Mathematica 11.3 Integration Test Results

Test results for the 705 problems in "Timofeev Problems.m"

Problem 3: Result more than twice size of optimal antiderivative.

$$\int \text{Sec}[2\,a\,x]\,dx$$

Optimal (type 3, 13 leaves, 1 step):

$$\frac{\text{ArcTanh}[\text{Sin}[2\,a\,x]]}{2\,a}$$

Result (type 3, 37 leaves):

$$-\frac{\text{Log}[\text{Cos}[a\,x]-\text{Sin}[a\,x]]}{2\,a}+\frac{\text{Log}[\text{Cos}[a\,x]+\text{Sin}[a\,x]]}{2\,a}$$

Problem 4: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{4}\,\text{Csc}\left[\frac{x}{3}\right]\,dx$$

Optimal (type 3, 11 leaves, 2 steps):

$$-\frac{3}{4}\,\text{ArcTanh}\left[\text{Cos}\left[\frac{x}{3}\right]\right]$$

Result (type 3, 23 leaves):

$$\frac{1}{4}\left(-3\,\text{Log}\left[\text{Cos}\left[\frac{x}{6}\right]\right]+3\,\text{Log}\left[\text{Sin}\left[\frac{x}{6}\right]\right]\right)$$

Problem 5: Result more than twice size of optimal antiderivative.

$$\int -\text{Sec}\left[\frac{\pi}{4}+2\,x\right]\,dx$$

Optimal (type 3, 15 leaves, 1 step):

$$-\frac{1}{2}\text{ArcTanh}\left[\text{Sin}\left[\frac{\pi}{4}+2x\right]\right]$$

Result (type 3, 55 leaves):

$$\frac{1}{2}\text{Log}\left[\text{Cos}\left[\frac{1}{8}(\pi+8x)\right]-\text{Sin}\left[\frac{1}{8}(\pi+8x)\right]\right]-\frac{1}{2}\text{Log}\left[\text{Cos}\left[\frac{1}{8}(\pi+8x)\right]+\text{Sin}\left[\frac{1}{8}(\pi+8x)\right]\right]$$

Problem 19: Result more than twice size of optimal antiderivative.

$$\int\frac{e^x}{-1+e^{2x}}\,dx$$

Optimal (type 3, 6 leaves, 2 steps):

$$-\text{ArcTanh}\left[e^x\right]$$

Result (type 3, 23 leaves):

$$\frac{1}{2}\text{Log}\left[1-e^x\right]-\frac{1}{2}\text{Log}\left[1+e^x\right]$$

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

$$\int\text{Cot}[x]^3\,\text{Csc}[x]\,dx$$

Optimal (type 3, 11 leaves, 2 steps):

$$\text{Csc}[x]-\frac{\text{Csc}[x]^3}{3}$$

Result (type 3, 57 leaves):

$$\frac{5}{12}\text{Cot}\left[\frac{x}{2}\right]-\frac{1}{24}\text{Cot}\left[\frac{x}{2}\right]\text{Csc}\left[\frac{x}{2}\right]^2+\frac{5}{12}\text{Tan}\left[\frac{x}{2}\right]-\frac{1}{24}\text{Sec}\left[\frac{x}{2}\right]^2\text{Tan}\left[\frac{x}{2}\right]$$

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

$$\int\frac{\text{Sin}[x]}{1+\text{Sin}[x]}\,dx$$

Optimal (type 3, 11 leaves, 2 steps):

$$x+\frac{\text{Cos}[x]}{1+\text{Sin}[x]}$$

Result (type 3, 25 leaves):

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

Problem 51: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x\,\sqrt{-a^2+x^2}}\,dx$$

Optimal (type 3, 22 leaves, 3 steps):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{-a^2+x^2}}{a}\right]}{a}$$

Result (type 3, 35 leaves):

$$-\frac{i\,\text{Log}\left[-\frac{2\,i\,a}{x}+\frac{2\,\sqrt{-a^2+x^2}}{x}\right]}{a}$$

Problem 56: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{x-x^2}}\,dx$$

Optimal (type 3, 8 leaves, 2 steps):

$$-\text{ArcSin}[1-2\,x]$$

Result (type 3, 38 leaves):

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

Problem 63: Result more than twice size of optimal antiderivative.

$$\int \frac{1+\text{Tan}[x]^2}{1-\text{Tan}[x]^2}\,dx$$

Optimal (type 3, 11 leaves, 2 steps):

$$\frac{1}{2} \text{ArcTanh}[2 \text{Cos}[x] \text{Sin}[x]]$$

Result (type 3, 23 leaves):

$$-\frac{1}{2} \text{Log}[\text{Cos}[x] - \text{Sin}[x]] + \frac{1}{2} \text{Log}[\text{Cos}[x] + \text{Sin}[x]]$$

Problem 64: Result more than twice size of optimal antiderivative.

$$\int \left(a^2 - 4 \text{Cos}[x]^2\right)^{3/4} \text{Sin}[2 x] \, dx$$

Optimal (type 3, 18 leaves, 3 steps):

$$\frac{1}{7} \left(a^2 - 4 \text{Cos}[x]^2\right)^{7/4}$$

Result (type 3, 127 leaves):

$$\frac{1}{7 \left(-2 + a^2 - 2 \text{Cos}[2 x]\right)^{1/4}} \left(6 - 4 a^2 + a^4 - 4 \left(\frac{-2 + a^2 - 2 \text{Cos}[2 x]}{-2 + a^2}\right)^{1/4} + 4 a^2 \left(\frac{-2 + a^2 - 2 \text{Cos}[2 x]}{-2 + a^2}\right)^{1/4} - a^4 \left(\frac{-2 + a^2 - 2 \text{Cos}[2 x]}{-2 + a^2}\right)^{1/4} - 4 \left(-2 + a^2\right) \text{Cos}[2 x] + 2 \text{Cos}[4 x]\right)$$

Problem 65: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Sin}[2 x]}{\left(a^2 - 4 \text{Sin}[x]^2\right)^{1/3}} \, dx$$

Optimal (type 3, 18 leaves, 3 steps):

$$-\frac{3}{8} \left(a^2 - 4 \text{Sin}[x]^2\right)^{2/3}$$

Result (type 3, 67 leaves):

$$-\frac{3 \left(-2 + a^2 + 2 \text{Cos}[2 x]\right)^{2/3} \left(-1 + \left(\frac{-2+a^2+2 \text{Cos}[2 x]}{-2+a^2}\right)^{2/3}\right)}{8 \left(\frac{-2+a^2+2 \text{Cos}[2 x]}{-2+a^2}\right)^{2/3}}$$

Problem 76: Result more than twice size of optimal antiderivative.

$$\int \text{Csc}[x]^5 \, dx$$

Optimal (type 3, 26 leaves, 3 steps):

$$-\frac{3}{8}\text{ArcTanh}[\text{Cos}[x]]-\frac{3}{8}\text{Cot}[x]\,\text{Csc}[x]-\frac{1}{4}\text{Cot}[x]\,\text{Csc}[x]^3$$

Result (type 3, 71 leaves):

$$-\frac{3}{32}\text{Csc}\left[\frac{x}{2}\right]^2-\frac{1}{64}\text{Csc}\left[\frac{x}{2}\right]^4-\frac{3}{8}\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]\right]+\frac{3}{8}\text{Log}\left[\text{Sin}\left[\frac{x}{2}\right]\right]+\frac{3}{32}\text{Sec}\left[\frac{x}{2}\right]^2+\frac{1}{64}\text{Sec}\left[\frac{x}{2}\right]^4$$

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

$$\int\frac{-5+2x^2}{6-5x^2+x^4}\,dx$$

Optimal (type 3, 31 leaves, 3 steps):

$$-\frac{\text{ArcTanh}\left[\frac{x}{\sqrt{2}}\right]}{\sqrt{2}}-\frac{\text{ArcTanh}\left[\frac{x}{\sqrt{3}}\right]}{\sqrt{3}}$$

Result (type 3, 69 leaves):

$$\frac{1}{12}\left(3\sqrt{2}\,\text{Log}\left[\sqrt{2}-x\right]+2\sqrt{3}\,\text{Log}\left[\sqrt{3}-x\right]-3\sqrt{2}\,\text{Log}\left[\sqrt{2}+x\right]-2\sqrt{3}\,\text{Log}\left[\sqrt{3}+x\right]\right)$$

Problem 113: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{1+x^2+x^4}\,dx$$

Optimal (type 3, 67 leaves, 9 steps):

$$-\frac{\text{ArcTan}\left[\frac{1-2x}{\sqrt{3}}\right]}{2\sqrt{3}}+\frac{\text{ArcTan}\left[\frac{1+2x}{\sqrt{3}}\right]}{2\sqrt{3}}-\frac{1}{4}\text{Log}\left[1-x+x^2\right]+\frac{1}{4}\text{Log}\left[1+x+x^2\right]$$

Result (type 3, 73 leaves):

$$\frac{i\left(\sqrt{1-i\sqrt{3}}\,\text{ArcTan}\left[\frac{1}{2}\left(-i+\sqrt{3}\right)x\right]-\sqrt{1+i\sqrt{3}}\,\text{ArcTan}\left[\frac{1}{2}\left(i+\sqrt{3}\right)x\right]\right)}{\sqrt{6}}$$

Problem 193: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (b1 + c1\, x)\, \left(a + 2\, b\, x + c\, x^2\right)^n \, dx$$

Optimal (type 5, 159 leaves, 2 steps):

$$\frac{c1\, \left(a + 2\, b\, x + c\, x^2\right)^{1+n}}{2\, c\, (1+n)} - \frac{2^n\, (b1\, c - b\, c1)\, \left(-\frac{b - \sqrt{b^2 - a\, c} + c\, x}{\sqrt{b^2 - a\, c}}\right)^{-1-n}\, \left(a + 2\, b\, x + c\, x^2\right)^{1+n}\, \text{Hypergeometric2F1}\left[-n,\, 1+n,\, 2+n,\, \frac{b + \sqrt{b^2 - a\, c} + c\, x}{2\, \sqrt{b^2 - a\, c}}\right]}{c\, \sqrt{b^2 - a\, c}\, (1+n)}$$

Result (type 6, 471 leaves):

$$\frac{1}{2} \left(b - \sqrt{b^2 - a\, c} + c\, x\right)\, \left(a + x\, (2\, b + c\, x)\right)^n \left(\left(3\, \left(b + \sqrt{b^2 - a\, c}\right)\, c1\, x^2\, \left(a + \left(b - \sqrt{b^2 - a\, c}\right)\, x\right)^2\, \text{AppellF1}\left[2,\, -n,\, -n,\, 3,\, -\frac{c\, x}{b + \sqrt{b^2 - a\, c}},\, \frac{c\, x}{-b + \sqrt{b^2 - a\, c}}\right]\right) \Big/ \left(\left(-b + \sqrt{b^2 - a\, c}\right)\, \left(b + \sqrt{b^2 - a\, c} + c\, x\right)\, \left(a + x\, (2\, b + c\, x)\right)\, \left(-3\, a\, \text{AppellF1}\left[2,\, -n,\, -n,\, 3,\, -\frac{c\, x}{b + \sqrt{b^2 - a\, c}},\, \frac{c\, x}{-b + \sqrt{b^2 - a\, c}}\right] + n\, x\, \left(\left(-b + \sqrt{b^2 - a\, c}\right)\, \text{AppellF1}\left[3,\, 1-n,\, -n,\, 4,\, -\frac{c\, x}{b + \sqrt{b^2 - a\, c}},\, \frac{c\, x}{-b + \sqrt{b^2 - a\, c}}\right] - \left(b + \sqrt{b^2 - a\, c}\right)\, \text{AppellF1}\left[3,\, -n,\, 1-n,\, 4,\, -\frac{c\, x}{b + \sqrt{b^2 - a\, c}},\, \frac{c\, x}{-b + \sqrt{b^2 - a\, c}}\right]\right)\right)\right) + \frac{2^{1+n}\, b1\, \left(\frac{b + \sqrt{b^2 - a\, c} + c\, x}{\sqrt{b^2 - a\, c}}\right)^{-n}\, \text{Hypergeometric2F1}\left[-n,\, 1+n,\, 2+n,\, \frac{-b + \sqrt{b^2 - a\, c} - c\, x}{2\, \sqrt{b^2 - a\, c}}\right]}{c\, (1+n)}\right)$$

Problem 198: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int (b1 + c1\, x)\, \left(a + 2\, b\, x + c\, x^2\right)^{-n} \, dx$$

Optimal (type 5, 169 leaves, 2 steps):

$$\frac{c1\,(a+2bx+cx^2)^{1-n}}{2c\,(1-n)}-\frac{2^{-n}\,(b1\,c-b\,c1)\left(-\frac{b-\sqrt{b^2-ac}+cx}{\sqrt{b^2-ac}}\right)^{-1+n}(a+2bx+cx^2)^{1-n}\,\text{Hypergeometric2F1}\left[1-n,n,2-n,\frac{b+\sqrt{b^2-ac}+cx}{2\sqrt{b^2-ac}}\right]}{c\sqrt{b^2-ac}\,(1-n)}$$

Result (type 6, 374 leaves):

$$\frac{1}{2}\left(a+x\,(2b+cx)\right)^{-n}\left(-\left(\left(3\,a\,c1\,x^2\,\text{AppellF1}\left[2,n,n,3,-\frac{cx}{b+\sqrt{b^2-ac}},\frac{cx}{-b+\sqrt{b^2-ac}}\right]\right)\Big/\left(-3\,a\,\text{AppellF1}\left[2,n,n,3,-\frac{cx}{b+\sqrt{b^2-ac}},\frac{cx}{-b+\sqrt{b^2-ac}}\right]+n\,x\left(\left(b+\sqrt{b^2-ac}\right)\text{AppellF1}\left[3,n,1+n,4,-\frac{cx}{b+\sqrt{b^2-ac}},\frac{cx}{-b+\sqrt{b^2-ac}}\right]+\left(b-\sqrt{b^2-ac}\right)\text{AppellF1}\left[3,1+n,n,4,-\frac{cx}{b+\sqrt{b^2-ac}},\frac{cx}{-b+\sqrt{b^2-ac}}\right]\right)\right)\right)-\frac{2^{1-n}\,b1\left(b-\sqrt{b^2-ac}+cx\right)\left(\frac{b+\sqrt{b^2-ac}+cx}{\sqrt{b^2-ac}}\right)^{n}\text{Hypergeometric2F1}\left[1-n,n,2-n,\frac{-b+\sqrt{b^2-ac}-cx}{2\sqrt{b^2-ac}}\right]}{c\,(-1+n)}\right)$$

Problem 217: Result unnecessarily involves higher level functions.

$$\int\frac{1}{(-1+x)^{2/3}\,x^5}\,dx$$

Optimal (type 3, 104 leaves, 8 steps):

$$\frac{(-1+x)^{1/3}}{4x^4}+\frac{11\,(-1+x)^{1/3}}{36x^3}+\frac{11\,(-1+x)^{1/3}}{27x^2}+\frac{55\,(-1+x)^{1/3}}{81x}-\frac{110\,\text{ArcTan}\left[\frac{1-2\,(-1+x)^{1/3}}{\sqrt{3}}\right]}{81\sqrt{3}}+\frac{55}{81}\text{Log}\left[1+(-1+x)^{1/3}\right]-\frac{55\,\text{Log}[x]}{243}$$

Result (type 5, 63 leaves):

$$\frac{-81-18x-33x^2-88x^3+220x^4-220\left(\frac{-1+x}{x}\right)^{2/3}x^4\,\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},\frac{1}{x}\right]}{324\,(-1+x)^{2/3}\,x^4}$$

Problem 221: Result unnecessarily involves higher level functions.

$$\int \frac{x^2 \sqrt{1+x} \left(1-x^2\right)^{1/4}}{\sqrt{1-x} \left(\sqrt{1-x}-\sqrt{1+x}\right)} \, dx$$

Optimal (type 3, 304 leaves, 33 steps):

$$\frac{5}{16} (1-x)^{3/4} (1+x)^{1/4} - \frac{1}{16} (1-x)^{1/4} (1+x)^{3/4} + \frac{1}{24} (1-x)^{5/4} (1+x)^{3/4} + \frac{7 \left(1-x^2\right)^{5/4}}{24 \sqrt{1-x}} + \frac{x \left(1-x^2\right)^{5/4}}{6 \sqrt{1-x}} + \frac{1}{6} \sqrt{1+x} \left(1-x^2\right)^{5/4} - \frac{3 \operatorname{ArcTan}\left[1-\frac{\sqrt{2} (1-x)^{1/4}}{(1+x)^{1/4}}\right]}{8 \sqrt{2}} + \frac{3 \operatorname{ArcTan}\left[1+\frac{\sqrt{2} (1-x)^{1/4}}{(1+x)^{1/4}}\right]}{8 \sqrt{2}} + \frac{\operatorname{Log}\left[1+\frac{\sqrt{1-x}}{\sqrt{1+x}}-\frac{\sqrt{2} (1-x)^{1/4}}{(1+x)^{1/4}}\right]}{8 \sqrt{2}} - \frac{\operatorname{Log}\left[1+\frac{\sqrt{1-x}}{\sqrt{1+x}}+\frac{\sqrt{2} (1-x)^{1/4}}{(1+x)^{1/4}}\right]}{8 \sqrt{2}}$$

Result (type 5, 165 leaves):

$$-\frac{1}{48} \sqrt{1+x} \left(1-x^2\right)^{1/4} \left(-7+2 x+8 x^2-\frac{\sqrt{1-x^2} \left(29+22 x+8 x^2\right)}{1+x}\right) + \frac{\left(-2 (-1+x)-(-1+x)^2\right)^{1/4} \operatorname{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{4}, \frac{5}{4}, \frac{1-x}{2}\right]}{8 \times 2^{1/4} (1+x)^{1/4}} + \frac{5 \left(-2 (-1+x)-(-1+x)^2\right)^{3/4} \operatorname{Hypergeometric2F1}\left[\frac{3}{4}, \frac{3}{4}, \frac{7}{4}, \frac{1-x}{2}\right]}{24 \times 2^{3/4} (1+x)^{3/4}}$$

Problem 222: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{1-x} \, x \, (1+x)^{2/3}}{-(1-x)^{5/6} (1+x)^{1/3}+(1-x)^{2/3} \sqrt{1+x}} \, dx$$

Optimal (type 3, 292 leaves, ? steps):

$$-\frac{1}{12} (1-3 x) (1-x)^{2/3} (1+x)^{1/3} + \frac{1}{4} \sqrt{1-x} \, x \sqrt{1+x} - \frac{1}{4} (1-x) (3+x) + \frac{1}{12} (1-x)^{1/3} (1+x)^{2/3} (1+3 x) + \frac{1}{12} (1-x)^{1/6} (1+x)^{5/6} (2+3 x) - \frac{1}{12} (1-x)^{5/6} (1+x)^{1/6} (10+3 x) + \frac{1}{6} \operatorname{ArcTan}\left[\frac{(1+x)^{1/6}}{(1-x)^{1/6}}\right] - \frac{4 \operatorname{ArcTan}\left[\frac{(1-x)^{1/3}-2 (1+x)^{1/3}}{\sqrt{3} (1-x)^{1/3}}\right]}{3 \sqrt{3}} - \frac{5}{6} \operatorname{ArcTan}\left[\frac{(1-x)^{1/3}-(1+x)^{1/3}}{(1-x)^{1/6} (1+x)^{1/6}}\right] + \frac{\operatorname{ArcTanh}\left[\frac{\sqrt{3} (1-x)^{1/6} (1+x)^{1/6}}{(1-x)^{1/3}+(1+x)^{1/3}}\right]}{6 \sqrt{3}}$$

Result (type 5, 391 leaves):

$$-\frac{2^{2/3}\left(-2\,(-1+x)-(-1+x)^2\right)^{1/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{1-x}{2}\right]}{3\,(1+x)^{1/3}}-$$

$$\frac{1}{12}\,(1+x)^{1/3}\left((1-3x)\,(1-x)^{2/3}-\frac{3\,(1-x)^{1/3}\,x\,(2+x)}{(1-x^2)^{1/3}}-3\,(1-x)^{1/3}\,x\,(1-x^2)^{1/6}-(1+3x)\,(1-x^2)^{1/3}-\frac{(2+3x)\,\sqrt{1-x^2}}{(1-x)^{1/3}}+\frac{(10+3x)\,(1-x^2)^{5/6}}{1+x}-\right.$$

$$\left.4\times 2^{2/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{1+x}{2}\right]\right)-\frac{7\left(-2\,(-1+x)-(-1+x)^2\right)^{5/6}\,\text{Hypergeometric2F1}\left[\frac{5}{6},\frac{5}{6},\frac{11}{6},\frac{1-x}{2}\right]}{30\times 2^{5/6}\,(1+x)^{5/6}}+$$

$$\frac{(1+x)^{1/3}\,\sqrt{2\,(1+x)-(1+x)^2}\,\text{Hypergeometric2F1}\left[\frac{5}{6},\frac{5}{6},\frac{11}{6},\frac{1+x}{2}\right]}{6\times 2^{5/6}\,\sqrt{1-x}}+\frac{(1-x)^{1/3}\,\sqrt{-1+x}\,(1+x)^{5/6}\,\text{Log}\left[\sqrt{-1+x}+\sqrt{1+x}\right]}{2\left(2\,(1+x)-(1+x)^2\right)^{5/6}}$$

Problem 226: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\left((-1+x)^2\,(1+x)\right)^{1/3}}\,dx$$

Optimal (type 3, 67 leaves, ? steps):

$$\sqrt{3}\,\text{ArcTan}\left[\frac{1+\frac{2\,(-1+x)}{\left((-1+x)^2\,(1+x)\right)^{1/3}}}{\sqrt{3}}\right]-\frac{1}{2}\,\text{Log}[1+x]-\frac{3}{2}\,\text{Log}\left[1-\frac{-1+x}{\left((-1+x)^2\,(1+x)\right)^{1/3}}\right]$$

