Mathematica 11.3 Integration Test Results

on the problems in the test-suite directory "1 Algebraic functions\1.3 Miscellaneous"

Test results for the 494 problems in "1.3.1 Rational functions.m"

Problem 12: Result is not expressed in closed-form.

$$\int \frac{1}{3 a b + 3 b^2 x + 3 b c x^2 + c^2 x^3} \, dx$$

Optimal (type 3, 188 leaves, 7 steps):

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

Result (type 7, 63 leaves):

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

Problem 13: Result is not expressed in closed-form.

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

Optimal (type 3, 245 leaves, 8 steps):

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

Result (type 7, 112 leaves):

$$-\frac{\frac{3\,(b+c\,x)}{3\,a\,b+x\,\left(3\,b^2+3\,b\,c\,x+c^2\,x^2\right)}+2\,c\,\text{RootSum}\left[3\,a\,b+3\,b^2\,\#1+3\,b\,c\,\#1^2+c^2\,\#1^3\,\&,\,\frac{\text{Log}[x-\#1]}{b^2+2\,b\,c\,\#1+c^2\,\#1^2}\,\&\right]}{9\,\left(b^3-3\,a\,b\,c\right)}$$

Problem 14: Result is not expressed in closed-form.

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

Optimal (type 3, 305 leaves, 9 steps):

$$-\frac{c\left(\frac{b}{c}+x\right)}{6\,b\,\left(b^2-3\,a\,c\right)\,\left(3\,a\,b+3\,b^2\,x+3\,b\,c\,x^2+c^2\,x^3\right)^2}+\frac{5\,c^2\left(\frac{b}{c}+x\right)}{18\,b^2\,\left(b^2-3\,a\,c\right)^2\,\left(3\,a\,b+3\,b^2\,x+3\,b\,c\,x^2+c^2\,x^3\right)}-\frac{5\,c^2\,\text{ArcTan}\left[\frac{b^{1/3}+\frac{2\,(b+c\,x)}{\left(b^2-3\,a\,c\right)^{1/3}}}{\sqrt{3}\,b^{1/3}}\right]}{9\,\sqrt{3}\,b^{8/3}\,\left(b^2-3\,a\,c\right)^{8/3}}+\frac{5\,c^2\,\text{Log}\left[b-b^{1/3}\,\left(b^2-3\,a\,c\right)^{1/3}+c\,x\right]}{27\,b^{8/3}\,\left(b^2-3\,a\,c\right)^{8/3}}-\frac{5\,c^2\,\text{Log}\left[b^{2/3}\,\left(b^2-3\,a\,c\right)^{2/3}+b^{1/3}\,c\,\left(b^2-3\,a\,c\right)^{1/3}\,\left(\frac{b}{c}+x\right)+c^2\,\left(\frac{b}{c}+x\right)^2\right]}{54\,b^{8/3}\,\left(b^2-3\,a\,c\right)^{8/3}}$$

Result (type 7, 149 leaves):

$$\frac{1}{54\,\left(b^3-3\,a\,b\,c\right)^2}\left(-\frac{3\,(b+c\,x)\,\left(3\,b^3-15\,b^2\,c\,x-5\,c^3\,x^3-3\,b\,c\,\left(8\,a+5\,c\,x^2\right)\right)}{\left(3\,a\,b+x\,\left(3\,b^2+3\,b\,c\,x+c^2\,x^2\right)\right)^2}+10\,c^2\,\text{RootSum}\left[3\,a\,b+3\,b^2\,\#1+3\,b\,c\,\#1^2+c^2\,\#1^3\,\&,\,\frac{\text{Log}[x-\#1]}{b^2+2\,b\,c\,\#1+c^2\,\#1^2}\,\&\right]\right)$$

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

$$\int \left(b\,x+c\,x^2+d\,x^3\right)^n\,dx$$

Optimal (type 6, 132 leaves, 3 steps):

$$\frac{1}{1+n}x\left(1+\frac{2\,d\,x}{c-\sqrt{c^2-4\,b\,d}}\right)^{-n}\left(1+\frac{2\,d\,x}{c+\sqrt{c^2-4\,b\,d}}\right)^{-n}\left(b\,x+c\,x^2+d\,x^3\right)^n \text{AppellF1}\left[1+n,\,-n,\,-n,\,2+n,\,-\frac{2\,d\,x}{c-\sqrt{c^2-4\,b\,d}},\,-\frac{2\,d\,x}{c+\sqrt{c^2-4\,b\,d}}\right]$$

