b\,(c+d\,x)}{d}\right]+\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\right.\right.$$

$$\text{FresnelS}\Big[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+d\,x}\Big]+\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]\Big)\Big)\Big)\Big)\Big)\Big/$$

$$\Big(216\sqrt{6}\left(\frac{b}{d}\right)^{7/2}d^3\Big)\Big)-\frac{1}{4}d^2\,\text{Cos}[6\,a]\,\Big(\frac{1}{6\sqrt{6}\,\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\text{Cos}\Big[\frac{6\,b\,c}{d}\Big]$$

$$\Big(-\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\Big[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+d\,x}\Big]\Big)-$$

$$\frac{1}{6\sqrt{6}\,\left(\frac{b}{d}\right)^{3/2}d^3}c^2\,\text{Sin}\Big[\frac{6\,b\,c}{d}\Big]\,\Big(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\Big[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+d\,x}\Big]+$$

$$\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]\Big)+\Big(c\,\text{Sin}\Big[\frac{6\,b\,c}{d}\Big]$$

$$\Big(-\frac{3}{2}\Big(-\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\Big[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+d\,x}\Big]\Big)+$$

$$6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]\Big)\Big)\Big/\Big(18\sqrt{6}\left(\frac{b}{d}\right)^{5/2}d^3\Big)-$$

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

$$\Big(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\Big[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+d\,x}\Big]+\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Sin}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]\Big)\Big)\Big)\Big/$$

$$\Big(18\sqrt{6}\left(\frac{b}{d}\right)^{5/2}d^3\Big)+\Big(\text{Cos}\Big[\frac{6\,b\,c}{d}\Big]\,\Big(-36\sqrt{6}\left(\frac{b}{d}\right)^{5/2}(c+d\,x)^{5/2}\,\text{Cos}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]+$$

$$\frac{5}{2}\Big(-\frac{3}{2}\Big(-\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+d\,x}\,\text{Cos}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]+\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\Big[$$

$$2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+d\,x}\Big]\Big)+6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}(c+d\,x)^{3/2}\,\text{Sin}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]\Big)\Big)\Big)\Big/$$

$$\Big(216\sqrt{6}\left(\frac{b}{d}\right)^{7/2}d^3\Big)-\Big(\text{Sin}\Big[\frac{6\,b\,c}{d}\Big]\,\Big(36\sqrt{6}\left(\frac{b}{d}\right)^{5/2}(c+d\,x)^{5/2}\,\text{Sin}\Big[\frac{6\,b\,(c+d\,x)}{d}\Big]-$$

$$\frac{5}{2}\left(-6\sqrt{6}\left(\frac{b}{d}\right)^{3/2}(c+d x)^{3/2}\,\text{Cos}\left[\frac{6 b (c+d x)}{d}\right]+\frac{3}{2}\left(-\sqrt{\frac{\pi}{2}}\,\text{FresnelS}\left[2\sqrt{\frac{b}{d}}\sqrt{\frac{3}{\pi}}\sqrt{c+d x}\right]+\sqrt{6}\sqrt{\frac{b}{d}}\sqrt{c+d x}\,\text{Sin}\left[\frac{6 b (c+d x)}{d}\right]\right)\right)\Bigg)\Bigg)\Bigg)\Bigg/\left(216\sqrt{6}\left(\frac{b}{d}\right)^{7/2} d^3\right)\Bigg)$$

Problem 209: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 158 leaves, 7 steps):

$$\frac{i (c+d x)^5}{5 d}-\frac{(c+d x)^4\,\text{Log}\left[1+e^{2 i (a+b x)}\right]}{b}+\frac{2 i d (c+d x)^3\,\text{PolyLog}\left[2,-e^{2 i (a+b x)}\right]}{b^2}-\frac{3 d^2 (c+d x)^2\,\text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]}{b^3}-\frac{3 i d^3 (c+d x)\,\text{PolyLog}\left[4,-e^{2 i (a+b x)}\right]}{b^4}+\frac{3 d^4\,\text{PolyLog}\left[5,-e^{2 i (a+b x)}\right]}{2 b^5}$$

Result (type 4, 722 leaves):

$$\frac{1}{2 b^3} c^2 d^2 e^{-i a} \left(2 i b^2 x^2 \left(2 b e^{2 i a} x + 3 i \left(1 + e^{2 i a}\right) \text{Log}\left[1 + e^{2 i (a+b x)}\right]\right) + 6 i b \left(1 + e^{2 i a}\right) x \,\text{PolyLog}\left[2, -e^{2 i (a+b x)}\right] - 3 \left(1 + e^{2 i a}\right) \text{PolyLog}\left[3, -e^{2 i (a+b x)}\right]\right)$$

$$\text{Sec}[a] - i c d^3 e^{i a} \left(-x^4 + \left(1 + e^{-2 i a}\right) x^4 - \frac{1}{2 b^4} e^{-2 i a} \left(1 + e^{2 i a}\right) \left(2 b^4 x^4 + 4 i b^3 x^3 \text{Log}\left[1 + e^{2 i (a+b x)}\right] + 6 b^2 x^2 \text{PolyLog}\left[2, -e^{2 i (a+b x)}\right] + 6 i b x \,\text{PolyLog}\left[3, -e^{2 i (a+b x)}\right] - 3 \,\text{PolyLog}\left[4, -e^{2 i (a+b x)}\right]\right)\right) \text{Sec}[a] -$$

$$\frac{1}{5} i d^4 e^{i a} \left(-x^5 + \left(1 + e^{-2 i a}\right) x^5 - \frac{1}{4 b^5} e^{-2 i a} \left(1 + e^{2 i a}\right) \left(4 b^5 x^5 + 10 i b^4 x^4 \text{Log}\left[1 + e^{2 i (a+b x)}\right] + 20 b^3 x^3 \text{PolyLog}\left[2, -e^{2 i (a+b x)}\right] + 30 i b^2 x^2 \text{PolyLog}\left[3, -e^{2 i (a+b x)}\right] - 30 b x \,\text{PolyLog}\left[4, -e^{2 i (a+b x)}\right] - 15 i \,\text{PolyLog}\left[5, -e^{2 i (a+b x)}\right]\right)\right) \text{Sec}[a] -$$

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

$$\left(2 c^3 d \,\text{Csc}[a] \left(b^2 e^{-i \text{ArcTan}[\text{Cot}[a]]} x^2 - \frac{1}{\sqrt{1 + \text{Cot}[a]^2}} \text{Cot}[a] \left(i b x \left(-\pi - 2 \text{ArcTan}[\text{Cot}[a]]\right) - \pi \text{Log}\left[1 + e^{-2 i b x}\right] - 2 \left(b x - \text{ArcTan}[\text{Cot}[a]]\right) \text{Log}\left[1 - e^{2 i (b x - \text{ArcTan}[\text{Cot}[a]])}\right] + \pi \text{Log}[\text{Cos}[b x]] - 2 \text{ArcTan}[\text{Cot}[a]] \text{Log}[\text{Sin}[b x - \text{ArcTan}[\text{Cot}[a]]]] + i \,\text{PolyLog}\left[2, e^{2 i (b x - \text{ArcTan}[\text{Cot}[a]])}\right]\right)\right) \text{Sec}[a]\right) \Big/$$

$$\left(b^2 \sqrt{\text{Csc}[a]^2 \left(\text{Cos}[a]^2 + \text{Sin}[a]^2\right)}\right) + \frac{1}{5} x \left(5 c^4 + 10 c^3 d x + 10 c^2 d^2 x^2 + 5 c d^3 x^3 + d^4 x^4\right) \text{Tan}[a]$$

Problem 210: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 132 leaves, 6 steps):

$$\frac{i (c + d x)^4}{4 d} - \frac{(c + d x)^3 \text{Log}\left[1 + e^{2 i (a+b x)}\right]}{b} + \frac{3 i d (c + d x)^2 \text{PolyLog}\left[2, -e^{2 i (a+b x)}\right]}{2 b^2} - \frac{3 d^2 (c + d x) \text{PolyLog}\left[3, -e^{2 i (a+b x)}\right]}{2 b^3} - \frac{3 i d^3 \text{PolyLog}\left[4, -e^{2 i (a+b x)}\right]}{4 b^4}$$

Result (type 4, 533 leaves):

$$\frac{1}{4 b^3} c d^2 e^{-i a} \left(2 i b^2 x^2 \left(2 b e^{2 i a} x + 3 i \left(1 + e^{2 i a}\right) \text{Log}\left[1 + e^{2 i (a+b x)}\right]\right) + 6 i b \left(1 + e^{2 i a}\right) x \, \text{PolyLog}\left[2, -e^{2 i (a+b x)}\right] - 3 \left(1 + e^{2 i a}\right) \text{PolyLog}\left[3, -e^{2 i (a+b x)}\right]\right) \text{Sec}[a] -$$

$$\frac{1}{4} i d^3 e^{i a} \left(-x^4 + \left(1 + e^{-2 i a}\right) x^4 - \frac{1}{2 b^4} e^{-2 i a} \left(1 + e^{2 i a}\right) \left(2 b^4 x^4 + 4 i b^3 x^3 \text{Log}\left[1 + e^{2 i (a+b x)}\right] + 6 b^2 x^2 \text{PolyLog}\left[2, -e^{2 i (a+b x)}\right] + 6 i b x \, \text{PolyLog}\left[3, -e^{2 i (a+b x)}\right] - 3 \text{PolyLog}\left[4, -e^{2 i (a+b x)}\right]\right)\right)$$

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

$$\left(3 c^2 d \, \text{Csc}[a] \left(b^2 e^{-i \text{ArcTan}[\text{Cot}[a]]} x^2 - \frac{1}{\sqrt{1 + \text{Cot}[a]^2}} \text{Cot}[a] \left(i b x \left(-\pi - 2 \text{ArcTan}[\text{Cot}[a]]\right) - \pi \text{Log}\left[1 + e^{-2 i b x}\right] - 2 \left(b x - \text{ArcTan}[\text{Cot}[a]]\right) \text{Log}\left[1 - e^{2 i (b x - \text{ArcTan}[\text{Cot}[a]])}\right] + \pi \text{Log}[\text{Cos}[b x]] - 2 \text{ArcTan}[\text{Cot}[a]] \text{Log}[\text{Sin}[b x - \text{ArcTan}[\text{Cot}[a]]]] + i \, \text{PolyLog}\left[2, e^{2 i (b x - \text{ArcTan}[\text{Cot}[a]])}\right]\right)\right) \text{Sec}[a]\right) \Big/$$

$$\left(2 b^2 \sqrt{\text{Csc}[a]^2 \left(\text{Cos}[a]^2 + \text{Sin}[a]^2\right)}\right) + \frac{1}{4} x \left(4 c^3 + 6 c^2 d x + 4 c d^2 x^2 + d^3 x^3\right) \text{Tan}[a]$$

Problem 211: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 96 leaves, 5 steps):

$$\frac{i (c + d x)^3}{3 d} - \frac{(c + d x)^2 \text{Log}\left[1 + e^{2 i (a+b x)}\right]}{b} + \frac{i d (c + d x) \text{PolyLog}\left[2, -e^{2 i (a+b x)}\right]}{b^2} - \frac{d^2 \text{PolyLog}\left[3, -e^{2 i (a+b x)}\right]}{2 b^3}$$

Result (type 4, 363 leaves):

$$\frac{1}{12 b^3} d^2 e^{-i a} \left(2 i b^2 x^2 \left(2 b e^{2 i a} x + 3 i \left(1 + e^{2 i a}\right) \text{Log}\left[1 + e^{2 i (a+b x)}\right]\right) + 6 i b \left(1 + e^{2 i a}\right) x \text{PolyLog}\left[2, -e^{2 i (a+b x)}\right] - 3 \left(1 + e^{2 i a}\right) \text{PolyLog}\left[3, -e^{2 i (a+b x)}\right]\right) \text{Sec}[a] - \left(c^2 \text{Sec}[a] \left(\text{Cos}[a] \text{Log}[\text{Cos}[a] \text{Cos}[b x] - \text{Sin}[a] \text{Sin}[b x]] + b x \text{Sin}[a]\right)\right) \Big/ \left(b \left(\text{Cos}[a]^2 + \text{Sin}[a]^2\right)\right) - \left(c d \text{Csc}[a] \left(b^2 e^{-i \text{ArcTan}[\text{Cot}[a]]} x^2 - \frac{1}{\sqrt{1 + \text{Cot}[a]^2}} \text{Cot}[a] \left(i b x \left(-\pi - 2 \text{ArcTan}[\text{Cot}[a]]\right) - \pi \text{Log}\left[1 + e^{-2 i b x}\right] - 2 \left(b x - \text{ArcTan}[\text{Cot}[a]]\right) \text{Log}\left[1 - e^{2 i (b x - \text{ArcTan}[\text{Cot}[a]])}\right] + \pi \text{Log}[\text{Cos}[b x]] - 2 \text{ArcTan}[\text{Cot}[a]] \text{Log}[\text{Sin}[b x - \text{ArcTan}[\text{Cot}[a]]]] + i \text{PolyLog}\left[2, e^{2 i (b x - \text{ArcTan}[\text{Cot}[a]])}\right]\right)\right) \text{Sec}[a]\right) \Big/ \left(b^2 \sqrt{\text{Csc}[a]^2 \left(\text{Cos}[a]^2 + \text{Sin}[a]^2\right)}\right) + \frac{1}{3} x \left(3 c^2 + 3 c d x + d^2 x^2\right) \text{Tan}[a]$$

Problem 212: Result more than twice size of optimal antiderivative.

$$\int (c + d x) \text{Tan}[a + b x] \, dx$$

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

$$\frac{i (c + d x)^2}{2 d} - \frac{(c + d x) \text{Log}\left[1 + e^{2 i (a+b x)}\right]}{b} + \frac{i d \text{PolyLog}\left[2, -e^{2 i (a+b x)}\right]}{2 b^2}$$

Result (type 4, 190 leaves):

$$-\frac{c \text{Log}[\text{Cos}[a + b x]]}{b} - \left(d \text{Csc}[a] \left(b^2 e^{-i \text{ArcTan}[\text{Cot}[a]]} x^2 - \frac{1}{\sqrt{1 + \text{Cot}[a]^2}} \text{Cot}[a] \left(i b x \left(-\pi - 2 \text{ArcTan}[\text{Cot}[a]]\right) - \pi \text{Log}\left[1 + e^{-2 i b x}\right] - 2 \left(b x - \text{ArcTan}[\text{Cot}[a]]\right) \text{Log}\left[1 - e^{2 i (b x - \text{ArcTan}[\text{Cot}[a]])}\right] + \pi \text{Log}[\text{Cos}[b x]] - 2 \text{ArcTan}[\text{Cot}[a]] \text{Log}[\text{Sin}[b x - \text{ArcTan}[\text{Cot}[a]]]] + i \text{PolyLog}\left[2, e^{2 i (b x - \text{ArcTan}[\text{Cot}[a]])}\right]\right)\right) \text{Sec}[a]\right) \Big/ \left(2 b^2 \sqrt{\text{Csc}[a]^2 \left(\text{Cos}[a]^2 + \text{Sin}[a]^2\right)}\right) + \frac{1}{2} d x^2 \text{Tan}[a]$$

Problem 216: Result more than twice size of optimal antiderivative.

$$\int (c + d x)^3 \text{Sin}[a + b x] \text{Tan}[a + b x] \, dx$$

Optimal (type 4, 275 leaves, 14 steps):

$$-\frac{2 i (c+d x)^3 \text{ArcTan}\left[e^{i (a+b x)}\right]}{b}+\frac{6 d^3 \text{Cos}[a+b x]}{b^4}-\frac{3 d (c+d x)^2 \text{Cos}[a+b x]}{b^2}+\frac{3 i d (c+d x)^2 \text{PolyLog}\left[2,-i e^{i (a+b x)}\right]}{b^2}-\frac{3 i d (c+d x)^2 \text{PolyLog}\left[2, i e^{i (a+b x)}\right]}{b^2}-\frac{6 d^2 (c+d x) \text{PolyLog}\left[3,-i e^{i (a+b x)}\right]}{b^3}+\frac{6 d^2 (c+d x) \text{PolyLog}\left[3, i e^{i (a+b x)}\right]}{b^3}-\frac{6 i d^3 \text{PolyLog}\left[4,-i e^{i (a+b x)}\right]}{b^4}+\frac{6 i d^3 \text{PolyLog}\left[4, i e^{i (a+b x)}\right]}{b^4}+\frac{6 d^2 (c+d x) \text{Sin}[a+b x]}{b^3}-\frac{(c+d x)^3 \text{Sin}[a+b x]}{b}$$

Result (type 4, 557 leaves):

$$-\frac{1}{b^4}\Big(2 i b^3 c^3 \text{ArcTan}\left[e^{i (a+b x)}\right]+3 b^2 c^2 d \text{Cos}[a+b x]-6 d^3 \text{Cos}[a+b x]+6 b^2 c d^2 x \text{Cos}[a+b x]+3 b^2 d^3 x^2 \text{Cos}[a+b x]-3 b^3 c^2 d x \text{Log}\left[1-i e^{i (a+b x)}\right]-3 b^3 c d^2 x^2 \text{Log}\left[1-i e^{i (a+b x)}\right]-b^3 d^3 x^3 \text{Log}\left[1-i e^{i (a+b x)}\right]+3 b^3 c^2 d x \text{Log}\left[1+i e^{i (a+b x)}\right]+3 b^3 c d^2 x^2 \text{Log}\left[1+i e^{i (a+b x)}\right]+b^3 d^3 x^3 \text{Log}\left[1+i e^{i (a+b x)}\right]-3 i b^2 d (c+d x)^2 \text{PolyLog}\left[2,-i e^{i (a+b x)}\right]+3 i b^2 d (c+d x)^2 \text{PolyLog}\left[2, i e^{i (a+b x)}\right]+6 b c d^2 \text{PolyLog}\left[3,-i e^{i (a+b x)}\right]+6 b d^3 x \text{PolyLog}\left[3,-i e^{i (a+b x)}\right]-6 b c d^2 \text{PolyLog}\left[3, i e^{i (a+b x)}\right]-6 b d^3 x \text{PolyLog}\left[3, i e^{i (a+b x)}\right]+6 i d^3 \text{PolyLog}\left[4,-i e^{i (a+b x)}\right]-6 i d^3 \text{PolyLog}\left[4, i e^{i (a+b x)}\right]+b^3 c^3 \text{Sin}[a+b x]-6 b c d^2 \text{Sin}[a+b x]+3 b^3 c^2 d x \text{Sin}[a+b x]-6 b d^3 x \text{Sin}[a+b x]+3 b^3 c d^2 x^2 \text{Sin}[a+b x]+b^3 d^3 x^3 \text{Sin}[a+b x]\Big)$$

Problem 218: Result more than twice size of optimal antiderivative.

$$\int (c+d x) \text{Sin}[a+b x] \text{Tan}[a+b x] \, dx$$

Optimal (type 4, 103 leaves, 8 steps):

$$-\frac{2 i (c+d x) \text{ArcTan}\left[e^{i (a+b x)}\right]}{b}-\frac{d \text{Cos}[a+b x]}{b^2}+\frac{i d \text{PolyLog}\left[2,-i e^{i (a+b x)}\right]}{b^2}-\frac{i d \text{PolyLog}\left[2, i e^{i (a+b x)}\right]}{b^2}-\frac{(c+d x) \text{Sin}[a+b x]}{b}$$

Result (type 4, 258 leaves):

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

Problem 222: Result more than twice size of optimal antiderivative.

$$\int (c+d x)^3 \operatorname{Sin}[a+b x]^2 \operatorname{Tan}[a+b x] \, dx$$

Optimal (type 4, 251 leaves, 12 steps):

$$-\frac{3 d^3 x}{8 b^3}+\frac{(c+d x)^3}{4 b}+\frac{i (c+d x)^4}{4 d}-\frac{(c+d x)^3 \operatorname{Log}\left[1+e^{2 i (a+b x)}\right]}{b}+\frac{3 i d (c+d x)^2 \operatorname{PolyLog}\left[2,-e^{2 i (a+b x)}\right]}{2 b^2}-\frac{3 d^2 (c+d x) \operatorname{PolyLog}\left[3,-e^{2 i (a+b x)}\right]}{2 b^3}-\frac{3 i d^3 \operatorname{PolyLog}\left[4,-e^{2 i (a+b x)}\right]}{4 b^4}+\frac{3 d^3 \operatorname{Cos}[a+b x] \operatorname{Sin}[a+b x]}{8 b^4}-\frac{3 d (c+d x)^2 \operatorname{Cos}[a+b x] \operatorname{Sin}[a+b x]}{4 b^2}+\frac{3 d^2 (c+d x) \operatorname{Sin}[a+b x]^2}{4 b^3}-\frac{(c+d x)^3 \operatorname{Sin}[a+b x]^2}{2 b}$$

Result (type 4, 1734 leaves):

$$\frac{1}{4 b^3} c d^2 e^{-i a} \left(2 i b^2 x^2 \left(2 b e^{2 i a} x + 3 i \left(1 + e^{2 i a}\right) \text{Log}\left[1 + e^{2 i (a+b x)}\right]\right) + 6 i b \left(1 + e^{2 i a}\right) x \,\text{PolyLog}\left[2, -e^{2 i (a+b x)}\right] - 3 \left(1 + e^{2 i a}\right) \text{PolyLog}\left[3, -e^{2 i (a+b x)}\right]\right) \text{Sec}[a] - \frac{1}{4} i d^3 e^{i a} \left(-x^4 + \left(1 + e^{-2 i a}\right) x^4 - \frac{1}{2 b^4} e^{-2 i a} \left(1 + e^{2 i a}\right) \left(2 b^4 x^4 + 4 i b^3 x^3 \text{Log}\left[1 + e^{2 i (a+b x)}\right] + 6 b^2 x^2 \text{PolyLog}\left[2, -e^{2 i (a+b x)}\right] + 6 i b x \,\text{PolyLog}\left[3, -e^{2 i (a+b x)}\right] - 3 \,\text{PolyLog}\left[4, -e^{2 i (a+b x)}\right]\right)\right)$$

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

$$\left(3 c^2 d \,\text{Csc}[a] \left(b^2 e^{-i \text{ArcTan}[\text{Cot}[a]]} x^2 - \frac{1}{\sqrt{1 + \text{Cot}[a]^2}} \text{Cot}[a] \left(i b x \left(-\pi - 2 \text{ArcTan}[\text{Cot}[a]]\right) - \pi \text{Log}\left[1 + e^{-2 i b x}\right] - 2 \left(b x - \text{ArcTan}[\text{Cot}[a]]\right) \text{Log}\left[1 - e^{2 i (b x - \text{ArcTan}[\text{Cot}[a]])}\right] + \pi \text{Log}[\text{Cos}[b x]] - 2 \text{ArcTan}[\text{Cot}[a]] \text{Log}[\text{Sin}[b x - \text{ArcTan}[\text{Cot}[a]]]] + i \,\text{PolyLog}\left[2, e^{2 i (b x - \text{ArcTan}[\text{Cot}[a]])}\right]\right)\right) \text{Sec}[a]\right) \Big/$$

$$\left(2 b^2 \sqrt{\text{Csc}[a]^2 \left(\text{Cos}[a]^2 + \text{Sin}[a]^2\right)}\right) + \text{Sec}[a] \left(\frac{\text{Cos}[2 a + 2 b x]}{64 b^4} - \frac{i \,\text{Sin}[2 a + 2 b x]}{64 b^4}\right)$$

$$\left(8 b^3 c^3 \text{Cos}[a] - 12 i b^2 c^2 d \,\text{Cos}[a] - 12 b c d^2 \text{Cos}[a] + 6 i d^3 \text{Cos}[a] + 24 b^3 c^2 d x \,\text{Cos}[a] - 24 i b^2 c d^2 x \,\text{Cos}[a] - 12 b d^3 x \,\text{Cos}[a] + 24 b^3 c d^2 x^2 \text{Cos}[a] - 12 i b^2 d^3 x^2 \text{Cos}[a] + 8 b^3 d^3 x^3 \text{Cos}[a] + 32 i b^4 c^3 x \,\text{Cos}[a + 2 b x] + 48 i b^4 c^2 d x^2 \text{Cos}[a + 2 b x] + 32 i b^4 c d^2 x^3 \text{Cos}[a + 2 b x] + 8 i b^4 d^3 x^4 \text{Cos}[a + 2 b x] - 32 i b^4 c^3 x \,\text{Cos}[3 a + 2 b x] - 48 i b^4 c^2 d x^2 \text{Cos}[3 a + 2 b x] - 32 i b^4 c d^2 x^3 \text{Cos}[3 a + 2 b x] - 8 i b^4 d^3 x^4 \text{Cos}[3 a + 2 b x] + 4 b^3 c^3 \text{Cos}[3 a + 4 b x] + 6 i b^2 c^2 d \,\text{Cos}[3 a + 4 b x] - 6 b c d^2 \text{Cos}[3 a + 4 b x] - 3 i d^3 \text{Cos}[3 a + 4 b x] + 12 b^3 c^2 d x \,\text{Cos}[3 a + 4 b x] + 12 i b^2 c d^2 x \,\text{Cos}[3 a + 4 b x] - 6 b d^3 x \,\text{Cos}[3 a + 4 b x] + 12 b^3 c d^2 x^2 \text{Cos}[3 a + 4 b x] + 6 i b^2 d^3 x^2 \text{Cos}[3 a + 4 b x] + 4 b^3 d^3 x^3 \text{Cos}[3 a + 4 b x] + 4 b^3 c^3 \text{Cos}[5 a + 4 b x] + 6 i b^2 c^2 d \,\text{Cos}[5 a + 4 b x] - 6 b c d^2 \text{Cos}[5 a + 4 b x] - 3 i d^3 \text{Cos}[5 a + 4 b x] + 12 b^3 c^2 d x \,\text{Cos}[5 a + 4 b x] + 12 i b^2 c d^2 x \,\text{Cos}[5 a + 4 b x] - 6 b d^3 x \,\text{Cos}[5 a + 4 b x] + 12 b^3 c d^2 x^2 \text{Cos}[5 a + 4 b x] + 6 i b^2 d^3 x^2 \text{Cos}[5 a + 4 b x] + 4 b^3 d^3 x^3 \text{Cos}[5 a + 4 b x] - 32 b^4 c^3 x \,\text{Sin}[a + 2 b x] - 48 b^4 c^2 d x^2 \text{Sin}[a + 2 b x] - 32 b^4 c d^2 x^3 \text{Sin}[a + 2 b x] - 8 b^4 d^3 x^4 \text{Sin}[a + 2 b x] + 32 b^4 c^3 x \,\text{Sin}[3 a + 2 b x] + 48 b^4 c^2 d x^2 \text{Sin}[3 a + 2 b x] + 32 b^4 c d^2 x^3 \text{Sin}[3 a + 2 b x] + 8 b^4 d^3 x^4 \text{Sin}[3 a + 2 b x] + 4 i b^3 c^3 \text{Sin}[3 a + 4 b x] - 6 b^2 c^2 d \,\text{Sin}[3 a + 4 b x] - 6 i b c d^2 \text{Sin}[3 a + 4 b x] + 3 d^3 \text{Sin}[3 a + 4 b x] + 12 i b^3 c^2 d x \,\text{Sin}[3 a + 4 b x] - 12 b^2 c d^2 x \,\text{Sin}[3 a + 4 b x] - 6 i b d^3 x \,\text{Sin}[3 a + 4 b x] + 12 i b^3 c d^2 x^2 \text{Sin}[3 a + 4 b x] - 6 b^2 d^3 x^2 \text{Sin}[3 a + 4 b x] + 4 i b^3 d^3 x^3 \text{Sin}[3 a + 4 b x] + 4 i b^3 c^3 \text{Sin}[5 a + 4 b x] - 6 b^2 c^2 d \,\text{Sin}[5 a + 4 b x] - 6 i b c d^2 \text{Sin}[5 a + 4 b x] + 3 d^3 \text{Sin}[5 a + 4 b x] + 12 i b^3 c^2 d x \,\text{Sin}[5 a + 4 b x] - 12 b^2 c d^2 x \,\text{Sin}[5 a + 4 b x] - 6 i b d^3 x \,\text{Sin}[5 a + 4 b x] + 12 i b^3 c d^2 x^2 \text{Sin}[5 a + 4 b x] - 6 b^2 d^3 x^2 \text{Sin}[5 a + 4 b x] + 4 i b^3 d^3 x^3 \text{Sin}[5 a + 4 b x]\right)$$