Result (type 5, 49 leaves):

$$\frac{3\,(-1+x)\,(1+x)^{1/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{1-x}{2}\right]}{2^{1/3}\left((-1+x)^2\,(1+x)\right)^{1/3}}$$

Problem 228: Result unnecessarily involves higher level functions.

$$\int \frac{\left((-1+x)^2\,(1+x)\right)^{1/3}}{x^2}\,dx$$

Optimal (type 3, 150 leaves, ? steps):

$$-\frac{\left((-1+x)^2 (1+x)\right)^{1/3}}{x}-\frac{\text{ArcTan}\left[\frac{1-\frac{2 (-1+x)}{\left((-1+x)^2 (1+x)\right)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3}}-\sqrt{3}\,\text{ArcTan}\left[\frac{1+\frac{2 (-1+x)}{\left((-1+x)^2 (1+x)\right)^{1/3}}}{\sqrt{3}}\right]+$$

$$\frac{\text{Log}[x]}{6}-\frac{2}{3}\text{Log}[1+x]-\frac{3}{2}\text{Log}\left[1-\frac{-1+x}{\left((-1+x)^2 (1+x)\right)^{1/3}}\right]-\frac{1}{2}\text{Log}\left[1+\frac{-1+x}{\left((-1+x)^2 (1+x)\right)^{1/3}}\right]$$

Result (type 6, 145 leaves):

$$\frac{1}{2}\left((-1+x)^2 (1+x)\right)^{1/3}\left(-\frac{2}{x}-\left(4 x\,\text{AppellF1}\left[1,\frac{1}{3},\frac{2}{3},2,\frac{1}{x},-\frac{1}{x}\right]\right)\Big/\right.$$

$$\left((-1+x)(1+x)\left(6 x\,\text{AppellF1}\left[1,\frac{1}{3},\frac{2}{3},2,\frac{1}{x},-\frac{1}{x}\right]-2\,\text{AppellF1}\left[2,\frac{1}{3},\frac{5}{3},3,\frac{1}{x},-\frac{1}{x}\right]+\text{AppellF1}\left[2,\frac{4}{3},\frac{2}{3},3,\frac{1}{x},-\frac{1}{x}\right]\right)\right)-$$

$$\left.\frac{3\times 2^{2/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{1+x}{2}\right]}{(1-x)^{2/3}}\right)$$

Problem 232: Result unnecessarily involves higher level functions.

$$\int \frac{1}{\left(9+3 x-5 x^2+x^3\right)^{1/3}}\,dx$$

Optimal (type 3, 75 leaves, ? steps):

$$\sqrt{3}\,\text{ArcTan}\left[\frac{1+\frac{2 (-3+x)}{\left(9+3 x-5 x^2+x^3\right)^{1/3}}}{\sqrt{3}}\right]-\frac{1}{2}\text{Log}[1+x]-\frac{3}{2}\text{Log}\left[1-\frac{-3+x}{\left(9+3 x-5 x^2+x^3\right)^{1/3}}\right]$$

Result (type 5, 49 leaves):

$$\frac{3 (-3+x) (1+x)^{1/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{3-x}{4}\right]}{2^{2/3}\left((-3+x)^2 (1+x)\right)^{1/3}}$$

Problem 245: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{x}{\left(4+x+x^2\right)\sqrt{5+4 x+4 x^2}}\,dx$$

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

$$\frac{\text{ArcTan}\left[\frac{\sqrt{5+4x+4x^2}}{\sqrt{11}}\right]}{\sqrt{11}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{\frac{11}{15}}\,(1+2x)}{\sqrt{5+4x+4x^2}}\right]}{\sqrt{165}}$$

Result (type 3, 426 leaves):

$$\frac{\left(\mathrm{i}+\sqrt{15}\right)\text{ArcTan}\left[\frac{-4\sqrt{15}-\sqrt{15}\,x-\sqrt{15}\,x^2-4\sqrt{11}\,\sqrt{5+4x+4x^2}}{16+15x+15x^2}\right]}{2\sqrt{165}}+\frac{\left(-\mathrm{i}+\sqrt{15}\right)\text{ArcTan}\left[\frac{4\sqrt{15}+\sqrt{15}\,x+\sqrt{15}\,x^2-4\sqrt{11}\,\sqrt{5+4x+4x^2}}{16+15x+15x^2}\right]}{2\sqrt{165}}+$$
$$\frac{\mathrm{i}\left(-\mathrm{i}+\sqrt{15}\right)\text{Log}\left[\left(-\mathrm{i}+\sqrt{15}-2\,\mathrm{i}\,x\right)^2\left(\mathrm{i}+\sqrt{15}+2\,\mathrm{i}\,x\right)^2\right]}{4\sqrt{165}}+\frac{\mathrm{i}\left(\mathrm{i}+\sqrt{15}\right)\text{Log}\left[\left(-\mathrm{i}+\sqrt{15}-2\,\mathrm{i}\,x\right)^2\left(\mathrm{i}+\sqrt{15}+2\,\mathrm{i}\,x\right)^2\right]}{4\sqrt{165}}-$$
$$\frac{\mathrm{i}\left(\mathrm{i}+\sqrt{15}\right)\text{Log}\left[\left(4+x+x^2\right)\left(43+52x+52x^2-\sqrt{165}\,\sqrt{5+4x+4x^2}-2\sqrt{165}\,x\sqrt{5+4x+4x^2}\right)\right]}{4\sqrt{165}}-$$
$$\frac{\mathrm{i}\left(-\mathrm{i}+\sqrt{15}\right)\text{Log}\left[\left(4+x+x^2\right)\left(43+52x+52x^2+\sqrt{165}\,\sqrt{5+4x+4x^2}+2\sqrt{165}\,x\sqrt{5+4x+4x^2}\right)\right]}{4\sqrt{165}}$$

Problem 246: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{3+x}{\left(1+x^2\right)\sqrt{1+x+x^2}}\,dx$$

Optimal (type 3, 56 leaves, 5 steps):

$$-2\sqrt{2}\,\text{ArcTan}\left[\frac{1-x}{\sqrt{2}\,\sqrt{1+x+x^2}}\right]+\sqrt{2}\,\text{ArcTanh}\left[\frac{1+x}{\sqrt{2}\,\sqrt{1+x+x^2}}\right]$$

Result (type 3, 352 leaves):

$$\left(\frac{1}{4}+\frac{\mathrm{i}}{4}\right)(-1)^{3/4}\left(\left(4+2\,\mathrm{i}\right)\text{ArcTan}\left[\left(\left(-7+12\,\mathrm{i}\right)+\left(12+25\,\mathrm{i}\right)x^3+40\,(-1)^{1/4}\sqrt{1+x+x^2}+x^2\left(\left(5+28\,\mathrm{i}\right)+20\,(-1)^{3/4}\sqrt{1+x+x^2}\right)+\right.\right.\right.$$
$$\left.\left.x\left(\left(-4+37\,\mathrm{i}\right)-\left(10-30\,\mathrm{i}\right)\sqrt{2}\,\sqrt{1+x+x^2}\right)\right)\Big/\left(\left(1-36\,\mathrm{i}\right)+\left(32-11\,\mathrm{i}\right)x+\left(5+16\,\mathrm{i}\right)x^2+\left(4+25\,\mathrm{i}\right)x^3\right)\right]+$$
$$\left(4-2\,\mathrm{i}\right)\text{ArcTan}\left[\left(\left(-7-12\,\mathrm{i}\right)+\left(12-25\,\mathrm{i}\right)x^3+20\,(-1)^{1/4}\sqrt{1+x+x^2}+x^2\left(\left(5-28\,\mathrm{i}\right)-40\,(-1)^{3/4}\sqrt{1+x+x^2}\right)+\right.\right.$$
$$\left.\left.x\left(\left(-4-37\,\mathrm{i}\right)+\left(30+10\,\mathrm{i}\right)\sqrt{2}\,\sqrt{1+x+x^2}\right)\right)\Big/\left(\left(-49+36\,\mathrm{i}\right)-\left(48-61\,\mathrm{i}\right)x-\left(45-64\,\mathrm{i}\right)x^2+\left(4+25\,\mathrm{i}\right)x^3\right)\right]+$$
$$2\,\text{Log}\left[1+x^2\right]-\left(1+2\,\mathrm{i}\right)\text{Log}\left[\left(5+4\,\mathrm{i}\right)+\left(8+4\,\mathrm{i}\right)x+\left(5+4\,\mathrm{i}\right)x^2+8\,(-1)^{1/4}\sqrt{1+x+x^2}+4\,(-1)^{1/4}x\sqrt{1+x+x^2}\right]-$$
$$\left.\left(1-2\,\mathrm{i}\right)\text{Log}\left[\left(5+4\,\mathrm{i}\right)+\left(8+4\,\mathrm{i}\right)x+\left(5+4\,\mathrm{i}\right)x^2+4\,(-1)^{1/4}\sqrt{1+x+x^2}+8\,(-1)^{1/4}x\sqrt{1+x+x^2}\right]\right)$$

Problem 247: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1+2x}{\sqrt{-1+6x+x^2}\,\left(4+4x+3x^2\right)}\,dx$$

Optimal (type 3, 70 leaves, 5 steps):

$$-\frac{5\,\text{ArcTan}\left[\frac{\sqrt{\frac{7}{2}}\,(2-x)}{2\sqrt{-1+6x+x^2}}\right]}{6\sqrt{14}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{7}\,(1+x)}{\sqrt{-1+6x+x^2}}\right]}{3\sqrt{7}}$$

Result (type 3, 991 leaves):

$$\frac{1}{8\sqrt{14}}\left(\frac{1}{\sqrt{7+4i\sqrt{2}}}2\left(-i+4\sqrt{2}\right)\text{ArcTan}\left[\left(7840-5816i\sqrt{2}+18\left(112+37i\sqrt{2}\right)x^4+3564i\sqrt{7\left(7+4i\sqrt{2}\right)}\sqrt{-1+6x+x^2}+\right.\right.\right.$$

$$i x^2\left(56224i+29126\sqrt{2}-99\sqrt{7\left(7+4i\sqrt{2}\right)}\sqrt{-1+6x+x^2}\right)-72ix\left(-546i+265\sqrt{2}-11\sqrt{7\left(7+4i\sqrt{2}\right)}\sqrt{-1+6x+x^2}\right)+$$

$$\left.3x^3\left(1456+7564i\sqrt{2}-693i\sqrt{7\left(7+4i\sqrt{2}\right)}\sqrt{-1+6x+x^2}\right)\right)\Big/\left(9836i-5600\sqrt{2}+36\left(-1083i+560\sqrt{2}\right)x+\right.$$

$$\left.\left.\left(-41651i+78176\sqrt{2}\right)x^2+\left(-91506i+61824\sqrt{2}\right)x^3+9\left(-1487i+896\sqrt{2}\right)x^4\right)\right]-\frac{1}{\sqrt{-7+4i\sqrt{2}}}$$

$$2\left(i+4\sqrt{2}\right)\text{ArcTanh}\left[\left(4\left(6344i-700\sqrt{2}+18\left(477i+140\sqrt{2}\right)x+\left(9847i+9772\sqrt{2}\right)x^2+12\left(947i+644\sqrt{2}\right)x^3+9\left(421i+112\sqrt{2}\right)x^4\right)\right)\Big/\right.$$

$$\left(-9\left(112i+37\sqrt{2}\right)x^4+36x\left(546i+265\sqrt{2}+44\sqrt{-98+56i\sqrt{2}}\sqrt{-1+6x+x^2}\right)+\right.$$

$$3x^3\left(-728i-3782\sqrt{2}+99\sqrt{-98+56i\sqrt{2}}\sqrt{-1+6x+x^2}\right)+4\left(-980i+727\sqrt{2}+297\sqrt{-98+56i\sqrt{2}}\sqrt{-1+6x+x^2}\right)+$$

$$\left.\left.x^2\left(28112i-14563\sqrt{2}+1287\sqrt{-98+56i\sqrt{2}}\sqrt{-1+6x+x^2}\right)\right)\right]+$$

$$\frac{\left(1+4i\sqrt{2}\right)\text{Log}\left[9\left(4+4x+3x^2\right)^2\right]}{\sqrt{7+4i\sqrt{2}}}+\frac{\left(i+4\sqrt{2}\right)\text{Log}\left[9\left(4+4x+3x^2\right)^2\right]}{\sqrt{-7+4i\sqrt{2}}}-\frac{1}{\sqrt{-7+4i\sqrt{2}}}$$

$$\left(i+4\sqrt{2}\right)\text{Log}\left[\left(4+4x+3x^2\right)\right.$$

$$\left.\left(-101i-14\sqrt{2}+2\left(-2i+7\sqrt{2}\right)x^2+9i\sqrt{7\left(-7+4i\sqrt{2}\right)}\sqrt{-1+6x+x^2}+x\left(186i+84\sqrt{2}-7i\sqrt{7\left(-7+4i\sqrt{2}\right)}\sqrt{-1+6x+x^2}\right)\right)\right]-$$

$$\frac{1}{\sqrt{7+4i\sqrt{2}}}i\left(-i+4\sqrt{2}\right)\text{Log}\left[\left(4+4x+3x^2\right)\left(\left(-53i+14\sqrt{2}\right)x^2+2x\left(-54i+42\sqrt{2}-i\sqrt{98+56i\sqrt{2}}\sqrt{-1+6x+x^2}\right)-\right.\right.$$

$$\left.\left.\left.2i\left(26-7i\sqrt{2}+3\sqrt{98+56i\sqrt{2}}\sqrt{-1+6x+x^2}\right)\right)\right]\right)$$

Problem 248: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{B+Ax}{\left(17-18x+5x^2\right)\sqrt{13-22x+10x^2}}\,dx$$

Optimal (type 3, 80 leaves, 5 steps):

$$-\frac{(2A+B)\,\text{ArcTan}\left[\frac{\sqrt{35}\,(2-x)}{\sqrt{13-22x+10x^2}}\right]}{\sqrt{35}}-\frac{(A+B)\,\text{ArcTanh}\left[\frac{\sqrt{35}\,(1-x)}{2\sqrt{13-22x+10x^2}}\right]}{2\sqrt{35}}$$

Result (type 3, 1149 leaves):

$$\frac{1}{8\sqrt{35}}\Big(\Big(\big((8-2\,\mathrm{i})\,A+(4-2\,\mathrm{i})\,B\big)$$

$$\text{ArcTan}\Big[\Big(4A^2\big((-2494-6746\,\mathrm{i})+(3811+15444\,\mathrm{i})\,x-(1900+11640\,\mathrm{i})\,x^2+(300+2800\,\mathrm{i})\,x^3\big)+(2+4\,\mathrm{i})\,B^2\big((-1843+92\,\mathrm{i})+(3955+186\,\mathrm{i})\,x-$$

$$(2827+336\,\mathrm{i})\,x^2+(645+110\,\mathrm{i})\,x^3\big)+(4+8\,\mathrm{i})\,A\,B\big((-3439-76\,\mathrm{i})+(7427+942\,\mathrm{i})\,x-(5354+1092\,\mathrm{i})\,x^2+(1240+320\,\mathrm{i})\,x^3\big)\Big)\Big/$$

$$\Big((1+2\,\mathrm{i})\,B^2\Big((-608-1208\,\mathrm{i})+(395+610\,\mathrm{i})\,x^3+(66-77\,\mathrm{i})\sqrt{35}\sqrt{13-22x+10x^2}+$$

$$x\left((1540+3036\,\mathrm{i})-(104-103\,\mathrm{i})\sqrt{35}\sqrt{13-22x+10x^2}\right)+(4-3\,\mathrm{i})\,x^2\left((80-549\,\mathrm{i})+10\sqrt{35}\sqrt{13-22x+10x^2}\right)\Big)+$$

$$A^2\Big((10987-3210\,\mathrm{i})-(4800-2800\,\mathrm{i})\,x^3+(748+187\,\mathrm{i})\sqrt{35}\sqrt{13-22x+10x^2}+$$

$$10x^2\left((1969-892\,\mathrm{i})+(34+17\,\mathrm{i})\sqrt{35}\sqrt{13-22x+10x^2}\right)-x\left((25633-9460\,\mathrm{i})+(1054+357\,\mathrm{i})\sqrt{35}\sqrt{13-22x+10x^2}\right)\Big)+$$

$$A\,B\Big((9519-6362\,\mathrm{i})-(4225-4200\,\mathrm{i})\,x^3+(792+198\,\mathrm{i})\sqrt{35}\sqrt{13-22x+10x^2}+$$

$$(10+5\,\mathrm{i})\,x^2\left((828-1871\,\mathrm{i})+36\sqrt{35}\sqrt{13-22x+10x^2}\right)-x\left((22801-16808\,\mathrm{i})+(1116+378\,\mathrm{i})\sqrt{35}\sqrt{13-22x+10x^2}\right)\Big)\Big)\Big]+$$

$$\big((-2+8\,\mathrm{i})\,A-(2-4\,\mathrm{i})\,B\big)\,\text{ArcTanh}\Big[\Big(A^2\big((3594-15991\,\mathrm{i})-(8096-43289\,\mathrm{i})\,x+(5990-39425\,\mathrm{i})\,x^2-(1400-12175\,\mathrm{i})\,x^3\big)+$$

$$(2+\mathrm{i})\,B^2\big((-367-3288\,\mathrm{i})+(1085+8506\,\mathrm{i})\,x-(1073+7336\,\mathrm{i})\,x^2+(355+2110\,\mathrm{i})\,x^3\big)+$$

$$(4+2\,\mathrm{i})\,A\,B\big((-1147-4952\,\mathrm{i})+(3185+12882\,\mathrm{i})\,x-(2993+11256\,\mathrm{i})\,x^2+(955+3310\,\mathrm{i})\,x^3\big)\Big)\Big/$$

$$\Big(2\Big((2+\mathrm{i})\,B^2\Big((-1208-608\,\mathrm{i})+(610+395\,\mathrm{i})\,x^3+(77-66\,\mathrm{i})\sqrt{35}\sqrt{13-22x+10x^2}+$$

$$x\left((3036+1540\,\mathrm{i})-(103-104\,\mathrm{i})\sqrt{35}\sqrt{13-22x+10x^2}\right)+(3-4\,\mathrm{i})\,x^2\left((-80-549\,\mathrm{i})+10\sqrt{35}\sqrt{13-22x+10x^2}\right)\Big)+$$

$$A\,B\Big((-9519-6362\,\mathrm{i})+(4225+4200\,\mathrm{i})\,x^3+(792-198\,\mathrm{i})\sqrt{35}\sqrt{13-22x+10x^2}+$$

$$x\left((22801+16808\,\mathrm{i})-(1116-378\,\mathrm{i})\sqrt{35}\sqrt{13-22x+10x^2}\right)+(10-5\,\mathrm{i})\,x^2\left((-828-1871\,\mathrm{i})+36\sqrt{35}\sqrt{13-22x+10x^2}\right)\Big)+$$

$$A^2\Big((4800+2800\,\mathrm{i})\,x^3+x\left((25633+9460\,\mathrm{i})-(1054-357\,\mathrm{i})\sqrt{35}\sqrt{13-22x+10x^2}\right)-$$

$$10\,\mathrm{i}\,x^2\left((892-1969\,\mathrm{i})+(17+34\,\mathrm{i})\sqrt{35}\sqrt{13-22x+10x^2}\right)+(1-4\,\mathrm{i})\left((109-2774\,\mathrm{i})+(88+165\,\mathrm{i})\sqrt{35}\sqrt{13-22x+10x^2}\right)\Big)\Big)\Big)\Big]-$$

$$2A\,\text{Log}\left[\mathrm{i}\,(17-18x+5x^2)\right]-2B\,\text{Log}\left[\mathrm{i}\,(17-18x+5x^2)\right]+(1-4\,\mathrm{i})$$

$$A$$

$$\text{Log}\Big[$$

$$(1+2\,i)\left((-127-1566\,i)+(118+2844\,i)\,x-(25+1350\,i)\,x^2+68\,i\sqrt{35}\sqrt{13-22x+10x^2}-70\,i\sqrt{35}\,x\sqrt{13-22x+10x^2}\right)\Big]+$$
$$(1-2\,i)\,B\,\mathrm{Log}\Big[(1+2\,i)\left((-127-1566\,i)+(118+2844\,i)\,x-(25+1350\,i)\,x^2+68\,i\sqrt{35}\sqrt{13-22x+10x^2}-70\,i\sqrt{35}\,x\sqrt{13-22x+10x^2}\right)\Big]+$$
$$(1+4\,i)\,A\,\mathrm{Log}\Big[(2+i)\left((1566+127\,i)-(2844+118\,i)\,x+(1350+25\,i)\,x^2-68\sqrt{35}\sqrt{13-22x+10x^2}+70\sqrt{35}\,x\sqrt{13-22x+10x^2}\right)\Big]+$$
$$(1+2\,i)\,B\,\mathrm{Log}\Big[(2+i)\left((1566+127\,i)-(2844+118\,i)\,x+(1350+25\,i)\,x^2-68\sqrt{35}\sqrt{13-22x+10x^2}+70\sqrt{35}\,x\sqrt{13-22x+10x^2}\right)\Big]\Bigg)$$

Problem 249: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{-2+x}{(17-18x+5x^2)\sqrt{13-22x+10x^2}}\,dx$$

Optimal (type 3, 38 leaves, 2 steps):

$$\frac{\mathrm{ArcTanh}\left[\frac{\sqrt{35}\,(1-x)}{2\sqrt{13-22x+10x^2}}\right]}{2\sqrt{35}}$$