Result (type 6, 438 leaves):

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

Problem 32: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\left(a+d\,x^3\right)^n dx$$

Optimal (type 5, 35 leaves, 2 steps):

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

Result (type 6, 196 leaves):

$$\frac{1}{d^{1/3}\,(1+n)}2^{-n}\left(\left(-1\right)^{2/3}a^{1/3}+d^{1/3}\,x\right)\left(\frac{a^{1/3}+\left(-1\right)^{2/3}d^{1/3}\,x}{\left(1+\left(-1\right)^{1/3}\right)a^{1/3}}\right)^{-n}\left(\frac{i\left(1+\frac{d^{1/3}\,x}{a^{1/3}}\right)}{3\,i+\sqrt{3}}\right)^{-n}$$
$$\left(a+d\,x^3\right)^n\text{AppellF1}\left[1+n,\,-n,\,-n,\,2+n,\,-\frac{i\left(\left(-1\right)^{2/3}a^{1/3}+d^{1/3}\,x\right)}{\sqrt{3}\,a^{1/3}},\,\frac{i+\sqrt{3}-\frac{2\,i\,d^{1/3}\,x}{a^{1/3}}}{3\,i+\sqrt{3}}\right]$$

Problem 37: Result is not expressed in closed-form.

$$\int\frac{1}{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}\,dx$$

Optimal (type 3, 529 leaves, 10 steps) :

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

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

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

Result (type 7, 71 leaves) :

$$\frac{1}{4}\,\text{RootSum}\left[4\,a\,c+4\,c^2\,\#1^2+4\,c\,d\,\#1^3+d^2\,\#1^4\,\&,\ \frac{\text{Log}[x-\#1]}{2\,c^2\,\#1+3\,c\,d\,\#1^2+d^2\,\#1^3}\,\&\right]$$

Problem 38: Result is not expressed in closed-form.

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

Optimal (type 3, 746 leaves, 11 steps) :

$$-\frac{\left(\frac{c}{d}+x\right)\left(c^3-4 a d^2-c d^2\left(\frac{c}{d}+x\right)^2\right)}{16 a c\left(c^3+4 a d^2\right)\left(4 a c+4 c^2 x^2+4 c d x^3+d^2 x^4\right)}-\frac{d\left(c^3+12 a d^2+c^{3/2}\sqrt{c^3+4 a d^2}\right)\text{ArcTanh}\left[\frac{\sqrt{2}\,c+c^{1/4}\sqrt{c^{3/2}+\sqrt{c^3+4 a d^2}}+\sqrt{2}\,d x}{c^{1/4}\sqrt{c^{3/2}-\sqrt{c^3+4 a d^2}}}\right]}{32\sqrt{2}\,a c^{7/4}\left(c^3+4 a d^2\right)^{3/2}\sqrt{c^{3/2}-\sqrt{c^3+4 a d^2}}}+$$

$$\frac{d\left(c^3+12 a d^2+c^{3/2}\sqrt{c^3+4 a d^2}\right)\text{ArcTanh}\left[\frac{c^{1/4}\sqrt{c^{3/2}+\sqrt{c^3+4 a d^2}}-\sqrt{2}\,(c+d x)}{c^{1/4}\sqrt{c^{3/2}-\sqrt{c^3+4 a d^2}}}\right]}{32\sqrt{2}\,a c^{7/4}\left(c^3+4 a d^2\right)^{3/2}\sqrt{c^{3/2}-\sqrt{c^3+4 a d^2}}}-$$

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

$$\left(64\sqrt{2}\,a c^{7/4}\left(c^3+4 a d^2\right)^{3/2}\sqrt{c^{3/2}+\sqrt{c^3+4 a d^2}}\right)+$$