Problem 223: Result more than twice size of optimal antiderivative.

$$\int (c + d x)^2 \text{Sin}[a + b x]^2 \text{Tan}[a + b x] \, dx$$

Optimal (type 4, 184 leaves, 9 steps):

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

Result (type 4, 525 leaves):

$$\frac{1}{12\,b^3}d^2\,e^{-i\,a}\left(2\,i\,b^2\,x^2\left(2\,b\,e^{2\,i\,a}\,x+3\,i\left(1+e^{2\,i\,a}\right)\text{Log}\left[1+e^{2\,i\,(a+b\,x)}\right]\right)+6\,i\,b\left(1+e^{2\,i\,a}\right)x\,\text{PolyLog}\left[2,-e^{2\,i\,(a+b\,x)}\right]-3\left(1+e^{2\,i\,a}\right)\text{PolyLog}\left[3,-e^{2\,i\,(a+b\,x)}\right]\right)\text{Sec}[a]-\left(c^2\,\text{Sec}[a]\left(\text{Cos}[a]\,\text{Log}[\text{Cos}[a]\,\text{Cos}[b\,x]-\text{Sin}[a]\,\text{Sin}[b\,x]]+b\,x\,\text{Sin}[a]\right)\right)\Big/\left(b\left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)-\left(c\,d\,\text{Csc}[a]\left(b^2\,e^{-i\,\text{ArcTan}[\text{Cot}[a]]}\,x^2-\frac{1}{\sqrt{1+\text{Cot}[a]^2}}\text{Cot}[a]\left(i\,b\,x\,(-\pi-2\,\text{ArcTan}[\text{Cot}[a]])-\pi\,\text{Log}\left[1+e^{-2\,i\,b\,x}\right]-2\,(b\,x-\text{ArcTan}[\text{Cot}[a]])\,\text{Log}\left[1-e^{2\,i\,(b\,x-\text{ArcTan}[\text{Cot}[a]])}\right]+\pi\,\text{Log}[\text{Cos}[b\,x]]-2\,\text{ArcTan}[\text{Cot}[a]]\,\text{Log}[\text{Sin}[b\,x-\text{ArcTan}[\text{Cot}[a]]]]+i\,\text{PolyLog}\left[2,e^{2\,i\,(b\,x-\text{ArcTan}[\text{Cot}[a]])}\right]\right)\right)\text{Sec}[a]\right)\Big/\left(b^2\sqrt{\text{Csc}[a]^2\left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)}\right)+\frac{1}{8\,b^3}\text{Cos}[2\,b\,x]\left(2\,b^2\,c^2\,\text{Cos}[2\,a]-d^2\,\text{Cos}[2\,a]+4\,b^2\,c\,d\,x\,\text{Cos}[2\,a]+2\,b^2\,d^2\,x^2\,\text{Cos}[2\,a]-2\,b\,c\,d\,\text{Sin}[2\,a]-2\,b\,d^2\,x\,\text{Sin}[2\,a]\right)-\frac{1}{8\,b^3}\left(2\,b\,c\,d\,\text{Cos}[2\,a]+2\,b\,d^2\,x\,\text{Cos}[2\,a]+2\,b^2\,c^2\,\text{Sin}[2\,a]-d^2\,\text{Sin}[2\,a]+4\,b^2\,c\,d\,x\,\text{Sin}[2\,a]+2\,b^2\,d^2\,x^2\,\text{Sin}[2\,a]\right)\text{Sin}[2\,b\,x]+\frac{1}{3}x\left(3\,c^2+3\,c\,d\,x+d^2\,x^2\right)\text{Tan}[a]$$

Problem 228: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 247 leaves, 12 steps):

$$-\frac{2\,(c+d\,x)^4\,\text{ArcTanh}\left[e^{2\,i\,(a+b\,x)}\right]}{b}+\frac{2\,i\,d\,(c+d\,x)^3\,\text{PolyLog}\left[2,-e^{2\,i\,(a+b\,x)}\right]}{b^2}-\frac{2\,i\,d\,(c+d\,x)^3\,\text{PolyLog}\left[2,e^{2\,i\,(a+b\,x)}\right]}{b^2}-\frac{3\,d^2\,(c+d\,x)^2\,\text{PolyLog}\left[3,-e^{2\,i\,(a+b\,x)}\right]}{b^3}+\frac{3\,d^2\,(c+d\,x)^2\,\text{PolyLog}\left[3,e^{2\,i\,(a+b\,x)}\right]}{b^3}-\frac{3\,i\,d^3\,(c+d\,x)\,\text{PolyLog}\left[4,-e^{2\,i\,(a+b\,x)}\right]}{b^4}+\frac{3\,i\,d^3\,(c+d\,x)\,\text{PolyLog}\left[4,e^{2\,i\,(a+b\,x)}\right]}{b^4}+\frac{3\,d^4\,\text{PolyLog}\left[5,-e^{2\,i\,(a+b\,x)}\right]}{2\,b^5}-\frac{3\,d^4\,\text{PolyLog}\left[5,e^{2\,i\,(a+b\,x)}\right]}{2\,b^5}$$

Result (type 4, 578 leaves):

$$\frac{1}{2 b^5}\Big(-4 b^4 c^4 \text{ArcTanh}\left[e^{2 i (a+b x)}\right]+8 b^4 c^3 d x \text{Log}\left[1-e^{2 i (a+b x)}\right]+ 12 b^4 c^2 d^2 x^2 \text{Log}\left[1-e^{2 i (a+b x)}\right]+8 b^4 c d^3 x^3 \text{Log}\left[1-e^{2 i (a+b x)}\right]+2 b^4 d^4 x^4 \text{Log}\left[1-e^{2 i (a+b x)}\right]- 8 b^4 c^3 d x \text{Log}\left[1+e^{2 i (a+b x)}\right]-12 b^4 c^2 d^2 x^2 \text{Log}\left[1+e^{2 i (a+b x)}\right]-8 b^4 c d^3 x^3 \text{Log}\left[1+e^{2 i (a+b x)}\right]- 2 b^4 d^4 x^4 \text{Log}\left[1+e^{2 i (a+b x)}\right]+4 i b^3 d (c+d x)^3 \text{PolyLog}\left[2,-e^{2 i (a+b x)}\right]- 4 i b^3 d (c+d x)^3 \text{PolyLog}\left[2,e^{2 i (a+b x)}\right]-6 b^2 c^2 d^2 \text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]- 12 b^2 c d^3 x \text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]-6 b^2 d^4 x^2 \text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]+ 6 b^2 c^2 d^2 \text{PolyLog}\left[3,e^{2 i (a+b x)}\right]+12 b^2 c d^3 x \text{PolyLog}\left[3,e^{2 i (a+b x)}\right]+ 6 b^2 d^4 x^2 \text{PolyLog}\left[3,e^{2 i (a+b x)}\right]-6 i b c d^3 \text{PolyLog}\left[4,-e^{2 i (a+b x)}\right]- 6 i b d^4 x \text{PolyLog}\left[4,-e^{2 i (a+b x)}\right]+6 i b c d^3 \text{PolyLog}\left[4,e^{2 i (a+b x)}\right]+ 6 i b d^4 x \text{PolyLog}\left[4,e^{2 i (a+b x)}\right]+3 d^4 \text{PolyLog}\left[5,-e^{2 i (a+b x)}\right]-3 d^4 \text{PolyLog}\left[5,e^{2 i (a+b x)}\right]\Big)$$

Problem 235: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 350 leaves, 23 steps):

$$-\frac{2 i (c+d x)^3 \text{ArcTan}\left[e^{i (a+b x)}\right]}{b}-\frac{6 d (c+d x)^2 \text{ArcTanh}\left[e^{i (a+b x)}\right]}{b^2}- \frac{(c+d x)^3 \text{Csc}[a+b x]}{b}+\frac{6 i d^2 (c+d x) \text{PolyLog}\left[2,-e^{i (a+b x)}\right]}{b^3}+ \frac{3 i d (c+d x)^2 \text{PolyLog}\left[2,-i e^{i (a+b x)}\right]}{b^2}-\frac{3 i d (c+d x)^2 \text{PolyLog}\left[2,i e^{i (a+b x)}\right]}{b^2}- \frac{6 i d^2 (c+d x) \text{PolyLog}\left[2,e^{i (a+b x)}\right]}{b^3}-\frac{6 d^3 \text{PolyLog}\left[3,-e^{i (a+b x)}\right]}{b^4}- \frac{6 d^2 (c+d x) \text{PolyLog}\left[3,-i e^{i (a+b x)}\right]}{b^3}+\frac{6 d^2 (c+d x) \text{PolyLog}\left[3,i e^{i (a+b x)}\right]}{b^3}+ \frac{6 d^3 \text{PolyLog}\left[3,e^{i (a+b x)}\right]}{b^4}-\frac{6 i d^3 \text{PolyLog}\left[4,-i e^{i (a+b x)}\right]}{b^4}+\frac{6 i d^3 \text{PolyLog}\left[4,i e^{i (a+b x)}\right]}{b^4}$$

Result (type 4, 760 leaves):

$$-\frac{1}{b^4}\Big(2\,i\,b^3\,c^3\,\text{ArcTan}\big[e^{i\,(a+b\,x)}\big]+6\,b^2\,c^2\,d\,\text{ArcTanh}\big[e^{i\,(a+b\,x)}\big]+b^3\,c^3\,\text{Csc}[a+b\,x]+$$
$$3\,b^3\,c^2\,d\,x\,\text{Csc}[a+b\,x]+3\,b^3\,c\,d^2\,x^2\,\text{Csc}[a+b\,x]+b^3\,d^3\,x^3\,\text{Csc}[a+b\,x]-$$
$$6\,b^2\,c\,d^2\,x\,\text{Log}\big[1-e^{i\,(a+b\,x)}\big]-3\,b^2\,d^3\,x^2\,\text{Log}\big[1-e^{i\,(a+b\,x)}\big]-3\,b^3\,c^2\,d\,x\,\text{Log}\big[1-i\,e^{i\,(a+b\,x)}\big]-$$
$$3\,b^3\,c\,d^2\,x^2\,\text{Log}\big[1-i\,e^{i\,(a+b\,x)}\big]-b^3\,d^3\,x^3\,\text{Log}\big[1-i\,e^{i\,(a+b\,x)}\big]+3\,b^3\,c^2\,d\,x\,\text{Log}\big[1+i\,e^{i\,(a+b\,x)}\big]+$$
$$3\,b^3\,c\,d^2\,x^2\,\text{Log}\big[1+i\,e^{i\,(a+b\,x)}\big]+b^3\,d^3\,x^3\,\text{Log}\big[1+i\,e^{i\,(a+b\,x)}\big]+6\,b^2\,c\,d^2\,x\,\text{Log}\big[1+e^{i\,(a+b\,x)}\big]+$$
$$3\,b^2\,d^3\,x^2\,\text{Log}\big[1+e^{i\,(a+b\,x)}\big]-6\,i\,b\,d^2\,(c+d\,x)\,\text{PolyLog}\big[2,-e^{i\,(a+b\,x)}\big]-$$
$$3\,i\,b^2\,d\,(c+d\,x)^2\,\text{PolyLog}\big[2,-i\,e^{i\,(a+b\,x)}\big]+3\,i\,b^2\,c^2\,d\,\text{PolyLog}\big[2,i\,e^{i\,(a+b\,x)}\big]+$$
$$6\,i\,b^2\,c\,d^2\,x\,\text{PolyLog}\big[2,i\,e^{i\,(a+b\,x)}\big]+3\,i\,b^2\,d^3\,x^2\,\text{PolyLog}\big[2,i\,e^{i\,(a+b\,x)}\big]+$$
$$6\,i\,b\,c\,d^2\,\text{PolyLog}\big[2,e^{i\,(a+b\,x)}\big]+6\,i\,b\,d^3\,x\,\text{PolyLog}\big[2,e^{i\,(a+b\,x)}\big]+6\,d^3\,\text{PolyLog}\big[3,-e^{i\,(a+b\,x)}\big]+$$
$$6\,b\,c\,d^2\,\text{PolyLog}\big[3,-i\,e^{i\,(a+b\,x)}\big]+6\,b\,d^3\,x\,\text{PolyLog}\big[3,-i\,e^{i\,(a+b\,x)}\big]-$$
$$6\,b\,c\,d^2\,\text{PolyLog}\big[3,i\,e^{i\,(a+b\,x)}\big]-6\,b\,d^3\,x\,\text{PolyLog}\big[3,i\,e^{i\,(a+b\,x)}\big]-$$
$$6\,d^3\,\text{PolyLog}\big[3,e^{i\,(a+b\,x)}\big]+6\,i\,d^3\,\text{PolyLog}\big[4,-i\,e^{i\,(a+b\,x)}\big]-6\,i\,d^3\,\text{PolyLog}\big[4,i\,e^{i\,(a+b\,x)}\big]\Big)$$

Problem 236: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 226 leaves, 19 steps):

$$-\frac{2\,i\,(c+d\,x)^2\,\text{ArcTan}\big[e^{i\,(a+b\,x)}\big]}{b}-\frac{4\,d\,(c+d\,x)\,\text{ArcTanh}\big[e^{i\,(a+b\,x)}\big]}{b^2}-$$
$$\frac{(c+d\,x)^2\,\text{Csc}[a+b\,x]}{b}+\frac{2\,i\,d^2\,\text{PolyLog}\big[2,-e^{i\,(a+b\,x)}\big]}{b^3}+$$
$$\frac{2\,i\,d\,(c+d\,x)\,\text{PolyLog}\big[2,-i\,e^{i\,(a+b\,x)}\big]}{b^2}-\frac{2\,i\,d\,(c+d\,x)\,\text{PolyLog}\big[2,i\,e^{i\,(a+b\,x)}\big]}{b^2}-$$
$$\frac{2\,i\,d^2\,\text{PolyLog}\big[2,e^{i\,(a+b\,x)}\big]}{b^3}-\frac{2\,d^2\,\text{PolyLog}\big[3,-i\,e^{i\,(a+b\,x)}\big]}{b^3}+\frac{2\,d^2\,\text{PolyLog}\big[3,i\,e^{i\,(a+b\,x)}\big]}{b^3}$$

Result (type 4, 593 leaves):

$$-\frac{(c+d\,x)^2\,\text{Csc}[a]}{b}+\frac{1}{b^3}\Big(-2\,i\,b^2\,c^2\,\text{ArcTan}\big[e^{i\,(a+b\,x)}\big]+2\,b^2\,c\,d\,x\,\text{Log}\big[1-i\,e^{i\,(a+b\,x)}\big]+b^2\,d^2\,x^2\,\text{Log}\big[1-i\,e^{i\,(a+b\,x)}\big]-2\,b^2\,c\,d\,x\,\text{Log}\big[1+i\,e^{i\,(a+b\,x)}\big]-b^2\,d^2\,x^2\,\text{Log}\big[1+i\,e^{i\,(a+b\,x)}\big]+2\,i\,b\,d\,(c+d\,x)\,\text{PolyLog}\big[2,-i\,e^{i\,(a+b\,x)}\big]-2\,i\,b\,d\,(c+d\,x)\,\text{PolyLog}\big[2,i\,e^{i\,(a+b\,x)}\big]-2\,d^2\,\text{PolyLog}\big[3,-i\,e^{i\,(a+b\,x)}\big]+2\,d^2\,\text{PolyLog}\big[3,i\,e^{i\,(a+b\,x)}\big]\Big)+$$

$$\frac{4\,i\,c\,d\,\text{ArcTan}\Big[\frac{i\,\text{Cos}[a]-i\,\text{Sin}[a]\,\text{Tan}[\frac{b\,x}{2}]}{\sqrt{\text{Cos}[a]^2+\text{Sin}[a]^2}}\Big]}{b^2\,\sqrt{\text{Cos}[a]^2+\text{Sin}[a]^2}}+\frac{\text{Sec}[\frac{a}{2}]\,\text{Sec}[\frac{a}{2}+\frac{b\,x}{2}]\,\big(-c^2\,\text{Sin}[\frac{b\,x}{2}]-2\,c\,d\,x\,\text{Sin}[\frac{b\,x}{2}]-d^2\,x^2\,\text{Sin}[\frac{b\,x}{2}]\big)}{2\,b}+$$

$$\frac{\text{Csc}[\frac{a}{2}]\,\text{Csc}[\frac{a}{2}+\frac{b\,x}{2}]\,\big(c^2\,\text{Sin}[\frac{b\,x}{2}]+2\,c\,d\,x\,\text{Sin}[\frac{b\,x}{2}]+d^2\,x^2\,\text{Sin}[\frac{b\,x}{2}]\big)}{2\,b}+\frac{1}{b^3}$$

$$2\,d^2\left(-\frac{2\,\text{ArcTan}[\text{Tan}[a]]\,\text{ArcTanh}\Big[\frac{-\text{Cos}[a]+\text{Sin}[a]\,\text{Tan}[\frac{b\,x}{2}]}{\sqrt{\text{Cos}[a]^2+\text{Sin}[a]^2}}\Big]}{\sqrt{\text{Cos}[a]^2+\text{Sin}[a]^2}}+\frac{1}{\sqrt{1+\text{Tan}[a]^2}}\Big(\big(b\,x+\text{ArcTan}[\text{Tan}[a]]\big)\,\big(\text{Log}\big[1-e^{i\,(b\,x+\text{ArcTan}[\text{Tan}[a]])}\big]-\text{Log}\big[1+e^{i\,(b\,x+\text{ArcTan}[\text{Tan}[a]])}\big]\big)+i\,\big(\text{PolyLog}\big[2,-e^{i\,(b\,x+\text{ArcTan}[\text{Tan}[a]])}\big]-\text{PolyLog}\big[2,e^{i\,(b\,x+\text{ArcTan}[\text{Tan}[a]])}\big]\big)\Big)\,\text{Sec}[a]\right)$$

Problem 237: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 131 leaves, 10 steps):

$$-\frac{2\,i\,d\,x\,\text{ArcTan}\big[e^{i\,(a+b\,x)}\big]}{b}-\frac{d\,\text{ArcTanh}[\text{Cos}[a+b\,x]]}{b^2}-\frac{d\,x\,\text{ArcTanh}[\text{Sin}[a+b\,x]]}{b}+\frac{(c+d\,x)\,\text{ArcTanh}[\text{Sin}[a+b\,x]]}{b}-\frac{(c+d\,x)\,\text{Csc}[a+b\,x]}{b}+\frac{i\,d\,\text{PolyLog}\big[2,-i\,e^{i\,(a+b\,x)}\big]}{b^2}-\frac{i\,d\,\text{PolyLog}\big[2,i\,e^{i\,(a+b\,x)}\big]}{b^2}$$

Result (type 4, 550 leaves):

$$-\frac{c\,\mathrm{Cot}\left[\frac{1}{2}\,(a+b\,x)\right]}{2\,b}+\frac{d\,\left(a\,\mathrm{Cos}\left[\frac{1}{2}\,(a+b\,x)\right]-(a+b\,x)\,\mathrm{Cos}\left[\frac{1}{2}\,(a+b\,x)\right]\right)\,\mathrm{Csc}\left[\frac{1}{2}\,(a+b\,x)\right]}{2\,b^2}-$$
$$\frac{d\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}\,(a+b\,x)\right]\right]}{b^2}-\frac{c\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}\,(a+b\,x)\right]-\mathrm{Sin}\left[\frac{1}{2}\,(a+b\,x)\right]\right]}{b}+$$
$$\frac{d\,\mathrm{Log}\left[\mathrm{Sin}\left[\frac{1}{2}\,(a+b\,x)\right]\right]}{b^2}+\frac{c\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}\,(a+b\,x)\right]+\mathrm{Sin}\left[\frac{1}{2}\,(a+b\,x)\right]\right]}{b}+$$
$$\frac{1}{b^2}d\,\left(a\,\left(\mathrm{Log}\left[1-\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right]-\mathrm{Log}\left[1+\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right]\right)+\right.$$
$$(a+b\,x)\,\left(-\mathrm{Log}\left[1-\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right]+\mathrm{Log}\left[1+\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right]\right)-$$
$$i\,\left(\mathrm{Log}\left[1-\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right]\,\mathrm{Log}\left[\left(\frac{1}{2}+\frac{i}{2}\right)\,\left(-i+\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right)\right]-\right.$$
$$\mathrm{Log}\left[\frac{1}{2}\,\left((1+i)-(1-i)\,\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right)\right]\,\mathrm{Log}\left[1+\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right]+$$
$$\mathrm{Log}\left[\left(-\frac{1}{2}-\frac{i}{2}\right)\,\left(i+\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right)\right]\,\mathrm{Log}\left[1+\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right]-$$
$$\mathrm{Log}\left[1-\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right]\,\mathrm{Log}\left[\frac{1}{2}\,\left((1+i)+(1-i)\,\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right)\right]+$$
$$\mathrm{PolyLog}\left[2,\,\left(-\frac{1}{2}-\frac{i}{2}\right)\,\left(-1+\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right)\right]-$$
$$\mathrm{PolyLog}\left[2,\,\left(-\frac{1}{2}+\frac{i}{2}\right)\,\left(-1+\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right)\right]-\mathrm{PolyLog}\left[2,\right.$$
$$\left.\left.\left.\left(\frac{1}{2}-\frac{i}{2}\right)\,\left(1+\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right)\right]+\mathrm{PolyLog}\left[2,\,\left(\frac{1}{2}+\frac{i}{2}\right)\,\left(1+\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right)\right]\right)\right)+$$
$$\frac{d\,\mathrm{Sec}\left[\frac{1}{2}\,(a+b\,x)\right]\,\left(a\,\mathrm{Sin}\left[\frac{1}{2}\,(a+b\,x)\right]-(a+b\,x)\,\mathrm{Sin}\left[\frac{1}{2}\,(a+b\,x)\right]\right)}{2\,b^2}-$$
$$\frac{c\,\mathrm{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]}{2\,b}$$

Problem 241: Result more than twice size of optimal antiderivative.

$$\int (c+d\,x)^3\,\mathrm{Csc}[a+b\,x]^3\,\mathrm{Sec}[a+b\,x]\,dx$$

Optimal (type 4, 325 leaves, 22 steps):

$$-\frac{3 i d (c+d x)^2}{2 b^2}-\frac{(c+d x)^3}{2 b}-\frac{2 (c+d x)^3 \text{ArcTanh}\left[e^{2 i (a+b x)}\right]}{b}-\frac{3 d (c+d x)^2 \text{Cot}[a+b x]}{2 b^2}-\frac{(c+d x)^3 \text{Cot}[a+b x]^2}{2 b}+\frac{3 d^2 (c+d x) \text{Log}\left[1-e^{2 i (a+b x)}\right]}{b^3}+\frac{3 i d (c+d x)^2 \text{PolyLog}\left[2,-e^{2 i (a+b x)}\right]}{2 b^2}-\frac{3 i d^3 \text{PolyLog}\left[2,e^{2 i (a+b x)}\right]}{2 b^4}-\frac{3 i d (c+d x)^2 \text{PolyLog}\left[2,e^{2 i (a+b x)}\right]}{2 b^2}-\frac{3 d^2 (c+d x) \text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]}{2 b^3}+\frac{3 d^2 (c+d x) \text{PolyLog}\left[3,e^{2 i (a+b x)}\right]}{2 b^3}-\frac{3 i d^3 \text{PolyLog}\left[4,-e^{2 i (a+b x)}\right]}{4 b^4}+\frac{3 i d^3 \text{PolyLog}\left[4,e^{2 i (a+b x)}\right]}{4 b^4}$$