Result (type 3, 410 leaves):

$$\frac{1}{8\sqrt{35}}\Bigg(-2\,i\,\mathrm{ArcTan}\Big[\left(4\left((-2+2\,i)+5x\right)(13-22x+10x^2)\right)\Big/\Big((-819-182\,i)+350x^3+(44+11\,i)\sqrt{35}\sqrt{13-22x+10x^2}+$$
$$x\left((1841+308\,i)-(62+21\,i)\sqrt{35}\sqrt{13-22x+10x^2}\right)+10x^2\left((-140-14\,i)+(2+i)\sqrt{35}\sqrt{13-22x+10x^2}\right)\Big)\Big]-$$
$$2\,i\,\mathrm{ArcTan}\Big[\left((7+14\,i)\left((-169-116\,i)+(419+218\,i)\,x-(335+140\,i)\,x^2+(85+30\,i)\,x^3\right)\right)\Big/$$
$$\Big((-1638+364\,i)+700x^3-(88-22\,i)\sqrt{35}\sqrt{13-22x+10x^2}+20\,i\,x^2\left((14+140\,i)+(1+2\,i)\sqrt{35}\sqrt{13-22x+10x^2}\right)+$$
$$(4-2\,i)\,x\left((798+245\,i)+(29+4\,i)\sqrt{35}\sqrt{13-22x+10x^2}\right)\Big)\Big]+2\,\mathrm{Log}\left[i\,(17-18x+5x^2)\right]-$$
$$\mathrm{Log}\Big[(1+2\,i)\left((1566-127\,i)-(2844-118\,i)\,x+(1350-25\,i)\,x^2-68\sqrt{35}\sqrt{13-22x+10x^2}+70\sqrt{35}\,x\sqrt{13-22x+10x^2}\right)\Big]-$$
$$\mathrm{Log}\Big[(2+i)\left((1566+127\,i)-(2844+118\,i)\,x+(1350+25\,i)\,x^2-68\sqrt{35}\sqrt{13-22x+10x^2}+70\sqrt{35}\,x\sqrt{13-22x+10x^2}\right)\Big]\Bigg)$$

Problem 260: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{x^2 \left(2-\sqrt{1+x^2}\right)}{\sqrt{1+x^2}\left(1-x^3+\left(1+x^2\right)^{3/2}\right)}\,dx$$

Optimal (type 3, 136 leaves, 32 steps):

$$\frac{8x}{9}-\frac{x^2}{6}+\frac{8\sqrt{1+x^2}}{9}-\frac{1}{6}x\sqrt{1+x^2}-\frac{41\,\text{ArcSinh}[x]}{54}+\frac{4}{27}\sqrt{2}\,\text{ArcTan}\left[\frac{1+3x}{2\sqrt{2}}\right]+\frac{4}{27}\sqrt{2}\,\text{ArcTan}\left[\frac{1+x}{\sqrt{2}\sqrt{1+x^2}}\right]+\frac{7}{27}\text{ArcTanh}\left[\frac{1-x}{2\sqrt{1+x^2}}\right]-\frac{7}{54}\text{Log}\left[3+2x+3x^2\right]$$

Result (type 3, 947 leaves):

$$\begin{aligned}
&\frac{1}{108}\Bigg(96x-18x^2-6(-16+3x)\sqrt{1+x^2}-82\,\text{ArcSinh}[x]+16\sqrt{2}\,\text{ArcTan}\left[\frac{1+3x}{2\sqrt{2}}\right]-\frac{1}{\sqrt{1+2i\sqrt{2}}}2i\left(-i+11\sqrt{2}\right)\\
&\quad\text{ArcTan}\Big[\Big(2\Big(169\left(7-4i\sqrt{2}\right)-1716i\left(-i+2\sqrt{2}\right)x+\left(-4622-5032i\sqrt{2}\right)x^2-1716i\left(-i+2\sqrt{2}\right)x^3+\left(-1449-4356i\sqrt{2}\right)x^4\Big)\Big)\Big/\\
&\quad\Big(-559\left(-8i+7\sqrt{2}\right)+9\left(-88i+383\sqrt{2}\right)x^4+12x\left(230\left(4i+\sqrt{2}\right)+729\sqrt{1+2i\sqrt{2}}\sqrt{1+x^2}\right)+\\
&\quad 12x^3\left(230\left(4i+\sqrt{2}\right)+729\sqrt{1+2i\sqrt{2}}\sqrt{1+x^2}\right)+x^2\left(3680i-862\sqrt{2}+5832\sqrt{1+2i\sqrt{2}}\sqrt{1+x^2}\right)\Big)\Big]+\frac{1}{\sqrt{-1+2i\sqrt{2}}}2\left(i+11\sqrt{2}\right)\\
&\quad\text{ArcTan}\Big[\Big(559\left(8-7i\sqrt{2}\right)+9i\left(88i+383\sqrt{2}\right)x^4+6561i\sqrt{-2+4i\sqrt{2}}\sqrt{1+x^2}+3x^3\left(920\left(4+i\sqrt{2}\right)-729i\sqrt{-2+4i\sqrt{2}}\sqrt{1+x^2}\right)+\\
&\quad 3x\left(920\left(4+i\sqrt{2}\right)+729i\sqrt{-2+4i\sqrt{2}}\sqrt{1+x^2}\right)+x^2\left(3680-862i\sqrt{2}+5103i\sqrt{-2+4i\sqrt{2}}\sqrt{1+x^2}\right)\Big)\Big/\\
&\quad\Big(17317i+1352\sqrt{2}+3432\left(i+2\sqrt{2}\right)x+2\left(19931i+5032\sqrt{2}\right)x^2+3432\left(i+2\sqrt{2}\right)x^3+9\left(2509i+968\sqrt{2}\right)x^4\Big)\Big]-\\
&\quad 14\,\text{Log}\left[3+2x+3x^2\right]-\frac{\left(-i+11\sqrt{2}\right)\text{Log}\left[9\left(3+2x+3x^2\right)^2\right]}{\sqrt{1+2i\sqrt{2}}}+\frac{i\left(i+11\sqrt{2}\right)\text{Log}\left[9\left(3+2x+3x^2\right)^2\right]}{\sqrt{-1+2i\sqrt{2}}}+\frac{1}{\sqrt{-1+2i\sqrt{2}}}\\
&\quad\left(1-11i\sqrt{2}\right)\text{Log}\left[\left(3+2x+3x^2\right)\left(-7i+4\sqrt{2}+\left(-7i+4\sqrt{2}\right)x^2-2ix\left(-3+4\sqrt{-1+2i\sqrt{2}}\sqrt{1+x^2}\right)\right)\right]+\frac{1}{\sqrt{1+2i\sqrt{2}}}\\
&\quad\left(-i+11\sqrt{2}\right)\text{Log}\left[\left(3+2x+3x^2\right)\left(-11i+4\sqrt{2}+\left(-11i+4\sqrt{2}\right)x^2-6i\sqrt{2+4i\sqrt{2}}\sqrt{1+x^2}+2ix\left(3+\sqrt{2+4i\sqrt{2}}\sqrt{1+x^2}\right)\right)\right]\Bigg)
\end{aligned}$$

Problem 264: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(-1+x^2\right)\sqrt{2x+x^2}}\,dx$$

Optimal (type 3, 49 leaves, 5 steps):

$$-\frac{1}{2}\,\text{ArcTan}\left[\sqrt{2x+x^2}\right]-\frac{\text{ArcTanh}\left[\frac{1+2x}{\sqrt{3}\,\sqrt{2x+x^2}}\right]}{2\sqrt{3}}$$

Result (type 3, 113 leaves):

$$\frac{1}{6\sqrt{x\,(2+x)}}\sqrt{x}\,\sqrt{2+x}\,\left(-6\,\text{ArcTan}\left[\sqrt{\frac{x}{2+x}}\right]+\sqrt{3}\,\left(\text{Log}\left[1-\sqrt{x}\right]-\text{Log}\left[1+\sqrt{x}\right]+\text{Log}\left[2-\sqrt{x}+\sqrt{3}\,\sqrt{2+x}\right]-\text{Log}\left[2+\sqrt{x}+\sqrt{3}\,\sqrt{2+x}\right]\right)\right)$$

Problem 294: Result unnecessarily involves higher level functions.

$$\int \frac{(-1+3x)^{4/3}}{x^2}\,dx$$

Optimal (type 3, 71 leaves, 6 steps):

$$12\,(-1+3x)^{1/3}-\frac{(-1+3x)^{4/3}}{x}+4\sqrt{3}\,\text{ArcTan}\left[\frac{1-2\,(-1+3x)^{1/3}}{\sqrt{3}}\right]+2\,\text{Log}[x]-6\,\text{Log}\left[1+(-1+3x)^{1/3}\right]$$

Result (type 5, 59 leaves):

$$\frac{-1-6x+27x^2+2\times 3^{1/3}\left(3-\frac{1}{x}\right)^{2/3}x\,\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},\frac{1}{3x}\right]}{x\,(-1+3x)^{2/3}}$$

Problem 296: Result unnecessarily involves higher level functions.

$$\int \frac{\left(1-2x^{1/3}\right)^{3/4}}{x}\,dx$$

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

$$4\left(1-2x^{1/3}\right)^{3/4}+6\,\text{ArcTan}\left[\left(1-2x^{1/3}\right)^{1/4}\right]-6\,\text{ArcTanh}\left[\left(1-2x^{1/3}\right)^{1/4}\right]$$

Result (type 5, 62 leaves):

$$\frac{4-8\,x^{1/3}-6\times 2^{3/4}\left(2-\frac{1}{x^{1/3}}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{1}{2\,x^{1/3}}\right]}{\left(1-2\,x^{1/3}\right)^{1/4}}$$

Problem 298: Result unnecessarily involves higher level functions.

$$\int \frac{\left(-1+2\sqrt{x}\right)^{5/4}}{x^2}\,dx$$

Optimal (type 3, 193 leaves, 13 steps):

$$-\frac{\left(-1+2\sqrt{x}\right)^{5/4}}{x}-\frac{5\left(-1+2\sqrt{x}\right)^{1/4}}{2\sqrt{x}}-\frac{5\,\text{ArcTan}\left[1-\sqrt{2}\left(-1+2\sqrt{x}\right)^{1/4}\right]}{2\sqrt{2}}+\frac{5\,\text{ArcTan}\left[1+\sqrt{2}\left(-1+2\sqrt{x}\right)^{1/4}\right]}{2\sqrt{2}}-\frac{5\,\text{Log}\left[1-\sqrt{2}\left(-1+2\sqrt{x}\right)^{1/4}+\sqrt{-1+2\sqrt{x}}\right]}{4\sqrt{2}}+\frac{5\,\text{Log}\left[1+\sqrt{2}\left(-1+2\sqrt{x}\right)^{1/4}+\sqrt{-1+2\sqrt{x}}\right]}{4\sqrt{2}}$$

Result (type 5, 72 leaves):

$$\frac{-6+39\sqrt{x}-54\,x-5\times 2^{1/4}\left(2-\frac{1}{\sqrt{x}}\right)^{3/4}x\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{1}{2\sqrt{x}}\right]}{6\left(-1+2\sqrt{x}\right)^{3/4}x}$$

Problem 301: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x\left(-27+2\,x^7\right)^{2/3}}\,dx$$

Optimal (type 3, 59 leaves, 5 steps):

$$-\frac{\text{ArcTan}\left[\frac{3-2\left(-27+2\,x^7\right)^{1/3}}{3\sqrt{3}}\right]}{21\sqrt{3}}-\frac{\text{Log}[x]}{18}+\frac{1}{42}\,\text{Log}\left[3+\left(-27+2\,x^7\right)^{1/3}\right]$$

Result (type 5, 43 leaves):

$$-\frac{3\left(2-\frac{27}{x^7}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},\frac{27}{2\,x^7}\right]}{14\left(-54+4\,x^7\right)^{2/3}}$$

Problem 302: Result unnecessarily involves higher level functions.

$$\int \frac{\left(1+x^7\right)^{2/3}}{x^8}\,dx$$

Optimal (type 3, 70 leaves, 6 steps):

$$-\frac{\left(1+x^7\right)^{2/3}}{7 x^7}+\frac{2\,\text{ArcTan}\left[\frac{1+2\left(1+x^7\right)^{1/3}}{\sqrt{3}}\right]}{7\sqrt{3}}-\frac{\text{Log}[x]}{3}+\frac{1}{7}\text{Log}\left[1-\left(1+x^7\right)^{1/3}\right]$$

Result (type 5, 54 leaves):

$$-\frac{\left(1+x^7\right)^{2/3}}{7 x^7}-\frac{2\left(1+\frac{1}{x^7}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},-\frac{1}{x^7}\right]}{7\left(1+x^7\right)^{1/3}}$$

Problem 303: Result unnecessarily involves higher level functions.

$$\int \frac{\left(3+4 x^4\right)^{1/4}}{x^2}\,dx$$

Optimal (type 3, 68 leaves, 5 steps):

$$-\frac{\left(3+4 x^4\right)^{1/4}}{x}-\frac{\text{ArcTan}\left[\frac{\sqrt{2}\,x}{\left(3+4 x^4\right)^{1/4}}\right]}{\sqrt{2}}+\frac{\text{ArcTanh}\left[\frac{\sqrt{2}\,x}{\left(3+4 x^4\right)^{1/4}}\right]}{\sqrt{2}}$$

Result (type 5, 46 leaves):

$$-\frac{\left(3+4 x^4\right)^{1/4}}{x}+\frac{4 x^3\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{4 x^4}{3}\right]}{3\times 3^{3/4}}$$

Problem 304: Result unnecessarily involves higher level functions.

$$\int x^2\left(3+4 x^4\right)^{5/4}\,dx$$

Optimal (type 3, 93 leaves, 6 steps):

$$\frac{15}{32}x^3\left(3+4 x^4\right)^{1/4}+\frac{1}{8}x^3\left(3+4 x^4\right)^{5/4}-\frac{45\,\text{ArcTan}\left[\frac{\sqrt{2}\,x}{\left(3+4 x^4\right)^{1/4}}\right]}{128\sqrt{2}}+\frac{45\,\text{ArcTanh}\left[\frac{\sqrt{2}\,x}{\left(3+4 x^4\right)^{1/4}}\right]}{128\sqrt{2}}$$

Result (type 5, 51 leaves):

$$\frac{1}{32} x^3 \left(\left(3+4 x^4\right)^{1/4} \left(27+16 x^4\right)+5\times 3^{1/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{4 x^4}{3}\right]\right)$$

Problem 305: Result unnecessarily involves higher level functions.

$$\int x^6 \left(3+4 x^4\right)^{1/4} \, dx$$

Optimal (type 3, 93 leaves, 6 steps):

$$\frac{3}{128} x^3 \left(3+4 x^4\right)^{1/4}+\frac{1}{8} x^7 \left(3+4 x^4\right)^{1/4}+\frac{27 \text{ArcTan}\left[\frac{\sqrt{2} x}{\left(3+4 x^4\right)^{1/4}}\right]}{512 \sqrt{2}}-\frac{27 \text{ArcTanh}\left[\frac{\sqrt{2} x}{\left(3+4 x^4\right)^{1/4}}\right]}{512 \sqrt{2}}$$

Result (type 5, 51 leaves):

$$\frac{1}{128} x^3 \left(\left(3+4 x^4\right)^{1/4} \left(3+16 x^4\right)-3\times 3^{1/4} \text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},-\frac{4 x^4}{3}\right]\right)$$

Problem 306: Result unnecessarily involves higher level functions.

$$\int \left(x \left(1-x^2\right)\right)^{1/3} \, dx$$

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

$$\frac{1}{2} x \left(x \left(1-x^2\right)\right)^{1/3}+\frac{\text{ArcTan}\left[\frac{2 x-\left(x \left(1-x^2\right)\right)^{1/3}}{\sqrt{3} \left(x \left(1-x^2\right)\right)^{1/3}}\right]}{2 \sqrt{3}}+\frac{\text{Log}[x]}{12}-\frac{1}{4} \text{Log}\left[x+\left(x \left(1-x^2\right)\right)^{1/3}\right]$$

Result (type 5, 56 leaves):

$$\frac{x \left(x-x^3\right)^{1/3} \left(-2+2 x^2-\left(1-x^2\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},x^2\right]\right)}{4 \left(-1+x^2\right)}$$

Problem 311: Result more than twice size of optimal antiderivative.

$$\int \frac{-1+x^2}{x \sqrt{1+3 x^2+x^4}} \, dx$$

Optimal (type 3, 21 leaves, 3 steps):

$$\text{ArcTanh}\left[\frac{1+x^2}{\sqrt{1+3 x^2+x^4}}\right]$$

Result (type 3, 59 leaves):

$$\frac{1}{2}\left(-\text{Log}\left[x^2\right]+\text{Log}\left[3+2x^2+2\sqrt{1+3x^2+x^4}\right]+\text{Log}\left[2+3x^2+2\sqrt{1+3x^2+x^4}\right]\right)$$

Problem 319: Unable to integrate problem.

$$\int \frac{1}{\left(3x+3x^2+x^3\right)\left(3+3x+3x^2+x^3\right)^{1/3}}\,dx$$

Optimal (type 3, 123 leaves, 9 steps):

$$-\frac{\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2(1+x)}{3^{1/6}\left(2+(1+x)^3\right)^{1/3}}\right]}{3^{5/6}}+\frac{\text{Log}\left[1-\frac{3^{1/3}(1+x)}{\left(2+(1+x)^3\right)^{1/3}}\right]}{3\times 3^{1/3}}-\frac{\text{Log}\left[1+\frac{3^{2/3}(1+x)^2}{\left(2+(1+x)^3\right)^{2/3}}+\frac{3^{1/3}(1+x)}{\left(2+(1+x)^3\right)^{1/3}}\right]}{6\times 3^{1/3}}$$

Result (type 8, 34 leaves):

$$\int \frac{1}{\left(3x+3x^2+x^3\right)\left(3+3x+3x^2+x^3\right)^{1/3}}\,dx$$

Problem 320: Result unnecessarily involves higher level functions.

$$\int \frac{1-x^2}{\left(1+x^2\right)\sqrt{1+x^4}}\,dx$$

Optimal (type 3, 23 leaves, 2 steps):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{2}\,x}{\sqrt{1+x^4}}\right]}{\sqrt{2}}$$

Result (type 4, 40 leaves):

$$(-1)^{1/4}\left(\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}x\right],-1\right]-2\,\text{EllipticPi}\left[-i,\,i\,\text{ArcSinh}\left[(-1)^{1/4}x\right],-1\right]\right)$$

Problem 321: Result unnecessarily involves higher level functions.

$$\int \frac{1+x^2}{\left(1-x^2\right)\sqrt{1+x^4}}\,dx$$

Optimal (type 3, 23 leaves, 2 steps):

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{2}\,x}{\sqrt{1+x^4}}\right]}{\sqrt{2}}$$

Result (type 4, 36 leaves):

$$(-1)^{1/4}\left(\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}\,x\right],-1\right]-2\,\text{EllipticPi}\left[i,\text{ArcSin}\left[(-1)^{3/4}\,x\right],-1\right]\right)$$

Problem 324: Unable to integrate problem.

$$\int \frac{1+x^2}{\left(1-x^2\right)\sqrt{1+x^2+x^4}}\,dx$$

Optimal (type 3, 26 leaves, 2 steps):

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{3}\,x}{\sqrt{1+x^2+x^4}}\right]}{\sqrt{3}}$$

Result (type 8, 29 leaves):

$$\int \frac{1+x^2}{\left(1-x^2\right)\sqrt{1+x^2+x^4}}\,dx$$

Problem 325: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{1-x^2}{\left(1+x^2\right)\sqrt{1+x^2+x^4}}\,dx$$

Optimal (type 3, 15 leaves, 2 steps):

$$\text{ArcTan}\left[\frac{x}{\sqrt{1+x^2+x^4}}\right]$$

Result (type 4, 94 leaves):

$$-\frac{1}{\sqrt{1+x^2+x^4}}(-1)^{2/3}\sqrt{1+(-1)^{1/3}x^2}\,\sqrt{1-(-1)^{2/3}x^2}\,\left(\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{5/6}\,x\right],(-1)^{2/3}\right]+2\,\text{EllipticPi}\left[(-1)^{1/3},-i\,\text{ArcSinh}\left[(-1)^{5/6}\,x\right],(-1)^{2/3}\right]\right)$$

Problem 327: Result unnecessarily involves higher level functions and more than twice size of optimal

antiderivative.

$$\int \frac{1-x^2}{\left(1+2 a x+x^2\right) \sqrt{1+2 a x+2 b x^2+2 a x^3+x^4}} \, dx$$

Optimal (type 3, 74 leaves, 1 step):

$$\frac{\text{ArcTan}\left[\frac{a+2 \left(1+a^2-b\right) x+a x^2}{\sqrt{2} \sqrt{1-b} \sqrt{1+2 a x+2 b x^2+2 a x^3+x^4}}\right]}{\sqrt{2} \sqrt{1-b}}$$