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

$$\left(64\sqrt{2}\,a c^{7/4}\left(c^3+4 a d^2\right)^{3/2}\sqrt{c^{3/2}+\sqrt{c^3+4 a d^2}}\right)$$

Result (type 7, 182 leaves) :

$$\frac{1}{64 a c\left(c^3+4 a d^2\right)}\left(\frac{4(c+d x)(4 a d+c x(2 c+d x))}{4 a c+x^2(2 c+d x)^2}+\right.$$

$$\left.\text{RootSum}\left[4 a c+4 c^2 \#1^2+4 c d \#1^3+d^2 \#1^4\,\&,\ \frac{2 c^3 \text{Log}[x-\#1]+12 a d^2 \text{Log}[x-\#1]+2 c^2 d \text{Log}[x-\#1]\,\#1+c d^2 \text{Log}[x-\#1]\,\#1^2}{2 c^2 \#1+3 c d \#1^2+d^2 \#1^3}\,\&\right]\right)$$

Problem 43: Result is not expressed in closed-form.

$$\int \frac{1}{8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4}\,dx$$

Optimal (type 3, 153 leaves, 4 steps) :

$$\frac{2\,\text{ArcTanh}\left[\frac{d+4 e x}{\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}\right]}{\sqrt{d^4-64 a e^3}\,\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}-\frac{2\,\text{ArcTanh}\left[\frac{d+4 e x}{\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}\right]}{\sqrt{d^4-64 a e^3}\,\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}$$

Result (type 7, 71 leaves):

$$-\text{RootSum}\left[8 a e^2-d^3 \#1+8 d e^2 \#1^3+8 e^3 \#1^4\,\&,\ \frac{\text{Log}[x-\#1]}{d^3-24 d e^2 \#1^2-32 e^3 \#1^3}\,\&\right]$$

Problem 44: Result is not expressed in closed-form.

$$\int \frac{1}{\left(8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4\right)^2}\,dx$$

Optimal (type 3, 342 leaves, 5 steps):

$$\frac{2 e \left(\frac{d}{4 e}+x\right) \left(13 d^4-256 a e^3-48 d^2 e^2 \left(\frac{d}{4 e}+x\right)^2\right)}{\left(5 d^8-64 a d^4 e^3-16384 a^2 e^6\right) \left(8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4\right)}-$$

$$\frac{24 e \left(d^4+128 a e^3-d^2 \sqrt{d^4-64 a e^3}\right) \text{ArcTanh}\left[\frac{d+4 e x}{\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}\right]}{\left(d^4-64 a e^3\right)^{3/2} \left(5 d^4+256 a e^3\right) \sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}+\frac{24 e \left(d^4+128 a e^3+d^2 \sqrt{d^4-64 a e^3}\right) \text{ArcTanh}\left[\frac{d+4 e x}{\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}\right]}{\left(d^4-64 a e^3\right)^{3/2} \left(5 d^4+256 a e^3\right) \sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}$$

Result (type 7, 234 leaves):

$$\frac{(d+4 e x) \left(5 d^4-128 a e^3-12 d^3 e x-24 d^2 e^2 x^2\right)}{\left(d^4-64 a e^3\right) \left(5 d^4+256 a e^3\right) \left(8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4\right)}+$$

$$\frac{48 e^2\,\text{RootSum}\left[8 a e^2-d^3 \#1+8 d e^2 \#1^3+8 e^3 \#1^4\,\&,\ \frac{32 a e^2 \text{Log}[x-\#1]+d^3 \text{Log}[x-\#1] \#1+2 d^2 e \text{Log}[x-\#1] \#1^2}{-d^3+24 d e^2 \#1^2+32 e^3 \#1^3}\,\&\right]}{-5 d^8+64 a d^4 e^3+16384 a^2 e^6}$$

Problem 49: Result is not expressed in closed-form.