Result (type 4, 1285 leaves):

$$-\frac{(c+d x)^3 \text{Csc}[a+b x]^2}{2 b}-\frac{1}{4 b^3} c d^2 e^{-i a} \text{Csc}[a] \left(2 b^2 x^2 \left(2 b e^{2 i a} x+3 i \left(-1+e^{2 i a}\right) \text{Log}\left[1-e^{2 i (a+b x)}\right]\right)+6 b \left(-1+e^{2 i a}\right) x \text{PolyLog}\left[2,e^{2 i (a+b x)}\right]+3 i \left(-1+e^{2 i a}\right) \text{PolyLog}\left[3,e^{2 i (a+b x)}\right]\right)-\frac{1}{4} d^3 e^{i a} \text{Csc}[a] \left(x^4+\left(-1+e^{-2 i a}\right) x^4+\frac{1}{2 b^4} e^{-2 i a} \left(-1+e^{2 i a}\right) \left(2 b^4 x^4+4 i b^3 x^3 \text{Log}\left[1-e^{2 i (a+b x)}\right]+6 b^2 x^2 \text{PolyLog}\left[2,e^{2 i (a+b x)}\right]+6 i b x \text{PolyLog}\left[3,e^{2 i (a+b x)}\right]-3 \text{PolyLog}\left[4,e^{2 i (a+b x)}\right]\right)\right)+\frac{1}{4} x \left(4 c^3+6 c^2 d x+4 c d^2 x^2+d^3 x^3\right) \text{Csc}[a] \text{Sec}[a]+\frac{1}{4 b^3} c d^2 e^{-i a} \left(2 i b^2 x^2 \left(2 b e^{2 i a} x+3 i \left(1+e^{2 i a}\right) \text{Log}\left[1+e^{2 i (a+b x)}\right]\right)+6 i b \left(1+e^{2 i a}\right) x \text{PolyLog}\left[2,-e^{2 i (a+b x)}\right]-3 \left(1+e^{2 i a}\right) \text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]\right) \text{Sec}[a]-\frac{1}{4} i d^3 e^{i a} \left(-x^4+\left(1+e^{-2 i a}\right) x^4-\frac{1}{2 b^4} e^{-2 i a} \left(1+e^{2 i a}\right) \left(2 b^4 x^4+4 i b^3 x^3 \text{Log}\left[1+e^{2 i (a+b x)}\right]+6 b^2 x^2 \text{PolyLog}\left[2,-e^{2 i (a+b x)}\right]+6 i b x \text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]-3 \text{PolyLog}\left[4,-e^{2 i (a+b x)}\right]\right)\right) \text{Sec}[a]-\left(c^3 \text{Sec}[a] \left(\text{Cos}[a] \text{Log}[\text{Cos}[a] \text{Cos}[b x]-\text{Sin}[a] \text{Sin}[b x]]+b x \text{Sin}[a]\right)\right)/\left(b \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)+\left(c^3 \text{Csc}[a] \left(-b x \text{Cos}[a]+\text{Log}[\text{Cos}[b x] \text{Sin}[a]+\text{Cos}[a] \text{Sin}[b x]] \text{Sin}[a]\right)\right)/\left(b \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)+\left(3 c d^2 \text{Csc}[a] \left(-b x \text{Cos}[a]+\text{Log}[\text{Cos}[b x] \text{Sin}[a]+\text{Cos}[a] \text{Sin}[b x]] \text{Sin}[a]\right)\right)/\left(b^3 \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)-\left(3 c^2 d \text{Csc}[a] \left(b^2 e^{-i \text{ArcTan}[\text{Cot}[a]]} x^2-\frac{1}{\sqrt{1+\text{Cot}[a]^2}} \text{Cot}[a] \left(i b x \left(-\pi-2 \text{ArcTan}[\text{Cot}[a]]\right)-\pi \text{Log}\left[1+e^{-2 i b x}\right]-2 \left(b x-\text{ArcTan}[\text{Cot}[a]]\right) \text{Log}\left[1-e^{2 i \left(b x-\text{ArcTan}[\text{Cot}[a]]\right)}\right]+\pi \text{Log}[\text{Cos}[b x]]-2 \text{ArcTan}[\text{Cot}[a]] \text{Log}[\text{Sin}[b x-\text{ArcTan}[\text{Cot}[a]]]]+i \text{PolyLog}\left[2,e^{2 i \left(b x-\text{ArcTan}[\text{Cot}[a]]\right)}\right]\right) \text{Sec}[a]\right)\right)/\left(2 b^2 \sqrt{\text{Csc}[a]^2 \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)}\right)+\frac{1}{2 b^2} 3 \text{Csc}[a] \text{Csc}[a+b x] \left(c^2 d \text{Sin}[b x]+2 c d^2 x \text{Sin}[b x]+d^3 x^2 \text{Sin}[b x]\right)-$$

$$\left(3 c^2 d \operatorname{Csc}[a] \operatorname{Sec}[a] \left(b^2 e^{i \operatorname{ArcTan}[\operatorname{Tan}[a]]} x^2 + \frac{1}{\sqrt{1+\operatorname{Tan}[a]^2}} \left(i b x \left(-\pi + 2 \operatorname{ArcTan}[\operatorname{Tan}[a]]\right) - \pi \operatorname{Log}\left[1+e^{-2 i b x}\right] - 2 \left(b x + \operatorname{ArcTan}[\operatorname{Tan}[a]]\right) \operatorname{Log}\left[1 - e^{2 i (b x + \operatorname{ArcTan}[\operatorname{Tan}[a]])}\right] + \pi \operatorname{Log}[\operatorname{Cos}[b x]] + 2 \operatorname{ArcTan}[\operatorname{Tan}[a]] \operatorname{Log}[\operatorname{Sin}[b x + \operatorname{ArcTan}[\operatorname{Tan}[a]]]] + i \operatorname{PolyLog}\left[2, e^{2 i (b x + \operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]\right) \operatorname{Tan}[a]\right)\right) \Big/ \left(2 b^2 \sqrt{\operatorname{Sec}[a]^2 \left(\operatorname{Cos}[a]^2 + \operatorname{Sin}[a]^2\right)}\right) - \left(3 d^3 \operatorname{Csc}[a] \operatorname{Sec}[a] \left(b^2 e^{i \operatorname{ArcTan}[\operatorname{Tan}[a]]} x^2 + \frac{1}{\sqrt{1+\operatorname{Tan}[a]^2}} \left(i b x \left(-\pi + 2 \operatorname{ArcTan}[\operatorname{Tan}[a]]\right) - \pi \operatorname{Log}\left[1+e^{-2 i b x}\right] - 2 \left(b x + \operatorname{ArcTan}[\operatorname{Tan}[a]]\right) \operatorname{Log}\left[1 - e^{2 i (b x + \operatorname{ArcTan}[\operatorname{Tan}[a]])}\right] + \pi \operatorname{Log}[\operatorname{Cos}[b x]] + 2 \operatorname{ArcTan}[\operatorname{Tan}[a]] \operatorname{Log}[\operatorname{Sin}[b x + \operatorname{ArcTan}[\operatorname{Tan}[a]]]] + i \operatorname{PolyLog}\left[2, e^{2 i (b x + \operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]\right) \operatorname{Tan}[a]\right)\right) \Big/ \left(2 b^4 \sqrt{\operatorname{Sec}[a]^2 \left(\operatorname{Cos}[a]^2 + \operatorname{Sin}[a]^2\right)}\right)$$

Problem 242: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 201 leaves, 17 steps):

$$-\frac{c d x}{b} - \frac{d^2 x^2}{2 b} - \frac{2 (c + d x)^2 \operatorname{ArcTanh}\left[e^{2 i (a+b x)}\right]}{b} - \frac{d (c + d x) \operatorname{Cot}[a + b x]}{b^2} - \frac{(c + d x)^2 \operatorname{Cot}[a + b x]^2}{2 b} + \frac{d^2 \operatorname{Log}[\operatorname{Sin}[a + b x]]}{b^3} + \frac{i d (c + d x) \operatorname{PolyLog}\left[2, -e^{2 i (a+b x)}\right]}{b^2} - \frac{i d (c + d x) \operatorname{PolyLog}\left[2, e^{2 i (a+b x)}\right]}{b^2} - \frac{d^2 \operatorname{PolyLog}\left[3, -e^{2 i (a+b x)}\right]}{2 b^3} + \frac{d^2 \operatorname{PolyLog}\left[3, e^{2 i (a+b x)}\right]}{2 b^3}$$

Result (type 4, 785 leaves):

$$-\frac{(c+d x)^2 \operatorname{Csc}[a+b x]^2}{2 b}-\frac{1}{12 b^3}$$

$$d^2 e^{-i a} \operatorname{Csc}[a] \left(2 b^2 x^2 \left(2 b e^{2 i a} x+3 i \left(-1+e^{2 i a}\right) \operatorname{Log}\left[1-e^{2 i (a+b x)}\right]\right)+6 b \left(-1+e^{2 i a}\right) x \operatorname{PolyLog}\left[2, e^{2 i (a+b x)}\right]+3 i \left(-1+e^{2 i a}\right) \operatorname{PolyLog}\left[3, e^{2 i (a+b x)}\right]\right)+$$

$$\frac{1}{3} x \left(3 c^2+3 c d x+d^2 x^2\right) \operatorname{Csc}[a] \operatorname{Sec}[a]+\frac{1}{12 b^3}$$

$$d^2 e^{-i a} \left(2 i b^2 x^2 \left(2 b e^{2 i a} x+3 i \left(1+e^{2 i a}\right) \operatorname{Log}\left[1+e^{2 i (a+b x)}\right]\right)+6 i b \left(1+e^{2 i a}\right) x \operatorname{PolyLog}\left[2,-e^{2 i (a+b x)}\right]-3 \left(1+e^{2 i a}\right) \operatorname{PolyLog}\left[3,-e^{2 i (a+b x)}\right]\right) \operatorname{Sec}[a]-$$

$$\left(c^2 \operatorname{Sec}[a] \left(\operatorname{Cos}[a] \operatorname{Log}[\operatorname{Cos}[a] \operatorname{Cos}[b x]-\operatorname{Sin}[a] \operatorname{Sin}[b x]]+b x \operatorname{Sin}[a]\right)\right) \Big/ \left(b \left(\operatorname{Cos}[a]^2+\operatorname{Sin}[a]^2\right)\right)+$$

$$\left(c^2 \operatorname{Csc}[a] \left(-b x \operatorname{Cos}[a]+\operatorname{Log}[\operatorname{Cos}[b x] \operatorname{Sin}[a]+\operatorname{Cos}[a] \operatorname{Sin}[b x]] \operatorname{Sin}[a]\right)\right) \Big/ \left(b \left(\operatorname{Cos}[a]^2+\operatorname{Sin}[a]^2\right)\right)+$$

$$\left(d^2 \operatorname{Csc}[a] \left(-b x \operatorname{Cos}[a]+\operatorname{Log}[\operatorname{Cos}[b x] \operatorname{Sin}[a]+\operatorname{Cos}[a] \operatorname{Sin}[b x]] \operatorname{Sin}[a]\right)\right) \Big/ \left(b^3 \left(\operatorname{Cos}[a]^2+\operatorname{Sin}[a]^2\right)\right)-\left(c d \operatorname{Csc}[a] \left(b^2 e^{-i \operatorname{ArcTan}[\operatorname{Cot}[a]]} x^2-\frac{1}{\sqrt{1+\operatorname{Cot}[a]^2}}\right.\right.$$

$$\operatorname{Cot}[a] \left(i b x \left(-\pi-2 \operatorname{ArcTan}[\operatorname{Cot}[a]]\right)-\pi \operatorname{Log}\left[1+e^{-2 i b x}\right]-2 \left(b x-\operatorname{ArcTan}[\operatorname{Cot}[a]]\right) \operatorname{Log}\left[1-e^{2 i (b x-\operatorname{ArcTan}[\operatorname{Cot}[a]])}\right]+\pi \operatorname{Log}[\operatorname{Cos}[b x]]-2 \operatorname{ArcTan}[\operatorname{Cot}[a]]\right.$$

$$\left.\left.\left.\operatorname{Log}[\operatorname{Sin}[b x-\operatorname{ArcTan}[\operatorname{Cot}[a]]]]+i \operatorname{PolyLog}\left[2, e^{2 i (b x-\operatorname{ArcTan}[\operatorname{Cot}[a]])}\right]\right)\right) \operatorname{Sec}[a]\right) \Big/$$

$$\left(b^2 \sqrt{\operatorname{Csc}[a]^2 \left(\operatorname{Cos}[a]^2+\operatorname{Sin}[a]^2\right)}\right)+\frac{\operatorname{Csc}[a] \operatorname{Csc}[a+b x] \left(c d \operatorname{Sin}[b x]+d^2 x \operatorname{Sin}[b x]\right)}{b^2}-$$

$$\left(c d \operatorname{Csc}[a] \operatorname{Sec}[a] \left(b^2 e^{i \operatorname{ArcTan}[\operatorname{Tan}[a]]} x^2+\frac{1}{\sqrt{1+\operatorname{Tan}[a]^2}} \left(i b x \left(-\pi+2 \operatorname{ArcTan}[\operatorname{Tan}[a]]\right)-\right.\right.\right.$$

$$\pi \operatorname{Log}\left[1+e^{-2 i b x}\right]-2 \left(b x+\operatorname{ArcTan}[\operatorname{Tan}[a]]\right) \operatorname{Log}\left[1-e^{2 i (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]+$$

$$\pi \operatorname{Log}[\operatorname{Cos}[b x]]+2 \operatorname{ArcTan}[\operatorname{Tan}[a]] \operatorname{Log}[\operatorname{Sin}[b x+\operatorname{ArcTan}[\operatorname{Tan}[a]]]]+$$

$$\left.\left.\left.i \operatorname{PolyLog}\left[2, e^{2 i (b x+\operatorname{ArcTan}[\operatorname{Tan}[a]])}\right]\right) \operatorname{Tan}[a]\right)\right) \Big/ \left(b^2 \sqrt{\operatorname{Sec}[a]^2 \left(\operatorname{Cos}[a]^2+\operatorname{Sin}[a]^2\right)}\right)$$

Problem 250: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 29 leaves, 2 steps):

$$-\frac{d \operatorname{ArcTanh}[\operatorname{Sin}[a+b x]]}{b^2}+\frac{(c+d x) \operatorname{Sec}[a+b x]}{b}$$

Result (type 3, 93 leaves):

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

Problem 254: Result more than twice size of optimal antiderivative.

$$\int (c+d\,x)^3\,\mathrm{Tan}[a+b\,x]^2\,dx$$

Optimal (type 4, 128 leaves, 7 steps):

$$-\frac{i\,(c+d\,x)^3}{b}-\frac{(c+d\,x)^4}{4\,d}+\frac{3\,d\,(c+d\,x)^2\,\mathrm{Log}\left[1+e^{2\,i\,(a+b\,x)}\right]}{b^2}-\frac{3\,i\,d^2\,(c+d\,x)\,\mathrm{PolyLog}\left[2,-e^{2\,i\,(a+b\,x)}\right]}{b^3}+\frac{3\,d^3\,\mathrm{PolyLog}\left[3,-e^{2\,i\,(a+b\,x)}\right]}{2\,b^4}+\frac{(c+d\,x)^3\,\mathrm{Tan}[a+b\,x]}{b}$$

Result (type 4, 431 leaves):

$$-\frac{1}{4}\,x\,\left(4\,c^3+6\,c^2\,d\,x+4\,c\,d^2\,x^2+d^3\,x^3\right)-\frac{1}{4\,b^4}d^3\,e^{-i\,a}\,\left(2\,i\,b^2\,x^2\,\left(2\,b\,e^{2\,i\,a}\,x+3\,i\,\left(1+e^{2\,i\,a}\right)\,\mathrm{Log}\left[1+e^{2\,i\,(a+b\,x)}\right]\right)+6\,i\,b\,\left(1+e^{2\,i\,a}\right)\,x\,\mathrm{PolyLog}\left[2,-e^{2\,i\,(a+b\,x)}\right]-3\,\left(1+e^{2\,i\,a}\right)\,\mathrm{PolyLog}\left[3,-e^{2\,i\,(a+b\,x)}\right]\right)\,\mathrm{Sec}[a]+$$
$$\left(3\,c^2\,d\,\mathrm{Sec}[a]\,\left(\mathrm{Cos}[a]\,\mathrm{Log}[\mathrm{Cos}[a]\,\mathrm{Cos}[b\,x]-\mathrm{Sin}[a]\,\mathrm{Sin}[b\,x]]+b\,x\,\mathrm{Sin}[a]\right)\right)\Big/\left(b^2\,\left(\mathrm{Cos}[a]^2+\mathrm{Sin}[a]^2\right)\right)+$$
$$\left(3\,c\,d^2\,\mathrm{Csc}[a]\,\left(b^2\,e^{-i\,\mathrm{ArcTan}[\mathrm{Cot}[a]]}\,x^2-\frac{1}{\sqrt{1+\mathrm{Cot}[a]^2}}\mathrm{Cot}[a]\,\left(i\,b\,x\,\left(-\pi-2\,\mathrm{ArcTan}[\mathrm{Cot}[a]]\right)-\pi\,\mathrm{Log}\left[1+e^{-2\,i\,b\,x}\right]-2\,\left(b\,x-\mathrm{ArcTan}[\mathrm{Cot}[a]]\right)\,\mathrm{Log}\left[1-e^{2\,i\,(b\,x-\mathrm{ArcTan}[\mathrm{Cot}[a]])}\right]+\pi\,\mathrm{Log}[\mathrm{Cos}[b\,x]]-2\,\mathrm{ArcTan}[\mathrm{Cot}[a]]\,\mathrm{Log}[\mathrm{Sin}[b\,x-\mathrm{ArcTan}[\mathrm{Cot}[a]]]]+i\,\mathrm{PolyLog}\left[2,e^{2\,i\,(b\,x-\mathrm{ArcTan}[\mathrm{Cot}[a]])}\right]\right)\right)\,\mathrm{Sec}[a]\right)\Big/\left(b^3\,\sqrt{\mathrm{Csc}[a]^2\,\left(\mathrm{Cos}[a]^2+\mathrm{Sin}[a]^2\right)}\right)+$$
$$\frac{1}{b}\mathrm{Sec}[a]\,\mathrm{Sec}[a+b\,x]\,\left(c^3\,\mathrm{Sin}[b\,x]+3\,c^2\,d\,x\,\mathrm{Sin}[b\,x]+3\,c\,d^2\,x^2\,\mathrm{Sin}[b\,x]+d^3\,x^3\,\mathrm{Sin}[b\,x]\right)$$

Problem 255: Result more than twice size of optimal antiderivative.

$$\int (c+d\,x)^2\,\mathrm{Tan}[a+b\,x]^2\,dx$$

Optimal (type 4, 96 leaves, 6 steps):

$$-\frac{i\,(c+d\,x)^2}{b}-\frac{(c+d\,x)^3}{3\,d}+\frac{2\,d\,(c+d\,x)\,\mathrm{Log}\left[1+e^{2\,i\,(a+b\,x)}\right]}{b^2}-\frac{i\,d^2\,\mathrm{PolyLog}\left[2,-e^{2\,i\,(a+b\,x)}\right]}{b^3}+\frac{(c+d\,x)^2\,\mathrm{Tan}[a+b\,x]}{b}$$

Result (type 4, 276 leaves):

$$-\frac{1}{3}x\left(3c^2+3cdx+d^2x^2\right)+\left(2cd\,\mathrm{Sec}[a]\left(\mathrm{Cos}[a]\,\mathrm{Log}[\mathrm{Cos}[a]\,\mathrm{Cos}[bx]-\mathrm{Sin}[a]\,\mathrm{Sin}[bx]]+bx\,\mathrm{Sin}[a]\right)\right)\Big/\left(b^2\left(\mathrm{Cos}[a]^2+\mathrm{Sin}[a]^2\right)\right)+$$
$$\left(d^2\,\mathrm{Csc}[a]\left(b^2\,e^{-i\,\mathrm{ArcTan}[\mathrm{Cot}[a]]}x^2-\frac{1}{\sqrt{1+\mathrm{Cot}[a]^2}}\mathrm{Cot}[a]\left(i\,b\,x\left(-\pi-2\,\mathrm{ArcTan}[\mathrm{Cot}[a]]\right)-\pi\,\mathrm{Log}\left[1+e^{-2ibx}\right]-2\left(bx-\mathrm{ArcTan}[\mathrm{Cot}[a]]\right)\mathrm{Log}\left[1-e^{2i(bx-\mathrm{ArcTan}[\mathrm{Cot}[a]])}\right]+\pi\,\mathrm{Log}[\mathrm{Cos}[bx]]-2\,\mathrm{ArcTan}[\mathrm{Cot}[a]]\,\mathrm{Log}[\mathrm{Sin}[bx-\mathrm{ArcTan}[\mathrm{Cot}[a]]]]+i\,\mathrm{PolyLog}\left[2,e^{2i(bx-\mathrm{ArcTan}[\mathrm{Cot}[a]])}\right]\right)\right)\mathrm{Sec}[a]\right)\Big/\left(b^3\sqrt{\mathrm{Csc}[a]^2\left(\mathrm{Cos}[a]^2+\mathrm{Sin}[a]^2\right)}\right)+$$
$$\frac{\mathrm{Sec}[a]\,\mathrm{Sec}[a+bx]\left(c^2\,\mathrm{Sin}[bx]+2cdx\,\mathrm{Sin}[bx]+d^2x^2\,\mathrm{Sin}[bx]\right)}{b}$$

Problem 260: Result more than twice size of optimal antiderivative.

$$\int(c+dx)^3\,\mathrm{Sin}[a+bx]\,\mathrm{Tan}[a+bx]^2\,dx$$

Optimal (type 4, 228 leaves, 13 steps):

$$\frac{6\,i\,d\,(c+dx)^2\,\mathrm{ArcTan}\left[e^{i(a+bx)}\right]}{b^2}-\frac{6d^2(c+dx)\,\mathrm{Cos}[a+bx]}{b^3}+\frac{(c+dx)^3\,\mathrm{Cos}[a+bx]}{b}-\frac{6\,i\,d^2(c+dx)\,\mathrm{PolyLog}\left[2,-i\,e^{i(a+bx)}\right]}{b^3}+\frac{6\,i\,d^2(c+dx)\,\mathrm{PolyLog}\left[2,i\,e^{i(a+bx)}\right]}{b^3}+\frac{6d^3\,\mathrm{PolyLog}\left[3,-i\,e^{i(a+bx)}\right]}{b^4}-\frac{6d^3\,\mathrm{PolyLog}\left[3,i\,e^{i(a+bx)}\right]}{b^4}+\frac{(c+dx)^3\,\mathrm{Sec}[a+bx]}{b}+\frac{6d^3\,\mathrm{Sin}[a+bx]}{b^4}-\frac{3d(c+dx)^2\,\mathrm{Sin}[a+bx]}{b^2}$$

Result (type 4, 532 leaves):

$$\frac{1}{2b^4}\mathrm{Sec}[a+bx]\Big(3b^3c^3-6bcd^2+9b^3c^2dx-6bd^3x+9b^3cd^2x^2+3b^3d^3x^3+12\,i\,b^2c^2d\,\mathrm{ArcTan}\left[e^{i(a+bx)}\right]\mathrm{Cos}[a+bx]+b^3c^3\,\mathrm{Cos}[2(a+bx)]-6bcd^2\,\mathrm{Cos}[2(a+bx)]+3b^3c^2dx\,\mathrm{Cos}[2(a+bx)]-6bd^3x\,\mathrm{Cos}[2(a+bx)]+3b^3cd^2x^2\,\mathrm{Cos}[2(a+bx)]+b^3d^3x^3\,\mathrm{Cos}[2(a+bx)]-12b^2cd^2x\,\mathrm{Cos}[a+bx]\,\mathrm{Log}\left[1-i\,e^{i(a+bx)}\right]-6b^2d^3x^2\,\mathrm{Cos}[a+bx]\,\mathrm{Log}\left[1-i\,e^{i(a+bx)}\right]+12b^2cd^2x\,\mathrm{Cos}[a+bx]\,\mathrm{Log}\left[1+i\,e^{i(a+bx)}\right]+6b^2d^3x^2\,\mathrm{Cos}[a+bx]\,\mathrm{Log}\left[1+i\,e^{i(a+bx)}\right]-12\,i\,bd^2(c+dx)\,\mathrm{Cos}[a+bx]\,\mathrm{PolyLog}\left[2,-i\,e^{i(a+bx)}\right]+12\,i\,bd^2(c+dx)\,\mathrm{Cos}[a+bx]\,\mathrm{PolyLog}\left[2,i\,e^{i(a+bx)}\right]+12d^3\,\mathrm{Cos}[a+bx]\,\mathrm{PolyLog}\left[3,-i\,e^{i(a+bx)}\right]-12d^3\,\mathrm{Cos}[a+bx]\,\mathrm{PolyLog}\left[3,i\,e^{i(a+bx)}\right]-3b^2c^2d\,\mathrm{Sin}[2(a+bx)]+6d^3\,\mathrm{Sin}[2(a+bx)]-6b^2cd^2x\,\mathrm{Sin}[2(a+bx)]-3b^2d^3x^2\,\mathrm{Sin}[2(a+bx)]\Big)$$

Problem 261: Result more than twice size of optimal antiderivative.

$$\int (c+d x)^2 \operatorname{Sin}[a+b x] \operatorname{Tan}[a+b x]^2 \, dx$$

Optimal (type 4, 145 leaves, 10 steps):

$$\frac{4 i d (c+d x) \operatorname{ArcTan}\left[e^{i (a+b x)}\right]}{b^2}-\frac{2 d^2 \operatorname{Cos}[a+b x]}{b^3}+\frac{(c+d x)^2 \operatorname{Cos}[a+b x]}{b}-\frac{2 i d^2 \operatorname{PolyLog}\left[2,-i e^{i (a+b x)}\right]}{b^3}+\frac{2 i d^2 \operatorname{PolyLog}\left[2, i e^{i (a+b x)}\right]}{b^3}+\frac{(c+d x)^2 \operatorname{Sec}[a+b x]}{b}-\frac{2 d (c+d x) \operatorname{Sin}[a+b x]}{b^2}$$

Result (type 4, 362 leaves):

$$\frac{1}{b^3}\left(-4 b c d \operatorname{ArcTanh}\left[\operatorname{Sin}[a]+\operatorname{Cos}[a] \operatorname{Tan}\left[\frac{b x}{2}\right]\right]-4 d^2 \operatorname{ArcTan}[\operatorname{Cot}[a]] \operatorname{ArcTanh}\left[\operatorname{Sin}[a]+\operatorname{Cos}[a] \operatorname{Tan}\left[\frac{b x}{2}\right]\right]+\frac{1}{\sqrt{\operatorname{Csc}[a]^2}} 2 d^2 \operatorname{Csc}[a]\left((b x-\operatorname{ArcTan}[\operatorname{Cot}[a]])\left(\operatorname{Log}\left[1-e^{i (b x-\operatorname{ArcTan}[\operatorname{Cot}[a]])}\right]-\operatorname{Log}\left[1+e^{i (b x-\operatorname{ArcTan}[\operatorname{Cot}[a]])}\right]\right)+i \operatorname{PolyLog}\left[2,-e^{i (b x-\operatorname{ArcTan}[\operatorname{Cot}[a]])}\right]-i \operatorname{PolyLog}\left[2, e^{i (b x-\operatorname{ArcTan}[\operatorname{Cot}[a]])}\right]\right)+b^2 (c+d x)^2 \operatorname{Sec}[a]+\operatorname{Cos}[b x]\left(\left(-2 d^2+b^2 (c+d x)^2\right) \operatorname{Cos}[a]-2 b d (c+d x) \operatorname{Sin}[a]\right)-\left(2 b d (c+d x) \operatorname{Cos}[a]+\left(-2 d^2+b^2 (c+d x)^2\right) \operatorname{Sin}[a]\right) \operatorname{Sin}[b x]+\frac{b^2 (c+d x)^2 \operatorname{Sin}\left[\frac{b x}{2}\right]}{\left(\operatorname{Cos}\left[\frac{a}{2}\right]-\operatorname{Sin}\left[\frac{a}{2}\right]\right)\left(\operatorname{Cos}\left[\frac{1}{2}(a+b x)\right]-\operatorname{Sin}\left[\frac{1}{2}(a+b x)\right]\right)}-\frac{b^2 (c+d x)^2 \operatorname{Sin}\left[\frac{b x}{2}\right]}{\left(\operatorname{Cos}\left[\frac{a}{2}\right]+\operatorname{Sin}\left[\frac{a}{2}\right]\right)\left(\operatorname{Cos}\left[\frac{1}{2}(a+b x)\right]+\operatorname{Sin}\left[\frac{1}{2}(a+b x)\right]\right)}\right)$$

Problem 266: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 469 leaves, 27 steps):

$$\frac{8\,i\,d\,(c+d\,x)^3\,\text{ArcTan}\left[e^{i\,(a+b\,x)}\right]}{b^2}-\frac{2\,(c+d\,x)^4\,\text{ArcTanh}\left[e^{i\,(a+b\,x)}\right]}{b}+\frac{4\,i\,d\,(c+d\,x)^3\,\text{PolyLog}\left[2,-e^{i\,(a+b\,x)}\right]}{b^2}-\frac{12\,i\,d^2\,(c+d\,x)^2\,\text{PolyLog}\left[2,-i\,e^{i\,(a+b\,x)}\right]}{b^3}+\frac{12\,i\,d^2\,(c+d\,x)^2\,\text{PolyLog}\left[2,i\,e^{i\,(a+b\,x)}\right]}{b^3}-\frac{4\,i\,d\,(c+d\,x)^3\,\text{PolyLog}\left[2,e^{i\,(a+b\,x)}\right]}{b^2}-\frac{12\,d^2\,(c+d\,x)^2\,\text{PolyLog}\left[3,-e^{i\,(a+b\,x)}\right]}{b^3}+\frac{24\,d^3\,(c+d\,x)\,\text{PolyLog}\left[3,-i\,e^{i\,(a+b\,x)}\right]}{b^4}-\frac{24\,d^3\,(c+d\,x)\,\text{PolyLog}\left[3,i\,e^{i\,(a+b\,x)}\right]}{b^4}+\frac{12\,d^2\,(c+d\,x)^2\,\text{PolyLog}\left[3,e^{i\,(a+b\,x)}\right]}{b^3}-\frac{24\,i\,d^3\,(c+d\,x)\,\text{PolyLog}\left[4,-e^{i\,(a+b\,x)}\right]}{b^4}+\frac{24\,i\,d^4\,\text{PolyLog}\left[4,-i\,e^{i\,(a+b\,x)}\right]}{b^5}-\frac{24\,i\,d^4\,\text{PolyLog}\left[4,i\,e^{i\,(a+b\,x)}\right]}{b^5}+\frac{24\,i\,d^3\,(c+d\,x)\,\text{PolyLog}\left[4,e^{i\,(a+b\,x)}\right]}{b^4}+\frac{24\,d^4\,\text{PolyLog}\left[5,-e^{i\,(a+b\,x)}\right]}{b^5}-\frac{24\,d^4\,\text{PolyLog}\left[5,e^{i\,(a+b\,x)}\right]}{b^5}+\frac{(c+d\,x)^4\,\text{Sec}[a+b\,x]}{b}$$