Result (type 4, 17 955 leaves):

$$\Big(2 a \left(x-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 2\right]\right)^2$$

$$\Big(\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{}\Big(\Big(\left(x-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 1\right]\right) \Big(\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 2\right]-$$

$$\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 4\right]\Big)\Big) \Big/ \Big(\left(x-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 2\right]\right)$$

$$\left(\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 1\right]-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 4\right]\right)\Big)\Big)\Big],$$

$$-\Big(\Big(\left(\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 2\right]-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 3\right]\right)$$

$$\left(\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 1\right]-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 4\right]\right)\Big) \Big/$$

$$\Big(\left(-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 1\right]+\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 3\right]\right) \Big(\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&,\right.$$

$$\left.2\right]-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 4\right]\Big)\Big)\Big)\Big] \left(-a+\sqrt{-1+a^2}-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 1\right]\right) -$$

$$\text{EllipticPi}\Big[\Big(\left(a-\sqrt{-1+a^2}+\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 2\right]\right) \Big(-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 1\right]+$$

$$\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 4\right]\Big)\Big) \Big/ \Big(\left(a-\sqrt{-1+a^2}+\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 1\right]\right)$$

$$\left(-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 2\right]+\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 4\right]\right)\Big),$$

$$\text{ArcSin}\Big[\sqrt{}\Big(\Big(\left(x-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 1\right]\right) \Big(\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 2\right]-$$

$$\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 4\right]\Big)\Big) \Big/ \Big(\left(x-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 2\right]\right)$$

$$\left(\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 1\right]-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 4\right]\right)\Big)\Big)\Big],$$

$$-\Big(\Big(\left(\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 2\right]-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 3\right]\right)$$

$$\left(\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 1\right]-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 4\right]\right)\Big) \Big/$$

$$\Big(\left(-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 1\right]+\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 3\right]\right)$$

$$\left(\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 2\right]-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 4\right]\right)\Big)\Big)\Big]$$

$$\left(-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 1\right]+\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 2\right]\right)\Big)$$

$$\sqrt{}\Big(\Big(\left(-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 1\right]+\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 2\right]\right)$$

$$\left(x-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 3\right]\right)\Big) \Big/ \Big(\left(x-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 2\right]\right)$$

$$\left(-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 1\right]+\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 3\right]\right)\Big)\Big)$$

$$\sqrt{}\Big(\Big(\left(x-\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 1\right]\right) \Big(\text{Root}\left[1+2 a \#1+2 b \#1^2+2 a \#1^3+\#1^4 \&, 2\right]-$$

$$\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,4]))) \,/\, ((x-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,2])$$
$$(\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,1]-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,4])))$$
$$\sqrt{}(((-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,1]+\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,2])$$
$$(x-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,4]))\,/\,((x-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,2])$$
$$(-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,1]+\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,4])))$$
$$(-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,1]+\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,4]))\Big)\Big/$$
$$\Big(\sqrt{1+2\,b\,x^2+x^4+2\,a\,(x+x^3)}$$
$$\Big(a-\sqrt{-1+a^2}+$$
$$\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,1]\Big)$$
$$\Big(-a+\sqrt{-1+a^2}-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,2]\Big)$$
$$(-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,1]+$$
$$\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,2])$$
$$(\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,2]-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,4])\Big)+$$
$$\Big((x-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,2])^2$$
$$\Big(\text{EllipticF}[\text{ArcSin}[\sqrt{}(((x-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,1])\;(\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,2]-$$
$$\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,4]))\,/\,((x-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,2])$$
$$(\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,1]-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,4]))))],$$
$$-(((\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,2]-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,3])$$
$$(\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,1]-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,4]))\,/$$
$$((-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,1]+\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,3])\;(\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,$$
$$2]-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,4]))))]\;\Big(-a+\sqrt{-1+a^2}-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,1]\Big)-$$
$$\text{EllipticPi}\Big[\Big(\Big(a-\sqrt{-1+a^2}+\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,2]\Big)\;(-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,1]+$$
$$\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,4])\Big)\Big/\Big(\Big(a-\sqrt{-1+a^2}+\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,1]\Big)$$
$$(-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,2]+\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,4])\Big),$$
$$\text{ArcSin}[\sqrt{}(((x-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,1])\;(\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,2]-$$
$$\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,4]))\,/\,((x-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,2])$$
$$(\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,1]-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,4]))))],$$
$$-(((\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,2]-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,3])$$
$$(\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,1]-\text{Root}[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,4]))\,/$$

```
((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
  (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4]))))]
 (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2]))
√(((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
   (x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
   (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])))
√(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] -
     Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
   (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))
√(((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
   (x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
   (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))
(-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / (√(-1 + a^2)
√(1 + 2 b x^2 + x^4 + 2 a (x + x^3))
(a - √(-1 + a^2) + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1])
(-a + √(-1 + a^2) - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
(-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] +
  Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
(Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) -
(a^2 (x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])^2
 (EllipticF[ArcSin[√(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] -
       Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
      (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))],
   -(((Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
      (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) /
     ((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &,
        2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))] (-a + √(-1 + a^2) - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) -
  EllipticPi[((a - √(-1 + a^2) + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2]) (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] +
       Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((a - √(-1 + a^2) + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1])
      (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])),
```

$$\text{ArcSin}\Big[\surd\Big(\Big(\Big(x-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]\Big)\ \Big(\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]-$$
$$\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,4\big]\Big)\Big)\Big/\Big(\Big(x-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]\Big)$$
$$\Big(\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,4\big]\Big)\Big)\Big)\Big],$$
$$-\Big(\Big(\Big(\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,3\big]\Big)$$
$$\Big(\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,4\big]\Big)\Big)\Big/$$
$$\Big(\Big(-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]+\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,3\big]\Big)$$
$$\Big(\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,4\big]\Big)\Big)\Big)\Big]$$
$$\Big(-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]+\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]\Big)\Big)$$
$$\surd\Big(\Big(\Big(-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]+\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]\Big)$$
$$\Big(x-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,3\big]\Big)\Big)\Big/\Big(\Big(x-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]\Big)$$
$$\Big(-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]+\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,3\big]\Big)\Big)\Big)$$
$$\surd\Big(\Big(\Big(x-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]\Big)\ \Big(\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]-$$
$$\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,4\big]\Big)\Big)\Big/\Big(\Big(x-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]\Big)$$
$$\Big(\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,4\big]\Big)\Big)\Big)$$
$$\surd\Big(\Big(\Big(-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]+\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]\Big)$$
$$\Big(x-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,4\big]\Big)\Big)\Big/\Big(\Big(x-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]\Big)$$
$$\Big(-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]+\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,4\big]\Big)\Big)\Big)$$
$$\Big(-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]+\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,4\big]\Big)\Big)\Big/\Big(\sqrt{-1+a^2}$$
$$\sqrt{1+2bx^2+x^4+2a\,(x+x^3)}$$
$$\Big(a-\sqrt{-1+a^2}+\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]\Big)$$
$$\Big(-a+\sqrt{-1+a^2}-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]\Big)$$
$$\Big(-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]+$$
$$\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]\Big)$$
$$\Big(\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,4\big]\Big)\Big)-$$
$$\Big(\sqrt{-1+a^2}\ \Big(x-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]\Big)^2$$
$$\Big(\text{EllipticF}\Big[\text{ArcSin}\Big[\surd\Big(\Big(\Big(x-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]\Big)\ \Big(\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]-$$
$$\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,4\big]\Big)\Big)\Big/\Big(\Big(x-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]\Big)$$
$$\Big(\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,4\big]\Big)\Big)\Big)\Big],$$
$$-\Big(\Big(\Big(\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,2\big]-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,3\big]\Big)$$
$$\Big(\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,4\big]\Big)\Big)\Big/$$
$$\Big(\Big(-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]+\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,3\big]\Big)\ \Big(\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,$$
$$2\big]-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,4\big]\Big)\Big)\Big)\Big]\ \Big(-a+\sqrt{-1+a^2}-\text{Root}\big[1+2a\#1+2b\#1^2+2a\#1^3+\#1^4\,\&,1\big]\Big)-$$

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EllipticPi[((a - Sqrt[-1 + a^2] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2]) (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] +
      Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((a - Sqrt[-1 + a^2] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1])
    (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])),
  ArcSin[√(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] -
          Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
        (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))],
  -(((Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
       (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) /
     ((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
       (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))]
 (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2]))
√(((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
    (x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
    (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])))
√(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] -
      Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
    (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))
√(((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
    (x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
    (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))
(-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) /
(Sqrt[1 + 2 b x^2 + x^4 + 2 a (x + x^3)]
 (a - Sqrt[-1 + a^2] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1])
 (-a + Sqrt[-1 + a^2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
 (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] +
   Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
 (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) + (2
 a
 (x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])^2
 (EllipticF[ArcSin[√(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] -
          Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
```

(Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))],
- (((Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
(Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) /
((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &,
2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))] (-a - Sqrt[-1 + a^2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) -
EllipticPi[((a + Sqrt[-1 + a^2] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2]) (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] +
Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((a + Sqrt[-1 + a^2] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1])
(-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])),
ArcSin[Sqrt[(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] -
Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
(Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))],
- (((Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
(Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) /
((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
(Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))]
(-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2]))
Sqrt[(((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
(x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
(-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])))]
Sqrt[(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] -
Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
(Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))]
Sqrt[(((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
(x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
(-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))]
(-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) /
(Sqrt[1 + 2 b x^2 + x^4 + 2 a (x + x^3)]
(a + Sqrt[-1 + a^2] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1])
(-a - Sqrt[-1 + a^2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
(-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] +
Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])

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(Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) -
((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])^2
  (EllipticF[ArcSin[√(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] -
            Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
          (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))],
      -(((Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
          (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) /
        ((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &,
            2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))] (-a - √(-1 + a^2) - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) -
    EllipticPi[((a + √(-1 + a^2) + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2]) (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] +
          Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((a + √(-1 + a^2) + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1])
        (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])),
      ArcSin[√(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] -
            Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
          (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))],
      -(((Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
          (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) /
        ((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
          (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))]
     (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2]))
  √(((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
       (x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
       (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])))
  √(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] -
         Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
       (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))
  √(((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
       (x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
       (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))
  (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / (√(-1 + a^2)
  √(1 + 2 b x^2 + x^4 + 2 a (x + x^3))
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(a + Sqrt[-1 + a^2] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1])
(-a - Sqrt[-1 + a^2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
(-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] +
  Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
(Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) +
(a^2 (x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])^2
 (EllipticF[ArcSin[Sqrt[(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] -
        Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
       (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))]],
    -(((Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
       (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) /
     ((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &,
        2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))] (-a - Sqrt[-1 + a^2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) -
   EllipticPi[((a + Sqrt[-1 + a^2] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2]) (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] +
        Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((a + Sqrt[-1 + a^2] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1])
      (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])),
    ArcSin[Sqrt[(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] -
        Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
       (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))]],
    -(((Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
       (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) /
     ((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
       (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))]
   (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2]))
 Sqrt[(((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
     (x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
     (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])))]
 Sqrt[(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] -
      Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
     (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))]
 Sqrt[(((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
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(x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4]))) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
    (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))
(-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / (√(-1 + a^2)
√(1 + 2 b x^2 + x^4 + 2 a (x + x^3))
(a + √(-1 + a^2) + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1])
(-a - √(-1 + a^2) - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
(-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] +
  Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
(Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) +
(√(-1 + a^2) (x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])^2
(EllipticF[ArcSin[√(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] -
        Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
        (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))],
    -(((Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
        (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) /
      ((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &,
        2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))] (-a - √(-1 + a^2) - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) -
  EllipticPi[((a + √(-1 + a^2) + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2]) (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] +
      Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((a + √(-1 + a^2) + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1])
      (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])),
    ArcSin[√(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] -
        Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
        (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))],
    -(((Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
        (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) /
      ((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
        (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))]
  (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2]))
√(((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
    (x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
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        (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])))
   √(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] -
          Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4]))) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
        (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))
   √(((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
        (x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4]))) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
        (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))
   (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4]))) /
  (√(1 + 2 b x^2 + x^4 + 2 a (x + x^3))
   (a + √(-1 + a^2) + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1])
   (-a - √(-1 + a^2) - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
   (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] +
     Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
   (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) -
 (2 EllipticF[ArcSin[√(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] +
              Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4]))) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
            (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))],
     ((Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
        (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])) /
      ((Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])
        (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4]))]
   (x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])^2
   √(((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
        (x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3]))) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
        (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 3])))
   (Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])
   √(((-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
        (x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4]))) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
        (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))
   √(((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1]) (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] +
          Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4]))) / ((x - Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
        (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 4])))) /
  (√(1 + 2 b x^2 + x^4 + 2 a (x + x^3)) (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 1] + Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2])
   (-Root[1 + 2 a #1 + 2 b #1^2 + 2 a #1^3 + #1^4 &, 2] +
```

$\text{Root}\left[1+2\,a\,\#1+2\,b\,\#1^2+2\,a\,\#1^3+\#1^4\,\&,\,4\right]\big)\Big)$

Problem 338: Result more than twice size of optimal antiderivative.

$$\int \text{Csc}[x]^7\,dx$$

Optimal (type 3, 36 leaves, 4 steps):

$$-\frac{5}{16}\,\text{ArcTanh}[\text{Cos}[x]]-\frac{5}{16}\,\text{Cot}[x]\,\text{Csc}[x]-\frac{5}{24}\,\text{Cot}[x]\,\text{Csc}[x]^3-\frac{1}{6}\,\text{Cot}[x]\,\text{Csc}[x]^5$$

Result (type 3, 95 leaves):

$$-\frac{5}{64}\,\text{Csc}\left[\frac{x}{2}\right]^2-\frac{1}{64}\,\text{Csc}\left[\frac{x}{2}\right]^4-\frac{1}{384}\,\text{Csc}\left[\frac{x}{2}\right]^6-\frac{5}{16}\,\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]\right]+\frac{5}{16}\,\text{Log}\left[\text{Sin}\left[\frac{x}{2}\right]\right]+\frac{5}{64}\,\text{Sec}\left[\frac{x}{2}\right]^2+\frac{1}{64}\,\text{Sec}\left[\frac{x}{2}\right]^4+\frac{1}{384}\,\text{Sec}\left[\frac{x}{2}\right]^6$$

Problem 355: Result more than twice size of optimal antiderivative.

$$\int \text{Cot}[x]^3\,\text{Csc}[x]\,dx$$

Optimal (type 3, 11 leaves, 2 steps):

$$\text{Csc}[x]-\frac{\text{Csc}[x]^3}{3}$$

Result (type 3, 57 leaves):

$$\frac{5}{12}\,\text{Cot}\left[\frac{x}{2}\right]-\frac{1}{24}\,\text{Cot}\left[\frac{x}{2}\right]\,\text{Csc}\left[\frac{x}{2}\right]^2+\frac{5}{12}\,\text{Tan}\left[\frac{x}{2}\right]-\frac{1}{24}\,\text{Sec}\left[\frac{x}{2}\right]^2\,\text{Tan}\left[\frac{x}{2}\right]$$

Problem 357: Result more than twice size of optimal antiderivative.

$$\int \text{Cot}[x]^2\,\text{Csc}[x]^3\,dx$$

Optimal (type 3, 26 leaves, 3 steps):

$$\frac{1}{8}\,\text{ArcTanh}[\text{Cos}[x]]+\frac{1}{8}\,\text{Cot}[x]\,\text{Csc}[x]-\frac{1}{4}\,\text{Cot}[x]\,\text{Csc}[x]^3$$

Result (type 3, 71 leaves):

$$\frac{1}{32}\,\text{Csc}\left[\frac{x}{2}\right]^2-\frac{1}{64}\,\text{Csc}\left[\frac{x}{2}\right]^4+\frac{1}{8}\,\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]\right]-\frac{1}{8}\,\text{Log}\left[\text{Sin}\left[\frac{x}{2}\right]\right]-\frac{1}{32}\,\text{Sec}\left[\frac{x}{2}\right]^2+\frac{1}{64}\,\text{Sec}\left[\frac{x}{2}\right]^4$$

Problem 361: Result more than twice size of optimal antiderivative.

$$\int \cot(x)^4 \csc(x)^3 \, dx$$

Optimal (type 3, 38 leaves, 4 steps):

$$-\frac{1}{16} \text{ArcTanh}[\cos(x)] - \frac{1}{16} \cot(x) \csc(x) + \frac{1}{8} \cot(x) \csc(x)^3 - \frac{1}{6} \cot(x)^3 \csc(x)^3$$

Result (type 3, 95 leaves):

$$-\frac{1}{64} \csc\left[\frac{x}{2}\right]^2 + \frac{1}{64} \csc\left[\frac{x}{2}\right]^4 - \frac{1}{384} \csc\left[\frac{x}{2}\right]^6 - \frac{1}{16} \text{Log}\left[\cos\left[\frac{x}{2}\right]\right] + \frac{1}{16} \text{Log}\left[\sin\left[\frac{x}{2}\right]\right] + \frac{1}{64} \sec\left[\frac{x}{2}\right]^2 - \frac{1}{64} \sec\left[\frac{x}{2}\right]^4 + \frac{1}{384} \sec\left[\frac{x}{2}\right]^6$$

Problem 367: Result more than twice size of optimal antiderivative.

$$\int \cos(4x) \sec(x) \, dx$$

Optimal (type 3, 12 leaves, 4 steps):

$$\text{ArcTanh}[\sin(x)] - \frac{8 \sin(x)^3}{3}$$

Result (type 3, 45 leaves):

$$-\text{Log}\left[\cos\left[\frac{x}{2}\right] - \sin\left[\frac{x}{2}\right]\right] + \text{Log}\left[\cos\left[\frac{x}{2}\right] + \sin\left[\frac{x}{2}\right]\right] - 2 \sin(x) + \frac{2}{3} \sin(3x)$$

Problem 369: Result more than twice size of optimal antiderivative.

$$\int \cos(4x) \sec(x)^5 \, dx$$

Optimal (type 3, 26 leaves, 4 steps):

$$\frac{35}{8} \text{ArcTanh}[\sin(x)] - \frac{29}{8} \sec(x) \tan(x) + \frac{1}{4} \sec(x)^3 \tan(x)$$

Result (type 3, 58 leaves):

$$\frac{1}{16} \left(-70 \text{Log}\left[\cos\left[\frac{x}{2}\right] - \sin\left[\frac{x}{2}\right]\right] + 70 \text{Log}\left[\cos\left[\frac{x}{2}\right] + \sin\left[\frac{x}{2}\right]\right] - \frac{1}{2} \sec(x)^4 \left(21 \sin(x) + 29 \sin(3x)\right)\right)$$

Problem 383: Result more than twice size of optimal antiderivative.

$$\int \cos[x]^2 \sec[3x]\, dx$$

Optimal (type 3, 9 leaves, 2 steps):

$$\frac{1}{2} \text{ArcTanh}[2 \sin[x]]$$

Result (type 3, 23 leaves):

$$-\frac{1}{4} \text{Log}[1 - 2 \sin[x]] + \frac{1}{4} \text{Log}[1 + 2 \sin[x]]$$

Problem 384: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \sec[2x] \sin[x]\, dx$$

Optimal (type 3, 15 leaves, 2 steps):

$$\frac{\text{ArcTanh}\left[\sqrt{2} \cos[x]\right]}{\sqrt{2}}$$

Result (type 3, 174 leaves):

$$\frac{1}{4\sqrt{2}} \left(2 i \text{ArcTan}\left[\frac{\cos\left[\frac{x}{2}\right] - \left(-1 + \sqrt{2}\right) \sin\left[\frac{x}{2}\right]}{\left(1 + \sqrt{2}\right) \cos\left[\frac{x}{2}\right] - \sin\left[\frac{x}{2}\right]}\right] - 2 i \text{ArcTan}\left[\frac{\cos\left[\frac{x}{2}\right] - \left(1 + \sqrt{2}\right) \sin\left[\frac{x}{2}\right]}{\left(-1 + \sqrt{2}\right) \cos\left[\frac{x}{2}\right] - \sin\left[\frac{x}{2}\right]}\right] + 4 \text{ArcTanh}\left[\sqrt{2} + \text{Tan}\left[\frac{x}{2}\right]\right] - \text{Log}\left[2 - \sqrt{2} \cos[x] - \sqrt{2} \sin[x]\right] + \text{Log}\left[2 + \sqrt{2} \cos[x] - \sqrt{2} \sin[x]\right]\right)$$

Problem 388: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \csc[4x] \sin[x]\, dx$$

Optimal (type 3, 26 leaves, 4 steps):

$$-\frac{1}{4} \text{ArcTanh}[\sin[x]] + \frac{\text{ArcTanh}\left[\sqrt{2} \sin[x]\right]}{2\sqrt{2}}$$

Result (type 3, 218 leaves):

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

Problem 389: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \text{Csc}[4\,x]\,\text{Sin}[x]^3\,dx$$

Optimal (type 3, 26 leaves, 4 steps):

$$-\frac{1}{4}\text{ArcTanh}[\text{Sin}[x]]+\frac{\text{ArcTanh}\left[\sqrt{2}\,\text{Sin}[x]\right]}{4\sqrt{2}}$$

Result (type 3, 218 leaves):

$$\frac{1}{16\sqrt{2}}\left(-2\,i\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{x}{2}\right]-\left(-1+\sqrt{2}\right)\text{Sin}\left[\frac{x}{2}\right]}{\left(1+\sqrt{2}\right)\text{Cos}\left[\frac{x}{2}\right]-\text{Sin}\left[\frac{x}{2}\right]}\right]-2\,i\,\text{ArcTan}\left[\frac{\text{Cos}\left[\frac{x}{2}\right]-\left(1+\sqrt{2}\right)\text{Sin}\left[\frac{x}{2}\right]}{\left(-1+\sqrt{2}\right)\text{Cos}\left[\frac{x}{2}\right]-\text{Sin}\left[\frac{x}{2}\right]}\right]+4\sqrt{2}\,\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]-\text{Sin}\left[\frac{x}{2}\right]\right]-4\sqrt{2}\,\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]+\text{Sin}\left[\frac{x}{2}\right]\right]+2\,\text{Log}\left[\sqrt{2}+2\,\text{Sin}[x]\right]-\text{Log}\left[2-\sqrt{2}\,\text{Cos}[x]-\sqrt{2}\,\text{Sin}[x]\right]-\text{Log}\left[2+\sqrt{2}\,\text{Cos}[x]-\sqrt{2}\,\text{Sin}[x]\right]\right)$$

Problem 398: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\text{Tan}[5\,x]^{1/3}}\,dx$$

Optimal (type 3, 57 leaves, 9 steps):

$$-\frac{1}{10}\sqrt{3}\,\text{ArcTan}\left[\frac{1-2\,\text{Tan}[5\,x]^{2/3}}{\sqrt{3}}\right]+\frac{3}{20}\text{Log}\left[1+\text{Tan}[5\,x]^{2/3}\right]-\frac{1}{20}\text{Log}\left[1+\text{Tan}[5\,x]^2\right]$$

Result (type 3, 121 leaves):

$$\frac{1}{20}\left(-2\sqrt{3}\,\text{ArcTan}\left[\sqrt{3}-2\,\text{Tan}[5\,x]^{1/3}\right]-2\sqrt{3}\,\text{ArcTan}\left[\sqrt{3}+2\,\text{Tan}[5\,x]^{1/3}\right]+2\,\text{Log}\left[1+\text{Tan}[5\,x]^{2/3}\right]-\text{Log}\left[1-\sqrt{3}\,\text{Tan}[5\,x]^{1/3}+\text{Tan}[5\,x]^{2/3}\right]-\text{Log}\left[1+\sqrt{3}\,\text{Tan}[5\,x]^{1/3}+\text{Tan}[5\,x]^{2/3}\right]\right)$$

Problem 399: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{(4+3\,\mathrm{Tan}[2\,x])^{3/2}}\,dx$$