$$\int \frac{1}{8+8 x-x^3+8 x^4}\,dx$$

Optimal (type 3, 268 leaves, 16 steps):

$$-\frac{\text{ArcTan}\left[\frac{3-\left(1+\frac{4}{x}\right)^2}{6\sqrt{7}}\right]}{12\sqrt{7}}-\frac{1}{12}\sqrt{\frac{109+67\sqrt{29}}{1218}}\,\text{ArcTan}\left[\frac{2-\sqrt{6\left(1+\sqrt{29}\right)}+\frac{8}{x}}{\sqrt{6\left(-1+\sqrt{29}\right)}}\right]-\frac{1}{12}\sqrt{\frac{109+67\sqrt{29}}{1218}}\,\text{ArcTan}\left[\frac{2+\sqrt{6\left(1+\sqrt{29}\right)}+\frac{8}{x}}{\sqrt{6\left(-1+\sqrt{29}\right)}}\right]-$$

$$\frac{1}{24}\sqrt{\frac{-109+67\sqrt{29}}{1218}}\,\text{Log}\left[3\sqrt{29}-\sqrt{6\left(1+\sqrt{29}\right)}\left(1+\frac{4}{x}\right)+\left(1+\frac{4}{x}\right)^2\right]+\frac{1}{24}\sqrt{\frac{-109+67\sqrt{29}}{1218}}\,\text{Log}\left[3\sqrt{29}+\sqrt{6\left(1+\sqrt{29}\right)}\left(1+\frac{4}{x}\right)+\left(1+\frac{4}{x}\right)^2\right]$$

Result (type 7, 45 leaves):

$$\text{RootSum}\left[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\ \frac{\text{Log}[x-\#1]}{8-3\,\#1^2+32\,\#1^3}\,\&\right]$$

Problem 50: Result is not expressed in closed-form.

$$\int\frac{1}{\left(8+8x-x^3+8x^4\right)^2}\,dx$$

Optimal (type 3, 357 leaves, 18 steps):

$$-\frac{207+29\left(1+\frac{4}{x}\right)^2}{336\left(261-6\left(1+\frac{4}{x}\right)^2+\left(1+\frac{4}{x}\right)^4\right)}+\frac{5\left(5157+199\left(1+\frac{4}{x}\right)^2\right)\left(1+\frac{4}{x}\right)}{87696\left(261-6\left(1+\frac{4}{x}\right)^2+\left(1+\frac{4}{x}\right)^4\right)}-\frac{17\,\text{ArcTan}\left[\frac{3-\left(1+\frac{4}{x}\right)^2}{6\sqrt{7}}\right]}{1008\sqrt{7}}-\frac{\sqrt{\frac{180983329+45923327\sqrt{29}}{1218}}\,\text{ArcTan}\left[\frac{2-\sqrt{6\left(1+\sqrt{29}\right)}+\frac{8}{x}}{\sqrt{6\left(-1+\sqrt{29}\right)}}\right]}{87696}-$$

$$\frac{\sqrt{\frac{180983329+45923327\sqrt{29}}{1218}}\,\text{ArcTan}\left[\frac{2+\sqrt{6\left(1+\sqrt{29}\right)}+\frac{8}{x}}{\sqrt{6\left(-1+\sqrt{29}\right)}}\right]}{87696}-\frac{\sqrt{\frac{-180983329+45923327\sqrt{29}}{1218}}\,\text{Log}\left[3\sqrt{29}-\sqrt{6\left(1+\sqrt{29}\right)}\left(1+\frac{4}{x}\right)+\left(1+\frac{4}{x}\right)^2\right]}{175392}+$$

$$\frac{\sqrt{\frac{-180983329+45923327\sqrt{29}}{1218}}\,\text{Log}\left[3\sqrt{29}+\sqrt{6\left(1+\sqrt{29}\right)}\left(1+\frac{4}{x}\right)+\left(1+\frac{4}{x}\right)^2\right]}{175392}$$

Result (type 7, 113 leaves):

$$\frac{544+1539x-1146x^2+784x^3}{43848\left(8+8x-x^3+8x^4\right)}+\frac{\text{RootSum}\left[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\ \frac{2243\,\text{Log}[x-\#1]-1097\,\text{Log}[x-\#1]\,\#1+392\,\text{Log}[x-\#1]\,\#1^2}{8-3\,\#1^2+32\,\#1^3}\,\&\right]}{21924}$$

Problem 55: Result is not expressed in closed-form.