Result (type 4, 998 leaves):

$$\frac{1}{b^5}\Big(-2\,b^4\,c^4\,\text{ArcTanh}\left[e^{i\,(a+b\,x)}\right]+4\,b^4\,c^3\,d\,x\,\text{Log}\left[1-e^{i\,(a+b\,x)}\right]+6\,b^4\,c^2\,d^2\,x^2\,\text{Log}\left[1-e^{i\,(a+b\,x)}\right]+4\,b^4\,c\,d^3\,x^3\,\text{Log}\left[1-e^{i\,(a+b\,x)}\right]+b^4\,d^4\,x^4\,\text{Log}\left[1-e^{i\,(a+b\,x)}\right]-4\,b^4\,c^3\,d\,x\,\text{Log}\left[1+e^{i\,(a+b\,x)}\right]-6\,b^4\,c^2\,d^2\,x^2\,\text{Log}\left[1+e^{i\,(a+b\,x)}\right]-4\,b^4\,c\,d^3\,x^3\,\text{Log}\left[1+e^{i\,(a+b\,x)}\right]-b^4\,d^4\,x^4\,\text{Log}\left[1+e^{i\,(a+b\,x)}\right]+4\,i\,b^3\,d\,(c+d\,x)^3\,\text{PolyLog}\left[2,-e^{i\,(a+b\,x)}\right]-4\,i\,b^3\,d\,(c+d\,x)^3\,\text{PolyLog}\left[2,e^{i\,(a+b\,x)}\right]-12\,b^2\,c^2\,d^2\,\text{PolyLog}\left[3,-e^{i\,(a+b\,x)}\right]-24\,b^2\,c\,d^3\,x\,\text{PolyLog}\left[3,-e^{i\,(a+b\,x)}\right]-12\,b^2\,d^4\,x^2\,\text{PolyLog}\left[3,-e^{i\,(a+b\,x)}\right]+12\,b^2\,c^2\,d^2\,\text{PolyLog}\left[3,e^{i\,(a+b\,x)}\right]+24\,b^2\,c\,d^3\,x\,\text{PolyLog}\left[3,e^{i\,(a+b\,x)}\right]+12\,b^2\,d^4\,x^2\,\text{PolyLog}\left[3,e^{i\,(a+b\,x)}\right]-24\,i\,b\,c\,d^3\,\text{PolyLog}\left[4,-e^{i\,(a+b\,x)}\right]-24\,i\,b\,d^4\,x\,\text{PolyLog}\left[4,-e^{i\,(a+b\,x)}\right]-4\,d\,\Big(-2\,i\,b^3\,c^3\,\text{ArcTan}\left[e^{i\,(a+b\,x)}\right]+3\,b^3\,c^2\,d\,x\,\text{Log}\left[1-i\,e^{i\,(a+b\,x)}\right]+3\,b^3\,c\,d^2\,x^2\,\text{Log}\left[1-i\,e^{i\,(a+b\,x)}\right]+b^3\,d^3\,x^3\,\text{Log}\left[1-i\,e^{i\,(a+b\,x)}\right]-3\,b^3\,c^2\,d\,x\,\text{Log}\left[1+i\,e^{i\,(a+b\,x)}\right]-3\,b^3\,c\,d^2\,x^2\,\text{Log}\left[1+i\,e^{i\,(a+b\,x)}\right]-b^3\,d^3\,x^3\,\text{Log}\left[1+i\,e^{i\,(a+b\,x)}\right]+3\,i\,b^2\,d\,(c+d\,x)^2\,\text{PolyLog}\left[2,-i\,e^{i\,(a+b\,x)}\right]-3\,i\,b^2\,d\,(c+d\,x)^2\,\text{PolyLog}\left[2,i\,e^{i\,(a+b\,x)}\right]-6\,b\,c\,d^2\,\text{PolyLog}\left[3,-i\,e^{i\,(a+b\,x)}\right]-6\,b\,d^3\,x\,\text{PolyLog}\left[3,-i\,e^{i\,(a+b\,x)}\right]+6\,b\,c\,d^2\,\text{PolyLog}\left[3,i\,e^{i\,(a+b\,x)}\right]+6\,b\,d^3\,x\,\text{PolyLog}\left[3,i\,e^{i\,(a+b\,x)}\right]-6\,i\,d^3\,\text{PolyLog}\left[4,-i\,e^{i\,(a+b\,x)}\right]+6\,i\,d^3\,\text{PolyLog}\left[4,i\,e^{i\,(a+b\,x)}\right]\Big)+24\,i\,b\,c\,d^3\,\text{PolyLog}\left[4,e^{i\,(a+b\,x)}\right]+24\,i\,b\,d^4\,x\,\text{PolyLog}\left[4,e^{i\,(a+b\,x)}\right]+24\,d^4\,\text{PolyLog}\left[5,-e^{i\,(a+b\,x)}\right]-24\,d^4\,\text{PolyLog}\left[5,e^{i\,(a+b\,x)}\right]+b^4\,(c+d\,x)^4\,\text{Sec}[a+b\,x]\Big)$$

Problem 268: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 219 leaves, 19 steps):

$$\frac{4\,i\,d\,(c+d\,x)\,\text{ArcTan}\left[e^{i\,(a+b\,x)}\right]}{b^2}-\frac{2\,(c+d\,x)^2\,\text{ArcTanh}\left[e^{i\,(a+b\,x)}\right]}{b}+\frac{2\,i\,d\,(c+d\,x)\,\text{PolyLog}\left[2,-e^{i\,(a+b\,x)}\right]}{b^2}-\frac{2\,i\,d^2\,\text{PolyLog}\left[2,-i\,e^{i\,(a+b\,x)}\right]}{b^3}+\frac{2\,i\,d^2\,\text{PolyLog}\left[2,i\,e^{i\,(a+b\,x)}\right]}{b^3}-\frac{2\,i\,d\,(c+d\,x)\,\text{PolyLog}\left[2,e^{i\,(a+b\,x)}\right]}{b^2}-\frac{2\,d^2\,\text{PolyLog}\left[3,-e^{i\,(a+b\,x)}\right]}{b^3}+\frac{2\,d^2\,\text{PolyLog}\left[3,e^{i\,(a+b\,x)}\right]}{b^3}+\frac{(c+d\,x)^2\,\text{Sec}[a+b\,x]}{b}$$

Result (type 4, 449 leaves):

$$\frac{1}{b^3}\Big(-2\,b^2\,c^2\,\text{ArcTanh}\left[e^{i\,(a+b\,x)}\right]+2\,b^2\,c\,d\,x\,\text{Log}\left[1-e^{i\,(a+b\,x)}\right]+b^2\,d^2\,x^2\,\text{Log}\left[1-e^{i\,(a+b\,x)}\right]-2\,b^2\,c\,d\,x\,\text{Log}\left[1+e^{i\,(a+b\,x)}\right]-b^2\,d^2\,x^2\,\text{Log}\left[1+e^{i\,(a+b\,x)}\right]+2\,i\,b\,d\,(c+d\,x)\,\text{PolyLog}\left[2,-e^{i\,(a+b\,x)}\right]-2\,i\,b\,d\,(c+d\,x)\,\text{PolyLog}\left[2,e^{i\,(a+b\,x)}\right]-2\,d^2\,\text{PolyLog}\left[3,-e^{i\,(a+b\,x)}\right]+2\,d^2\,\text{PolyLog}\left[3,e^{i\,(a+b\,x)}\right]\Big)+\frac{(c+d\,x)^2\,\text{Sec}[a+b\,x]}{b}-\frac{4\,i\,c\,d\,\text{ArcTan}\left[\frac{-i\,\text{Sin}[a]-i\,\text{Cos}[a]\,\text{Tan}\left[\frac{b\,x}{2}\right]}{\sqrt{\text{Cos}[a]^2+\text{Sin}[a]^2}}\right]}{b^2\,\sqrt{\text{Cos}[a]^2+\text{Sin}[a]^2}}-\frac{1}{b^3}2\,d^2\left(-\frac{1}{\sqrt{1+\text{Cot}[a]^2}}\text{Csc}[a]\left(\left(b\,x-\text{ArcTan}[\text{Cot}[a]]\right)\left(\text{Log}\left[1-e^{i\,(b\,x-\text{ArcTan}[\text{Cot}[a]])}\right]-\text{Log}\left[1+e^{i\,(b\,x-\text{ArcTan}[\text{Cot}[a]])}\right]\right)+i\left(\text{PolyLog}\left[2,-e^{i\,(b\,x-\text{ArcTan}[\text{Cot}[a]])}\right]-\text{PolyLog}\left[2,e^{i\,(b\,x-\text{ArcTan}[\text{Cot}[a]])}\right]\right)\right)+\frac{2\,\text{ArcTan}[\text{Cot}[a]]\,\text{ArcTanh}\left[\frac{\text{Sin}[a]+\text{Cos}[a]\,\text{Tan}\left[\frac{b\,x}{2}\right]}{\sqrt{\text{Cos}[a]^2+\text{Sin}[a]^2}}\right]}{\sqrt{\text{Cos}[a]^2+\text{Sin}[a]^2}}\right)$$

Problem 280: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 305 leaves, 36 steps):

$$\frac{4\,i\,d^2\,x\,\text{ArcTan}\left[e^{i\,(a+b\,x)}\right]}{b^2}-\frac{3\,(c+d\,x)^2\,\text{ArcTanh}\left[e^{i\,(a+b\,x)}\right]}{b}-\frac{d^2\,\text{ArcTanh}[\text{Cos}[a+b\,x]]}{b^3}-\frac{2\,c\,d\,\text{ArcTanh}[\text{Sin}[a+b\,x]]}{b^2}-\frac{c\,d\,\text{Csc}[a+b\,x]}{b^2}-\frac{d^2\,x\,\text{Csc}[a+b\,x]}{b^2}+\frac{3\,i\,d\,(c+d\,x)\,\text{PolyLog}\left[2,-e^{i\,(a+b\,x)}\right]}{b^2}-\frac{2\,i\,d^2\,\text{PolyLog}\left[2,-i\,e^{i\,(a+b\,x)}\right]}{b^3}+\frac{2\,i\,d^2\,\text{PolyLog}\left[2,i\,e^{i\,(a+b\,x)}\right]}{b^3}-\frac{3\,i\,d\,(c+d\,x)\,\text{PolyLog}\left[2,e^{i\,(a+b\,x)}\right]}{b^2}-\frac{3\,d^2\,\text{PolyLog}\left[3,-e^{i\,(a+b\,x)}\right]}{b^3}+\frac{3\,d^2\,\text{PolyLog}\left[3,e^{i\,(a+b\,x)}\right]}{b^3}+\frac{3\,(c+d\,x)^2\,\text{Sec}[a+b\,x]}{2\,b}-\frac{(c+d\,x)^2\,\text{Csc}[a+b\,x]^2\,\text{Sec}[a+b\,x]}{2\,b}$$

Result (type 4, 889 leaves):

$$\frac{\left(-c^2-2\,c\,d\,x-d^2\,x^2\right)\,\text{Csc}\left[\frac{a}{2}+\frac{b\,x}{2}\right]^2}{8\,b}+$$

$$\frac{1}{2\,b^3}\left(3\,b^2\,c^2\,\text{Log}\left[1-e^{i\,(a+b\,x)}\right]+2\,d^2\,\text{Log}\left[1-e^{i\,(a+b\,x)}\right]+6\,b^2\,c\,d\,x\,\text{Log}\left[1-e^{i\,(a+b\,x)}\right]+3\,b^2\,d^2\,x^2\,\text{Log}\left[1-e^{i\,(a+b\,x)}\right]-3\,b^2\,c^2\,\text{Log}\left[1+e^{i\,(a+b\,x)}\right]-2\,d^2\,\text{Log}\left[1+e^{i\,(a+b\,x)}\right]-6\,b^2\,c\,d\,x\,\text{Log}\left[1+e^{i\,(a+b\,x)}\right]-3\,b^2\,d^2\,x^2\,\text{Log}\left[1+e^{i\,(a+b\,x)}\right]+6\,i\,b\,d\,(c+d\,x)\,\text{PolyLog}\left[2,-e^{i\,(a+b\,x)}\right]-6\,i\,b\,d\,(c+d\,x)\,\text{PolyLog}\left[2,e^{i\,(a+b\,x)}\right]-6\,d^2\,\text{PolyLog}\left[3,-e^{i\,(a+b\,x)}\right]+6\,d^2\,\text{PolyLog}\left[3,e^{i\,(a+b\,x)}\right]\right)+$$

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

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

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

$$\frac{1}{b^3}2\,d^2\left(-\frac{1}{\sqrt{1+\text{Cot}[a]^2}}\text{Csc}[a]\,\left(\left(b\,x-\text{ArcTan}[\text{Cot}[a]]\right)\,\left(\text{Log}\left[1-e^{i\,(b\,x-\text{ArcTan}[\text{Cot}[a]])}\right]-\text{Log}\left[1+e^{i\,(b\,x-\text{ArcTan}[\text{Cot}[a]])}\right]\right)+i\,\left(\text{PolyLog}\left[2,-e^{i\,(b\,x-\text{ArcTan}[\text{Cot}[a]])}\right]-\text{PolyLog}\left[2,e^{i\,(b\,x-\text{ArcTan}[\text{Cot}[a]])}\right]\right)\right)+\frac{2\,\text{ArcTan}[\text{Cot}[a]]\,\text{ArcTanh}\left[\frac{\text{Sin}[a]+\text{Cos}[a]\,\text{Tan}\left[\frac{b\,x}{2}\right]}{\sqrt{\text{Cos}[a]^2+\text{Sin}[a]^2}}\right]}{\sqrt{\text{Cos}[a]^2+\text{Sin}[a]^2}}\right)+$$

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

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

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

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

Problem 281: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 154 leaves, 13 steps):

$$-\frac{3\,d\,x\,\text{ArcTanh}\left[e^{i\,(a+b\,x)}\right]}{b}-\frac{3\,c\,\text{ArcTanh}[\text{Cos}[a+b\,x]]}{2\,b}-\frac{d\,\text{ArcTanh}[\text{Sin}[a+b\,x]]}{b^2}-\frac{d\,\text{Csc}[a+b\,x]}{2\,b^2}+\frac{3\,i\,d\,\text{PolyLog}\left[2,-e^{i\,(a+b\,x)}\right]}{2\,b^2}-\frac{3\,i\,d\,\text{PolyLog}\left[2,e^{i\,(a+b\,x)}\right]}{2\,b^2}+\frac{3\,(c+d\,x)\,\text{Sec}[a+b\,x]}{2\,b}-\frac{(c+d\,x)\,\text{Csc}[a+b\,x]^2\,\text{Sec}[a+b\,x]}{2\,b}$$

Result (type 4, 520 leaves):

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

Problem 286: Result more than twice size of optimal antiderivative.

$$\int x^2\,\text{Csc}[a+b\,x]^3\,\text{Sec}[a+b\,x]^2\,dx$$

Optimal (type 4, 235 leaves, 29 steps):

$$\frac{4\,i\,x\,\text{ArcTan}\left[e^{i\,(a+b\,x)}\right]}{b^2}-\frac{3\,x^2\,\text{ArcTanh}\left[e^{i\,(a+b\,x)}\right]}{b}-\frac{\text{ArcTanh}[\text{Cos}[a+b\,x]]}{b^3}-\frac{x\,\text{Csc}[a+b\,x]}{b^2}+\frac{3\,i\,x\,\text{PolyLog}\left[2,-e^{i\,(a+b\,x)}\right]}{b^2}-\frac{2\,i\,\text{PolyLog}\left[2,-i\,e^{i\,(a+b\,x)}\right]}{b^3}+\frac{2\,i\,\text{PolyLog}\left[2,i\,e^{i\,(a+b\,x)}\right]}{b^3}-\frac{3\,i\,x\,\text{PolyLog}\left[2,e^{i\,(a+b\,x)}\right]}{b^2}-\frac{3\,\text{PolyLog}\left[3,-e^{i\,(a+b\,x)}\right]}{b^3}+\frac{3\,\text{PolyLog}\left[3,e^{i\,(a+b\,x)}\right]}{b^3}+\frac{3\,x^2\,\text{Sec}[a+b\,x]}{2\,b}-\frac{x^2\,\text{Csc}[a+b\,x]^2\,\text{Sec}[a+b\,x]}{2\,b}$$

Result (type 4, 557 leaves):

$$-\frac{x^2 \operatorname{Csc}\left[\frac{a}{2}+\frac{b x}{2}\right]^2}{8 b}-\frac{1}{b^3}2\left(\left(-a+\frac{\pi}{2}-b x\right)\left(\operatorname{Log}\left[1-e^{i\left(-a+\frac{\pi}{2}-b x\right)}\right]-\operatorname{Log}\left[1+e^{i\left(-a+\frac{\pi}{2}-b x\right)}\right]\right)-\left(-a+\frac{\pi}{2}\right)\operatorname{Log}\left[\operatorname{Tan}\left[\frac{1}{2}\left(-a+\frac{\pi}{2}-b x\right)\right]\right]+i\left(\operatorname{PolyLog}\left[2,-e^{i\left(-a+\frac{\pi}{2}-b x\right)}\right]-\operatorname{PolyLog}\left[2,e^{i\left(-a+\frac{\pi}{2}-b x\right)}\right]\right)\right)-$$

$$\frac{1}{b^3}\left(2 \operatorname{ArcTanh}[\operatorname{Cos}[a+b x]+i \operatorname{Sin}[a+b x]]+3 b^2 x^2 \operatorname{ArcTanh}[\operatorname{Cos}[a+b x]+i \operatorname{Sin}[a+b x]]-3 i b x \operatorname{PolyLog}[2,-\operatorname{Cos}[a+b x]-i \operatorname{Sin}[a+b x]]+3 i b x \operatorname{PolyLog}[2,\operatorname{Cos}[a+b x]+i \operatorname{Sin}[a+b x]]+3 \operatorname{PolyLog}[3,-\operatorname{Cos}[a+b x]-i \operatorname{Sin}[a+b x]]-3 \operatorname{PolyLog}[3,\operatorname{Cos}[a+b x]+i \operatorname{Sin}[a+b x]]\right)+$$

$$\frac{x^2 \operatorname{Sec}\left[\frac{a}{2}+\frac{b x}{2}\right]^2}{8 b}+\frac{x \operatorname{Csc}[a] \operatorname{Sec}[a]\,(-\operatorname{Cos}[a]+b x \operatorname{Sin}[a])}{b^2}+\frac{x \operatorname{Csc}\left[\frac{a}{2}\right] \operatorname{Csc}\left[\frac{a}{2}+\frac{b x}{2}\right] \operatorname{Sin}\left[\frac{b x}{2}\right]}{2 b^2}-\frac{x \operatorname{Sec}\left[\frac{a}{2}\right] \operatorname{Sec}\left[\frac{a}{2}+\frac{b x}{2}\right] \operatorname{Sin}\left[\frac{b x}{2}\right]}{2 b^2}+$$

$$\frac{x^2 \operatorname{Sin}\left[\frac{b x}{2}\right]}{b\left(\operatorname{Cos}\left[\frac{a}{2}\right]-\operatorname{Sin}\left[\frac{a}{2}\right]\right)\left(\operatorname{Cos}\left[\frac{a}{2}+\frac{b x}{2}\right]-\operatorname{Sin}\left[\frac{a}{2}+\frac{b x}{2}\right]\right)}-\frac{x^2 \operatorname{Sin}\left[\frac{b x}{2}\right]}{b\left(\operatorname{Cos}\left[\frac{a}{2}\right]+\operatorname{Sin}\left[\frac{a}{2}\right]\right)\left(\operatorname{Cos}\left[\frac{a}{2}+\frac{b x}{2}\right]+\operatorname{Sin}\left[\frac{a}{2}+\frac{b x}{2}\right]\right)}$$

Problem 287: Result more than twice size of optimal antiderivative.

$$\int x \operatorname{Csc}[a+b x]^3 \operatorname{Sec}[a+b x]^2 \, dx$$

Optimal (type 4, 126 leaves, 13 steps):

$$-\frac{3 x \operatorname{ArcTanh}\left[e^{i(a+b x)}\right]}{b}-\frac{\operatorname{ArcTanh}[\operatorname{Sin}[a+b x]]}{b^2}-\frac{\operatorname{Csc}[a+b x]}{2 b^2}+\frac{3 i \operatorname{PolyLog}\left[2,-e^{i(a+b x)}\right]}{2 b^2}-\frac{3 i \operatorname{PolyLog}\left[2,e^{i(a+b x)}\right]}{2 b^2}+\frac{3 x \operatorname{Sec}[a+b x]}{2 b}-\frac{x \operatorname{Csc}[a+b x]^2 \operatorname{Sec}[a+b x]}{2 b}$$

Result (type 4, 282 leaves):

$$\frac{1}{8 b^2}\left(8 b x-2 \operatorname{Cot}\left[\frac{1}{2}(a+b x)\right]-b x \operatorname{Csc}\left[\frac{1}{2}(a+b x)\right]^2+12(a+b x)\left(\operatorname{Log}\left[1-e^{i(a+b x)}\right]-\operatorname{Log}\left[1+e^{i(a+b x)}\right]\right)+8 \operatorname{Log}\left[\operatorname{Cos}\left[\frac{1}{2}(a+b x)\right]-\operatorname{Sin}\left[\frac{1}{2}(a+b x)\right]\right]-8 \operatorname{Log}\left[\operatorname{Cos}\left[\frac{1}{2}(a+b x)\right]+\operatorname{Sin}\left[\frac{1}{2}(a+b x)\right]\right]-12 a \operatorname{Log}\left[\operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]\right]+12 i\left(\operatorname{PolyLog}\left[2,-e^{i(a+b x)}\right]-\operatorname{PolyLog}\left[2, e^{i(a+b x)}\right]\right)+b x \operatorname{Sec}\left[\frac{1}{2}(a+b x)\right]^2+\frac{8 b x \operatorname{Sin}\left[\frac{1}{2}(a+b x)\right]}{\operatorname{Cos}\left[\frac{1}{2}(a+b x)\right]-\operatorname{Sin}\left[\frac{1}{2}(a+b x)\right]}-\frac{8 b x \operatorname{Sin}\left[\frac{1}{2}(a+b x)\right]}{\operatorname{Cos}\left[\frac{1}{2}(a+b x)\right]+\operatorname{Sin}\left[\frac{1}{2}(a+b x)\right]}-2 \operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]\right)$$

Problem 291: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 139 leaves, 7 steps):

$$\frac{2 i d (c+d x)^3}{b^2}-\frac{6 d^2 (c+d x)^2 \operatorname{Log}\left[1+e^{2 i (a+b x)}\right]}{b^3}+\frac{6 i d^3 (c+d x) \operatorname{PolyLog}\left[2,-e^{2 i (a+b x)}\right]}{b^4}-\frac{3 d^4 \operatorname{PolyLog}\left[3,-e^{2 i (a+b x)}\right]}{b^5}+\frac{(c+d x)^4 \operatorname{Sec}[a+b x]^2}{2 b}-\frac{2 d (c+d x)^3 \operatorname{Tan}[a+b x]}{b^2}$$

Result (type 4, 425 leaves):

$$\frac{1}{2 b^5} d^4 e^{-i a}\left(2 i b^2 x^2\left(2 b e^{2 i a} x+3 i\left(1+e^{2 i a}\right) \operatorname{Log}\left[1+e^{2 i (a+b x)}\right]\right)+6 i b\left(1+e^{2 i a}\right) x \operatorname{PolyLog}\left[2,-e^{2 i (a+b x)}\right]-3\left(1+e^{2 i a}\right) \operatorname{PolyLog}\left[3,-e^{2 i (a+b x)}\right]\right) \operatorname{Sec}[a]+\frac{(c+d x)^4 \operatorname{Sec}[a+b x]^2}{2 b}-$$
$$\left(6 c^2 d^2 \operatorname{Sec}[a]\left(\operatorname{Cos}[a] \operatorname{Log}[\operatorname{Cos}[a] \operatorname{Cos}[b x]-\operatorname{Sin}[a] \operatorname{Sin}[b x]]+b x \operatorname{Sin}[a]\right)\right) / \left(b^3\left(\operatorname{Cos}[a]^2+\operatorname{Sin}[a]^2\right)\right)-$$
$$\left(6 c d^3 \operatorname{Csc}[a]\left(b^2 e^{-i \operatorname{ArcTan}[\operatorname{Cot}[a]]} x^2-\frac{1}{\sqrt{1+\operatorname{Cot}[a]^2}} \operatorname{Cot}[a]\left(i b x\left(-\pi-2 \operatorname{ArcTan}[\operatorname{Cot}[a]]\right)-\pi \operatorname{Log}\left[1+e^{-2 i b x}\right]-2\left(b x-\operatorname{ArcTan}[\operatorname{Cot}[a]]\right) \operatorname{Log}\left[1-e^{2 i (b x-\operatorname{ArcTan}[\operatorname{Cot}[a]])}\right]+\pi \operatorname{Log}[\operatorname{Cos}[b x]]-2 \operatorname{ArcTan}[\operatorname{Cot}[a]] \operatorname{Log}[\operatorname{Sin}[b x-\operatorname{ArcTan}[\operatorname{Cot}[a]]]]+i \operatorname{PolyLog}\left[2, e^{2 i (b x-\operatorname{ArcTan}[\operatorname{Cot}[a]])}\right]\right)\right) \operatorname{Sec}[a]\right) /$$
$$\left(b^4 \sqrt{\operatorname{Csc}[a]^2\left(\operatorname{Cos}[a]^2+\operatorname{Sin}[a]^2\right)}\right)-\frac{1}{b^2} 2 \operatorname{Sec}[a] \operatorname{Sec}[a+b x]\left(c^3 d \operatorname{Sin}[b x]+3 c^2 d^2 x \operatorname{Sin}[b x]+3 c d^3 x^2 \operatorname{Sin}[b x]+d^4 x^3 \operatorname{Sin}[b x]\right)$$

Problem 292: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 115 leaves, 6 steps):

$$\frac{3 i d (c+d x)^2}{2 b^2}-\frac{3 d^2 (c+d x) \operatorname{Log}\left[1+e^{2 i (a+b x)}\right]}{b^3}+\frac{3 i d^3 \operatorname{PolyLog}\left[2,-e^{2 i (a+b x)}\right]}{2 b^4}+\frac{(c+d x)^3 \operatorname{Sec}[a+b x]^2}{2 b}-\frac{3 d (c+d x)^2 \operatorname{Tan}[a+b x]}{2 b^2}$$