Optimal (type 3, 87 leaves, 6 steps):

$$-\frac{9\,\mathrm{ArcTan}\left[\frac{1-3\,\mathrm{Tan}[2\,x]}{\sqrt{2}\,\sqrt{4+3\,\mathrm{Tan}[2\,x]}}\right]}{250\,\sqrt{2}}+\frac{13\,\mathrm{ArcTanh}\left[\frac{3+\mathrm{Tan}[2\,x]}{\sqrt{2}\,\sqrt{4+3\,\mathrm{Tan}[2\,x]}}\right]}{250\,\sqrt{2}}-\frac{3}{25\,\sqrt{4+3\,\mathrm{Tan}[2\,x]}}$$

Result (type 3, 83 leaves):

$$\frac{(24-7\,i)\,\sqrt{4-3\,i}\,\mathrm{ArcTanh}\left[\frac{\sqrt{4+3\,\mathrm{Tan}[2\,x]}}{\sqrt{4-3\,i}}\right]+(24+7\,i)\,\sqrt{4+3\,i}\,\mathrm{ArcTanh}\left[\frac{\sqrt{4+3\,\mathrm{Tan}[2\,x]}}{\sqrt{4+3\,i}}\right]-\frac{150}{\sqrt{4+3\,\mathrm{Tan}[2\,x]}}}{1250}$$

Problem 411: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\mathrm{Cos}[x]^3\,(\mathrm{Cos}[2\,x]-3\,\mathrm{Tan}[x])}{(\mathrm{Sin}[x]^2-\mathrm{Sin}[2\,x])\,\mathrm{Sin}[2\,x]^{5/2}}\,dx$$

Optimal (type 3, 68 leaves, 6 steps):

$$\frac{33}{32}\,\mathrm{ArcTanh}\left[\frac{1}{2}\,\mathrm{Sec}[x]\,\sqrt{\mathrm{Sin}[2\,x]}\right]-\frac{9\,\mathrm{Cos}[x]}{16\,\sqrt{\mathrm{Sin}[2\,x]}}-\frac{5\,\mathrm{Cos}[x]\,\mathrm{Cot}[x]}{24\,\sqrt{\mathrm{Sin}[2\,x]}}+\frac{\mathrm{Cos}[x]\,\mathrm{Cot}[x]^2}{20\,\sqrt{\mathrm{Sin}[2\,x]}}$$

Result (type 4, 150 leaves):

$$\left(\text{Cos}[x]\,\sqrt{\text{Sin}[2x]}\,\left(\frac{1}{15}\,\text{Csc}[x]\,\left(-147-50\,\text{Cot}[x]+12\,\text{Csc}[x]^2\right)-\right.\right.$$

$$33\,\sqrt{\frac{\text{Cos}[x]}{-2+2\,\text{Cos}[x]}}\,\left(\text{EllipticF}\left[\text{ArcSin}\left[\frac{1}{\sqrt{\text{Tan}\left[\frac{x}{2}\right]}}\right],-1\right]+\text{EllipticPi}\left[-\frac{2}{-1+\sqrt{5}},-\text{ArcSin}\left[\frac{1}{\sqrt{\text{Tan}\left[\frac{x}{2}\right]}}\right],-1\right]+\right.$$

$$\left.\left.\left.\text{EllipticPi}\left[\frac{1}{2}\left(-1+\sqrt{5}\right),-\text{ArcSin}\left[\frac{1}{\sqrt{\text{Tan}\left[\frac{x}{2}\right]}}\right],-1\right]\right)\text{Sec}[x]\,\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right)\left(\text{Cos}[2x]-3\,\text{Tan}[x]\right)\right)\Big/\left(16\,\left(\text{Cos}[x]+\text{Cos}[3x]-6\,\text{Sin}[x]\right)\right)$$

Problem 416: Result unnecessarily involves higher level functions.

$$\int\frac{\text{Cos}[2x]-\sqrt{\text{Sin}[2x]}}{\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}}\,dx$$

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

$$-\sqrt{2}\,\text{Log}\left[\text{Cos}[x]+\text{Sin}[x]-\sqrt{2}\,\text{Sec}[x]\,\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}\right]-$$

$$\frac{\text{ArcSin}[\text{Cos}[x]-\text{Sin}[x]]\,\text{Cos}[x]\,\sqrt{\text{Sin}[2x]}}{\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}}-\frac{\text{ArcTanh}[\text{Sin}[x]]\,\text{Cos}[x]\,\sqrt{\text{Sin}[2x]}}{\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}}-\frac{\text{Sin}[2x]}{\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}}$$

Result (type 5, 105 leaves):

$$\left(-4\,\text{Cos}[x]^3\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\text{Cos}[x]^2\right]\text{Sin}[x]-\right.$$

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

Problem 417: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{\text{Cos}[x]\,\text{Sin}[x]^3} - 2\,\text{Sin}[2\,x]}{-\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]} + \sqrt{\text{Tan}[x]}}\,dx$$

Optimal (type 3, 364 leaves, 66 steps):

$$-2\sqrt{2}\,\text{ArcCoth}\left[\frac{\text{Cos}[x]\,(\text{Cos}[x]+\text{Sin}[x])}{\sqrt{2}\,\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}}\right] + 2^{1/4}\,\text{ArcCoth}\left[\frac{\text{Cos}[x]\,\left(\sqrt{2}\,\text{Cos}[x]+\text{Sin}[x]\right)}{2^{3/4}\,\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}}\right] - 2^{1/4}\,\text{ArcCoth}\left[\frac{\sqrt{2}+\text{Tan}[x]}{2^{3/4}\,\sqrt{\text{Tan}[x]}}\right] - 2\sqrt{2}\,\text{ArcTan}\left[\frac{\text{Cos}[x]\,(\text{Cos}[x]-\text{Sin}[x])}{\sqrt{2}\,\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}}\right] + 2^{1/4}\,\text{ArcTan}\left[\frac{\text{Cos}[x]\,\left(\sqrt{2}\,\text{Cos}[x]-\text{Sin}[x]\right)}{2^{3/4}\,\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}}\right] - 2^{1/4}\,\text{ArcTan}\left[\frac{\sqrt{2}-\text{Tan}[x]}{2^{3/4}\,\sqrt{\text{Tan}[x]}}\right] + 4\,\text{Csc}[x]\,\text{Sec}[x]\,\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]} + \frac{1}{4}\,\text{Csc}[x]^2\,\text{Log}\left[1+\text{Cos}[x]^2\right]\,\text{Sec}[x]^2\,\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}\,\sqrt{\text{Cos}[x]\,\text{Sin}[x]^3} + \frac{1}{2}\,\text{Csc}[x]^2\,\text{Log}[\text{Sin}[x]]\,\text{Sec}[x]^2\,\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}\,\sqrt{\text{Cos}[x]\,\text{Sin}[x]^3} + \frac{4}{\sqrt{\text{Tan}[x]}} - \frac{1}{4}\,\text{Csc}[x]^2\,\text{Log}\left[1+\text{Cos}[x]^2\right]\,\sqrt{\text{Cos}[x]\,\text{Sin}[x]^3}\,\sqrt{\text{Tan}[x]} + \frac{1}{2}\,\text{Csc}[x]^2\,\text{Log}[\text{Sin}[x]]\,\sqrt{\text{Cos}[x]\,\text{Sin}[x]^3}\,\sqrt{\text{Tan}[x]}$$

Result (type 5, 2057 leaves):

$$-\frac{\text{Cos}[x]\,\text{Csc}\left[\frac{x}{2}\right]\left(4\,\text{Log}\left[\text{Sec}\left[\frac{x}{2}\right]^2\right] - 2\,\text{Log}\left[\text{Tan}\left[\frac{x}{2}\right]\right] - \text{Log}\left[1+\text{Tan}\left[\frac{x}{2}\right]^4\right]\right)\text{Sec}\left[\frac{x}{2}\right]\sqrt{\text{Cos}[x]\,\text{Sin}[x]^3}}{8\,\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}} + \left((1+i)\left((4+4\,i)\,\text{EllipticPi}\left[-i,\,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],\,-1\right] - (4+4\,i)\,\text{EllipticPi}\left[i,\,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],\,-1\right] + (-1)^{1/4}\left(-\text{EllipticPi}\left[-(-1)^{1/4},\,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],\,-1\right] + \text{EllipticPi}\left[(-1)^{1/4},\,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],\,-1\right] - \text{EllipticPi}\left[-(-1)^{3/4},\,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],\,-1\right] + \text{EllipticPi}\left[(-1)^{3/4},\,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],\,-1\right]\right)\right)\text{Sec}\left[\frac{x}{2}\right]^4\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}\left(\frac{2\sqrt{2}\,\text{Sec}[x]^2\,\sqrt{2\,\text{Sin}[2\,x]+\text{Sin}[4\,x]}}{3+\text{Cos}[2\,x]} + \frac{\sqrt{2}\,\text{Cos}[2\,x]\,\text{Sec}[x]^2\,\sqrt{2\,\text{Sin}[2\,x]+\text{Sin}[4\,x]}}{3+\text{Cos}[2\,x]}\right)\right)\Big/$$

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

$$(1+i)\left((4+4\,i)\,\text{EllipticPi}\left[-i,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]-(4+4\,i)\,\text{EllipticPi}\left[i,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]+\right.$$

$$(-1)^{1/4}\left(-\text{EllipticPi}\left[-(-1)^{1/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]+\text{EllipticPi}\left[(-1)^{1/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]-\right.$$

$$\left.\left.\text{EllipticPi}\left[-(-1)^{3/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]+\text{EllipticPi}\left[(-1)^{3/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]\right)\right)$$

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

$$\left(\frac{1}{4}+\frac{i}{4}\right)\left((4+4\,i)\,\text{EllipticPi}\left[-i,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]-(4+4\,i)\,\text{EllipticPi}\left[i,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]+\right.$$

$$(-1)^{1/4}\left(-\text{EllipticPi}\left[-(-1)^{1/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]+\text{EllipticPi}\left[(-1)^{1/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]-\right.$$

$$\left.\left.\text{EllipticPi}\left[-(-1)^{3/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]+\text{EllipticPi}\left[(-1)^{3/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]\right)\right)$$

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

$$\left(\frac{1}{2}+\frac{i}{2}\right)\left((4+4\,i)\,\text{EllipticPi}\left[-i,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]-(4+4\,i)\,\text{EllipticPi}\left[i,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]+\right.$$

$$(-1)^{1/4}\left(-\text{EllipticPi}\left[-(-1)^{1/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]+\text{EllipticPi}\left[(-1)^{1/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]-\right.$$

$$\left.\left.\text{EllipticPi}\left[-(-1)^{3/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]+\text{EllipticPi}\left[(-1)^{3/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]\right)\right)$$

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

$$(2+2\,i)\left((4+4\,i)\,\text{EllipticPi}\left[-i,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]-(4+4\,i)\,\text{EllipticPi}\left[i,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]+\right.$$

$$(-1)^{1/4}\left(-\text{EllipticPi}\left[-(-1)^{1/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]+\text{EllipticPi}\left[(-1)^{1/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]-\right.$$

$$\left.\left.\text{EllipticPi}\left[-(-1)^{3/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]+\text{EllipticPi}\left[(-1)^{3/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]\right)\right)$$

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

$$\left(\frac{1}{2}+\frac{i}{2}\right)\left((4+4\,i)\,\text{EllipticPi}\left[-i,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]-(4+4\,i)\,\text{EllipticPi}\left[i,-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]+\right.$$

$$(-1)^{1/4}\left(-\text{EllipticPi}\left[-(-1)^{1/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]+\text{EllipticPi}\left[(-1)^{1/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]-\right.$$

$$\left.\left.\text{EllipticPi}\left[-(-1)^{3/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]+\text{EllipticPi}\left[(-1)^{3/4},-\text{ArcSin}\left[\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\right],-1\right]\right)\right)\text{Sec}\left[\frac{x}{2}\right]^4$$

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

$$(1+i)\,\text{Sec}\left[\frac{x}{2}\right]^4\sqrt{\text{Cos}[x]^3\,\text{Sin}[x]}\left(\frac{(1+i)\,\text{Sec}\left[\frac{x}{2}\right]^2}{\sqrt{1-\text{Tan}\left[\frac{x}{2}\right]}\left(1-i\,\text{Tan}\left[\frac{x}{2}\right]\right)\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\sqrt{1+\text{Tan}\left[\frac{x}{2}\right]}}-\right.$$

$$\frac{(1+i)\,\text{Sec}\left[\frac{x}{2}\right]^2}{\sqrt{1-\text{Tan}\left[\frac{x}{2}\right]}\left(1+i\,\text{Tan}\left[\frac{x}{2}\right]\right)\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\sqrt{1+\text{Tan}\left[\frac{x}{2}\right]}}+(-1)^{1/4}\left(-\frac{\text{Sec}\left[\frac{x}{2}\right]^2}{4\sqrt{1-\text{Tan}\left[\frac{x}{2}\right]}\sqrt{\text{Tan}\left[\frac{x}{2}\right]}\sqrt{1+\text{Tan}\left[\frac{x}{2}\right]}\left(1-(-1)^{1/4}\,\text{Tan}\left[\frac{x}{2}\right]\right)}+\right.$$

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

$$\left.\left.\left.\left.\frac{\mathrm{Sec}\left[\frac{x}{2}\right]^2}{4\sqrt{1-\mathrm{Tan}\left[\frac{x}{2}\right]}\sqrt{\mathrm{Tan}\left[\frac{x}{2}\right]}\sqrt{1+\mathrm{Tan}\left[\frac{x}{2}\right]}\left(1+(-1)^{3/4}\,\mathrm{Tan}\left[\frac{x}{2}\right]\right)}\right)\right)\right)\right)+$$

$$\frac{4}{\sqrt{\mathrm{Tan}[x]}}-\frac{2\left(\mathrm{Cos}[x]^2\right)^{3/4}\mathrm{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{\mathrm{Sin}[x]^2}{2\left(1-\frac{\mathrm{Sin}[x]^2}{2}\right)}\right]\left(2-\mathrm{Sin}[x]^2\right)\mathrm{Tan}[x]^{3/2}}{3\left(1-\frac{\mathrm{Sin}[x]^2}{2}\right)^{3/4}\left(-2+\mathrm{Sin}[x]^2\right)}+$$

$$\sqrt{2\,\mathrm{Sin}[2x]+\mathrm{Sin}[4x]}\left(\sqrt{2}\,\mathrm{Cot}[x]+\sqrt{2}\,\mathrm{Tan}[x]\right)+$$

$$\left(\mathrm{Csc}[x]^2\left(4\,\mathrm{Log}\left[\sqrt{\mathrm{Tan}[x]}\right]-\mathrm{Log}\left[2+\mathrm{Tan}[x]^2\right]\right)\mathrm{Sec}[x]^2\sqrt{2\,\mathrm{Sin}[2x]-\mathrm{Sin}[4x]}\sqrt{\mathrm{Tan}[x]}\left(2+\mathrm{Tan}[x]^2\right)\right)\Big/\left(4\sqrt{2}\left(3+\mathrm{Cos}[2x]\right)\left(1+\mathrm{Tan}[x]^2\right)^2\right)$$

Problem 424: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\mathrm{Sin}[5x]}{\left(5\,\mathrm{Cos}[x]^2+9\,\mathrm{Sin}[x]^2\right)^{5/2}}\,dx$$

Optimal (type 3, 48 leaves, 4 steps):

$$-\frac{1}{2}\mathrm{ArcSin}\left[\frac{2\,\mathrm{Cos}[x]}{3}\right]-\frac{55\,\mathrm{Cos}[x]}{27\left(9-4\,\mathrm{Cos}[x]^2\right)^{3/2}}+\frac{295\,\mathrm{Cos}[x]}{243\sqrt{9-4\,\mathrm{Cos}[x]^2}}$$

Result (type 3, 63 leaves):

$$\frac{2550\,\mathrm{Cos}[x]-590\,\mathrm{Cos}[3x]+243\,i\left(7-2\,\mathrm{Cos}[2x]\right)^{3/2}\mathrm{Log}\left[2\,i\,\mathrm{Cos}[x]+\sqrt{7-2\,\mathrm{Cos}[2x]}\right]}{486\left(7-2\,\mathrm{Cos}[2x]\right)^{3/2}}$$

Problem 426: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\text{Csc}[x]^2 \left(-2 \text{Cos}[x]^3 (-1+\text{Sin}[x]) + \text{Cos}[2x] \text{Sin}[x]\right)}{\sqrt{-5+\text{Sin}[x]^2}} \, dx$$

Optimal (type 3, 111 leaves, 18 steps):

$$2 \text{ArcTan}\left[\frac{\text{Cos}[x]}{\sqrt{-5+\text{Sin}[x]^2}}\right] - \frac{\text{ArcTan}\left[\frac{\sqrt{5}\,\text{Cos}[x]}{\sqrt{-5+\text{Sin}[x]^2}}\right]}{\sqrt{5}} - \frac{2 \text{ArcTan}\left[\frac{\sqrt{-5+\text{Sin}[x]^2}}{\sqrt{5}}\right]}{\sqrt{5}} - 2 \text{ArcTanh}\left[\frac{\text{Sin}[x]}{\sqrt{-5+\text{Sin}[x]^2}}\right] + 2\sqrt{-5+\text{Sin}[x]^2} + \frac{2}{5} \text{Csc}[x] \sqrt{-5+\text{Sin}[x]^2}$$

Result (type 4, 338 leaves):

$$\frac{1}{25\sqrt{2}\sqrt{-9-\text{Cos}[2x]}} \Bigg((16-32 i) \sqrt{5}\, \text{Cos}\left[\frac{x}{2}\right]^2 \sqrt{\frac{(1+2 i)(-2 i+\text{Cos}[x])}{1+\text{Cos}[x]}} \sqrt{\frac{(1-2 i)(2 i+\text{Cos}[x])}{1+\text{Cos}[x]}} \,\text{EllipticF}\left[\text{ArcSin}\left[\frac{(1+2 i)\,\text{Tan}\left[\frac{x}{2}\right]}{\sqrt{5}}\right], -\frac{7}{25}+\frac{24 i}{25}\right] - (32-64 i)\sqrt{5}\, \text{Cos}\left[\frac{x}{2}\right]^2 \sqrt{\frac{(1+2 i)(-2 i+\text{Cos}[x])}{1+\text{Cos}[x]}} \sqrt{\frac{(1-2 i)(2 i+\text{Cos}[x])}{1+\text{Cos}[x]}} \,\text{EllipticPi}\left[\frac{3}{5}+\frac{4 i}{5}, \text{ArcSin}\left[\frac{(1+2 i)\,\text{Tan}\left[\frac{x}{2}\right]}{\sqrt{5}}\right], -\frac{7}{25}+\frac{24 i}{25}\right] - 5 \left(85 + \sqrt{10}\, \text{ArcTan}\left[\frac{\sqrt{10}\,\text{Cos}[x]}{\sqrt{-9-\text{Cos}[2x]}}\right] \sqrt{-9-\text{Cos}[2x]} + 2\sqrt{10}\,\text{ArcTan}\left[\frac{\sqrt{-9-\text{Cos}[2x]}}{\sqrt{10}}\right] \sqrt{-9-\text{Cos}[2x]} + 18\,\text{Csc}[x] + 2\,\text{Cos}[2x]\,\text{Csc}[x] + 10 i \sqrt{2}\sqrt{-9-\text{Cos}[2x]}\,\text{Log}\left[i\sqrt{2}\,\text{Cos}[x] + \sqrt{-9-\text{Cos}[2x]}\right] + 5\,\text{Csc}[x]\,\text{Sin}[3x]\right)\Bigg)$$

Problem 427: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Cos}[3x]}{-\sqrt{-1+8\,\text{Cos}[x]^2} + \sqrt{3\,\text{Cos}[x]^2 - \text{Sin}[x]^2}} \, dx$$

Optimal (type 3, 112 leaves, 27 steps):

$$\frac{5\,\text{ArcSin}\left[2\sqrt{\frac{2}{7}}\,\text{Sin}[x]\right]}{4\sqrt{2}}+\frac{3}{4}\,\text{ArcSin}\left[\frac{2\,\text{Sin}[x]}{\sqrt{3}}\right]-\frac{3}{4}\,\text{ArcTan}\left[\frac{\text{Sin}[x]}{\sqrt{-1+4\,\text{Cos}[x]^2}}\right]-$$
$$\frac{3}{4}\,\text{ArcTan}\left[\frac{\text{Sin}[x]}{\sqrt{-1+8\,\text{Cos}[x]^2}}\right]-\frac{1}{2}\sqrt{-1+4\,\text{Cos}[x]^2}\,\text{Sin}[x]-\frac{1}{2}\sqrt{-1+8\,\text{Cos}[x]^2}\,\text{Sin}[x]$$

Result (type 3, 131 leaves):

$$\frac{1}{8}\left(-6\,\text{ArcTan}\left[\frac{\text{Sin}[x]}{\sqrt{1+2\,\text{Cos}[2\,x]}}\right]-6\,\text{ArcTan}\left[\frac{\text{Sin}[x]}{\sqrt{3+4\,\text{Cos}[2\,x]}}\right]-6\,i\,\text{Log}\left[\sqrt{1+2\,\text{Cos}[2\,x]}+2\,i\,\text{Sin}[x]\right]-\right.$$
$$\left.5\,i\sqrt{2}\,\text{Log}\left[\sqrt{3+4\,\text{Cos}[2\,x]}+2\,i\sqrt{2}\,\text{Sin}[x]\right]-4\sqrt{1+2\,\text{Cos}[2\,x]}\,\text{Sin}[x]-4\sqrt{3+4\,\text{Cos}[2\,x]}\,\text{Sin}[x]\right)$$

Problem 434: Result unnecessarily involves imaginary or complex numbers.