Result (type 4, 286 leaves):

$$\frac{(c+d x)^3 \operatorname{Sec}[a+b x]^2}{2 b}-\left(3 c d^2 \operatorname{Sec}[a] \left(\operatorname{Cos}[a] \operatorname{Log}[\operatorname{Cos}[a] \operatorname{Cos}[b x]-\operatorname{Sin}[a] \operatorname{Sin}[b x]]+b x \operatorname{Sin}[a]\right)\right) \Big/ \left(b^3 \left(\operatorname{Cos}[a]^2+\operatorname{Sin}[a]^2\right)\right)-$$
$$\left(3 d^3 \operatorname{Csc}[a] \left(b^2 e^{-i \operatorname{ArcTan}[\operatorname{Cot}[a]]} x^2-\frac{1}{\sqrt{1+\operatorname{Cot}[a]^2}}\operatorname{Cot}[a] \left(i b x \left(-\pi-2 \operatorname{ArcTan}[\operatorname{Cot}[a]]\right)-\pi \operatorname{Log}\left[1+e^{-2 i b x}\right]-2 \left(b x-\operatorname{ArcTan}[\operatorname{Cot}[a]]\right) \operatorname{Log}\left[1-e^{2 i (b x-\operatorname{ArcTan}[\operatorname{Cot}[a]])}\right]+\pi \operatorname{Log}[\operatorname{Cos}[b x]]-2 \operatorname{ArcTan}[\operatorname{Cot}[a]] \operatorname{Log}[\operatorname{Sin}[b x-\operatorname{ArcTan}[\operatorname{Cot}[a]]]]+i \operatorname{PolyLog}\left[2, e^{2 i (b x-\operatorname{ArcTan}[\operatorname{Cot}[a]])}\right]\right)\right) \operatorname{Sec}[a]\right) \Big/$$
$$\left(2 b^4 \sqrt{\operatorname{Csc}[a]^2 \left(\operatorname{Cos}[a]^2+\operatorname{Sin}[a]^2\right)}\right)-\frac{1}{2 b^2}3 \operatorname{Sec}[a] \operatorname{Sec}[a+b x] \left(c^2 d \operatorname{Sin}[b x]+2 c d^2 x \operatorname{Sin}[b x]+d^3 x^2 \operatorname{Sin}[b x]\right)$$

Problem 299: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 193 leaves, 17 steps):

$$\frac{i (c+d x)^2 \operatorname{ArcTan}\left[e^{i (a+b x)}\right]}{b}+\frac{d^2 \operatorname{ArcTanh}[\operatorname{Sin}[a+b x]]}{b^3}-\frac{i d (c+d x) \operatorname{PolyLog}\left[2,-i e^{i (a+b x)}\right]}{b^2}+\frac{i d (c+d x) \operatorname{PolyLog}\left[2, i e^{i (a+b x)}\right]}{b^2}+\frac{d^2 \operatorname{PolyLog}\left[3,-i e^{i (a+b x)}\right]}{b^3}-\frac{d^2 \operatorname{PolyLog}\left[3, i e^{i (a+b x)}\right]}{b^3}-\frac{d (c+d x) \operatorname{Sec}[a+b x]}{b^2}+\frac{(c+d x)^2 \operatorname{Sec}[a+b x] \operatorname{Tan}[a+b x]}{2 b}$$

Result (type 4, 526 leaves):

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

Problem 300: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 117 leaves, 12 steps):

$$\frac{i\,(c+d\,x)\,\text{ArcTan}\left[e^{i\,(a+b\,x)}\right]}{b}-\frac{i\,d\,\text{PolyLog}\left[2,-i\,e^{i\,(a+b\,x)}\right]}{2\,b^2}+$$
$$\frac{i\,d\,\text{PolyLog}\left[2,i\,e^{i\,(a+b\,x)}\right]}{2\,b^2}-\frac{d\,\text{Sec}[a+b\,x]}{2\,b^2}+\frac{(c+d\,x)\,\text{Sec}[a+b\,x]\,\text{Tan}[a+b\,x]}{2\,b}$$

Result (type 4, 607 leaves):

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

$$\frac{1}{2 b^2} d \Bigg((a+b x)\left(\text{Log}\left[1-\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right]-\text{Log}\left[1+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right]\right)+$$

$$a\left(-\text{Log}\left[1-\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right]+\text{Log}\left[1+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right]\right)+$$

$$i\Bigg(\text{Log}\left[1-\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right]\text{Log}\left[\left(\frac{1}{2}+\frac{i}{2}\right)\left(-i+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right)\right]-$$

$$\text{Log}\left[\frac{1}{2}\left((1+i)-(1-i)\,\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right)\right]\text{Log}\left[1+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right]+$$

$$\text{Log}\left[\left(-\frac{1}{2}-\frac{i}{2}\right)\left(i+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right)\right]\text{Log}\left[1+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right]-$$

$$\text{Log}\left[1-\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right]\text{Log}\left[\frac{1}{2}\left((1+i)+(1-i)\,\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right)\right]+$$

$$\text{PolyLog}\left[2,\left(-\frac{1}{2}-\frac{i}{2}\right)\left(-1+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right)\right]-$$

$$\text{PolyLog}\left[2,\left(-\frac{1}{2}+\frac{i}{2}\right)\left(-1+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right)\right]-\text{PolyLog}\Big[2,$$

$$\left(\frac{1}{2}-\frac{i}{2}\right)\left(1+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right)\Big]+\text{PolyLog}\left[2,\left(\frac{1}{2}+\frac{i}{2}\right)\left(1+\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right)\right]\Bigg)\Bigg)+$$

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

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

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

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

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

Problem 304: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 259 leaves, 13 steps):

$$\frac{3\,i\,d\,(c+d\,x)^2}{2\,b^2}+\frac{(c+d\,x)^3}{2\,b}-\frac{i\,(c+d\,x)^4}{4\,d}-\frac{3\,d^2\,(c+d\,x)\,\text{Log}\left[1+e^{2\,i\,(a+b\,x)}\right]}{b^3}+$$
$$\frac{(c+d\,x)^3\,\text{Log}\left[1+e^{2\,i\,(a+b\,x)}\right]}{b}+\frac{3\,i\,d^3\,\text{PolyLog}\left[2,-e^{2\,i\,(a+b\,x)}\right]}{2\,b^4}-$$
$$\frac{3\,i\,d\,(c+d\,x)^2\,\text{PolyLog}\left[2,-e^{2\,i\,(a+b\,x)}\right]}{2\,b^2}+\frac{3\,d^2\,(c+d\,x)\,\text{PolyLog}\left[3,-e^{2\,i\,(a+b\,x)}\right]}{2\,b^3}+$$
$$\frac{3\,i\,d^3\,\text{PolyLog}\left[4,-e^{2\,i\,(a+b\,x)}\right]}{4\,b^4}-\frac{3\,d\,(c+d\,x)^2\,\text{Tan}[a+b\,x]}{2\,b^2}+\frac{(c+d\,x)^3\,\text{Tan}[a+b\,x]^2}{2\,b}$$

Result (type 4, 817 leaves) :

$$-\frac{1}{4 b^3} c\, d^2 e^{-i a} \left(2 i b^2 x^2 \left(2 b e^{2 i a} x + 3 i \left(1 + e^{2 i a}\right) \mathrm{Log}\left[1 + e^{2 i (a+b x)}\right]\right) + 6 i b \left(1 + e^{2 i a}\right) x\, \mathrm{PolyLog}\left[2, -e^{2 i (a+b x)}\right] - 3 \left(1 + e^{2 i a}\right) \mathrm{PolyLog}\left[3, -e^{2 i (a+b x)}\right]\right) \mathrm{Sec}[a] +$$

$$\frac{1}{4} i d^3 e^{i a} \left(-x^4 + \left(1 + e^{-2 i a}\right) x^4 - \frac{1}{2 b^4} e^{-2 i a} \left(1 + e^{2 i a}\right) \left(2 b^4 x^4 + 4 i b^3 x^3 \mathrm{Log}\left[1 + e^{2 i (a+b x)}\right] + 6 b^2 x^2 \mathrm{PolyLog}\left[2, -e^{2 i (a+b x)}\right] + 6 i b x\, \mathrm{PolyLog}\left[3, -e^{2 i (a+b x)}\right] - 3 \mathrm{PolyLog}\left[4, -e^{2 i (a+b x)}\right]\right)\right) \mathrm{Sec}[a] + \frac{(c + d x)^3 \mathrm{Sec}[a + b x]^2}{2 b} +$$

$$\left(c^3 \mathrm{Sec}[a] \left(\mathrm{Cos}[a] \mathrm{Log}[\mathrm{Cos}[a] \mathrm{Cos}[b x] - \mathrm{Sin}[a] \mathrm{Sin}[b x]] + b x \mathrm{Sin}[a]\right)\right) \Big/ \left(b \left(\mathrm{Cos}[a]^2 + \mathrm{Sin}[a]^2\right)\right) -$$

$$\left(3 c d^2 \mathrm{Sec}[a] \left(\mathrm{Cos}[a] \mathrm{Log}[\mathrm{Cos}[a] \mathrm{Cos}[b x] - \mathrm{Sin}[a] \mathrm{Sin}[b x]] + b x \mathrm{Sin}[a]\right)\right) \Big/ \left(b^3 \left(\mathrm{Cos}[a]^2 + \mathrm{Sin}[a]^2\right)\right) +$$

$$\left(3 c^2 d\, \mathrm{Csc}[a] \left(b^2 e^{-i \mathrm{ArcTan}[\mathrm{Cot}[a]]} x^2 - \frac{1}{\sqrt{1 + \mathrm{Cot}[a]^2}} \mathrm{Cot}[a] \left(i b x \left(-\pi - 2 \mathrm{ArcTan}[\mathrm{Cot}[a]]\right) - \pi \mathrm{Log}\left[1 + e^{-2 i b x}\right] - 2 \left(b x - \mathrm{ArcTan}[\mathrm{Cot}[a]]\right) \mathrm{Log}\left[1 - e^{2 i (b x - \mathrm{ArcTan}[\mathrm{Cot}[a]])}\right] + \pi \mathrm{Log}[\mathrm{Cos}[b x]] - 2 \mathrm{ArcTan}[\mathrm{Cot}[a]] \mathrm{Log}[\mathrm{Sin}[b x - \mathrm{ArcTan}[\mathrm{Cot}[a]]]] + i \mathrm{PolyLog}\left[2, e^{2 i (b x - \mathrm{ArcTan}[\mathrm{Cot}[a]])}\right]\right)\right) \mathrm{Sec}[a]\right) \Big/$$

$$\left(2 b^2 \sqrt{\mathrm{Csc}[a]^2 \left(\mathrm{Cos}[a]^2 + \mathrm{Sin}[a]^2\right)}\right) - \left(3 d^3 \mathrm{Csc}[a] \left(b^2 e^{-i \mathrm{ArcTan}[\mathrm{Cot}[a]]} x^2 - \frac{1}{\sqrt{1 + \mathrm{Cot}[a]^2}} \mathrm{Cot}[a] \left(i b x \left(-\pi - 2 \mathrm{ArcTan}[\mathrm{Cot}[a]]\right) - \pi \mathrm{Log}\left[1 + e^{-2 i b x}\right] - 2 \left(b x - \mathrm{ArcTan}[\mathrm{Cot}[a]]\right) \mathrm{Log}\left[1 - e^{2 i (b x - \mathrm{ArcTan}[\mathrm{Cot}[a]])}\right] + \pi \mathrm{Log}[\mathrm{Cos}[b x]] - 2 \mathrm{ArcTan}[\mathrm{Cot}[a]] \mathrm{Log}[\mathrm{Sin}[b x - \mathrm{ArcTan}[\mathrm{Cot}[a]]]] + i \mathrm{PolyLog}\left[2, e^{2 i (b x - \mathrm{ArcTan}[\mathrm{Cot}[a]])}\right]\right)\right) \mathrm{Sec}[a]\right) \Big/$$

$$\left(2 b^4 \sqrt{\mathrm{Csc}[a]^2 \left(\mathrm{Cos}[a]^2 + \mathrm{Sin}[a]^2\right)}\right) - \frac{1}{2 b^2} 3 \mathrm{Sec}[a] \mathrm{Sec}[a + b x] \left(c^2 d \mathrm{Sin}[b x] + 2 c d^2 x \mathrm{Sin}[b x] + d^3 x^2 \mathrm{Sin}[b x]\right) - \frac{1}{4} x \left(4 c^3 + 6 c^2 d x + 4 c d^2 x^2 + d^3 x^3\right) \mathrm{Tan}[a]$$

Problem 305: Result more than twice size of optimal antiderivative.

$$\int (c + d x)^2 \mathrm{Tan}[a + b x]^3 \, dx$$

Optimal (type 4, 169 leaves, 9 steps):

$$\frac{c\,d\,x}{b}+\frac{d^2 x^2}{2\,b}-\frac{i\,(c+d\,x)^3}{3\,d}+\frac{(c+d\,x)^2\,\text{Log}\left[1+e^{2\,i\,(a+b\,x)}\right]}{b}-\frac{d^2\,\text{Log}[\text{Cos}[a+b\,x]]}{b^3}-\frac{i\,d\,(c+d\,x)\,\text{PolyLog}\left[2,-e^{2\,i\,(a+b\,x)}\right]}{b^2}+\frac{d^2\,\text{PolyLog}\left[3,-e^{2\,i\,(a+b\,x)}\right]}{2\,b^3}-\frac{d\,(c+d\,x)\,\text{Tan}[a+b\,x]}{b^2}+\frac{(c+d\,x)^2\,\text{Tan}[a+b\,x]^2}{2\,b}$$

Result (type 4, 461 leaves):

$$-\frac{1}{12\,b^3}d^2\,e^{-i\,a}\left(2\,i\,b^2\,x^2\left(2\,b\,e^{2\,i\,a}\,x+3\,i\left(1+e^{2\,i\,a}\right)\text{Log}\left[1+e^{2\,i\,(a+b\,x)}\right]\right)+6\,i\,b\left(1+e^{2\,i\,a}\right)x\,\text{PolyLog}\left[2,-e^{2\,i\,(a+b\,x)}\right]-3\left(1+e^{2\,i\,a}\right)\text{PolyLog}\left[3,-e^{2\,i\,(a+b\,x)}\right]\right)\text{Sec}[a]+\frac{(c+d\,x)^2\,\text{Sec}[a+b\,x]^2}{2\,b}+$$
$$\left(c^2\,\text{Sec}[a]\left(\text{Cos}[a]\,\text{Log}[\text{Cos}[a]\,\text{Cos}[b\,x]-\text{Sin}[a]\,\text{Sin}[b\,x]]+b\,x\,\text{Sin}[a]\right)\right)/\left(b\left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)-$$
$$\left(d^2\,\text{Sec}[a]\left(\text{Cos}[a]\,\text{Log}[\text{Cos}[a]\,\text{Cos}[b\,x]-\text{Sin}[a]\,\text{Sin}[b\,x]]+b\,x\,\text{Sin}[a]\right)\right)/\left(b^3\left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)+$$
$$\left(c\,d\,\text{Csc}[a]\left(b^2\,e^{-i\,\text{ArcTan}[\text{Cot}[a]]}\,x^2-\frac{1}{\sqrt{1+\text{Cot}[a]^2}}\text{Cot}[a]\left(i\,b\,x\left(-\pi-2\,\text{ArcTan}[\text{Cot}[a]]\right)-\pi\,\text{Log}\left[1+e^{-2\,i\,b\,x}\right]-2\left(b\,x-\text{ArcTan}[\text{Cot}[a]]\right)\text{Log}\left[1-e^{2\,i\,(b\,x-\text{ArcTan}[\text{Cot}[a]])}\right]+\pi\,\text{Log}[\text{Cos}[b\,x]]-2\,\text{ArcTan}[\text{Cot}[a]]\,\text{Log}[\text{Sin}[b\,x-\text{ArcTan}[\text{Cot}[a]]]]+i\,\text{PolyLog}\left[2,e^{2\,i\,(b\,x-\text{ArcTan}[\text{Cot}[a]])}\right]\right)\right)\text{Sec}[a]\right)/$$
$$\left(b^2\sqrt{\text{Csc}[a]^2\left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)}\right)+\frac{\text{Sec}[a]\,\text{Sec}[a+b\,x]\left(-c\,d\,\text{Sin}[b\,x]-d^2\,x\,\text{Sin}[b\,x]\right)}{b^2}-\frac{1}{3}x\left(3\,c^2+3\,c\,d\,x+d^2\,x^2\right)\text{Tan}[a]$$

Problem 306: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 108 leaves, 7 steps):

$$\frac{d\,x}{2\,b}-\frac{i\,(c+d\,x)^2}{2\,d}+\frac{(c+d\,x)\,\text{Log}\left[1+e^{2\,i\,(a+b\,x)}\right]}{b}-\frac{i\,d\,\text{PolyLog}\left[2,-e^{2\,i\,(a+b\,x)}\right]}{2\,b^2}-\frac{d\,\text{Tan}[a+b\,x]}{2\,b^2}+\frac{(c+d\,x)\,\text{Tan}[a+b\,x]^2}{2\,b}$$

Result (type 4, 242 leaves):

$$\frac{c\,\text{Log}[\text{Cos}[a+b\,x]]}{b}+\frac{c\,\text{Sec}[a+b\,x]^2}{2\,b}+$$
$$\frac{d\,x\,\text{Sec}[a+b\,x]^2}{2\,b}+\Bigg(d\,\text{Csc}[a]\,\Bigg(b^2\,e^{-i\,\text{ArcTan}[\text{Cot}[a]]}\,x^2-\frac{1}{\sqrt{1+\text{Cot}[a]^2}}$$
$$\text{Cot}[a]\,\Big(i\,b\,x\,\big(-\pi-2\,\text{ArcTan}[\text{Cot}[a]]\big)-\pi\,\text{Log}\big[1+e^{-2\,i\,b\,x}\big]-2\,\big(b\,x-\text{ArcTan}[\text{Cot}[a]]\big)$$
$$\text{Log}\big[1-e^{2\,i\,(b\,x-\text{ArcTan}[\text{Cot}[a]])}\big]+\pi\,\text{Log}[\text{Cos}[b\,x]]-2\,\text{ArcTan}[\text{Cot}[a]]$$
$$\text{Log}[\text{Sin}[b\,x-\text{ArcTan}[\text{Cot}[a]]]]+i\,\text{PolyLog}\big[2,\,e^{2\,i\,(b\,x-\text{ArcTan}[\text{Cot}[a]])}\big]\Big)\Bigg)\,\text{Sec}[a]\Bigg)\Big/$$
$$\Big(2\,b^2\,\sqrt{\text{Csc}[a]^2\,\big(\text{Cos}[a]^2+\text{Sin}[a]^2\big)}\Big)-\frac{d\,\text{Sec}[a]\,\text{Sec}[a+b\,x]\,\text{Sin}[b\,x]}{2\,b^2}-\frac{1}{2}$$
$$d$$
$$x^2$$
$$\text{Tan}[a]$$

Problem 310: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 399 leaves, 25 steps):

$$\frac{2\,i\,d\,(c+d\,x)^3}{b^2}+\frac{(c+d\,x)^4}{2\,b}-\frac{2\,(c+d\,x)^4\,\text{ArcTanh}\big[e^{2\,i\,(a+b\,x)}\big]}{b}-$$
$$\frac{6\,d^2\,(c+d\,x)^2\,\text{Log}\big[1+e^{2\,i\,(a+b\,x)}\big]}{b^3}+\frac{6\,i\,d^3\,(c+d\,x)\,\text{PolyLog}\big[2,\,-e^{2\,i\,(a+b\,x)}\big]}{b^4}+$$
$$\frac{2\,i\,d\,(c+d\,x)^3\,\text{PolyLog}\big[2,\,-e^{2\,i\,(a+b\,x)}\big]}{b^2}-\frac{2\,i\,d\,(c+d\,x)^3\,\text{PolyLog}\big[2,\,e^{2\,i\,(a+b\,x)}\big]}{b^2}-$$
$$\frac{3\,d^4\,\text{PolyLog}\big[3,\,-e^{2\,i\,(a+b\,x)}\big]}{b^5}-\frac{3\,d^2\,(c+d\,x)^2\,\text{PolyLog}\big[3,\,-e^{2\,i\,(a+b\,x)}\big]}{b^3}+$$
$$\frac{3\,d^2\,(c+d\,x)^2\,\text{PolyLog}\big[3,\,e^{2\,i\,(a+b\,x)}\big]}{b^3}-\frac{3\,i\,d^3\,(c+d\,x)\,\text{PolyLog}\big[4,\,-e^{2\,i\,(a+b\,x)}\big]}{b^4}+$$
$$\frac{3\,i\,d^3\,(c+d\,x)\,\text{PolyLog}\big[4,\,e^{2\,i\,(a+b\,x)}\big]}{b^4}+\frac{3\,d^4\,\text{PolyLog}\big[5,\,-e^{2\,i\,(a+b\,x)}\big]}{2\,b^5}-$$
$$\frac{3\,d^4\,\text{PolyLog}\big[5,\,e^{2\,i\,(a+b\,x)}\big]}{2\,b^5}-\frac{2\,d\,(c+d\,x)^3\,\text{Tan}[a+b\,x]}{b^2}+\frac{(c+d\,x)^4\,\text{Tan}[a+b\,x]^2}{2\,b}$$

Result (type 4, 1790 leaves):

$$-\frac{1}{2\,b^3}c^2\,d^2\,e^{-i\,a}\,\text{Csc}[a]\,\Big(2\,b^2\,x^2\,\big(2\,b\,e^{2\,i\,a}\,x+3\,i\,\big(-1+e^{2\,i\,a}\big)\,\text{Log}\big[1-e^{2\,i\,(a+b\,x)}\big]\big)+$$
$$6\,b\,\big(-1+e^{2\,i\,a}\big)\,x\,\text{PolyLog}\big[2,\,e^{2\,i\,(a+b\,x)}\big]+3\,i\,\big(-1+e^{2\,i\,a}\big)\,\text{PolyLog}\big[3,\,e^{2\,i\,(a+b\,x)}\big]\Big)-$$
$$c\,d^3\,e^{i\,a}\,\text{Csc}[a]\,\Bigg(x^4+\big(-1+e^{-2\,i\,a}\big)\,x^4+\frac{1}{2\,b^4}e^{-2\,i\,a}\,\big(-1+e^{2\,i\,a}\big)\,\Big(2\,b^4\,x^4+4\,i\,b^3\,x^3\,\text{Log}\big[1-e^{2\,i\,(a+b\,x)}\big]+$$
$$6\,b^2\,x^2\,\text{PolyLog}\big[2,\,e^{2\,i\,(a+b\,x)}\big]+6\,i\,b\,x\,\text{PolyLog}\big[3,\,e^{2\,i\,(a+b\,x)}\big]-3\,\text{PolyLog}\big[4,\,e^{2\,i\,(a+b\,x)}\big]\Big)\Bigg)-$$

$$\frac{1}{5} d^4 e^{i a} \text{Csc}[a] \left(x^5+\left(-1+e^{-2 i a}\right) x^5+\frac{1}{4 b^5} e^{-2 i a} \left(-1+e^{2 i a}\right) \left(4 b^5 x^5+10 i b^4 x^4 \text{Log}\left[1-e^{2 i (a+b x)}\right]+20 b^3 x^3 \text{PolyLog}\left[2, e^{2 i (a+b x)}\right]+30 i b^2 x^2 \text{PolyLog}\left[3, e^{2 i (a+b x)}\right]-30 b x \text{PolyLog}\left[4, e^{2 i (a+b x)}\right]-15 i \text{PolyLog}\left[5, e^{2 i (a+b x)}\right]\right)\right)+$$

$$\frac{1}{5} x \left(5 c^4+10 c^3 d x+10 c^2 d^2 x^2+5 c d^3 x^3+d^4 x^4\right) \text{Csc}[a] \text{Sec}[a]+$$

$$\frac{1}{2 b^3} c^2 d^2 e^{-i a} \left(2 i b^2 x^2 \left(2 b e^{2 i a} x+3 i \left(1+e^{2 i a}\right) \text{Log}\left[1+e^{2 i (a+b x)}\right]\right)+6 i b \left(1+e^{2 i a}\right) x \text{PolyLog}\left[2,-e^{2 i (a+b x)}\right]-3 \left(1+e^{2 i a}\right) \text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]\right) \text{Sec}[a]+$$

$$\frac{1}{2 b^5} d^4 e^{-i a} \left(2 i b^2 x^2 \left(2 b e^{2 i a} x+3 i \left(1+e^{2 i a}\right) \text{Log}\left[1+e^{2 i (a+b x)}\right]\right)+6 i b \left(1+e^{2 i a}\right) x \text{PolyLog}\left[2,-e^{2 i (a+b x)}\right]-3 \left(1+e^{2 i a}\right) \text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]\right) \text{Sec}[a]-i c d^3 e^{i a} \left(-x^4+\left(1+e^{-2 i a}\right) x^4-\frac{1}{2 b^4} e^{-2 i a} \left(1+e^{2 i a}\right) \left(2 b^4 x^4+4 i b^3 x^3 \text{Log}\left[1+e^{2 i (a+b x)}\right]+6 b^2 x^2 \text{PolyLog}\left[2,-e^{2 i (a+b x)}\right]+6 i b x \text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]-3 \text{PolyLog}\left[4,-e^{2 i (a+b x)}\right]\right)\right) \text{Sec}[a]-$$

$$\frac{1}{5} i d^4 e^{i a} \left(-x^5+\left(1+e^{-2 i a}\right) x^5-\frac{1}{4 b^5} e^{-2 i a} \left(1+e^{2 i a}\right) \left(4 b^5 x^5+10 i b^4 x^4 \text{Log}\left[1+e^{2 i (a+b x)}\right]+20 b^3 x^3 \text{PolyLog}\left[2,-e^{2 i (a+b x)}\right]+30 i b^2 x^2 \text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]-30 b x \text{PolyLog}\left[4,-e^{2 i (a+b x)}\right]-15 i \text{PolyLog}\left[5,-e^{2 i (a+b x)}\right]\right)\right) \text{Sec}[a]+\frac{(c+d x)^4 \text{Sec}[a+b x]^2}{2 b}-$$

$$\left(c^4 \text{Sec}[a] \left(\text{Cos}[a] \text{Log}[\text{Cos}[a] \text{Cos}[b x]-\text{Sin}[a] \text{Sin}[b x]]+b x \text{Sin}[a]\right)\right) / \left(b \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)-$$

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

$$\left(c^4 \text{Csc}[a] \left(-b x \text{Cos}[a]+\text{Log}[\text{Cos}[b x] \text{Sin}[a]+\text{Cos}[a] \text{Sin}[b x]] \text{Sin}[a]\right)\right) / \left(b \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)-$$

$$\left(2 c^3 d \text{Csc}[a] \left(b^2 e^{-i \text{ArcTan}[\text{Cot}[a]]} x^2-\frac{1}{\sqrt{1+\text{Cot}[a]^2}} \text{Cot}[a] \left(i b x \left(-\pi-2 \text{ArcTan}[\text{Cot}[a]]\right)-\pi \text{Log}\left[1+e^{-2 i b x}\right]-2 \left(b x-\text{ArcTan}[\text{Cot}[a]]\right) \text{Log}\left[1-e^{2 i (b x-\text{ArcTan}[\text{Cot}[a]])}\right]+\pi \text{Log}[\text{Cos}[b x]]-2 \text{ArcTan}[\text{Cot}[a]] \text{Log}[\text{Sin}[b x-\text{ArcTan}[\text{Cot}[a]]]]+i \text{PolyLog}\left[2, e^{2 i (b x-\text{ArcTan}[\text{Cot}[a]])}\right]\right)\right) \text{Sec}[a]\right) /$$

$$\left(b^2 \sqrt{\text{Csc}[a]^2 \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)}\right)-\left(6 c d^3 \text{Csc}[a] \left(b^2 e^{-i \text{ArcTan}[\text{Cot}[a]]} x^2-\frac{1}{\sqrt{1+\text{Cot}[a]^2}} \text{Cot}[a] \left(i b x \left(-\pi-2 \text{ArcTan}[\text{Cot}[a]]\right)-\pi \text{Log}\left[1+e^{-2 i b x}\right]-2 \left(b x-\text{ArcTan}[\text{Cot}[a]]\right) \text{Log}\left[1-e^{2 i (b x-\text{ArcTan}[\text{Cot}[a]])}\right]+\pi \text{Log}[\text{Cos}[b x]]-2 \text{ArcTan}[\text{Cot}[a]]\right.\right.\right.$$

$$\text{Log}[\text{Sin}[b\,x-\text{ArcTan}[\text{Cot}[a]]]]+i\,\text{PolyLog}\left[2,\,e^{2\,i\,(b\,x-\text{ArcTan}[\text{Cot}[a]])}\right]\Big)\Big)\,\text{Sec}[a]\Big)\Big/$$