$$\int\left(4-5\,\text{Sec}[x]^2\right)^{3/2}\,dx$$

Optimal (type 3, 68 leaves, 7 steps):

$$8\,\text{ArcTan}\left[\frac{2\,\text{Tan}[x]}{\sqrt{-1-5\,\text{Tan}[x]^2}}\right]-\frac{7}{2}\sqrt{5}\,\text{ArcTan}\left[\frac{\sqrt{5}\,\text{Tan}[x]}{\sqrt{-1-5\,\text{Tan}[x]^2}}\right]-\frac{5}{2}\,\text{Tan}[x]\sqrt{-1-5\,\text{Tan}[x]^2}$$

Result (type 3, 115 leaves):

$$-\frac{1}{2\left(-3+2\,\text{Cos}[2\,x]\right)^{3/2}}\left(-5+4\,\text{Cos}[x]^2\right)\text{Sec}[x]\sqrt{4-5\,\text{Sec}[x]^2}$$
$$\left(7\sqrt{5}\,\text{ArcTan}\left[\frac{\sqrt{5}\,\text{Sin}[x]}{\sqrt{-3+2\,\text{Cos}[2\,x]}}\right]\text{Cos}[x]^2+16\,i\,\text{Cos}[x]^2\,\text{Log}\left[\sqrt{-3+2\,\text{Cos}[2\,x]}+2\,i\,\text{Sin}[x]\right]+5\sqrt{-3+2\,\text{Cos}[2\,x]}\,\text{Sin}[x]\right)$$

Problem 438: Result more than twice size of optimal antiderivative.

$$\int\frac{\left(3+\text{Sin}[x]^2\right)\text{Tan}[x]^3}{\left(-2+\text{Cos}[x]^2\right)\left(5-4\,\text{Sec}[x]^2\right)^{3/2}}\,dx$$

Optimal (type 3, 73 leaves, 16 steps):

$$-\frac{\text{ArcTanh}\left[\frac{\sqrt{5-4\,\text{Sec}[x]^2}}{\sqrt{3}}\right]}{6\sqrt{3}}-\frac{\text{ArcTanh}\left[\frac{\sqrt{5-4\,\text{Sec}[x]^2}}{\sqrt{5}}\right]}{5\sqrt{5}}-\frac{2}{15\sqrt{5-4\,\text{Sec}[x]^2}}$$

Result (type 3, 234 leaves):

$$\frac{1}{60\left(5-4\,\text{Sec}[x]^2\right)^{3/2}}\text{Sec}[x]^2\left(12-20\,\text{Cos}[2x]+\left(\sqrt{2}\left(-3+5\,\text{Cos}[2x]\right)^{3/2}\left(15\sqrt{3}\,\text{ArcTanh}\left[\frac{\sqrt{-3+5\,\text{Cos}[2x]}}{\sqrt{6}\sqrt{\text{Cos}[x]^2}}\right]\text{Sin}[x]^2-18\sqrt{5}\left(\text{Log}\left[10\,\text{Sin}[x]^2\right]-\text{Log}\left[5\left(-\sqrt{-3+5\,\text{Cos}[2x]}+\text{Cos}[2x]\sqrt{-3+5\,\text{Cos}[2x]}+\sqrt{10}\sqrt{\text{Sin}[x]^2}\sqrt{\text{Sin}[2x]^2}\right)\right]\right)\text{Sin}[x]^2-20\sqrt{3}\,\text{ArcTanh}\left[\frac{\sqrt{6}\,\text{Cos}[x]}{\sqrt{-3+5\,\text{Cos}[2x]}}\right]\text{Sec}[x]\sqrt{\text{Sin}[x]^2}\sqrt{\text{Sin}[2x]^2}\right)\right)\Big/\left(15\sqrt{\text{Sin}[x]^2}\sqrt{\text{Sin}[2x]^2}\right)\right)$$

Problem 439: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Csc}[x]^2\left(\text{Sec}[x]^2-3\,\text{Tan}[x]\sqrt{4\,\text{Sec}[x]^2+5\,\text{Tan}[x]^2}\right)}{\left(4\,\text{Sec}[x]^2+5\,\text{Tan}[x]^2\right)^{3/2}}\,dx$$

Optimal (type 3, 57 leaves, 10 steps):

$$-\frac{3}{4}\text{Log}[\text{Tan}[x]]+\frac{3}{8}\text{Log}\left[4+9\,\text{Tan}[x]^2\right]-\frac{\text{Cot}[x]}{4\sqrt{4+9\,\text{Tan}[x]^2}}-\frac{7\,\text{Tan}[x]}{8\sqrt{4+9\,\text{Tan}[x]^2}}$$

Result (type 3, 116 leaves):

$$\frac{1}{16\sqrt{\frac{13-5\,\text{Cos}[2x]}{1+\text{Cos}[2x]}}}\left(5\,\text{Cot}[x]+6\sqrt{\frac{13-5\,\text{Cos}[2x]}{1+\text{Cos}[2x]}}\,\text{Log}\left[1+7\,\text{Tan}\left[\frac{x}{2}\right]^2+\text{Tan}\left[\frac{x}{2}\right]^4\right]-9\,\text{Csc}[x]\,\text{Sec}[x]-5\,\text{Tan}[x]-6\sqrt{2}\,\text{Log}\left[\text{Tan}\left[\frac{x}{2}\right]\right]\sqrt{-5+13\,\text{Sec}[x]^2+5\,\text{Tan}[x]^2}\right)$$

Problem 442: Result unnecessarily involves higher level functions.

$$\int\frac{\text{Tan}[x]}{\left(a^3+b^3\,\text{Tan}[x]^2\right)^{1/3}}\,dx$$

Optimal (type 3, 133 leaves, 6 steps):

$$\frac{\sqrt{3}\ \text{ArcTan}\left[\frac{1+\frac{2\left(a^3+b^3\,\text{Tan}[x]^2\right)^{1/3}}{\left(a^3-b^3\right)^{1/3}}}{\sqrt{3}}\right]}{2\left(a^3-b^3\right)^{1/3}}+\frac{\text{Log}[\text{Cos}[x]]}{2\left(a^3-b^3\right)^{1/3}}+\frac{3\,\text{Log}\left[\left(a^3-b^3\right)^{1/3}-\left(a^3+b^3\,\text{Tan}[x]^2\right)^{1/3}\right]}{4\left(a^3-b^3\right)^{1/3}}$$

Result (type 5, 90 leaves):

$$-\frac{3\left(\frac{a^3+b^3+\left(a^3-b^3\right)\text{Cos}[2x]}{b^3}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{\left(-a^3+b^3\right)\text{Cos}[x]^2}{b^3}\right]}{2\left(\left(a^3+b^3+\left(a^3-b^3\right)\text{Cos}[2x]\right)\text{Sec}[x]^2\right)^{1/3}}$$

Problem 443: Result unnecessarily involves higher level functions.

$$\int \text{Tan}[x]\left(1-7\,\text{Tan}[x]^2\right)^{2/3}\,dx$$

Optimal (type 3, 69 leaves, 7 steps):

$$2\sqrt{3}\ \text{ArcTan}\left[\frac{1+\left(1-7\,\text{Tan}[x]^2\right)^{1/3}}{\sqrt{3}}\right]+2\,\text{Log}[\text{Cos}[x]]+3\,\text{Log}\left[2-\left(1-7\,\text{Tan}[x]^2\right)^{1/3}\right]+\frac{3}{4}\left(1-7\,\text{Tan}[x]^2\right)^{2/3}$$

Result (type 5, 42 leaves):

$$-\frac{3}{4}\left(-1+\text{Hypergeometric2F1}\left[\frac{2}{3},1,\frac{5}{3},\frac{1}{8}\left(-3+4\,\text{Cos}[2x]\right)\text{Sec}[x]^2\right]\right)\left(1-7\,\text{Tan}[x]^2\right)^{2/3}$$

Problem 444: Result unnecessarily involves higher level functions.

$$\int \frac{\text{Cot}[x]}{\left(a^4+b^4\,\text{Csc}[x]^2\right)^{1/4}}\,dx$$

Optimal (type 3, 52 leaves, 6 steps):

$$-\frac{\text{ArcTan}\left[\frac{\left(a^4+b^4\,\text{Csc}[x]^2\right)^{1/4}}{a}\right]}{a}+\frac{\text{ArcTanh}\left[\frac{\left(a^4+b^4\,\text{Csc}[x]^2\right)^{1/4}}{a}\right]}{a}$$

Result (type 5, 84 leaves):

$$-\frac{\left(-a^4-2b^4+a^4\,\text{Cos}[2x]\right)\text{Csc}[x]^2\,\text{Hypergeometric2F1}\left[\frac{3}{4},1,\frac{7}{4},-\frac{\left(-a^4-2b^4+a^4\,\text{Cos}[2x]\right)\text{Csc}[x]^2}{2a^4}\right]}{3a^4\left(a^4+b^4\,\text{Csc}[x]^2\right)^{1/4}}$$

Problem 445: Result unnecessarily involves higher level functions.

$$\int \frac{\text{Cot}[x]}{\left(a^4-b^4\,\text{Csc}[x]^2\right)^{1/4}}\,dx$$

Optimal (type 3, 54 leaves, 6 steps):

$$-\frac{\text{ArcTan}\left[\frac{\left(a^4-b^4\,\text{Csc}[x]^2\right)^{1/4}}{a}\right]}{a}+\frac{\text{ArcTanh}\left[\frac{\left(a^4-b^4\,\text{Csc}[x]^2\right)^{1/4}}{a}\right]}{a}$$

Result (type 5, 85 leaves):

$$-\frac{\left(-a^4+2\,b^4+a^4\,\text{Cos}[2\,x]\right)\,\text{Csc}[x]^2\,\text{Hypergeometric2F1}\left[\frac{3}{4},1,\frac{7}{4},-\frac{\left(-a^4+2\,b^4+a^4\,\text{Cos}[2\,x]\right)\,\text{Csc}[x]^2}{2\,a^4}\right]}{3\,a^4\,\left(a^4-b^4\,\text{Csc}[x]^2\right)^{1/4}}$$

Problem 446: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\text{Sec}[x]^2\,\text{Tan}[x]\,\left(\left(1-3\,\text{Sec}[x]^2\right)^{1/3}\,\text{Sin}[x]^2+3\,\text{Tan}[x]^2\right)}{\left(1-3\,\text{Sec}[x]^2\right)^{5/6}\,\left(1-\sqrt{1-3\,\text{Sec}[x]^2}\right)}\,dx$$

Optimal (type 3, 133 leaves, 29 steps):

$$\sqrt{3}\,\text{ArcTan}\left[\frac{1+2\,\left(1-3\,\text{Sec}[x]^2\right)^{1/6}}{\sqrt{3}}\right]+\frac{1}{4}\,\text{Log}\left[\text{Sec}[x]^2\right]-\frac{3}{2}\,\text{Log}\left[1-\left(1-3\,\text{Sec}[x]^2\right)^{1/6}\right]+$$
$$\frac{1}{3}\,\text{Log}\left[1-\sqrt{1-3\,\text{Sec}[x]^2}\right]-\left(1-3\,\text{Sec}[x]^2\right)^{1/6}-\frac{1}{4}\,\left(1-3\,\text{Sec}[x]^2\right)^{2/3}+\frac{1}{2\,\left(1-\sqrt{1-3\,\text{Sec}[x]^2}\right)}$$

Result (type 6, 4397 leaves):

$$-\left(\left(3\,\left(6+\left(\frac{-5+\text{Cos}[2\,x]}{1+\text{Cos}[2\,x]}\right)^{1/3}+\text{Cos}[2\,x]\,\left(\frac{-5+\text{Cos}[2\,x]}{1+\text{Cos}[2\,x]}\right)^{1/3}\right)\,\left(3\,\text{Sec}[x]^2+\left(1-3\,\text{Sec}[x]^2\right)^{1/3}\right)\right.\right.$$
$$\text{Sin}[x]^2\,\text{Tan}[x]\,\left(-2-3\,\text{Tan}[x]^2\right)^{5/6}\,\left(1+\text{Tan}[x]^2\right)\,\left(2+3\,\text{Tan}[x]^2\right)\,\left(-8\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\,\text{Tan}[x]^2,-\text{Tan}[x]^2\right]+\right.$$
$$\left.4\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\,\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\,\text{Tan}[x]^2+3\,\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\,\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\,\text{Tan}[x]^2\right)^2$$

$$\left(\left(4\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]+3\,\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\right)\text{Tan}[x]^2\right.$$

$$\left(30\times 3^{2/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{1}{3+3\,\text{Tan}[x]^2}\right]\sqrt{-2-3\,\text{Tan}[x]^2}\,\left(1+\text{Tan}[x]^2\right)\left(\frac{2+3\,\text{Tan}[x]^2}{1+\text{Tan}[x]^2}\right)^{1/3}+\right.$$

$$12\times 3^{1/6}\,\text{Hypergeometric2F1}\left[\frac{5}{6},\frac{5}{6},\frac{11}{6},\frac{1}{3+3\,\text{Tan}[x]^2}\right]\left(1+\text{Tan}[x]^2\right)\left(\frac{2+3\,\text{Tan}[x]^2}{1+\text{Tan}[x]^2}\right)^{5/6}+$$

$$5\left(2\,\text{Log}\left[1+\text{Tan}[x]^2\right]\left(-2-3\,\text{Tan}[x]^2\right)^{5/6}\left(1+\text{Tan}[x]^2\right)+9\,\text{Tan}[x]^4\left(4+\sqrt{-2-3\,\text{Tan}[x]^2}\right)+3\,\text{Tan}[x]^2\right.$$

$$\left.\left.\left(20-2\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+5\sqrt{-2-3\,\text{Tan}[x]^2}\right)+2\left(12-2\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+3\sqrt{-2-3\,\text{Tan}[x]^2}+\left(-2-3\,\text{Tan}[x]^2\right)^{5/6}\right)\right)\right)-$$

$$8\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\left(30\times 3^{2/3}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{1}{3+3\,\text{Tan}[x]^2}\right]\sqrt{-2-3\,\text{Tan}[x]^2}\right.$$

$$\left(1+\text{Tan}[x]^2\right)\left(\frac{2+3\,\text{Tan}[x]^2}{1+\text{Tan}[x]^2}\right)^{1/3}+12\times 3^{1/6}\,\text{Hypergeometric2F1}\left[\frac{5}{6},\frac{5}{6},\frac{11}{6},\frac{1}{3+3\,\text{Tan}[x]^2}\right]\left(1+\text{Tan}[x]^2\right)\left(\frac{2+3\,\text{Tan}[x]^2}{1+\text{Tan}[x]^2}\right)^{5/6}+$$

$$5\left(2\,\text{Log}\left[1+\text{Tan}[x]^2\right]\left(-2-3\,\text{Tan}[x]^2\right)^{5/6}\left(1+\text{Tan}[x]^2\right)+9\,\text{Tan}[x]^4\left(4+\sqrt{-2-3\,\text{Tan}[x]^2}\right)+\text{Tan}[x]^2\right.$$

$$\left.\left.\left.\left.\left(60-7\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+15\sqrt{-2-3\,\text{Tan}[x]^2}\right)+2\left(12-2\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+3\sqrt{-2-3\,\text{Tan}[x]^2}+\left(-2-3\,\text{Tan}[x]^2\right)^{5/6}\right)\right)\right)\right)\right)\Big/$$

$$\left(10\times 2^{1/6}\left(-1+\sqrt{\frac{-5+\text{Cos}[2x]}{1+\text{Cos}[2x]}}\right)\left(1-3\,\text{Sec}[x]^2\right)^{5/6}\left(6+\left(1-3\,\text{Sec}[x]^2\right)^{1/3}+\text{Cos}[2x]\left(1-3\,\text{Sec}[x]^2\right)^{1/3}\right)\right.$$

$$\left(-4-6\,\text{Tan}[x]^2\right)^{5/6}$$

$$\left(-8\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]+\right.$$

$$\left.\left(4\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]+3\,\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\right)\text{Tan}[x]^2\right)$$

$$\left(1152\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^3+2880\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^5-\right.$$

$$1152\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^5-$$

$$864\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^5+$$

$$1728\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^7-2880\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]$$

$$\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^7+288\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^7-$$

$$2160\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^7+$$

$432\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^7+$

$162\,\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^7-1728\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]$

$\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^9+720\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^9-$

$1296\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^9+$

$1080\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^9+$

$405\,\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^9+432\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^{11}+$

$648\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^{11}+$

$243\,\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^{11}+$

$720\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^3\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}-$

$192\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^3\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}-$

$144\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^3\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+$

$1008\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^5\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}-$

$1032\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^5\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}-$

$774\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^5\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+$

$128\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[3,\frac{1}{2},3,4,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^5\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+$

$96\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[3,\frac{3}{2},2,4,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^5\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+$

$108\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[3,\frac{5}{2},1,4,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^5\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}-$

$1080\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^7\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+$

$96\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^7\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}-$

$810\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^7\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+$

$$144\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^7\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+$$

$$54\,\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^7\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+$$

$$320\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[3,\frac{1}{2},3,4,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^7\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+$$

$$240\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[3,\frac{3}{2},2,4,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^7\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+$$

$$270\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[3,\frac{5}{2},1,4,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^7\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+$$

$$144\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^9\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+$$

$$216\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^9\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+$$

$$81\,\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^9\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+$$

$$192\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[3,\frac{1}{2},3,4,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^9\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+$$

$$144\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[3,\frac{3}{2},2,4,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^9\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+$$

$$162\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[3,\frac{5}{2},1,4,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^9\left(-2-3\,\text{Tan}[x]^2\right)^{1/3}+$$

$$1152\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^3\sqrt{-2-3\,\text{Tan}[x]^2}+$$

$$2880\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^5\sqrt{-2-3\,\text{Tan}[x]^2}-$$

$$1152\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^5\sqrt{-2-3\,\text{Tan}[x]^2}-$$

$$864\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^5\sqrt{-2-3\,\text{Tan}[x]^2}+$$

$$1728\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^7\sqrt{-2-3\,\text{Tan}[x]^2}-$$

$$2880\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^7\sqrt{-2-3\,\text{Tan}[x]^2}+$$

$$288\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^7\sqrt{-2-3\,\text{Tan}[x]^2}-$$

$$2160\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^7\sqrt{-2-3\,\text{Tan}[x]^2}+$$

$$432\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^7\sqrt{-2-3\,\text{Tan}[x]^2}+$$

$$162\,\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^7\sqrt{-2-3\,\text{Tan}[x]^2}\;-$$

$$1728\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^9\sqrt{-2-3\,\text{Tan}[x]^2}\;+$$

$$720\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^9\sqrt{-2-3\,\text{Tan}[x]^2}\;-$$

$$1296\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^9\sqrt{-2-3\,\text{Tan}[x]^2}\;+$$

$$1080\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^9\sqrt{-2-3\,\text{Tan}[x]^2}\;+$$

$$405\,\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^9\sqrt{-2-3\,\text{Tan}[x]^2}\;+$$

$$432\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^{11}\sqrt{-2-3\,\text{Tan}[x]^2}\;+$$

$$648\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^{11}\sqrt{-2-3\,\text{Tan}[x]^2}\;+$$

$$243\,\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^{11}\sqrt{-2-3\,\text{Tan}[x]^2}+384\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2$$

$$\text{Tan}[x]^3\left(-2-3\,\text{Tan}[x]^2\right)^{5/6}+576\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^5\left(-2-3\,\text{Tan}[x]^2\right)^{5/6}-$$

$$384\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^5\left(-2-3\,\text{Tan}[x]^2\right)^{5/6}-$$

$$288\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^5\left(-2-3\,\text{Tan}[x]^2\right)^{5/6}-$$

$$576\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^7\left(-2-3\,\text{Tan}[x]^2\right)^{5/6}+$$

$$96\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^7\left(-2-3\,\text{Tan}[x]^2\right)^{5/6}-$$

$$432\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^7\left(-2-3\,\text{Tan}[x]^2\right)^{5/6}+$$

$$144\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^7\left(-2-3\,\text{Tan}[x]^2\right)^{5/6}+$$

$$54\,\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^7\left(-2-3\,\text{Tan}[x]^2\right)^{5/6}+$$

$$144\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^9\left(-2-3\,\text{Tan}[x]^2\right)^{5/6}+$$

$$216\,\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]\text{Tan}[x]^9\left(-2-3\,\text{Tan}[x]^2\right)^{5/6}+$$

$$81\,\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{3}{2}\text{Tan}[x]^2,-\text{Tan}[x]^2\right]^2\text{Tan}[x]^9\left(-2-3\,\text{Tan}[x]^2\right)^{5/6}\Big)\Big)\Big)$$

Problem 447: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 100 leaves, ? steps):

$$2\,\text{ArcTanh}\left[\frac{\text{Tan}[x]}{\sqrt{\text{Tan}[x]\,\text{Tan}[2x]}}\right]-\frac{11\,\text{ArcTanh}\left[\frac{\sqrt{2}\,\text{Tan}[x]}{\sqrt{\text{Tan}[x]\,\text{Tan}[2x]}}\right]}{4\sqrt{2}}+\frac{\text{Tan}[x]}{2\left(\text{Tan}[x]\,\text{Tan}[2x]\right)^{3/2}}+\frac{2\,\text{Tan}[x]^3}{3\left(\text{Tan}[x]\,\text{Tan}[2x]\right)^{3/2}}+\frac{3\,\text{Tan}[x]}{4\sqrt{\text{Tan}[x]\,\text{Tan}[2x]}}$$

Result (type 6, 207 leaves):

$$\Big(\left(-\text{Cos}[2x]+2\,\text{Tan}[x]^2\right)\Big(-3\,\text{Cot}[x]-4\,\text{Cos}[x]\,\text{Sin}[x]+18\,\text{Sin}[x]^2\,\text{Tan}[x]-4\,\text{Tan}[x]^3-9\,\text{ArcTan}\left[\sqrt{-1+\text{Tan}[x]^2}\right]\text{Cos}[x]\,\text{Sin}[x]\sqrt{-1+\text{Tan}[x]^2}-$$
$$\left(72\,\text{AppellF1}\left[\frac{1}{2},-\frac{1}{2},1,\frac{3}{2},\text{Cot}[x]^2,-\text{Cot}[x]^2\right]\text{Cos}[2x]\,\text{Sin}[x]^2\,\text{Tan}[x]\right)\Big/\Big(2\,\text{AppellF1}\left[\frac{3}{2},-\frac{1}{2},2,\frac{5}{2},\text{Cot}[x]^2,-\text{Cot}[x]^2\right]+$$
$$\text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1,\frac{5}{2},\text{Cot}[x]^2,-\text{Cot}[x]^2\right]-3\,\text{AppellF1}\left[\frac{1}{2},-\frac{1}{2},1,\frac{3}{2},\text{Cot}[x]^2,-\text{Cot}[x]^2\right]\text{Tan}[x]^2\Big)\Big)$$
$$\text{Tan}[2x]^2\Big)\Big/\left(6\left(-3+6\,\text{Cos}[2x]+\text{Cos}[4x]\right)\left(\text{Tan}[x]\,\text{Tan}[2x]\right)^{3/2}\right)$$

Problem 448: Result unnecessarily involves higher level functions.

$$\int\frac{\text{Tan}[x]}{\left(a^3-b^3\,\text{Cos}[x]^n\right)^{4/3}}\,dx$$

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

$$-\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{a+2\left(a^3-b^3\,\text{Cos}[x]^n\right)^{1/3}}{\sqrt{3}\,a}\right]}{a^4\,n}-\frac{3}{a^3\,n\left(a^3-b^3\,\text{Cos}[x]^n\right)^{1/3}}+\frac{\text{Log}[\text{Cos}[x]]}{2\,a^4}-\frac{3\,\text{Log}\left[a-\left(a^3-b^3\,\text{Cos}[x]^n\right)^{1/3}\right]}{2\,a^4\,n}$$

Result (type 5, 71 leaves):

$$\frac{3\left(-1+\left(1-\frac{a^3\,\text{Cos}[x]^{-n}}{b^3}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{3},\frac{4}{3},\frac{a^3\,\text{Cos}[x]^{-n}}{b^3}\right]\right)}{a^3\,n\left(a^3-b^3\,\text{Cos}[x]^n\right)^{1/3}}$$

Problem 449: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \left(1+2\,\text{Cos}[x]^9\right)^{5/6}\,\text{Tan}[x]\,dx$$

Optimal (type 3, 95 leaves, 14 steps):

$$\frac{\text{ArcTan}\left[\frac{1-\left(1+2\,\text{Cos}[x]^9\right)^{1/3}}{\sqrt{3}\,\left(1+2\,\text{Cos}[x]^9\right)^{1/6}}\right]}{3\sqrt{3}}+\frac{1}{3}\,\text{ArcTanh}\left[\left(1+2\,\text{Cos}[x]^9\right)^{1/6}\right]-\frac{1}{9}\,\text{ArcTanh}\left[\sqrt{1+2\,\text{Cos}[x]^9}\right]-\frac{2}{15}\,\left(1+2\,\text{Cos}[x]^9\right)^{5/6}$$

Result (type 5, 579 leaves):

$$\Bigg(\left(128+126\,\text{Cos}[x]+84\,\text{Cos}[3\,x]+36\,\text{Cos}[5\,x]+9\,\text{Cos}[7\,x]+\text{Cos}[9\,x]\right)^{5/6}$$
$$\left(1+\text{Cot}[x]^2\right)^5\,\text{Sin}[x]^2\,\left(1+5\,\text{Cot}[x]^2+10\,\text{Cot}[x]^4+10\,\text{Cot}[x]^6+5\,\text{Cot}[x]^8+\text{Cot}[x]^{10}+2\,\text{Cot}[x]^{10}\,\sqrt{1+\text{Tan}[x]^2}\right)$$
$$\left(\frac{1+5\,\text{Cot}[x]^2+10\,\text{Cot}[x]^4+10\,\text{Cot}[x]^6+5\,\text{Cot}[x]^8+\text{Cot}[x]^{10}+2\,\text{Cot}[x]^{10}\,\sqrt{1+\text{Tan}[x]^2}}{\left(1+\text{Cot}[x]^2\right)^5}\right)^{1/6}$$
$$\Bigg(-2\,\left(1+5\,\text{Tan}[x]^2+10\,\text{Tan}[x]^4+10\,\text{Tan}[x]^6+5\,\text{Tan}[x]^8+\text{Tan}[x]^{10}+2\,\sqrt{1+\text{Tan}[x]^2}\right)+$$
$$5\times 2^{5/6}\,\text{Hypergeometric2F1}\left[\frac{1}{6},\frac{1}{6},\frac{7}{6},-\frac{1}{2}\,\left(1+\text{Tan}[x]^2\right)^{9/2}\right]\,\left(1+\text{Tan}[x]^2\right)^5$$
$$\left(2+\sqrt{1+\text{Tan}[x]^2}+4\,\text{Tan}[x]^2\,\sqrt{1+\text{Tan}[x]^2}+6\,\text{Tan}[x]^4\,\sqrt{1+\text{Tan}[x]^2}+4\,\text{Tan}[x]^6\,\sqrt{1+\text{Tan}[x]^2}+\text{Tan}[x]^8\,\sqrt{1+\text{Tan}[x]^2}\right)^{1/6}\Bigg)\Bigg)\Bigg/$$
$$\Bigg(480\times 2^{5/6}\,\left(1+\text{Tan}[x]^2\right)^{9/2}\,\left(\frac{1+5\,\text{Tan}[x]^2+10\,\text{Tan}[x]^4+10\,\text{Tan}[x]^6+5\,\text{Tan}[x]^8+\text{Tan}[x]^{10}+2\,\sqrt{1+\text{Tan}[x]^2}}{\left(1+\text{Tan}[x]^2\right)^5}\right)^{1/6}$$
$$\Big(4\,\text{Cot}[x]^8+20\,\text{Cot}[x]^{10}+40\,\text{Cot}[x]^{12}+40\,\text{Cot}[x]^{14}+20\,\text{Cot}[x]^{16}+4\,\text{Cot}[x]^{18}+\sqrt{1+\text{Tan}[x]^2}+9\,\text{Cot}[x]^2\,\sqrt{1+\text{Tan}[x]^2}+$$
$$36\,\text{Cot}[x]^4\,\sqrt{1+\text{Tan}[x]^2}+84\,\text{Cot}[x]^6\,\sqrt{1+\text{Tan}[x]^2}+126\,\text{Cot}[x]^8\,\sqrt{1+\text{Tan}[x]^2}+126\,\text{Cot}[x]^{10}\,\sqrt{1+\text{Tan}[x]^2}+$$
$$84\,\text{Cot}[x]^{12}\,\sqrt{1+\text{Tan}[x]^2}+36\,\text{Cot}[x]^{14}\,\sqrt{1+\text{Tan}[x]^2}+9\,\text{Cot}[x]^{16}\,\sqrt{1+\text{Tan}[x]^2}+5\,\text{Cot}[x]^{18}\,\sqrt{1+\text{Tan}[x]^2}\Big)\Bigg)$$

Problem 451: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Sec}[x]^2 \, \text{Tan}[x] \left(1 + \left(1 - 8\,\text{Tan}[x]^2\right)^{1/3}\right)}{\left(1 - 8\,\text{Tan}[x]^2\right)^{2/3}} \, dx$$

Optimal (type 3, 20 leaves, 2 steps):

$$-\frac{3}{32} \left(1 + \left(1 - 8\,\text{Tan}[x]^2\right)^{1/3}\right)^2$$

Result (type 3, 42 leaves):

$$-\frac{3 \left(-7 + 9\,\text{Cos}[2\,x]\right) \text{Sec}[x]^2 \left(2 + \left(1 - 8\,\text{Tan}[x]^2\right)^{1/3}\right)}{64 \left(1 - 8\,\text{Tan}[x]^2\right)^{2/3}}$$

Problem 452: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\text{Csc}[x] \, \text{Sec}[x] \left(1 + \left(1 - 8\,\text{Tan}[x]^2\right)^{1/3}\right)}{\left(1 - 8\,\text{Tan}[x]^2\right)^{2/3}} \, dx$$

Optimal (type 3, 27 leaves, 15 steps):

$$-\text{Log}[\text{Tan}[x]] + \frac{3}{2} \text{Log}\left[1 - \left(1 - 8\,\text{Tan}[x]^2\right)^{1/3}\right]$$

Result (type 5, 93 leaves):

$$-\frac{3 \left(8 - \text{Cot}[x]^2\right)^{2/3} \text{Hypergeometric2F1}\left[\frac{2}{3}, \frac{2}{3}, \frac{5}{3}, \frac{\text{Cot}[x]^2}{8}\right]}{16 \left(1 - 8\,\text{Tan}[x]^2\right)^{2/3}} - \frac{3 \left(8 - \text{Cot}[x]^2\right)^{1/3} \text{Hypergeometric2F1}\left[\frac{1}{3}, \frac{1}{3}, \frac{4}{3}, \frac{\text{Cot}[x]^2}{8}\right]}{4 \left(1 - 8\,\text{Tan}[x]^2\right)^{1/3}}$$

Problem 453: Result unnecessarily involves higher level functions.

$$\int \frac{\left(5\,\text{Cos}[x]^2 - \sqrt{-1 + 5\,\text{Sin}[x]^2}\right) \text{Tan}[x]}{\left(-1 + 5\,\text{Sin}[x]^2\right)^{1/4} \left(2 + \sqrt{-1 + 5\,\text{Sin}[x]^2}\right)} \, dx$$

Optimal (type 3, 101 leaves, 14 steps):

$$-\frac{3\,\text{ArcTan}\left[\frac{\left(-1+5\,\text{Sin}[x]^2\right)^{1/4}}{\sqrt{2}}\right]}{\sqrt{2}}-\frac{\text{ArcTanh}\left[\frac{\left(-1+5\,\text{Sin}[x]^2\right)^{1/4}}{\sqrt{2}}\right]}{2\sqrt{2}}+2\left(-1+5\,\text{Sin}[x]^2\right)^{1/4}-\frac{\left(-1+5\,\text{Sin}[x]^2\right)^{1/4}}{2\left(2+\sqrt{-1+5\,\text{Sin}[x]^2}\right)}$$

Result (type 5, 158 leaves):

$$-\frac{1}{60\left(3-5\,\text{Cos}[2\,x]\right)^{3/4}}\Bigg(3\times 2^{1/4}\left(-3+5\,\text{Cos}[2\,x]\right)\left(8\sqrt{2}+\sqrt{3-5\,\text{Cos}[2\,x]}+10\sqrt{2}\,\text{Cos}[2\,x]\right)\text{Sec}[x]^2-$$
$$30\times 5^{3/4}\sqrt{3-5\,\text{Cos}[2\,x]}\;\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{4},\frac{5}{4},\frac{4\,\text{Sec}[x]^2}{5}\right]\left(\left(-3+5\,\text{Cos}[2\,x]\right)\text{Sec}[x]^2\right)^{1/4}+$$
$$28\times 5^{1/4}\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{4\,\text{Sec}[x]^2}{5}\right]\left(2-8\,\text{Tan}[x]^2\right)^{3/4}\Bigg)$$

Problem 454: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \text{Cos}[x]^3\,\text{Cos}[2\,x]^{2/3}\,\text{Sin}[x]\,dx$$

Optimal (type 3, 25 leaves, 4 steps):

$$-\frac{3}{40}\,\text{Cos}[2\,x]^{5/3}-\frac{3}{64}\,\text{Cos}[2\,x]^{8/3}$$

Result (type 5, 140 leaves):

$$-\frac{3}{40}\,\text{Cos}[2\,x]^{5/3}-$$
$$\left(3\,e^{-6\,i\,x}\left(1+e^{4\,i\,x}\right)^{1/3}\left(\left(1+e^{4\,i\,x}\right)^{2/3}\left(1+e^{8\,i\,x}\right)+2\,e^{4\,i\,x}\,\text{Hypergeometric2F1}\left[-\frac{1}{3},\frac{1}{3},\frac{2}{3},-e^{4\,i\,x}\right]+e^{8\,i\,x}\,\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{2}{3},\frac{5}{3},-e^{4\,i\,x}\right]\right)\right)\Big/$$
$$\left(256\times 2^{2/3}\left(e^{-2\,i\,x}+e^{2\,i\,x}\right)^{1/3}\right)$$

Problem 455: Result unnecessarily involves higher level functions.

$$\int \frac{\text{Sin}[x]^6\,\text{Tan}[x]}{\text{Cos}[2\,x]^{3/4}}\,dx$$

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

$$\frac{\text{ArcTan}\left[\frac{1-\sqrt{\text{Cos}[2\,x]}}{\sqrt{2}\,\text{Cos}[2\,x]^{1/4}}\right]}{\sqrt{2}}-\frac{\text{ArcTanh}\left[\frac{1+\sqrt{\text{Cos}[2\,x]}}{\sqrt{2}\,\text{Cos}[2\,x]^{1/4}}\right]}{\sqrt{2}}+\frac{7}{4}\,\text{Cos}[2\,x]^{1/4}-\frac{1}{5}\,\text{Cos}[2\,x]^{5/4}+\frac{1}{36}\,\text{Cos}[2\,x]^{9/4}$$

Result (type 5, 59 leaves):

$$\frac{1}{360}\,\text{Cos}[2\,x]^{1/4}\,\left(635-72\,\text{Cos}[2\,x]+5\,\text{Cos}[4\,x]\right)+\frac{2\,\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{\text{Sec}[x]^2}{2}\right]}{3\,\left(1+\text{Cos}[2\,x]\right)^{3/4}}$$

Problem 456: Result more than twice size of optimal antiderivative.

$$\int\sqrt{\text{Tan}[x]\,\text{Tan}[2\,x]}\,dx$$

Optimal (type 3, 17 leaves, 3 steps):

$$-\text{ArcTanh}\left[\frac{\text{Tan}[x]}{\sqrt{\text{Tan}[x]\,\text{Tan}[2\,x]}}\right]$$

Result (type 3, 45 leaves):

$$-\frac{\text{ArcTanh}\left[\frac{\sqrt{2}\,\text{Cos}[x]}{\sqrt{\text{Cos}[2\,x]}}\right]\sqrt{\text{Cos}[2\,x]}\,\text{Csc}[x]\,\sqrt{\text{Tan}[x]\,\text{Tan}[2\,x]}}{\sqrt{2}}$$

Problem 488: Result more than twice size of optimal antiderivative.

$$\int x\,\text{Sec}[x]\,\text{Tan}[x]^3\,dx$$

Optimal (type 3, 30 leaves, 5 steps):

$$\frac{5}{6}\,\text{ArcTanh}[\text{Sin}[x]]-x\,\text{Sec}[x]+\frac{1}{3}\,x\,\text{Sec}[x]^3-\frac{1}{6}\,\text{Sec}[x]\,\text{Tan}[x]$$

Result (type 3, 104 leaves):

$$-\frac{1}{24}\,\text{Sec}[x]^3\,\Big(4\,x+12\,x\,\text{Cos}[2\,x]+5\,\text{Cos}[3\,x]\,\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]-\text{Sin}\left[\frac{x}{2}\right]\right]+ 15\,\text{Cos}[x]\,\left(\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]-\text{Sin}\left[\frac{x}{2}\right]\right]-\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]+\text{Sin}\left[\frac{x}{2}\right]\right]\right)-5\,\text{Cos}[3\,x]\,\text{Log}\left[\text{Cos}\left[\frac{x}{2}\right]+\text{Sin}\left[\frac{x}{2}\right]\right]+2\,\text{Sin}[2\,x]\Big)$$

Problem 506: Unable to integrate problem.

$$\int\left(a^{k\,x}+a^{l\,x}\right)^n\,dx$$

Optimal (type 5, 72 leaves, 2 steps):

$$\frac{\left(1+a^{(k-1)x}\right)\left(a^{kx}+a^{lx}\right)^n \text{Hypergeometric2F1}\left[1,1+\frac{kn}{k-1},1+\frac{ln}{k-1},-a^{(k-1)x}\right]}{l\,n\,\text{Log}[a]}$$

Result (type 8, 15 leaves):

$$\int \left(a^{kx}+a^{lx}\right)^n dx$$

Problem 511: Unable to integrate problem.

$$\int \left(a^{kx}-a^{lx}\right)^n dx$$

Optimal (type 5, 74 leaves, 2 steps):

$$\frac{\left(1-a^{(k-1)x}\right)\left(a^{kx}-a^{lx}\right)^n \text{Hypergeometric2F1}\left[1,1+\frac{kn}{k-1},1+\frac{ln}{k-1},a^{(k-1)x}\right]}{l\,n\,\text{Log}[a]}$$

Result (type 8, 17 leaves):

$$\int \left(a^{kx}-a^{lx}\right)^n dx$$

Problem 523: Result is not expressed in closed-form.

$$\int \frac{e^x}{b+a\,e^{3x}}\,dx$$

Optimal (type 3, 100 leaves, 7 steps):

$$-\frac{\text{ArcTan}\left[\frac{b^{1/3}-2a^{1/3}e^x}{\sqrt{3}\,b^{1/3}}\right]}{\sqrt{3}\,a^{1/3}b^{2/3}}+\frac{\text{Log}\left[b^{1/3}+a^{1/3}e^x\right]}{2a^{1/3}b^{2/3}}-\frac{\text{Log}\left[b+a\,e^{3x}\right]}{6a^{1/3}b^{2/3}}$$

Result (type 7, 36 leaves):

$$\frac{\text{RootSum}\left[b+a\,\#1^3\,\&,\frac{-x+\text{Log}\left[e^x-\#1\right]}{\#1^2}\,\&\right]}{3a}$$

Problem 528: Result unnecessarily involves higher level functions.

$$\int \left(1-2\,e^{x/3}\right)^{1/4} dx$$

Optimal (type 3, 54 leaves, 6 steps):

$$12\left(1-2e^{x/3}\right)^{1/4}-6\,\text{ArcTan}\left[\left(1-2e^{x/3}\right)^{1/4}\right]-6\,\text{ArcTanh}\left[\left(1-2e^{x/3}\right)^{1/4}\right]$$

Result (type 5, 70 leaves):

$$-\frac{2\left(-6+12e^{x/3}+2^{1/4}\left(2-e^{-x/3}\right)^{3/4}\text{Hypergeometric2F1}\left[\frac{3}{4},\frac{3}{4},\frac{7}{4},\frac{e^{-x/3}}{2}\right]\right)}{\left(1-2e^{x/3}\right)^{3/4}}$$

Problem 540: Unable to integrate problem.

$$\int\frac{e^x\left(1-x-x^2\right)}{\sqrt{1-x^2}}\,dx$$

Optimal (type 3, 15 leaves, 1 step):

$$e^x\sqrt{1-x^2}$$

Result (type 8, 27 leaves):

$$\int\frac{e^x\left(1-x-x^2\right)}{\sqrt{1-x^2}}\,dx$$

Problem 552: Result more than twice size of optimal antiderivative.

$$\int\frac{e^x}{1+\text{Cos}[x]}\,dx$$

Optimal (type 5, 28 leaves, 2 steps):

$$(1-i)\,e^{(1+i)x}\,\text{Hypergeometric2F1}\left[1-i,2,2-i,-e^{ix}\right]$$

Result (type 5, 89 leaves):

$$-\frac{1}{1+\text{Cos}[x]}(1+i)\,e^x\,\text{Cos}\left[\frac{x}{2}\right]\left((1+i)\,\text{Cos}\left[\frac{x}{2}\right]\text{Hypergeometric2F1}\left[-i,1,1-i,-e^{ix}\right]-e^{ix}\,\text{Cos}\left[\frac{x}{2}\right]\text{Hypergeometric2F1}\left[1,1-i,2-i,-e^{ix}\right]-(1-i)\,\text{Sin}\left[\frac{x}{2}\right]\right)$$

Problem 553: Result more than twice size of optimal antiderivative.

$$\int\frac{e^x}{1-\text{Cos}[x]}\,dx$$

Optimal (type 5, 26 leaves, 2 steps):

$(-1+i)\, e^{(1+i)x}\, \text{Hypergeometric2F1}\left[1-i, 2, 2-i, e^{i x}\right]$

Result (type 5, 84 leaves):

$$\frac{1}{-1+\text{Cos}[x]}\,(1+i)\, e^{x}\, \text{Sin}\left[\frac{x}{2}\right]\left((1-i)\,\text{Cos}\left[\frac{x}{2}\right]+(1+i)\,\text{Hypergeometric2F1}\left[-i, 1, 1-i, e^{i x}\right]\text{Sin}\left[\frac{x}{2}\right]+e^{i x}\,\text{Hypergeometric2F1}\left[1, 1-i, 2-i, e^{i x}\right]\text{Sin}\left[\frac{x}{2}\right]\right)$$

Problem 554: Result more than twice size of optimal antiderivative.

$$\int \frac{e^{x}}{1+\text{Sin}[x]}\, dx$$

Optimal (type 5, 30 leaves, 2 steps):

$(-1+i)\, e^{(1-i)x}\, \text{Hypergeometric2F1}\left[1+i, 2, 2+i, -i\, e^{-i x}\right]$

Result (type 5, 61 leaves):

$$\frac{2\, e^{x}\, \text{Sin}\left[\frac{x}{2}\right]}{\text{Cos}\left[\frac{x}{2}\right]+\text{Sin}\left[\frac{x}{2}\right]}-(1-i)\,\left(1-(1-i)\,\text{Hypergeometric2F1}[-i, 1, 1-i, i\,\text{Cos}[x]-\text{Sin}[x]]\right)\,(\text{Cosh}[x]+\text{Sinh}[x])$$

Problem 555: Result more than twice size of optimal antiderivative.

$$\int \frac{e^{x}}{1-\text{Sin}[x]}\, dx$$

Optimal (type 5, 30 leaves, 2 steps):

$(1+i)\, e^{(1+i)x}\, \text{Hypergeometric2F1}\left[1-i, 2, 2-i, -i\, e^{i x}\right]$

Result (type 5, 61 leaves):

$$\frac{2\, e^{x}\, \text{Sin}\left[\frac{x}{2}\right]}{\text{Cos}\left[\frac{x}{2}\right]-\text{Sin}\left[\frac{x}{2}\right]}+(1+i)\,\left(1-(1+i)\,\text{Hypergeometric2F1}[-i, 1, 1-i, -i\,\text{Cos}[x]+\text{Sin}[x]]\right)\,(\text{Cosh}[x]+\text{Sinh}[x])$$