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

$$\left(c^3\,d\,\text{Sin}[b\,x]+3\,c^2\,d^2\,x\,\text{Sin}[b\,x]+3\,c\,d^3\,x^2\,\text{Sin}[b\,x]+d^4\,x^3\,\text{Sin}[b\,x]\right)-$$

$$\Bigg(2\,c^3\,d\,\text{Csc}[a]\,\text{Sec}[a]\,\Bigg(b^2\,e^{i\,\text{ArcTan}[\text{Tan}[a]]}\,x^2+\frac{1}{\sqrt{1+\text{Tan}[a]^2}}\Big(i\,b\,x\,(-\pi+2\,\text{ArcTan}[\text{Tan}[a]])-$$

$$\pi\,\text{Log}\left[1+e^{-2\,i\,b\,x}\right]-2\,(b\,x+\text{ArcTan}[\text{Tan}[a]])\,\text{Log}\left[1-e^{2\,i\,(b\,x+\text{ArcTan}[\text{Tan}[a]])}\right]+$$

$$\pi\,\text{Log}[\text{Cos}[b\,x]]+2\,\text{ArcTan}[\text{Tan}[a]]\,\text{Log}[\text{Sin}[b\,x+\text{ArcTan}[\text{Tan}[a]]]]+$$

$$i\,\text{PolyLog}\left[2,\,e^{2\,i\,(b\,x+\text{ArcTan}[\text{Tan}[a]])}\right]\Big)\,\text{Tan}[a]\Bigg)\Bigg)\Big/\left(b^2\sqrt{\text{Sec}[a]^2\,\left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)}\right)$$

Problem 311: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 325 leaves, 22 steps):

$$\frac{3\,i\,d\,(c+d\,x)^2}{2\,b^2}+\frac{(c+d\,x)^3}{2\,b}-\frac{2\,(c+d\,x)^3\,\text{ArcTanh}\left[e^{2\,i\,(a+b\,x)}\right]}{b}-\frac{3\,d^2\,(c+d\,x)\,\text{Log}\left[1+e^{2\,i\,(a+b\,x)}\right]}{b^3}+$$

$$\frac{3\,i\,d^3\,\text{PolyLog}\left[2,\,-e^{2\,i\,(a+b\,x)}\right]}{2\,b^4}+\frac{3\,i\,d\,(c+d\,x)^2\,\text{PolyLog}\left[2,\,-e^{2\,i\,(a+b\,x)}\right]}{2\,b^2}-$$

$$\frac{3\,i\,d\,(c+d\,x)^2\,\text{PolyLog}\left[2,\,e^{2\,i\,(a+b\,x)}\right]}{2\,b^2}-\frac{3\,d^2\,(c+d\,x)\,\text{PolyLog}\left[3,\,-e^{2\,i\,(a+b\,x)}\right]}{2\,b^3}+$$

$$\frac{3\,d^2\,(c+d\,x)\,\text{PolyLog}\left[3,\,e^{2\,i\,(a+b\,x)}\right]}{2\,b^3}-\frac{3\,i\,d^3\,\text{PolyLog}\left[4,\,-e^{2\,i\,(a+b\,x)}\right]}{4\,b^4}+$$

$$\frac{3\,i\,d^3\,\text{PolyLog}\left[4,\,e^{2\,i\,(a+b\,x)}\right]}{4\,b^4}-\frac{3\,d\,(c+d\,x)^2\,\text{Tan}[a+b\,x]}{2\,b^2}+\frac{(c+d\,x)^3\,\text{Tan}[a+b\,x]^2}{2\,b}$$

Result (type 4, 1294 leaves):

$$-\frac{1}{4\,b^3}c\,d^2\,e^{-i\,a}\,\text{Csc}[a]\,\left(2\,b^2\,x^2\,\left(2\,b\,e^{2\,i\,a}\,x+3\,i\,\left(-1+e^{2\,i\,a}\right)\,\text{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]\right)+\right.$$

$$\left.6\,b\,\left(-1+e^{2\,i\,a}\right)\,x\,\text{PolyLog}\left[2,\,e^{2\,i\,(a+b\,x)}\right]+3\,i\,\left(-1+e^{2\,i\,a}\right)\,\text{PolyLog}\left[3,\,e^{2\,i\,(a+b\,x)}\right]\right)-$$

$$\frac{1}{4}d^3\,e^{i\,a}\,\text{Csc}[a]\,\Bigg(x^4+\left(-1+e^{-2\,i\,a}\right)\,x^4+\frac{1}{2\,b^4}e^{-2\,i\,a}\,\left(-1+e^{2\,i\,a}\right)\,\left(2\,b^4\,x^4+4\,i\,b^3\,x^3\,\text{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]+\right.$$

$$\left.6\,b^2\,x^2\,\text{PolyLog}\left[2,\,e^{2\,i\,(a+b\,x)}\right]+6\,i\,b\,x\,\text{PolyLog}\left[3,\,e^{2\,i\,(a+b\,x)}\right]-3\,\text{PolyLog}\left[4,\,e^{2\,i\,(a+b\,x)}\right]\right)\Bigg)+$$

$$\frac{1}{4}x\,\left(4\,c^3+6\,c^2\,d\,x+4\,c\,d^2\,x^2+d^3\,x^3\right)\,\text{Csc}[a]\,\text{Sec}[a]+\frac{1}{4\,b^3}c\,d^2\,e^{-i\,a}$$

$$\left(2\,i\,b^2\,x^2\,\left(2\,b\,e^{2\,i\,a}\,x+3\,i\,\left(1+e^{2\,i\,a}\right)\,\text{Log}\left[1+e^{2\,i\,(a+b\,x)}\right]\right)+\right.$$

$$\left.6\,i\,b\,\left(1+e^{2\,i\,a}\right)\,x\,\text{PolyLog}\left[2,\,-e^{2\,i\,(a+b\,x)}\right]-3\,\left(1+e^{2\,i\,a}\right)\,\text{PolyLog}\left[3,\,-e^{2\,i\,(a+b\,x)}\right]\right)\,\text{Sec}[a]-$$

$$\frac{1}{4} i d^3 e^{i a} \left(-x^4 + \left(1 + e^{-2 i a}\right) x^4 - \frac{1}{2 b^4} e^{-2 i a} \left(1 + e^{2 i a}\right) \left(2 b^4 x^4 + 4 i b^3 x^3 \text{Log}\left[1 + e^{2 i (a+b x)}\right] + 6 b^2 x^2 \text{PolyLog}\left[2, -e^{2 i (a+b x)}\right] + 6 i b x \, \text{PolyLog}\left[3, -e^{2 i (a+b x)}\right] - 3 \text{PolyLog}\left[4, -e^{2 i (a+b x)}\right]\right)\right) \text{Sec}[a] + \frac{(c + d x)^3 \text{Sec}[a + b x]^2}{2 b} -$$

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

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

$$\left(c^3 \text{Csc}[a] \left(-b x \text{Cos}[a] + \text{Log}[\text{Cos}[b x] \text{Sin}[a] + \text{Cos}[a] \text{Sin}[b x]] \text{Sin}[a]\right)\right) \Big/ \left(b \left(\text{Cos}[a]^2 + \text{Sin}[a]^2\right)\right) -$$

$$\left(3 c^2 d \text{Csc}[a] \left(b^2 e^{-i \text{ArcTan}[\text{Cot}[a]]} x^2 - \frac{1}{\sqrt{1 + \text{Cot}[a]^2}} \text{Cot}[a] \left(i b x \left(-\pi - 2 \text{ArcTan}[\text{Cot}[a]]\right) - \pi \text{Log}\left[1 + e^{-2 i b x}\right] - 2 \left(b x - \text{ArcTan}[\text{Cot}[a]]\right) \text{Log}\left[1 - e^{2 i (b x - \text{ArcTan}[\text{Cot}[a]])}\right] + \pi \text{Log}[\text{Cos}[b x]] - 2 \text{ArcTan}[\text{Cot}[a]] \text{Log}[\text{Sin}[b x - \text{ArcTan}[\text{Cot}[a]]]] + i \text{PolyLog}\left[2, e^{2 i (b x - \text{ArcTan}[\text{Cot}[a]])}\right]\right) \text{Sec}[a]\right)\right) \Big/ \left(2 b^2 \sqrt{\text{Csc}[a]^2 \left(\text{Cos}[a]^2 + \text{Sin}[a]^2\right)}\right) -$$

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

$$\left(3 c^2 d \text{Csc}[a] \text{Sec}[a] \left(b^2 e^{i \text{ArcTan}[\text{Tan}[a]]} x^2 + \frac{1}{\sqrt{1 + \text{Tan}[a]^2}} \left(i b x \left(-\pi + 2 \text{ArcTan}[\text{Tan}[a]]\right) - \pi \text{Log}\left[1 + e^{-2 i b x}\right] - 2 \left(b x + \text{ArcTan}[\text{Tan}[a]]\right) \text{Log}\left[1 - e^{2 i (b x + \text{ArcTan}[\text{Tan}[a]])}\right] + \pi \text{Log}[\text{Cos}[b x]] + 2 \text{ArcTan}[\text{Tan}[a]] \text{Log}[\text{Sin}[b x + \text{ArcTan}[\text{Tan}[a]]]] + i \text{PolyLog}\left[2, e^{2 i (b x + \text{ArcTan}[\text{Tan}[a]])}\right]\right) \text{Tan}[a]\right)\right) \Big/ \left(2 b^2 \sqrt{\text{Sec}[a]^2 \left(\text{Cos}[a]^2 + \text{Sin}[a]^2\right)}\right)$$

Problem 312: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 201 leaves, 17 steps):

$$\frac{c\,d\,x}{b}+\frac{d^2\,x^2}{2\,b}-\frac{2\,(c+d\,x)^2\,\text{ArcTanh}\left[e^{2\,i\,(a+b\,x)}\right]}{b}-\frac{d^2\,\text{Log}[\text{Cos}[a+b\,x]]}{b^3}+\frac{i\,d\,(c+d\,x)\,\text{PolyLog}\left[2,-e^{2\,i\,(a+b\,x)}\right]}{b^2}-\frac{i\,d\,(c+d\,x)\,\text{PolyLog}\left[2,e^{2\,i\,(a+b\,x)}\right]}{b^2}-\frac{d^2\,\text{PolyLog}\left[3,-e^{2\,i\,(a+b\,x)}\right]}{2\,b^3}+\frac{d^2\,\text{PolyLog}\left[3,e^{2\,i\,(a+b\,x)}\right]}{2\,b^3}-\frac{d\,(c+d\,x)\,\text{Tan}[a+b\,x]}{b^2}+\frac{(c+d\,x)^2\,\text{Tan}[a+b\,x]^2}{2\,b}$$

Result (type 4, 788 leaves):

$$-\frac{1}{12\,b^3}d^2\,e^{-i\,a}\,\text{Csc}[a]\,\Big(2\,b^2\,x^2\,\left(2\,b\,e^{2\,i\,a}\,x+3\,i\,\left(-1+e^{2\,i\,a}\right)\,\text{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]\right)+6\,b\,\left(-1+e^{2\,i\,a}\right)\,x\,\text{PolyLog}\left[2,e^{2\,i\,(a+b\,x)}\right]+3\,i\,\left(-1+e^{2\,i\,a}\right)\,\text{PolyLog}\left[3,e^{2\,i\,(a+b\,x)}\right]\Big)+\frac{1}{3}\,x\,\left(3\,c^2+3\,c\,d\,x+d^2\,x^2\right)\,\text{Csc}[a]\,\text{Sec}[a]+\frac{1}{12\,b^3}d^2\,e^{-i\,a}\,\Big(2\,i\,b^2\,x^2\,\left(2\,b\,e^{2\,i\,a}\,x+3\,i\,\left(1+e^{2\,i\,a}\right)\,\text{Log}\left[1+e^{2\,i\,(a+b\,x)}\right]\right)+6\,i\,b\,\left(1+e^{2\,i\,a}\right)\,x\,\text{PolyLog}\left[2,-e^{2\,i\,(a+b\,x)}\right]-3\,\left(1+e^{2\,i\,a}\right)\,\text{PolyLog}\left[3,-e^{2\,i\,(a+b\,x)}\right]\Big)\,\text{Sec}[a]+\frac{(c+d\,x)^2\,\text{Sec}[a+b\,x]^2}{2\,b}-$$

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

$$\left(c\,d\,\text{Csc}[a]\,\left(b^2\,e^{-i\,\text{ArcTan}[\text{Cot}[a]]}\,x^2-\frac{1}{\sqrt{1+\text{Cot}[a]^2}}\text{Cot}[a]\,\Big(i\,b\,x\,(-\pi-2\,\text{ArcTan}[\text{Cot}[a]])-\pi\,\text{Log}\left[1+e^{-2\,i\,b\,x}\right]-2\,(b\,x-\text{ArcTan}[\text{Cot}[a]])\,\text{Log}\left[1-e^{2\,i\,(b\,x-\text{ArcTan}[\text{Cot}[a]])}\right]+\pi\,\text{Log}[\text{Cos}[b\,x]]-2\,\text{ArcTan}[\text{Cot}[a]]\,\text{Log}[\text{Sin}[b\,x-\text{ArcTan}[\text{Cot}[a]]]]+i\,\text{PolyLog}\left[2,e^{2\,i\,(b\,x-\text{ArcTan}[\text{Cot}[a]])}\right]\Big)\right)\,\text{Sec}[a]\right)\Big/\left(b^2\,\sqrt{\text{Csc}[a]^2\,\left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)}\right)+\frac{\text{Sec}[a]\,\text{Sec}[a+b\,x]\,\left(-c\,d\,\text{Sin}[b\,x]-d^2\,x\,\text{Sin}[b\,x]\right)}{b^2}-$$

$$\left(c\,d\,\text{Csc}[a]\,\text{Sec}[a]\,\left(b^2\,e^{i\,\text{ArcTan}[\text{Tan}[a]]}\,x^2+\frac{1}{\sqrt{1+\text{Tan}[a]^2}}\Big(i\,b\,x\,(-\pi+2\,\text{ArcTan}[\text{Tan}[a]])-\pi\,\text{Log}\left[1+e^{-2\,i\,b\,x}\right]-2\,(b\,x+\text{ArcTan}[\text{Tan}[a]])\,\text{Log}\left[1-e^{2\,i\,(b\,x+\text{ArcTan}[\text{Tan}[a]])}\right]+\pi\,\text{Log}[\text{Cos}[b\,x]]+2\,\text{ArcTan}[\text{Tan}[a]]\,\text{Log}[\text{Sin}[b\,x+\text{ArcTan}[\text{Tan}[a]]]]+i\,\text{PolyLog}\left[2,e^{2\,i\,(b\,x+\text{ArcTan}[\text{Tan}[a]])}\right]\Big)\,\text{Tan}[a]\right)\right)\Big/\left(b^2\,\sqrt{\text{Sec}[a]^2\,\left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)}\right)$$

Problem 318: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 341 leaves, 31 steps):

$$-\frac{3\,i\,(c+d\,x)^2\,\text{ArcTan}\left[e^{i\,(a+b\,x)}\right]}{b}+\frac{2\,d^2\,x\,\text{ArcTanh}\left[e^{i\,(a+b\,x)}\right]}{b^2}-\frac{6\,d\,(c+d\,x)\,\text{ArcTanh}\left[e^{i\,(a+b\,x)}\right]}{b^2}-\frac{d^2\,x\,\text{ArcTanh}[\text{Cos}[a+b\,x]]}{b^2}+\frac{d\,(c+d\,x)\,\text{ArcTanh}[\text{Cos}[a+b\,x]]}{b^2}+\frac{d^2\,\text{ArcTanh}[\text{Sin}[a+b\,x]]}{b^3}-\frac{3\,(c+d\,x)^2\,\text{Csc}[a+b\,x]}{2\,b}+\frac{2\,i\,d^2\,\text{PolyLog}\left[2,-e^{i\,(a+b\,x)}\right]}{b^3}+\frac{3\,i\,d\,(c+d\,x)\,\text{PolyLog}\left[2,-i\,e^{i\,(a+b\,x)}\right]}{b^2}-\frac{3\,i\,d\,(c+d\,x)\,\text{PolyLog}\left[2,i\,e^{i\,(a+b\,x)}\right]}{b^2}-\frac{2\,i\,d^2\,\text{PolyLog}\left[2,e^{i\,(a+b\,x)}\right]}{b^3}-\frac{3\,d^2\,\text{PolyLog}\left[3,-i\,e^{i\,(a+b\,x)}\right]}{b^3}+\frac{3\,d^2\,\text{PolyLog}\left[3,i\,e^{i\,(a+b\,x)}\right]}{b^3}-\frac{d\,(c+d\,x)\,\text{Sec}[a+b\,x]}{b^2}+\frac{(c+d\,x)^2\,\text{Csc}[a+b\,x]\,\text{Sec}[a+b\,x]^2}{2\,b}$$

Result (type 4, 889 leaves):

$$-\frac{1}{2\,b^3}\left(6\,i\,b^2\,c^2\,\text{ArcTan}\left[e^{i\,(a+b\,x)}\right]+4\,i\,d^2\,\text{ArcTan}\left[e^{i\,(a+b\,x)}\right]-6\,b^2\,c\,d\,x\,\text{Log}\left[1-i\,e^{i\,(a+b\,x)}\right]-3\,b^2\,d^2\,x^2\,\text{Log}\left[1-i\,e^{i\,(a+b\,x)}\right]+6\,b^2\,c\,d\,x\,\text{Log}\left[1+i\,e^{i\,(a+b\,x)}\right]+3\,b^2\,d^2\,x^2\,\text{Log}\left[1+i\,e^{i\,(a+b\,x)}\right]-6\,i\,b\,d\,(c+d\,x)\,\text{PolyLog}\left[2,-i\,e^{i\,(a+b\,x)}\right]+6\,i\,b\,d\,(c+d\,x)\,\text{PolyLog}\left[2,i\,e^{i\,(a+b\,x)}\right]+6\,d^2\,\text{PolyLog}\left[3,-i\,e^{i\,(a+b\,x)}\right]-6\,d^2\,\text{PolyLog}\left[3,i\,e^{i\,(a+b\,x)}\right]\right)-\frac{(c+d\,x)\,\text{Csc}[a]\,\text{Sec}[a]\,(b\,c\,\text{Cos}[a]+b\,d\,x\,\text{Cos}[a]+d\,\text{Sin}[a])}{b^2}+\frac{4\,i\,c\,d\,\text{ArcTan}\left[\frac{i\,\text{Cos}[a]-i\,\text{Sin}[a]\,\text{Tan}\left[\frac{b\,x}{2}\right]}{\sqrt{\text{Cos}[a]^2+\text{Sin}[a]^2}}\right]}{b^2\,\sqrt{\text{Cos}[a]^2+\text{Sin}[a]^2}}+\frac{\text{Sec}\left[\frac{a}{2}\right]\,\text{Sec}\left[\frac{a}{2}+\frac{b\,x}{2}\right]\left(-c^2\,\text{Sin}\left[\frac{b\,x}{2}\right]-2\,c\,d\,x\,\text{Sin}\left[\frac{b\,x}{2}\right]-d^2\,x^2\,\text{Sin}\left[\frac{b\,x}{2}\right]\right)}{2\,b}+\frac{\text{Csc}\left[\frac{a}{2}\right]\,\text{Csc}\left[\frac{a}{2}+\frac{b\,x}{2}\right]\left(c^2\,\text{Sin}\left[\frac{b\,x}{2}\right]+2\,c\,d\,x\,\text{Sin}\left[\frac{b\,x}{2}\right]+d^2\,x^2\,\text{Sin}\left[\frac{b\,x}{2}\right]\right)}{2\,b}+\frac{c^2+2\,c\,d\,x+d^2\,x^2}{4\,b\left(\text{Cos}\left[\frac{a}{2}+\frac{b\,x}{2}\right]-\text{Sin}\left[\frac{a}{2}+\frac{b\,x}{2}\right]\right)^2}+\frac{-c\,d\,\text{Sin}\left[\frac{b\,x}{2}\right]-d^2\,x\,\text{Sin}\left[\frac{b\,x}{2}\right]}{b^2\left(\text{Cos}\left[\frac{a}{2}\right]-\text{Sin}\left[\frac{a}{2}\right]\right)\left(\text{Cos}\left[\frac{a}{2}+\frac{b\,x}{2}\right]-\text{Sin}\left[\frac{a}{2}+\frac{b\,x}{2}\right]\right)}+\frac{-c^2-2\,c\,d\,x-d^2\,x^2}{4\,b\left(\text{Cos}\left[\frac{a}{2}+\frac{b\,x}{2}\right]+\text{Sin}\left[\frac{a}{2}+\frac{b\,x}{2}\right]\right)^2}+\frac{c\,d\,\text{Sin}\left[\frac{b\,x}{2}\right]+d^2\,x\,\text{Sin}\left[\frac{b\,x}{2}\right]}{b^2\left(\text{Cos}\left[\frac{a}{2}\right]+\text{Sin}\left[\frac{a}{2}\right]\right)\left(\text{Cos}\left[\frac{a}{2}+\frac{b\,x}{2}\right]+\text{Sin}\left[\frac{a}{2}+\frac{b\,x}{2}\right]\right)}+\frac{1}{b^3}2\,d^2\left(-\frac{2\,\text{ArcTan}[\text{Tan}[a]]\,\text{ArcTanh}\left[\frac{-\text{Cos}[a]+\text{Sin}[a]\,\text{Tan}\left[\frac{b\,x}{2}\right]}{\sqrt{\text{Cos}[a]^2+\text{Sin}[a]^2}}\right]}{\sqrt{\text{Cos}[a]^2+\text{Sin}[a]^2}}+\frac{1}{\sqrt{1+\text{Tan}[a]^2}}\left(\left(b\,x+\text{ArcTan}[\text{Tan}[a]]\right)\left(\text{Log}\left[1-e^{i\,(b\,x+\text{ArcTan}[\text{Tan}[a]])}\right]-\text{Log}\left[1+e^{i\,(b\,x+\text{ArcTan}[\text{Tan}[a]])}\right]\right)+i\left(\text{PolyLog}\left[2,-e^{i\,(b\,x+\text{ArcTan}[\text{Tan}[a]])}\right]-\text{PolyLog}\left[2,e^{i\,(b\,x+\text{ArcTan}[\text{Tan}[a]])}\right]\right)\right)\text{Sec}[a]\right)$$

Problem 319: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 162 leaves, 13 steps):

$$-\frac{3\,i\,d\,x\,\text{ArcTan}\left[e^{i\,(a+b\,x)}\right]}{b}-\frac{d\,\text{ArcTanh}[\text{Cos}[a+b\,x]]}{b^2}+$$
$$\frac{3\,c\,\text{ArcTanh}[\text{Sin}[a+b\,x]]}{2\,b}-\frac{3\,(c+d\,x)\,\text{Csc}[a+b\,x]}{2\,b}+\frac{3\,i\,d\,\text{PolyLog}\left[2,-i\,e^{i\,(a+b\,x)}\right]}{2\,b^2}-$$
$$\frac{3\,i\,d\,\text{PolyLog}\left[2,i\,e^{i\,(a+b\,x)}\right]}{2\,b^2}-\frac{d\,\text{Sec}[a+b\,x]}{2\,b^2}+\frac{(c+d\,x)\,\text{Csc}[a+b\,x]\,\text{Sec}[a+b\,x]^2}{2\,b}$$

Result (type 4, 772 leaves) :

$$
\begin{aligned}
&-\frac{c\,\mathrm{Cot}\left[\frac{1}{2}(a+b\,x)\right]}{2\,b}+\frac{d\left(a\,\mathrm{Cos}\left[\frac{1}{2}(a+b\,x)\right]-(a+b\,x)\,\mathrm{Cos}\left[\frac{1}{2}(a+b\,x)\right]\right)\mathrm{Csc}\left[\frac{1}{2}(a+b\,x)\right]}{2\,b^{2}}-\\
&\frac{d\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(a+b\,x)\right]\right]}{b^{2}}-\frac{3\,c\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(a+b\,x)\right]-\mathrm{Sin}\left[\frac{1}{2}(a+b\,x)\right]\right]}{2\,b}+\\
&\frac{d\,\mathrm{Log}\left[\mathrm{Sin}\left[\frac{1}{2}(a+b\,x)\right]\right]}{b^{2}}+\frac{3\,c\,\mathrm{Log}\left[\mathrm{Cos}\left[\frac{1}{2}(a+b\,x)\right]+\mathrm{Sin}\left[\frac{1}{2}(a+b\,x)\right]\right]}{2\,b}+\\
&\frac{1}{2\,b^{2}}\,3\,d\,\Bigg(a\left(\mathrm{Log}\left[1-\mathrm{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right]-\mathrm{Log}\left[1+\mathrm{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right]\right)+\\
&\quad(a+b\,x)\left(-\mathrm{Log}\left[1-\mathrm{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right]+\mathrm{Log}\left[1+\mathrm{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right]\right)-\\
&\quad i\,\Bigg(\mathrm{Log}\left[1-\mathrm{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right]\mathrm{Log}\left[\left(\frac{1}{2}+\frac{i}{2}\right)\left(-i+\mathrm{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)\right]-\\
&\qquad\mathrm{Log}\left[\frac{1}{2}\left((1+i)-(1-i)\,\mathrm{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)\right]\mathrm{Log}\left[1+\mathrm{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right]+\\
&\qquad\mathrm{Log}\left[\left(-\frac{1}{2}-\frac{i}{2}\right)\left(i+\mathrm{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)\right]\mathrm{Log}\left[1+\mathrm{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right]-\\
&\qquad\mathrm{Log}\left[1-\mathrm{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right]\mathrm{Log}\left[\frac{1}{2}\left((1+i)+(1-i)\,\mathrm{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)\right]+\\
&\qquad\mathrm{PolyLog}\left[2,\left(-\frac{1}{2}-\frac{i}{2}\right)\left(-1+\mathrm{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)\right]-\\
&\qquad\mathrm{PolyLog}\left[2,\left(-\frac{1}{2}+\frac{i}{2}\right)\left(-1+\mathrm{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)\right]-\mathrm{PolyLog}\Big[2,\\
&\qquad\left(\frac{1}{2}-\frac{i}{2}\right)\left(1+\mathrm{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)\Big]+\mathrm{PolyLog}\left[2,\left(\frac{1}{2}+\frac{i}{2}\right)\left(1+\mathrm{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)\right]\Bigg)\Bigg)+\\
&\frac{c}{4\,b\left(\mathrm{Cos}\left[\frac{1}{2}(a+b\,x)\right]-\mathrm{Sin}\left[\frac{1}{2}(a+b\,x)\right]\right)^{2}}+\frac{d\,x}{4\,b\left(\mathrm{Cos}\left[\frac{1}{2}(a+b\,x)\right]-\mathrm{Sin}\left[\frac{1}{2}(a+b\,x)\right]\right)^{2}}-\\
&\frac{d\,\mathrm{Sin}\left[\frac{1}{2}(a+b\,x)\right]}{2\,b^{2}\left(\mathrm{Cos}\left[\frac{1}{2}(a+b\,x)\right]-\mathrm{Sin}\left[\frac{1}{2}(a+b\,x)\right]\right)}-\\
&\frac{c}{4\,b\left(\mathrm{Cos}\left[\frac{1}{2}(a+b\,x)\right]+\mathrm{Sin}\left[\frac{1}{2}(a+b\,x)\right]\right)^{2}}-\\
&\frac{d\,x}{4\,b\left(\mathrm{Cos}\left[\frac{1}{2}(a+b\,x)\right]+\mathrm{Sin}\left[\frac{1}{2}(a+b\,x)\right]\right)^{2}}+\\
&\frac{d\,\mathrm{Sin}\left[\frac{1}{2}(a+b\,x)\right]}{2\,b^{2}\left(\mathrm{Cos}\left[\frac{1}{2}(a+b\,x)\right]+\mathrm{Sin}\left[\frac{1}{2}(a+b\,x)\right]\right)}+\\
&\frac{d\,\mathrm{Sec}\left[\frac{1}{2}(a+b\,x)\right]\left(a\,\mathrm{Sin}\left[\frac{1}{2}(a+b\,x)\right]-(a+b\,x)\,\mathrm{Sin}\left[\frac{1}{2}(a+b\,x)\right]\right)}{2\,b^{2}}-\\
&\frac{c\,\mathrm{Tan}\left[\frac{1}{2}(a+b\,x)\right]}{2\,b}
\end{aligned}
$$