Problem 557: Result more than twice size of optimal antiderivative.

$$\int \frac{e^{x}\,(1+\text{Sin}[x])}{1-\text{Cos}[x]}\, dx$$

Optimal (type 5, 41 leaves, 7 steps):

$$(-2+2\,i)\,e^{(1+i)\,x}\,\text{Hypergeometric2F1}\left[1-i,\,2,\,2-i,\,e^{i\,x}\right]+\frac{e^{x}\,\text{Sin}[x]}{1-\text{Cos}[x]}$$

Result (type 5, 100 leaves):

$$\left(2\,e^{x}\,\text{Sin}\left[\frac{x}{2}\right]\left(\text{Cos}\left[\frac{x}{2}\right]+2\,i\,\text{Hypergeometric2F1}\left[-i,\,1,\,1-i,\,e^{i\,x}\right]\text{Sin}\left[\frac{x}{2}\right]+(1+i)\,e^{i\,x}\,\text{Hypergeometric2F1}\left[1,\,1-i,\,2-i,\,e^{i\,x}\right]\text{Sin}\left[\frac{x}{2}\right]\right)(1+\text{Sin}[x])\right)\Big/\left((-1+\text{Cos}[x])\left(\text{Cos}\left[\frac{x}{2}\right]+\text{Sin}\left[\frac{x}{2}\right]\right)^{2}\right)$$

Problem 559: Result more than twice size of optimal antiderivative.

$$\int\frac{e^{x}\,(1-\text{Sin}[x])}{1+\text{Cos}[x]}\,dx$$

Optimal (type 5, 42 leaves, 7 steps):

$$(2-2\,i)\,e^{(1+i)\,x}\,\text{Hypergeometric2F1}\left[1-i,\,2,\,2-i,\,-e^{i\,x}\right]-\frac{e^{x}\,\text{Sin}[x]}{1+\text{Cos}[x]}$$

Result (type 5, 87 leaves):

$$-\frac{1}{1+\text{Cos}[x]}2\,e^{x}\,\text{Cos}\left[\frac{x}{2}\right]\left(2\,i\,\text{Cos}\left[\frac{x}{2}\right]\text{Hypergeometric2F1}\left[-i,\,1,\,1-i,\,-e^{i\,x}\right]-(1+i)\,e^{i\,x}\,\text{Cos}\left[\frac{x}{2}\right]\text{Hypergeometric2F1}\left[1,\,1-i,\,2-i,\,-e^{i\,x}\right]-\text{Sin}\left[\frac{x}{2}\right]\right)$$

Problem 574: Result more than twice size of optimal antiderivative.

$$\int\text{Sech}[x]\,dx$$

Optimal (type 3, 3 leaves, 1 step):

$$\text{ArcTan}[\text{Sinh}[x]]$$

Result (type 3, 9 leaves):

$$2\,\text{ArcTan}\left[\text{Tanh}\left[\frac{x}{2}\right]\right]$$

Problem 575: Result more than twice size of optimal antiderivative.

$$\int\text{Csch}[x]\,dx$$

Optimal (type 3, 5 leaves, 1 step):

$-\text{ArcTanh}[\text{Cosh}[x]]$

Result (type 3, 17 leaves):

$-\text{Log}\left[\text{Cosh}\left[\frac{x}{2}\right]\right]+\text{Log}\left[\text{Sinh}\left[\frac{x}{2}\right]\right]$

Problem 579: Result more than twice size of optimal antiderivative.

$\int \text{Csch}[x]^3\, dx$

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

$\frac{1}{2}\text{ArcTanh}[\text{Cosh}[x]]-\frac{1}{2}\text{Coth}[x]\,\text{Csch}[x]$

Result (type 3, 47 leaves):

$-\frac{1}{8}\text{Csch}\left[\frac{x}{2}\right]^2+\frac{1}{2}\text{Log}\left[\text{Cosh}\left[\frac{x}{2}\right]\right]-\frac{1}{2}\text{Log}\left[\text{Sinh}\left[\frac{x}{2}\right]\right]-\frac{1}{8}\text{Sech}\left[\frac{x}{2}\right]^2$

Problem 592: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$\int \frac{\text{Cosh}[x]\,(-\text{Cosh}[2x]+\text{Tanh}[x])}{\sqrt{\text{Sinh}[2x]}\,(\text{Sinh}[x]^2+\text{Sinh}[2x])}\, dx$

Optimal (type 3, 69 leaves, 8 steps):

$\sqrt{2}\,\text{ArcTan}\left[\text{Sech}[x]\sqrt{\text{Cosh}[x]\,\text{Sinh}[x]}\right]+\frac{1}{6}\text{ArcTan}\left[\frac{\text{Sinh}[x]}{\sqrt{\text{Sinh}[2x]}}\right]-\frac{1}{3}\sqrt{2}\,\text{ArcTanh}\left[\text{Sech}[x]\sqrt{\text{Cosh}[x]\,\text{Sinh}[x]}\right]+\frac{\text{Cosh}[x]}{\sqrt{\text{Sinh}[2x]}}$

Result (type 4, 487 leaves):

$$-\frac{\text{Coth}[x]\sqrt{\text{Sinh}[2x]}\left(-\text{Cosh}[2x]+\text{Tanh}[x]\right)}{\text{Cosh}[x]+\text{Cosh}[3x]-2\,\text{Sinh}[x]}+$$

$$\frac{1}{2\left(\text{Cosh}[x]+\text{Cosh}[3x]-2\,\text{Sinh}[x]\right)}\text{Cosh}[x]\left(-\left(\left(6\,(-1)^{1/4}\sqrt{1+\text{Coth}\left[\frac{x}{2}\right]^2}\left(\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{(-1)^{1/4}}{\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}}\right],-1\right]-\right.\right.\right.\right.$$

$$\left.\text{EllipticPi}\left[-(-1)^{1/6},\,i\,\text{ArcSinh}\left[\frac{(-1)^{1/4}}{\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}}\right],-1\right]-\text{EllipticPi}\left[-(-1)^{5/6},\,i\,\text{ArcSinh}\left[\frac{(-1)^{1/4}}{\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}}\right],-1\right]\right)$$

$$\left.\left.\sqrt{\text{Sinh}[2x]}\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\sqrt{\text{Tanh}\left[\frac{x}{2}\right]+\text{Tanh}\left[\frac{x}{2}\right]^3}\right)\bigg/\left(\left(1+\text{Cosh}[x]\right)\sqrt{\frac{\text{Sinh}[2x]}{\left(1+\text{Cosh}[x]\right)^2}}\left(1+\text{Tanh}\left[\frac{x}{2}\right]^2\right)\right)\right)+$$

$$\left(16\,(-1)^{5/12}\left(\left(3-3\,i\sqrt{3}\right)\text{EllipticPi}\left[-i,\,i\,\text{ArcSinh}\left[(-1)^{1/4}\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\right],-1\right]+2\left(-1+(-1)^{1/3}\right)\right.\right.$$

$$\text{EllipticPi}\left[i,\,\text{ArcSin}\left[(-1)^{3/4}\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\right],-1\right]+i\left(i+\sqrt{3}\right)\text{EllipticPi}\left[-(-1)^{1/6},\,i\,\text{ArcSinh}\left[(-1)^{1/4}\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\right],-1\right]+$$

$$\left.2\left(-1+(-1)^{1/3}\right)\text{EllipticPi}\left[-(-1)^{5/6},\,i\,\text{ArcSinh}\left[(-1)^{1/4}\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\right],-1\right]\right)\text{Sinh}[2x]^{3/2}\sqrt{\text{Tanh}\left[\frac{x}{2}\right]+\text{Tanh}\left[\frac{x}{2}\right]^3}\bigg/$$

$$\left.\left.\left(3\left(-i+\sqrt{3}\right)\left(1+\text{Cosh}[x]\right)^3\left(\frac{\text{Sinh}[2x]}{\left(1+\text{Cosh}[x]\right)^2}\right)^{3/2}\sqrt{\text{Tanh}\left[\frac{x}{2}\right]}\sqrt{1+\text{Tanh}\left[\frac{x}{2}\right]^2}\right)\right)\left(-\text{Cosh}[2x]+\text{Tanh}[x]\right)$$

Problem 601: Result more than twice size of optimal antiderivative.

$$\int e^{-2x}\,\text{Sech}[x]^4\,dx$$

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

$$-\frac{8}{3\left(1+e^{2x}\right)^3}$$

Result (type 3, 32 leaves):

$$\frac{8 e^{2x}\left(3+3 e^{2x}+e^{4x}\right)}{3\left(1+e^{2x}\right)^3}$$

Problem 622: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{x\sqrt{a^2+\text{Log}[x]^2}}\,dx$$

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

$$\text{ArcTanh}\left[\frac{\text{Log}[x]}{\sqrt{a^2+\text{Log}[x]^2}}\right]$$

Result (type 3, 46 leaves):

$$-\frac{1}{2}\text{Log}\left[1-\frac{\text{Log}[x]}{\sqrt{a^2+\text{Log}[x]^2}}\right]+\frac{1}{2}\text{Log}\left[1+\frac{\text{Log}[x]}{\sqrt{a^2+\text{Log}[x]^2}}\right]$$

Problem 623: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{x\sqrt{-a^2+\text{Log}[x]^2}}\,dx$$

Optimal (type 3, 18 leaves, 3 steps):

$$\text{ArcTanh}\left[\frac{\text{Log}[x]}{\sqrt{-a^2+\text{Log}[x]^2}}\right]$$

Result (type 3, 50 leaves):

$$-\frac{1}{2}\text{Log}\left[1-\frac{\text{Log}[x]}{\sqrt{-a^2+\text{Log}[x]^2}}\right]+\frac{1}{2}\text{Log}\left[1+\frac{\text{Log}[x]}{\sqrt{-a^2+\text{Log}[x]^2}}\right]$$

Problem 627: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x\,\text{Log}[x]\,\sqrt{-a^2+\text{Log}[x]^2}}\,dx$$

Optimal (type 3, 23 leaves, 4 steps):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{-a^2+\text{Log}[x]^2}}{a}\right]}{a}$$

Result (type 3, 38 leaves):

$$-\frac{i\,\text{Log}\left[-\frac{2\,i\,a}{\text{Log}[x]}+\frac{2\sqrt{-a^2+\text{Log}[x]^2}}{\text{Log}[x]}\right]}{a}$$

Problem 689: Result more than twice size of optimal antiderivative.

$$\int \frac{x^6\,\text{ArcSec}[x]}{\left(-1+x^2\right)^{5/2}}\,dx$$

Optimal (type 4, 175 leaves, 16 steps):

$$\frac{\sqrt{x^2}\,\left(2-3x^2\right)}{6\left(-1+x^2\right)}-\frac{13}{6}\text{ArcCoth}\left[\sqrt{x^2}\right]-\frac{5x^3\,\text{ArcSec}[x]}{6\left(-1+x^2\right)^{3/2}}+\frac{x^5\,\text{ArcSec}[x]}{2\left(-1+x^2\right)^{3/2}}-\frac{5x\,\text{ArcSec}[x]}{2\sqrt{-1+x^2}}-$$
$$\frac{5\,i\,\sqrt{x^2}\,\text{ArcSec}[x]\,\text{ArcTan}\left[e^{i\,\text{ArcSec}[x]}\right]}{x}+\frac{5\,i\,\sqrt{x^2}\,\text{PolyLog}\left[2,-i\,e^{i\,\text{ArcSec}[x]}\right]}{2x}-\frac{5\,i\,\sqrt{x^2}\,\text{PolyLog}\left[2,i\,e^{i\,\text{ArcSec}[x]}\right]}{2x}$$

Result (type 4, 383 leaves):

$$-\frac{1}{96\left(-1+x^2\right)^{3/2}}x^5\left(22\,\text{ArcSec}[x]+40\,\text{ArcSec}[x]\,\text{Cos}[2\,\text{ArcSec}[x]]-30\,\text{ArcSec}[x]\,\text{Cos}[4\,\text{ArcSec}[x]]-30\sqrt{1-\frac{1}{x^2}}\,\text{ArcSec}[x]\,\text{Log}\left[1-i\,e^{i\,\text{ArcSec}[x]}\right]+\right.$$
$$30\sqrt{1-\frac{1}{x^2}}\,\text{ArcSec}[x]\,\text{Log}\left[1+i\,e^{i\,\text{ArcSec}[x]}\right]+26\sqrt{1-\frac{1}{x^2}}\,\text{Log}\left[\text{Cos}\left[\frac{\text{ArcSec}[x]}{2}\right]\right]-26\sqrt{1-\frac{1}{x^2}}\,\text{Log}\left[\text{Sin}\left[\frac{\text{ArcSec}[x]}{2}\right]\right]+16\,\text{Sin}[2\,\text{ArcSec}[x]]-$$
$$60\,i\sqrt{1-\frac{1}{x^2}}\,\text{PolyLog}\left[2,-i\,e^{i\,\text{ArcSec}[x]}\right]\text{Sin}[2\,\text{ArcSec}[x]]^2+60\,i\sqrt{1-\frac{1}{x^2}}\,\text{PolyLog}\left[2,i\,e^{i\,\text{ArcSec}[x]}\right]\text{Sin}[2\,\text{ArcSec}[x]]^2-$$
$$15\,\text{ArcSec}[x]\,\text{Log}\left[1-i\,e^{i\,\text{ArcSec}[x]}\right]\text{Sin}[3\,\text{ArcSec}[x]]+15\,\text{ArcSec}[x]\,\text{Log}\left[1+i\,e^{i\,\text{ArcSec}[x]}\right]\text{Sin}[3\,\text{ArcSec}[x]]+$$
$$13\,\text{Log}\left[\text{Cos}\left[\frac{\text{ArcSec}[x]}{2}\right]\right]\text{Sin}[3\,\text{ArcSec}[x]]-13\,\text{Log}\left[\text{Sin}\left[\frac{\text{ArcSec}[x]}{2}\right]\right]\text{Sin}[3\,\text{ArcSec}[x]]-4\,\text{Sin}[4\,\text{ArcSec}[x]]+$$
$$15\,\text{ArcSec}[x]\,\text{Log}\left[1-i\,e^{i\,\text{ArcSec}[x]}\right]\text{Sin}[5\,\text{ArcSec}[x]]-15\,\text{ArcSec}[x]\,\text{Log}\left[1+i\,e^{i\,\text{ArcSec}[x]}\right]\text{Sin}[5\,\text{ArcSec}[x]]-$$
$$\left.13\,\text{Log}\left[\text{Cos}\left[\frac{\text{ArcSec}[x]}{2}\right]\right]\text{Sin}[5\,\text{ArcSec}[x]]+13\,\text{Log}\left[\text{Sin}\left[\frac{\text{ArcSec}[x]}{2}\right]\right]\text{Sin}[5\,\text{ArcSec}[x]]\right)$$

Problem 698: Result more than twice size of optimal antiderivative.

$$\int -\frac{\text{ArcTan}[a-x]}{a+x}\,dx$$

Optimal (type 4, 122 leaves, 5 steps):

$$\text{ArcTan}[a-x]\,\text{Log}\left[\frac{2}{1-i\,(a-x)}\right]-\text{ArcTan}[a-x]\,\text{Log}\left[-\frac{2\,(a+x)}{(i-2\,a)\,(1-i\,(a-x))}\right]-$$
$$\frac{1}{2}\,i\,\text{PolyLog}\left[2,1-\frac{2}{1-i\,(a-x)}\right]+\frac{1}{2}\,i\,\text{PolyLog}\left[2,1+\frac{2\,(a+x)}{(i-2\,a)\,(1-i\,(a-x))}\right]$$

Result (type 4, 256 leaves):

$$-\text{ArcTan}[a-x]\left(\frac{1}{2}\text{Log}\left[1+a^2-2ax+x^2\right]+\text{Log}[-\text{Sin}[\text{ArcTan}[2a]-\text{ArcTan}[a-x]]]\right)+$$

$$\frac{1}{2}\left(\frac{1}{4}i\left(\pi-2\,\text{ArcTan}[a-x]\right)^2+i\left(\text{ArcTan}[2a]-\text{ArcTan}[a-x]\right)^2-\right.$$
$$\left(\pi-2\,\text{ArcTan}[a-x]\right)\text{Log}\left[1+e^{-2i\,\text{ArcTan}[a-x]}\right]-2\left(-\text{ArcTan}[2a]+\text{ArcTan}[a-x]\right)\text{Log}\left[1-e^{2i(-\text{ArcTan}[2a]+\text{ArcTan}[a-x])}\right]+$$
$$\left(\pi-2\,\text{ArcTan}[a-x]\right)\text{Log}\left[\frac{2}{\sqrt{1+(a-x)^2}}\right]-2\left(\text{ArcTan}[2a]-\text{ArcTan}[a-x]\right)\text{Log}[-2\,\text{Sin}[\text{ArcTan}[2a]-\text{ArcTan}[a-x]]]+$$
$$\left.i\,\text{PolyLog}\left[2,-e^{-2i\,\text{ArcTan}[a-x]}\right]+i\,\text{PolyLog}\left[2,e^{2i(-\text{ArcTan}[2a]+\text{ArcTan}[a-x])}\right]\right)$$

Problem 703: Result unnecessarily involves imaginary or complex numbers.

$$\int \text{ArcSin}[\text{Sinh}[x]]\,\text{Sech}[x]^4\,dx$$

Optimal (type 3, 49 leaves, 5 steps):

$$-\frac{2}{3}\text{ArcSin}\left[\frac{\text{Cosh}[x]}{\sqrt{2}}\right]+\frac{1}{6}\text{Sech}[x]\sqrt{1-\text{Sinh}[x]^2}+\text{ArcSin}[\text{Sinh}[x]]\,\text{Tanh}[x]-\frac{1}{3}\text{ArcSin}[\text{Sinh}[x]]\,\text{Tanh}[x]^3$$

Result (type 3, 66 leaves):

$$\frac{1}{12}\left(8\,i\,\text{Log}\left[i\sqrt{2}\,\text{Cosh}[x]+\sqrt{3-\text{Cosh}[2x]}\right]+\sqrt{6-2\,\text{Cosh}[2x]}\,\text{Sech}[x]+4\,\text{ArcSin}[\text{Sinh}[x]]\left(2+\text{Cosh}[2x]\right)\text{Sech}[x]^2\,\text{Tanh}[x]\right)$$

Problem 704: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \text{ArcCot}[\text{Cosh}[x]]\,\text{Coth}[x]\,\text{Csch}[x]^3\,dx$$

Optimal (type 3, 36 leaves, 6 steps):

$$\frac{\text{ArcTanh}\left[\frac{\text{Tanh}[x]}{\sqrt{2}}\right]}{6\sqrt{2}}+\frac{\text{Coth}[x]}{6}-\frac{1}{3}\text{ArcCot}[\text{Cosh}[x]]\,\text{Csch}[x]^3$$

Result (type 3, 144 leaves):

$$\frac{1}{48}\text{Csch}[x]^3\left(-16\,\text{ArcCot}[\text{Cosh}[x]]-2\,\text{Cosh}[x]+2\,\text{Cosh}[3x]-3i\sqrt{2}\,\text{ArcTan}\left[1-i\sqrt{2}\,\text{Tanh}\left[\frac{x}{2}\right]\right]\text{Sinh}[x]+\right.$$
$$\left.3i\sqrt{2}\,\text{ArcTan}\left[1+i\sqrt{2}\,\text{Tanh}\left[\frac{x}{2}\right]\right]\text{Sinh}[x]+i\sqrt{2}\,\text{ArcTan}\left[1-i\sqrt{2}\,\text{Tanh}\left[\frac{x}{2}\right]\right]\text{Sinh}[3x]-i\sqrt{2}\,\text{ArcTan}\left[1+i\sqrt{2}\,\text{Tanh}\left[\frac{x}{2}\right]\right]\text{Sinh}[3x]\right)$$

Problem 705: Result more than twice size of optimal antiderivative.

$$\int e^x \text{ArcSin}[\text{Tanh}[x]] \, dx$$

Optimal (type 3, 28 leaves, 5 steps):

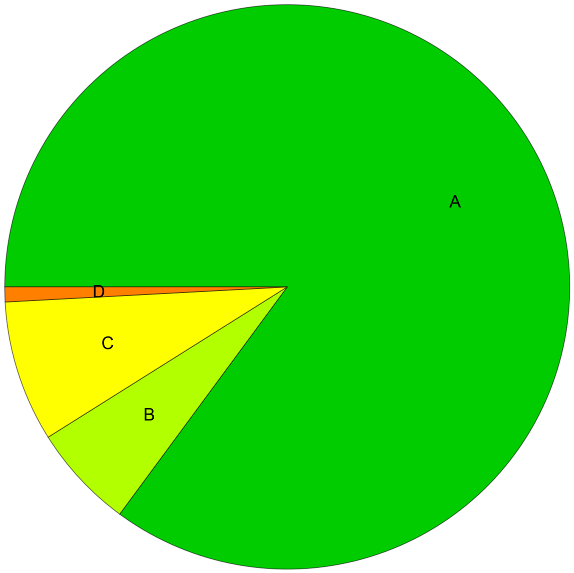
$$e^x \text{ArcSin}[\text{Tanh}[x]] - \text{Cosh}[x] \, \text{Log}\left[1 + e^{2x}\right] \sqrt{\text{Sech}[x]^2}$$

Result (type 3, 64 leaves):

$$e^x \text{ArcSin}\left[\frac{-1 + e^{2x}}{1 + e^{2x}}\right] - e^{-x} \sqrt{\frac{e^{2x}}{\left(1 + e^{2x}\right)^2}} \left(1 + e^{2x}\right) \text{Log}\left[1 + e^{2x}\right]$$

Summary of Integration Test Results

705 integration problems



A - 600 optimal antiderivatives

B - 42 more than twice size of optimal antiderivatives

C - 57 unnecessarily complex antiderivatives

D - 6 unable to integrate problems

E - 0 integration timeouts