Problem 324: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 190 leaves, 10 steps):

$$-\frac{4\,(c+d\,x)^2\,\mathrm{ArcTanh}\left[e^{2\,i\,(a+b\,x)}\right]}{b}-\frac{d^2\,\mathrm{ArcTanh}[\mathrm{Cos}[2\,a+2\,b\,x]]}{b^3}-\frac{2\,d\,(c+d\,x)\,\mathrm{Csc}[2\,a+2\,b\,x]}{b^2}-\frac{2\,(c+d\,x)^2\,\mathrm{Cot}[2\,a+2\,b\,x]\,\mathrm{Csc}[2\,a+2\,b\,x]}{b}+\frac{2\,i\,d\,(c+d\,x)\,\mathrm{PolyLog}\left[2,-e^{2\,i\,(a+b\,x)}\right]}{b^2}-\frac{2\,i\,d\,(c+d\,x)\,\mathrm{PolyLog}\left[2,e^{2\,i\,(a+b\,x)}\right]}{b^2}-\frac{d^2\,\mathrm{PolyLog}\left[3,-e^{2\,i\,(a+b\,x)}\right]}{b^3}+\frac{d^2\,\mathrm{PolyLog}\left[3,e^{2\,i\,(a+b\,x)}\right]}{b^3}$$

Result (type 4, 429 leaves):

$$8\left(-\frac{d\,(c+d\,x)\,\mathrm{Csc}[2\,a]}{4\,b^2}+\frac{(-c^2-2\,c\,d\,x-d^2\,x^2)\,\mathrm{Csc}[a+b\,x]^2}{16\,b}+\frac{1}{8\,b^3}\left(2\,b^2\,c^2\,\mathrm{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]+d^2\,\mathrm{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]+4\,b^2\,c\,d\,x\,\mathrm{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]+2\,b^2\,d^2\,x^2\,\mathrm{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]-2\,b^2\,c^2\,\mathrm{Log}\left[1+e^{2\,i\,(a+b\,x)}\right]-d^2\,\mathrm{Log}\left[1+e^{2\,i\,(a+b\,x)}\right]-4\,b^2\,c\,d\,x\,\mathrm{Log}\left[1+e^{2\,i\,(a+b\,x)}\right]-2\,b^2\,d^2\,x^2\,\mathrm{Log}\left[1+e^{2\,i\,(a+b\,x)}\right]+2\,i\,b\,d\,(c+d\,x)\,\mathrm{PolyLog}\left[2,-e^{2\,i\,(a+b\,x)}\right]-2\,i\,b\,d\,(c+d\,x)\,\mathrm{PolyLog}\left[2,e^{2\,i\,(a+b\,x)}\right]-d^2\,\mathrm{PolyLog}\left[3,-e^{2\,i\,(a+b\,x)}\right]+d^2\,\mathrm{PolyLog}\left[3,e^{2\,i\,(a+b\,x)}\right]\right)+\frac{(c^2+2\,c\,d\,x+d^2\,x^2)\,\mathrm{Sec}[a+b\,x]^2}{16\,b}+\frac{\mathrm{Sec}[a]\,\mathrm{Sec}[a+b\,x]\,(-c\,d\,\mathrm{Sin}[b\,x]-d^2\,x\,\mathrm{Sin}[b\,x])}{8\,b^2}+\frac{\mathrm{Csc}[a]\,\mathrm{Csc}[a+b\,x]\,(c\,d\,\mathrm{Sin}[b\,x]+d^2\,x\,\mathrm{Sin}[b\,x])}{8\,b^2}\right)$$

Problem 325: Result more than twice size of optimal antiderivative.

$$\int (c+d\,x)\,\mathrm{Csc}[a+b\,x]^3\,\mathrm{Sec}[a+b\,x]^3\,dx$$

Optimal (type 4, 110 leaves, 7 steps):

$$-\frac{4\,(c+d\,x)\,\mathrm{ArcTanh}\left[e^{2\,i\,(a+b\,x)}\right]}{b}-\frac{d\,\mathrm{Csc}[2\,a+2\,b\,x]}{b^2}-\frac{2\,(c+d\,x)\,\mathrm{Cot}[2\,a+2\,b\,x]\,\mathrm{Csc}[2\,a+2\,b\,x]}{b}+\frac{i\,d\,\mathrm{PolyLog}\left[2,-e^{2\,i\,(a+b\,x)}\right]}{b^2}-\frac{i\,d\,\mathrm{PolyLog}\left[2,e^{2\,i\,(a+b\,x)}\right]}{b^2}$$

Result (type 4, 236 leaves):

$$-\frac{d\,\text{Cot}[a+b\,x]}{2\,b^2}-\frac{c\,\text{Csc}[a+b\,x]^2}{2\,b}+\frac{d\,\left(2\,a-2\,(a+b\,x)\right)\,\text{Csc}[a+b\,x]^2}{4\,b^2}-\frac{2\,c\,\text{Log}[\text{Cos}[a+b\,x]]}{b}+\frac{2\,c\,\text{Log}[\text{Sin}[a+b\,x]]}{b}-\frac{2\,a\,d\,\text{Log}[\text{Tan}[a+b\,x]]}{b^2}+\frac{1}{b^2}d\,\Big(2\,(a+b\,x)\,\left(\text{Log}\left[1-e^{2\,i\,(a+b\,x)}\right]-\text{Log}\left[1+e^{2\,i\,(a+b\,x)}\right]\right)+i\,\left(\text{PolyLog}\left[2,-e^{2\,i\,(a+b\,x)}\right]-\text{PolyLog}\left[2,e^{2\,i\,(a+b\,x)}\right]\right)\Big)+\frac{c\,\text{Sec}[a+b\,x]^2}{2\,b}+\frac{d\,\left(-2\,a+2\,(a+b\,x)\right)\,\text{Sec}[a+b\,x]^2}{4\,b^2}-\frac{d\,\text{Tan}[a+b\,x]}{2\,b^2}$$

Problem 331: Result more than twice size of optimal antiderivative.

$$\int \frac{x\,\text{Sin}[a+b\,x]}{\sqrt{\text{Cos}[a+b\,x]}}\,dx$$

Optimal (type 4, 33 leaves, 2 steps):

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

Result (type 4, 181 leaves):

$$\frac{1}{b^2\,\sqrt{\frac{\text{Cos}[a+b\,x]}{1+\text{Cos}[a+b\,x]}}}4\,\left(\text{Cos}\left[\frac{1}{2}\,(a+b\,x)\right]^2\right)^{3/2}\,\sqrt{\frac{\text{Cos}[a+b\,x]}{(1+\text{Cos}[a+b\,x])^2}}\,\sqrt{\frac{1}{1+\text{Cos}[a+b\,x]}}\,\Bigg(2\,\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right],-1\right]\,\sqrt{\text{Sec}\left[\frac{1}{2}\,(a+b\,x)\right]^2}-2\,\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right],-1\right]\,\sqrt{\text{Sec}\left[\frac{1}{2}\,(a+b\,x)\right]^2}+\sqrt{\text{Cos}[a+b\,x]\,\text{Sec}\left[\frac{1}{2}\,(a+b\,x)\right]^2}\,\left(-b\,x+2\,\text{Tan}\left[\frac{1}{2}\,(a+b\,x)\right]\right)\Bigg)$$

Problem 340: Result more than twice size of optimal antiderivative.

$$\int x\,\sqrt{\text{Sec}[a+b\,x]}\,\text{Sin}[a+b\,x]\,dx$$

Optimal (type 4, 53 leaves, 3 steps):

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

Result (type 4, 132 leaves):

$$\frac{1}{b^2\sqrt{\text{Sec}[a+b x]}}2\left(-b x+\frac{2\,\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right],-1\right]\text{Sec}\left[\frac{1}{2}(a+b x)\right]^2}{\sqrt{\text{Cos}[a+b x]\,\text{Sec}\left[\frac{1}{2}(a+b x)\right]^4}}-\frac{2\,\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right],-1\right]\text{Sec}\left[\frac{1}{2}(a+b x)\right]^2}{\sqrt{\text{Cos}[a+b x]\,\text{Sec}\left[\frac{1}{2}(a+b x)\right]^4}}+2\,\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right)$$

Problem 342: Result more than twice size of optimal antiderivative.

$$\int\frac{x\,\text{Sin}[a+b x]}{\text{Sec}[a+b x]^{3/2}}\,dx$$

Optimal (type 4, 80 leaves, 4 steps):

$$-\frac{2 x}{5\,b\,\text{Sec}[a+b x]^{5/2}}+\frac{12\sqrt{\text{Cos}[a+b x]}\,\text{EllipticE}\left[\frac{1}{2}(a+b x),2\right]\sqrt{\text{Sec}[a+b x]}}{25\,b^2}+\frac{4\,\text{Sin}[a+b x]}{25\,b^2\,\text{Sec}[a+b x]^{3/2}}$$

Result (type 4, 212 leaves):

$$\frac{1}{b}\sqrt{\text{Sec}[a+b x]}\left(-\frac{1}{10}x\,\text{Cos}[a+b x]-\frac{1}{10}x\,\text{Cos}[3(a+b x)]+\frac{\text{Sin}[a+b x]}{25 b}+\frac{\text{Sin}[3(a+b x)]}{25 b}\right)+\frac{1}{25 b^2}\text{Cos}\left[\frac{1}{2}(a+b x)\right]^2\sqrt{\text{Sec}[a+b x]}\left(12\,\text{EllipticE}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right],-1\right]\sqrt{\text{Cos}[a+b x]\,\text{Sec}\left[\frac{1}{2}(a+b x)\right]^4}-12\,\text{EllipticF}\left[\text{ArcSin}\left[\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right],-1\right]\sqrt{\text{Cos}[a+b x]\,\text{Sec}\left[\frac{1}{2}(a+b x)\right]^4}+\left(-5 a+5(a+b x)-12\,\text{Tan}\left[\frac{1}{2}(a+b x)\right]\right)\left(-1+\text{Tan}\left[\frac{1}{2}(a+b x)\right]^2\right)\right)$$

Problem 345: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int x\,\text{Cos}[a+b x]\,\text{Sin}[a+b x]^{3/2}\,dx$$

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

$$-\frac{12\,\text{EllipticE}\left[\frac{1}{2}\left(a-\frac{\pi}{2}+b\,x\right),2\right]}{25\,b^2}+\frac{4\,\text{Cos}[a+b\,x]\,\text{Sin}[a+b\,x]^{3/2}}{25\,b^2}+\frac{2\,x\,\text{Sin}[a+b\,x]^{5/2}}{5\,b}$$

Result (type 4, 186 leaves):

$$-\frac{1}{25\,b^2\sqrt{\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}}\sqrt{\text{Sin}[a+b\,x]}\left(12\,(-1)^{3/4}\,\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[(-1)^{1/4}\sqrt{\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}\right],-1\right]\sqrt{\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2}-12\,(-1)^{3/4}\,\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[(-1)^{1/4}\sqrt{\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}\right],-1\right]\sqrt{\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2}+\sqrt{\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}\left(-5\,b\,x+5\,b\,x\,\text{Cos}[2\,(a+b\,x)]-2\,\text{Sin}[2\,(a+b\,x)]+12\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)\right)$$

Problem 347: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{x\,\text{Cos}[a+b\,x]}{\sqrt{\text{Sin}[a+b\,x]}}\,dx$$

Optimal (type 4, 38 leaves, 2 steps):

$$-\frac{4\,\text{EllipticE}\left[\frac{1}{2}\left(a-\frac{\pi}{2}+b\,x\right),2\right]}{b^2}+\frac{2\,x\sqrt{\text{Sin}[a+b\,x]}}{b}$$

Result (type 4, 162 leaves):

$$-\left(\left(2\sqrt{\text{Sin}[a+b\,x]}\left(2\,(-1)^{3/4}\,\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[(-1)^{1/4}\sqrt{\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}\right],-1\right]\sqrt{\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2}-2\,(-1)^{3/4}\,\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[(-1)^{1/4}\sqrt{\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}\right],-1\right]\sqrt{\text{Sec}\left[\frac{1}{2}(a+b\,x)\right]^2}+\sqrt{\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}\left(-b\,x+2\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)\right)\right)\Big/\left(b^2\sqrt{\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}\right)\right)$$

Problem 356: Result unnecessarily involves complex numbers and more than

twice size of optimal antiderivative.

$$\int x \operatorname{Cos}[a+b x] \sqrt{\operatorname{Csc}[a+b x]}\, dx$$

Optimal (type 4, 58 leaves, 3 steps):

$$\frac{2 x}{b \sqrt{\operatorname{Csc}[a+b x]}}-\frac{4 \sqrt{\operatorname{Csc}[a+b x]}\ \operatorname{EllipticE}\left[\frac{1}{2}\left(a-\frac{\pi}{2}+b x\right), 2\right] \sqrt{\operatorname{Sin}[a+b x]}}{b^2}$$

Result (type 4, 161 leaves):

$$\left(4 \sqrt{\operatorname{Csc}[a+b x]} \left(-2 (-1)^{3/4} \operatorname{EllipticE}\left[i \operatorname{ArcSinh}\left[(-1)^{1/4} \sqrt{\operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]}\right], -1\right]+ 2 (-1)^{3/4} \operatorname{EllipticF}\left[i \operatorname{ArcSinh}\left[(-1)^{1/4} \sqrt{\operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]}\right], -1\right]+ \frac{\left(b x-2 \operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]\right) \sqrt{\operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]}}{\sqrt{\operatorname{Sec}\left[\frac{1}{2}(a+b x)\right]^2}}\right) \sqrt{\operatorname{Tan}\left[\frac{1}{2}(a+b x)\right]}\right) \Big/ \left(b^2 \sqrt{\operatorname{Sec}\left[\frac{1}{2}(a+b x)\right]^2}\right)$$

Problem 358: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 85 leaves, 4 steps):

$$\frac{2 x}{5 b \operatorname{Csc}[a+b x]^{5/2}}+\frac{4 \operatorname{Cos}[a+b x]}{25 b^2 \operatorname{Csc}[a+b x]^{3/2}}-\frac{12 \sqrt{\operatorname{Csc}[a+b x]}\ \operatorname{EllipticE}\left[\frac{1}{2}\left(a-\frac{\pi}{2}+b x\right), 2\right] \sqrt{\operatorname{Sin}[a+b x]}}{25 b^2}$$

Result (type 4, 190 leaves):

$$\left(5\,b\,x - 5\,b\,x\,\text{Cos}[2\,(a+b\,x)] + 2\,\text{Sin}[2\,(a+b\,x)] - \left(12\,(-1)^{3/4}\sqrt{2}\,\sqrt{\frac{1}{1+\text{Cos}[a+b\,x]}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}\sqrt{\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}\right],-1\right]\right)\Big/\left(\sqrt{\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}\right) + \left(12\,(-1)^{3/4}\sqrt{2}\,\sqrt{\frac{1}{1+\text{Cos}[a+b\,x]}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}\sqrt{\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}\right],-1\right]\right)\Big/\left(\sqrt{\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]}\right) - 12\,\text{Tan}\left[\frac{1}{2}(a+b\,x)\right]\right)\Big/\left(25\,b^2\sqrt{\text{Csc}[a+b\,x]}\right)$$

Problem 376: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 255 leaves, 20 steps):

$$-\frac{6\,(c+d\,x)^3\,\text{ArcTanh}\left[e^{i\,(a+b\,x)}\right]}{b} - \frac{24\,d^2\,(c+d\,x)\,\text{Cos}[a+b\,x]}{b^3} + \frac{4\,(c+d\,x)^3\,\text{Cos}[a+b\,x]}{b} + \frac{9\,i\,d\,(c+d\,x)^2\,\text{PolyLog}\left[2,-e^{i\,(a+b\,x)}\right]}{b^2} - \frac{9\,i\,d\,(c+d\,x)^2\,\text{PolyLog}\left[2,e^{i\,(a+b\,x)}\right]}{b^2} - \frac{18\,d^2\,(c+d\,x)\,\text{PolyLog}\left[3,-e^{i\,(a+b\,x)}\right]}{b^3} + \frac{18\,d^2\,(c+d\,x)\,\text{PolyLog}\left[3,e^{i\,(a+b\,x)}\right]}{b^3} - \frac{18\,i\,d^3\,\text{PolyLog}\left[4,-e^{i\,(a+b\,x)}\right]}{b^4} + \frac{18\,i\,d^3\,\text{PolyLog}\left[4,e^{i\,(a+b\,x)}\right]}{b^4} + \frac{24\,d^3\,\text{Sin}[a+b\,x]}{b^4} - \frac{12\,d\,(c+d\,x)^2\,\text{Sin}[a+b\,x]}{b^2}$$

Result (type 4, 515 leaves):

$$\frac{1}{b^4}\left(-6 b^3 c^3 \text{ArcTanh}\left[e^{i (a+b x)}\right]+4 b^3 c^3 \text{Cos}[a+b x]-24 b c d^2 \text{Cos}[a+b x]+12 b^3 c^2 d x \text{Cos}[a+b x]-24 b d^3 x \text{Cos}[a+b x]+12 b^3 c d^2 x^2 \text{Cos}[a+b x]+4 b^3 d^3 x^3 \text{Cos}[a+b x]+9 b^3 c^2 d x \text{Log}\left[1-e^{i (a+b x)}\right]+9 b^3 c d^2 x^2 \text{Log}\left[1-e^{i (a+b x)}\right]+3 b^3 d^3 x^3 \text{Log}\left[1-e^{i (a+b x)}\right]-9 b^3 c^2 d x \text{Log}\left[1+e^{i (a+b x)}\right]-9 b^3 c d^2 x^2 \text{Log}\left[1+e^{i (a+b x)}\right]-3 b^3 d^3 x^3 \text{Log}\left[1+e^{i (a+b x)}\right]+9 i b^2 d (c+d x)^2 \text{PolyLog}\left[2,-e^{i (a+b x)}\right]-9 i b^2 d (c+d x)^2 \text{PolyLog}\left[2,e^{i (a+b x)}\right]-18 b c d^2 \text{PolyLog}\left[3,-e^{i (a+b x)}\right]-18 b d^3 x \text{PolyLog}\left[3,-e^{i (a+b x)}\right]+18 b c d^2 \text{PolyLog}\left[3,e^{i (a+b x)}\right]+18 b d^3 x \text{PolyLog}\left[3,e^{i (a+b x)}\right]-18 i d^3 \text{PolyLog}\left[4,-e^{i (a+b x)}\right]+18 i d^3 \text{PolyLog}\left[4,e^{i (a+b x)}\right]-12 b^2 c^2 d \text{Sin}[a+b x]+24 d^3 \text{Sin}[a+b x]-24 b^2 c d^2 x \text{Sin}[a+b x]-12 b^2 d^3 x^2 \text{Sin}[a+b x]\right)$$

Problem 382: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 299 leaves, 20 steps):

$$\frac{6 c d^3 x}{b^3}+\frac{3 d^4 x^2}{b^3}-\frac{(c+d x)^4}{b}-\frac{i (c+d x)^5}{5 d}+\frac{(c+d x)^4 \text{Log}\left[1+e^{2 i (a+b x)}\right]}{b}-\frac{2 i d (c+d x)^3 \text{PolyLog}\left[2,-e^{2 i (a+b x)}\right]}{b^2}+\frac{3 d^2 (c+d x)^2 \text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]}{b^3}+\frac{3 i d^3 (c+d x) \text{PolyLog}\left[4,-e^{2 i (a+b x)}\right]}{b^4}-\frac{3 d^4 \text{PolyLog}\left[5,-e^{2 i (a+b x)}\right]}{2 b^5}-\frac{6 d^3 (c+d x) \text{Cos}[a+b x] \text{Sin}[a+b x]}{b^4}+\frac{4 d (c+d x)^3 \text{Cos}[a+b x] \text{Sin}[a+b x]}{b^2}+\frac{3 d^4 \text{Sin}[a+b x]^2}{b^5}-\frac{6 d^2 (c+d x)^2 \text{Sin}[a+b x]^2}{b^3}+\frac{2 (c+d x)^4 \text{Sin}[a+b x]^2}{b}$$

Result (type 4, 2517 leaves):

$$-\frac{1}{2 b^3}c^2 d^2 e^{-i a} \left(2 i b^2 x^2 \left(2 b e^{2 i a} x+3 i \left(1+e^{2 i a}\right) \text{Log}\left[1+e^{2 i (a+b x)}\right]\right)+6 i b \left(1+e^{2 i a}\right) x \text{PolyLog}\left[2,-e^{2 i (a+b x)}\right]-3 \left(1+e^{2 i a}\right) \text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]\right) \text{Sec}[a]+i c d^3 e^{i a} \left(-x^4+\left(1+e^{-2 i a}\right) x^4-\frac{1}{2 b^4}e^{-2 i a} \left(1+e^{2 i a}\right) \left(2 b^4 x^4+4 i b^3 x^3 \text{Log}\left[1+e^{2 i (a+b x)}\right]+6 b^2 x^2 \text{PolyLog}\left[2,-e^{2 i (a+b x)}\right]+6 i b x \text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]-3 \text{PolyLog}\left[4,-e^{2 i (a+b x)}\right]\right)\right) \text{Sec}[a]+\frac{1}{5} i d^4 e^{i a} \left(-x^5+\left(1+e^{-2 i a}\right) x^5-\frac{1}{4 b^5}e^{-2 i a} \left(1+e^{2 i a}\right) \left(4 b^5 x^5+10 i b^4 x^4 \text{Log}\left[1+e^{2 i (a+b x)}\right]+20 b^3 x^3 \text{PolyLog}\left[2,-e^{2 i (a+b x)}\right]+30 i b^2 x^2 \text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]-30 b x \text{PolyLog}\left[4,-e^{2 i (a+b x)}\right]-15 i \text{PolyLog}\left[5,-e^{2 i (a+b x)}\right]\right)\right) \text{Sec}[a]+\left(c^4 \text{Sec}[a] (\text{Cos}[a] \text{Log}[\text{Cos}[a] \text{Cos}[b x]-\text{Sin}[a] \text{Sin}[b x]]+b x \text{Sin}[a])\right)/\left(b \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)+$$

$$\left(2 c^3 d \operatorname{Csc}[a] \left(b^2 e^{-i \operatorname{ArcTan}[\operatorname{Cot}[a]]} x^2 - \frac{1}{\sqrt{1+\operatorname{Cot}[a]^2}} \operatorname{Cot}[a] \left(i b x \left(-\pi - 2 \operatorname{ArcTan}[\operatorname{Cot}[a]]\right) - \pi \operatorname{Log}\left[1+e^{-2 i b x}\right] - 2 \left(b x - \operatorname{ArcTan}[\operatorname{Cot}[a]]\right) \operatorname{Log}\left[1 - e^{2 i (b x - \operatorname{ArcTan}[\operatorname{Cot}[a]])}\right] + \pi \operatorname{Log}[\operatorname{Cos}[b x]] - 2 \operatorname{ArcTan}[\operatorname{Cot}[a]] \operatorname{Log}[\operatorname{Sin}[b x - \operatorname{ArcTan}[\operatorname{Cot}[a]]]] + i \operatorname{PolyLog}\left[2, e^{2 i (b x - \operatorname{ArcTan}[\operatorname{Cot}[a]])}\right]\right)\right) \operatorname{Sec}[a]\right) \Big/$$

$$\left(b^2 \sqrt{\operatorname{Csc}[a]^2 \left(\operatorname{Cos}[a]^2 + \operatorname{Sin}[a]^2\right)}\right) + \operatorname{Sec}[a] \left(\frac{\operatorname{Cos}[2 a + 2 b x]}{40 b^5} - \frac{i \operatorname{Sin}[2 a + 2 b x]}{40 b^5}\right)$$

$$\left(-20 b^4 c^4 \operatorname{Cos}[a] + 40 i b^3 c^3 d \operatorname{Cos}[a] + 60 b^2 c^2 d^2 \operatorname{Cos}[a] - 60 i b c d^3 \operatorname{Cos}[a] - 30 d^4 \operatorname{Cos}[a] - 80 b^4 c^3 d x \operatorname{Cos}[a] + 120 i b^3 c^2 d^2 x \operatorname{Cos}[a] + 120 b^2 c d^3 x \operatorname{Cos}[a] - 60 i b d^4 x \operatorname{Cos}[a] - 120 b^4 c^2 d^2 x^2 \operatorname{Cos}[a] + 120 i b^3 c d^3 x^2 \operatorname{Cos}[a] + 60 b^2 d^4 x^2 \operatorname{Cos}[a] - 80 b^4 c d^3 x^3 \operatorname{Cos}[a] + 40 i b^3 d^4 x^3 \operatorname{Cos}[a] - 20 b^4 d^4 x^4 \operatorname{Cos}[a] - 20 i b^5 c^4 x \operatorname{Cos}[a + 2 b x] - 40 i b^5 c^3 d x^2 \operatorname{Cos}[a + 2 b x] - 40 i b^5 c^2 d^2 x^3 \operatorname{Cos}[a + 2 b x] - 20 i b^5 c d^3 x^4 \operatorname{Cos}[a + 2 b x] - 4 i b^5 d^4 x^5 \operatorname{Cos}[a + 2 b x] + 20 i b^5 c^4 x \operatorname{Cos}[3 a + 2 b x] + 40 i b^5 c^3 d x^2 \operatorname{Cos}[3 a + 2 b x] + 40 i b^5 c^2 d^2 x^3 \operatorname{Cos}[3 a + 2 b x] + 20 i b^5 c d^3 x^4 \operatorname{Cos}[3 a + 2 b x] + 4 i b^5 d^4 x^5 \operatorname{Cos}[3 a + 2 b x] - 10 b^4 c^4 \operatorname{Cos}[3 a + 4 b x] - 20 i b^3 c^3 d \operatorname{Cos}[3 a + 4 b x] + 30 b^2 c^2 d^2 \operatorname{Cos}[3 a + 4 b x] + 30 i b c d^3 \operatorname{Cos}[3 a + 4 b x] - 15 d^4 \operatorname{Cos}[3 a + 4 b x] - 40 b^4 c^3 d x \operatorname{Cos}[3 a + 4 b x] - 60 i b^3 c^2 d^2 x \operatorname{Cos}[3 a + 4 b x] + 60 b^2 c d^3 x \operatorname{Cos}[3 a + 4 b x] + 30 i b d^4 x \operatorname{Cos}[3 a + 4 b x] - 60 b^4 c^2 d^2 x^2 \operatorname{Cos}[3 a + 4 b x] - 60 i b^3 c d^3 x^2 \operatorname{Cos}[3 a + 4 b x] + 30 b^2 d^4 x^2 \operatorname{Cos}[3 a + 4 b x] - 40 b^4 c d^3 x^3 \operatorname{Cos}[3 a + 4 b x] - 20 i b^3 d^4 x^3 \operatorname{Cos}[3 a + 4 b x] - 10 b^4 d^4 x^4 \operatorname{Cos}[3 a + 4 b x] - 10 b^4 c^4 \operatorname{Cos}[5 a + 4 b x] - 20 i b^3 c^3 d \operatorname{Cos}[5 a + 4 b x] + 30 b^2 c^2 d^2 \operatorname{Cos}[5 a + 4 b x] + 30 i b c d^3 \operatorname{Cos}[5 a + 4 b x] - 15 d^4 \operatorname{Cos}[5 a + 4 b x] - 40 b^4 c^3 d x \operatorname{Cos}[5 a + 4 b x] - 60 i b^3 c^2 d^2 x \operatorname{Cos}[5 a + 4 b x] + 60 b^2 c d^3 x \operatorname{Cos}[5 a + 4 b x] + 30 i b d^4 x \operatorname{Cos}[5 a + 4 b x] - 60 b^4 c^2 d^2 x^2 \operatorname{Cos}[5 a + 4 b x] - 60 i b^3 c d^3 x^2 \operatorname{Cos}[5 a + 4 b x] + 30 b^2 d^4 x^2 \operatorname{Cos}[5 a + 4 b x] - 40 b^4 c d^3 x^3 \operatorname{Cos}[5 a + 4 b x] - 20 i b^3 d^4 x^3 \operatorname{Cos}[5 a + 4 b x] - 10 b^4 d^4 x^4 \operatorname{Cos}[5 a + 4 b x] + 20 b^5 c^4 x \operatorname{Sin}[a + 2 b x] + 40 b^5 c^3 d x^2 \operatorname{Sin}[a + 2 b x] + 40 b^5 c^2 d^2 x^3 \operatorname{Sin}[a + 2 b x] + 20 b^5 c d^3 x^4 \operatorname{Sin}[a + 2 b x] + 4 b^5 d^4 x^5 \operatorname{Sin}[a + 2 b x] - 20 b^5 c^4 x \operatorname{Sin}[3 a + 2 b x] - 40 b^5 c^3 d x^2 \operatorname{Sin}[3 a + 2 b x] - 40 b^5 c^2 d^2 x^3 \operatorname{Sin}[3 a + 2 b x] - 20 b^5 c d^3 x^4 \operatorname{Sin}[3 a + 2 b x] - 4 b^5 d^4 x^5 \operatorname{Sin}[3 a + 2 b x] - 10 i b^4 c^4 \operatorname{Sin}[3 a + 4 b x] + 20 b^3 c^3 d \operatorname{Sin}[3 a + 4 b x] + 30 i b^2 c^2 d^2 \operatorname{Sin}[3 a + 4 b x] - 30 b c d^3 \operatorname{Sin}[3 a + 4 b x] - 15 i d^4 \operatorname{Sin}[3 a + 4 b x] - 40 i b^4 c^3 d x \operatorname{Sin}[3 a + 4 b x] + 60 b^3 c^2 d^2 x \operatorname{Sin}[3 a + 4 b x] + 60 i b^2 c d^3 x \operatorname{Sin}[3 a + 4 b x] - 30 b d^4 x \operatorname{Sin}[3 a + 4 b x] - 60 i b^4 c^2 d^2 x^2 \operatorname{Sin}[3 a + 4 b x] + 60 b^3 c d^3 x^2 \operatorname{Sin}[3 a + 4 b x] + 30 i b^2 d^4 x^2 \operatorname{Sin}[3 a + 4 b x] - 40 i b^4 c d^3 x^3 \operatorname{Sin}[3 a + 4 b x] + 20 b^3 d^4 x^3 \operatorname{Sin}[3 a + 4 b x] - 10 i b^4 d^4 x^4 \operatorname{Sin}[3 a + 4 b x] - 10 i b^4 c^4 \operatorname{Sin}[5 a + 4 b x] + 20 b^3 c^3 d \operatorname{Sin}[5 a + 4 b x] + 30 i b^2 c^2 d^2 \operatorname{Sin}[5 a + 4 b x] - 30 b c d^3 \operatorname{Sin}[5 a + 4 b x] - 15 i d^4 \operatorname{Sin}[5 a + 4 b x] - 40 i b^4 c^3 d x \operatorname{Sin}[5 a + 4 b x] + 60 b^3 c^2 d^2 x \operatorname{Sin}[5 a + 4 b x] + 60 i b^2 c d^3 x \operatorname{Sin}[5 a + 4 b x] - 30 b d^4 x \operatorname{Sin}[5 a + 4 b x] - 60 i b^4 c^2 d^2 x^2 \operatorname{Sin}[5 a + 4 b x] + 60 b^3 c d^3 x^2 \operatorname{Sin}[5 a + 4 b x] + 30 i b^2 d^4 x^2 \operatorname{Sin}[5 a + 4 b x] - 40 i b^4 c d^3 x^3 \operatorname{Sin}[5 a + 4 b x] + 20 b^3 d^4 x^3 \operatorname{Sin}[5 a + 4 b x] - 10 i b^4 d^4 x^4 \operatorname{Sin}[5 a + 4 b x]\right)$$

Problem 383: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 242 leaves, 19 steps):

$$\frac{3 d^3 x}{2 b^3}-\frac{(c+d x)^3}{b}-\frac{i (c+d x)^4}{4 d}+\frac{(c+d x)^3 \operatorname{Log}\left[1+e^{2 i (a+b x)}\right]}{b}-$$
$$\frac{3 i d (c+d x)^2 \operatorname{PolyLog}\left[2,-e^{2 i (a+b x)}\right]}{2 b^2}+\frac{3 d^2 (c+d x) \operatorname{PolyLog}\left[3,-e^{2 i (a+b x)}\right]}{2 b^3}+$$
$$\frac{3 i d^3 \operatorname{PolyLog}\left[4,-e^{2 i (a+b x)}\right]}{4 b^4}-\frac{3 d^3 \operatorname{Cos}[a+b x] \operatorname{Sin}[a+b x]}{2 b^4}+$$
$$\frac{3 d (c+d x)^2 \operatorname{Cos}[a+b x] \operatorname{Sin}[a+b x]}{b^2}-\frac{3 d^2 (c+d x) \operatorname{Sin}[a+b x]^2}{b^3}+\frac{2 (c+d x)^3 \operatorname{Sin}[a+b x]^2}{b}$$

Result (type 4, 1733 leaves) :

$$-\frac{1}{4 b^3} c\, d^2\, e^{-i a} \left(2 i b^2 x^2 \left(2 b e^{2 i a} x+3 i \left(1+e^{2 i a}\right) \text{Log}\left[1+e^{2 i (a+b x)}\right]\right)+ 6 i b \left(1+e^{2 i a}\right) x \,\text{PolyLog}\left[2,-e^{2 i (a+b x)}\right]-3 \left(1+e^{2 i a}\right) \text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]\right) \text{Sec}[a]+ \frac{1}{4} i d^3 e^{i a} \left(-x^4+\left(1+e^{-2 i a}\right) x^4-\frac{1}{2 b^4} e^{-2 i a} \left(1+e^{2 i a}\right) \left(2 b^4 x^4+4 i b^3 x^3 \text{Log}\left[1+e^{2 i (a+b x)}\right]+6 b^2 x^2 \text{PolyLog}\left[2,-e^{2 i (a+b x)}\right]+6 i b x \,\text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]-3 \text{PolyLog}\left[4,-e^{2 i (a+b x)}\right]\right)\right) \text{Sec}[a]+\left(c^3 \text{Sec}[a] \left(\text{Cos}[a] \text{Log}[\text{Cos}[a] \text{Cos}[b x]-\text{Sin}[a] \text{Sin}[b x]]+b x \text{Sin}[a]\right)\right) \Big/ \left(b \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)+ \left(3 c^2 d \,\text{Csc}[a] \left(b^2 e^{-i \text{ArcTan}[\text{Cot}[a]]} x^2-\frac{1}{\sqrt{1+\text{Cot}[a]^2}} \text{Cot}[a] \left(i b x \left(-\pi-2 \text{ArcTan}[\text{Cot}[a]]\right)-\pi \text{Log}\left[1+e^{-2 i b x}\right]-2 \left(b x-\text{ArcTan}[\text{Cot}[a]]\right) \text{Log}\left[1-e^{2 i (b x-\text{ArcTan}[\text{Cot}[a]])}\right]+\pi \text{Log}[\text{Cos}[b x]]-2 \text{ArcTan}[\text{Cot}[a]] \text{Log}[\text{Sin}[b x-\text{ArcTan}[\text{Cot}[a]]]]+i \,\text{PolyLog}\left[2,e^{2 i (b x-\text{ArcTan}[\text{Cot}[a]])}\right]\right)\right) \text{Sec}[a]\right) \Big/ \left(2 b^2 \sqrt{\text{Csc}[a]^2 \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)}\right)+\text{Sec}[a] \left(\frac{\text{Cos}[2 a+2 b x]}{16 b^4}-\frac{i \,\text{Sin}[2 a+2 b x]}{16 b^4}\right)$$

$$\left(-8 b^3 c^3 \text{Cos}[a]+12 i b^2 c^2 d \,\text{Cos}[a]+12 b c d^2 \text{Cos}[a]-6 i d^3 \text{Cos}[a]-24 b^3 c^2 d x \,\text{Cos}[a]+ 24 i b^2 c d^2 x \,\text{Cos}[a]+12 b d^3 x \,\text{Cos}[a]-24 b^3 c d^2 x^2 \text{Cos}[a]+12 i b^2 d^3 x^2 \text{Cos}[a]- 8 b^3 d^3 x^3 \text{Cos}[a]-8 i b^4 c^3 x \,\text{Cos}[a+2 b x]-12 i b^4 c^2 d x^2 \text{Cos}[a+2 b x]- 8 i b^4 c d^2 x^3 \text{Cos}[a+2 b x]-2 i b^4 d^3 x^4 \text{Cos}[a+2 b x]+8 i b^4 c^3 x \,\text{Cos}[3 a+2 b x]+ 12 i b^4 c^2 d x^2 \text{Cos}[3 a+2 b x]+8 i b^4 c d^2 x^3 \text{Cos}[3 a+2 b x]+2 i b^4 d^3 x^4 \text{Cos}[3 a+2 b x]- 4 b^3 c^3 \text{Cos}[3 a+4 b x]-6 i b^2 c^2 d \,\text{Cos}[3 a+4 b x]+6 b c d^2 \text{Cos}[3 a+4 b x]+ 3 i d^3 \text{Cos}[3 a+4 b x]-12 b^3 c^2 d x \,\text{Cos}[3 a+4 b x]-12 i b^2 c d^2 x \,\text{Cos}[3 a+4 b x]+ 6 b d^3 x \,\text{Cos}[3 a+4 b x]-12 b^3 c d^2 x^2 \text{Cos}[3 a+4 b x]-6 i b^2 d^3 x^2 \text{Cos}[3 a+4 b x]- 4 b^3 d^3 x^3 \text{Cos}[3 a+4 b x]-4 b^3 c^3 \text{Cos}[5 a+4 b x]-6 i b^2 c^2 d \,\text{Cos}[5 a+4 b x]+ 6 b c d^2 \text{Cos}[5 a+4 b x]+3 i d^3 \text{Cos}[5 a+4 b x]-12 b^3 c^2 d x \,\text{Cos}[5 a+4 b x]- 12 i b^2 c d^2 x \,\text{Cos}[5 a+4 b x]+6 b d^3 x \,\text{Cos}[5 a+4 b x]-12 b^3 c d^2 x^2 \text{Cos}[5 a+4 b x]- 6 i b^2 d^3 x^2 \text{Cos}[5 a+4 b x]-4 b^3 d^3 x^3 \text{Cos}[5 a+4 b x]+8 b^4 c^3 x \,\text{Sin}[a+2 b x]+ 12 b^4 c^2 d x^2 \text{Sin}[a+2 b x]+8 b^4 c d^2 x^3 \text{Sin}[a+2 b x]+2 b^4 d^3 x^4 \text{Sin}[a+2 b x]- 8 b^4 c^3 x \,\text{Sin}[3 a+2 b x]-12 b^4 c^2 d x^2 \text{Sin}[3 a+2 b x]-8 b^4 c d^2 x^3 \text{Sin}[3 a+2 b x]- 2 b^4 d^3 x^4 \text{Sin}[3 a+2 b x]-4 i b^3 c^3 \text{Sin}[3 a+4 b x]+6 b^2 c^2 d \,\text{Sin}[3 a+4 b x]+ 6 i b c d^2 \text{Sin}[3 a+4 b x]-3 d^3 \text{Sin}[3 a+4 b x]-12 i b^3 c^2 d x \,\text{Sin}[3 a+4 b x]+ 12 b^2 c d^2 x \,\text{Sin}[3 a+4 b x]+6 i b d^3 x \,\text{Sin}[3 a+4 b x]-12 i b^3 c d^2 x^2 \text{Sin}[3 a+4 b x]+ 6 b^2 d^3 x^2 \text{Sin}[3 a+4 b x]-4 i b^3 d^3 x^3 \text{Sin}[3 a+4 b x]-4 i b^3 c^3 \text{Sin}[5 a+4 b x]+ 6 b^2 c^2 d \,\text{Sin}[5 a+4 b x]+6 i b c d^2 \text{Sin}[5 a+4 b x]-3 d^3 \text{Sin}[5 a+4 b x]- 12 i b^3 c^2 d x \,\text{Sin}[5 a+4 b x]+12 b^2 c d^2 x \,\text{Sin}[5 a+4 b x]+6 i b d^3 x \,\text{Sin}[5 a+4 b x]- 12 i b^3 c d^2 x^2 \text{Sin}[5 a+4 b x]+6 b^2 d^3 x^2 \text{Sin}[5 a+4 b x]-4 i b^3 d^3 x^3 \text{Sin}[5 a+4 b x]\right)$$

Problem 384: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 173 leaves, 14 steps):

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

Result (type 4, 523 leaves):

$$-\frac{1}{12 b^3}d^2 e^{-i a} \left(2 i b^2 x^2 \left(2 b e^{2 i a} x+3 i \left(1+e^{2 i a}\right) \text{Log}\left[1+e^{2 i (a+b x)}\right]\right)+6 i b \left(1+e^{2 i a}\right) x \text{PolyLog}\left[2,-e^{2 i (a+b x)}\right]-3 \left(1+e^{2 i a}\right) \text{PolyLog}\left[3,-e^{2 i (a+b x)}\right]\right) \text{Sec}[a]+\left(c^2 \text{Sec}[a] (\text{Cos}[a] \text{Log}[\text{Cos}[a] \text{Cos}[b x]-\text{Sin}[a] \text{Sin}[b x]]+b x \text{Sin}[a])\right)/\left(b \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)\right)+\left(c d \text{Csc}[a] \left(b^2 e^{-i \text{ArcTan}[\text{Cot}[a]]} x^2-\frac{1}{\sqrt{1+\text{Cot}[a]^2}}\text{Cot}[a] (i b x (-\pi-2 \text{ArcTan}[\text{Cot}[a]])-\pi \text{Log}\left[1+e^{-2 i b x}\right]-2 (b x-\text{ArcTan}[\text{Cot}[a]]) \text{Log}\left[1-e^{2 i (b x-\text{ArcTan}[\text{Cot}[a]])}\right]+\pi \text{Log}[\text{Cos}[b x]]-2 \text{ArcTan}[\text{Cot}[a]] \text{Log}[\text{Sin}[b x-\text{ArcTan}[\text{Cot}[a]]]]+i \text{PolyLog}\left[2,e^{2 i (b x-\text{ArcTan}[\text{Cot}[a]])}\right])\right) \text{Sec}[a]\right)/\left(b^2 \sqrt{\text{Csc}[a]^2 \left(\text{Cos}[a]^2+\text{Sin}[a]^2\right)}\right)-\frac{1}{2 b^3}\text{Cos}[2 b x] \left(2 b^2 c^2 \text{Cos}[2 a]-d^2 \text{Cos}[2 a]+4 b^2 c d x \text{Cos}[2 a]+2 b^2 d^2 x^2 \text{Cos}[2 a]-2 b c d \text{Sin}[2 a]-2 b d^2 x \text{Sin}[2 a]\right)+\frac{1}{2 b^3}\left(2 b c d \text{Cos}[2 a]+2 b d^2 x \text{Cos}[2 a]+2 b^2 c^2 \text{Sin}[2 a]-d^2 \text{Sin}[2 a]+4 b^2 c d x \text{Sin}[2 a]+2 b^2 d^2 x^2 \text{Sin}[2 a]\right) \text{Sin}[2 b x]-\frac{1}{3} x \left(3 c^2+3 c d x+d^2 x^2\right) \text{Tan}[a]$$

Problem 385: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 107 leaves, 13 steps):

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

Result (type 4, 257 leaves):

$$-\frac{c\,\mathrm{Cos}\left[2\,(a+b\,x)\right]}{b}+\frac{c\,\mathrm{Log}[\mathrm{Cos}[a+b\,x]]}{b}+$$
$$\Bigg(d\,\mathrm{Csc}[a]\,\Bigg(b^2\,e^{-i\,\mathrm{ArcTan}[\mathrm{Cot}[a]]}\,x^2-\frac{1}{\sqrt{1+\mathrm{Cot}[a]^2}}\mathrm{Cot}[a]\,\Big(i\,b\,x\,(-\pi-2\,\mathrm{ArcTan}[\mathrm{Cot}[a]])-$$
$$\pi\,\mathrm{Log}\left[1+e^{-2\,i\,b\,x}\right]-2\,(b\,x-\mathrm{ArcTan}[\mathrm{Cot}[a]])\,\mathrm{Log}\left[1-e^{2\,i\,(b\,x-\mathrm{ArcTan}[\mathrm{Cot}[a]])}\right]+$$
$$\pi\,\mathrm{Log}[\mathrm{Cos}[b\,x]]-2\,\mathrm{ArcTan}[\mathrm{Cot}[a]]\,\mathrm{Log}[\mathrm{Sin}[b\,x-\mathrm{ArcTan}[\mathrm{Cot}[a]]]]+$$
$$i\,\mathrm{PolyLog}\left[2,\,e^{2\,i\,(b\,x-\mathrm{ArcTan}[\mathrm{Cot}[a]])}\right]\Big)\Bigg)\,\mathrm{Sec}[a]\Bigg)\Bigg/$$
$$\left(2\,b^2\,\sqrt{\mathrm{Csc}[a]^2\,\left(\mathrm{Cos}[a]^2+\mathrm{Sin}[a]^2\right)}\right)-\frac{d\,\mathrm{Cos}[2\,b\,x]\,(2\,b\,x\,\mathrm{Cos}[2\,a]-\mathrm{Sin}[2\,a])}{2\,b^2}+$$
$$\frac{d\,(\mathrm{Cos}[2\,a]+2\,b\,x\,\mathrm{Sin}[2\,a])\,\mathrm{Sin}[2\,b\,x]}{2\,b^2}-$$

$\frac{1}{2}$

d

x^2

Tan[a]

Problem 389: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 230 leaves, 19 steps):

$$-\frac{6\,i\,d\,(c+d\,x)^2\,\mathrm{ArcTan}\left[e^{i\,(a+b\,x)}\right]}{b^2}+\frac{24\,d^2\,(c+d\,x)\,\mathrm{Cos}[a+b\,x]}{b^3}-\frac{4\,(c+d\,x)^3\,\mathrm{Cos}[a+b\,x]}{b}+$$
$$\frac{6\,i\,d^2\,(c+d\,x)\,\mathrm{PolyLog}\left[2,\,-i\,e^{i\,(a+b\,x)}\right]}{b^3}-\frac{6\,i\,d^2\,(c+d\,x)\,\mathrm{PolyLog}\left[2,\,i\,e^{i\,(a+b\,x)}\right]}{b^3}-$$
$$\frac{6\,d^3\,\mathrm{PolyLog}\left[3,\,-i\,e^{i\,(a+b\,x)}\right]}{b^4}+\frac{6\,d^3\,\mathrm{PolyLog}\left[3,\,i\,e^{i\,(a+b\,x)}\right]}{b^4}-$$
$$\frac{(c+d\,x)^3\,\mathrm{Sec}[a+b\,x]}{b}-\frac{24\,d^3\,\mathrm{Sin}[a+b\,x]}{b^4}+\frac{12\,d\,(c+d\,x)^2\,\mathrm{Sin}[a+b\,x]}{b^2}$$

Result (type 4, 532 leaves):

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

Problem 390: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 147 leaves, 15 steps):

$$-\frac{4 i d (c+d x) \text{ArcTan}\left[e^{i (a+b x)}\right]}{b^2}+\frac{8 d^2 \text{Cos}[a+b x]}{b^3}-\frac{4 (c+d x)^2 \text{Cos}[a+b x]}{b}+\frac{2 i d^2 \text{PolyLog}\left[2,-i e^{i (a+b x)}\right]}{b^3}-\frac{2 i d^2 \text{PolyLog}\left[2,i e^{i (a+b x)}\right]}{b^3}-\frac{(c+d x)^2 \text{Sec}[a+b x]}{b}+\frac{8 d (c+d x) \text{Sin}[a+b x]}{b^2}$$

Result (type 4, 364 leaves):

$$\frac{1}{b^3}\left(4 b c d \text{ArcTanh}\left[\text{Sin}[a]+\text{Cos}[a] \text{Tan}\left[\frac{b x}{2}\right]\right]+2 d^2 \left(2 \text{ArcTan}[\text{Cot}[a]] \text{ArcTanh}\left[\text{Sin}[a]+\text{Cos}[a] \text{Tan}\left[\frac{b x}{2}\right]\right]-\frac{1}{\sqrt{\text{Csc}[a]^2}}\text{Csc}[a]\left((b x-\text{ArcTan}[\text{Cot}[a]]) \left(\text{Log}\left[1-e^{i (b x-\text{ArcTan}[\text{Cot}[a]])}\right]-\text{Log}\left[1+e^{i (b x-\text{ArcTan}[\text{Cot}[a]])}\right]\right)+i \text{PolyLog}\left[2,-e^{i (b x-\text{ArcTan}[\text{Cot}[a]])}\right]-i \text{PolyLog}\left[2,e^{i (b x-\text{ArcTan}[\text{Cot}[a]])}\right]\right)\right)-b^2 (c+d x)^2 \text{Sec}[a]-4 \text{Cos}[b x] \left(\left(-2 d^2+b^2 (c+d x)^2\right) \text{Cos}[a]-2 b d (c+d x) \text{Sin}[a]\right)+4 \left(2 b d (c+d x) \text{Cos}[a]+\left(-2 d^2+b^2 (c+d x)^2\right) \text{Sin}[a]\right) \text{Sin}[b x]-\frac{b^2 (c+d x)^2 \text{Sin}\left[\frac{b x}{2}\right]}{\left(\text{Cos}\left[\frac{a}{2}\right]-\text{Sin}\left[\frac{a}{2}\right]\right) \left(\text{Cos}\left[\frac{1}{2} (a+b x)\right]-\text{Sin}\left[\frac{1}{2} (a+b x)\right]\right)}+\frac{b^2 (c+d x)^2 \text{Sin}\left[\frac{b x}{2}\right]}{\left(\text{Cos}\left[\frac{a}{2}\right]+\text{Sin}\left[\frac{a}{2}\right]\right) \left(\text{Cos}\left[\frac{1}{2} (a+b x)\right]+\text{Sin}\left[\frac{1}{2} (a+b x)\right]\right)}\right)$$

Problem 397: Result more than twice size of optimal antiderivative.

$$\int x \operatorname{Cos}[2x] \operatorname{Sec}[x]^3 \, dx$$

Optimal (type 4, 67 leaves, 19 steps):

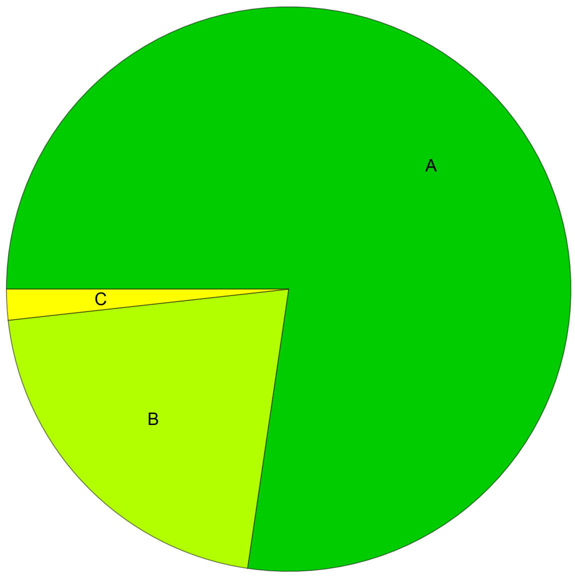
$$-3 i x \operatorname{ArcTan}\left[e^{i x}\right] + \frac{3}{2} i \operatorname{PolyLog}\left[2, -i e^{i x}\right] - \frac{3}{2} i \operatorname{PolyLog}\left[2, i e^{i x}\right] + \frac{\operatorname{Sec}[x]}{2} - \frac{1}{2} x \operatorname{Sec}[x] \operatorname{Tan}[x]$$

Result (type 4, 146 leaves):

$$\frac{1}{4} \left(6 x \operatorname{Log}\left[1 - i e^{i x}\right] - 6 x \operatorname{Log}\left[1 + i e^{i x}\right] + 6 i \operatorname{PolyLog}\left[2, -i e^{i x}\right] - 6 i \operatorname{PolyLog}\left[2, i e^{i x}\right] + \frac{2 \operatorname{Sin}\left[\frac{x}{2}\right]}{\operatorname{Cos}\left[\frac{x}{2}\right] - \operatorname{Sin}\left[\frac{x}{2}\right]} + \frac{x}{\left(\operatorname{Cos}\left[\frac{x}{2}\right] + \operatorname{Sin}\left[\frac{x}{2}\right]\right)^2} - \frac{2 \operatorname{Sin}\left[\frac{x}{2}\right]}{\operatorname{Cos}\left[\frac{x}{2}\right] + \operatorname{Sin}\left[\frac{x}{2}\right]} + \frac{x}{-1 + \operatorname{Sin}[x]}\right)$$

Summary of Integration Test Results

397 integration problems



A - 307 optimal antiderivatives

B - 83 more than twice size of optimal antiderivatives

C - 7 unnecessarily complex antiderivatives

D - 0 unable to integrate problems

E - 0 integration timeouts