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

Optimal (type 3, 234 leaves, 15 steps):

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

Result (type 7, 47 leaves):

$$\frac{1}{4}\text{RootSum}\left[1+4\,\#1+4\,\#1^2+4\,\#1^4\,\&,\ \frac{\text{Log}[x-\#1]}{1+2\,\#1+4\,\#1^3}\,\&\right]$$

Problem 56: Result is not expressed in closed-form.

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

Optimal (type 3, 317 leaves, 17 steps):

$$-\frac{17-\left(1+\frac{1}{x}\right)^2}{2\left(5-2\left(1+\frac{1}{x}\right)^2+\left(1+\frac{1}{x}\right)^4\right)}+\frac{\left(59-17\left(1+\frac{1}{x}\right)^2\right)\left(1+\frac{1}{x}\right)}{10\left(5-2\left(1+\frac{1}{x}\right)^2+\left(1+\frac{1}{x}\right)^4\right)}+\frac{7}{4}\text{ArcTan}\left[\frac{1}{2}\left(-1+\left(1+\frac{1}{x}\right)^2\right)\right]-$$

$$\frac{1}{20}\sqrt{\frac{1}{10}\left(5959+2665\sqrt{5}\right)}\,\text{ArcTan}\left[\frac{2-\sqrt{2\left(1+\sqrt{5}\right)}+\frac{2}{x}}{\sqrt{2\left(-1+\sqrt{5}\right)}}\right]-\frac{1}{20}\sqrt{\frac{1}{10}\left(5959+2665\sqrt{5}\right)}\,\text{ArcTan}\left[\frac{2+\sqrt{2\left(1+\sqrt{5}\right)}+\frac{2}{x}}{\sqrt{2\left(-1+\sqrt{5}\right)}}\right]+$$

$$\frac{1}{40}\sqrt{\frac{1}{10}\left(-5959+2665\sqrt{5}\right)}\,\text{Log}\left[\sqrt{5}-\sqrt{2\left(1+\sqrt{5}\right)}\left(1+\frac{1}{x}\right)+\left(1+\frac{1}{x}\right)^2\right]-$$

$$\frac{1}{40}\sqrt{\frac{1}{10}\left(-5959+2665\sqrt{5}\right)}\,\text{Log}\left[\sqrt{5}+\sqrt{2\left(1+\sqrt{5}\right)}\left(1+\frac{1}{x}\right)+\left(1+\frac{1}{x}\right)^2\right]$$

Result (type 7, 108 leaves):

$$\frac{1}{40}\left(\frac{38+84x-32x^2+72x^3}{1+4x+4x^2+4x^4}+\text{RootSum}\left[1+4\#1+4\#1^2+4\#1^4\,\&,\ \frac{27\,\text{Log}[x-\#1]-16\,\text{Log}[x-\#1]\,\#1+18\,\text{Log}[x-\#1]\,\#1^2}{1+2\#1+4\#1^3}\,\&\right]\right)$$

Problem 61: Result is not expressed in closed-form.

$$\int\frac{1}{8+24x+8x^2-15x^3+8x^4}\,dx$$

Optimal (type 3, 263 leaves, 16 steps):

$$-\frac{1}{4}\sqrt{\frac{5167+235\sqrt{517}}{40326}}\,\text{ArcTan}\left[\frac{6-\sqrt{2\left(19+\sqrt{517}\right)}+\frac{8}{x}}{\sqrt{2\left(-19+\sqrt{517}\right)}}\right]-\frac{1}{4}\sqrt{\frac{5167+235\sqrt{517}}{40326}}\,\text{ArcTan}\left[\frac{6+\sqrt{2\left(19+\sqrt{517}\right)}+\frac{8}{x}}{\sqrt{2\left(-19+\sqrt{517}\right)}}\right]+$$

$$\frac{1}{4}\sqrt{\frac{3}{13}}\,\text{ArcTan}\left[\frac{8+12x-5x^2}{\sqrt{39}\,x^2}\right]-\frac{1}{8}\sqrt{\frac{-5167+235\sqrt{517}}{40326}}\,\text{Log}\left[\sqrt{517}-\sqrt{2\left(19+\sqrt{517}\right)}\left(3+\frac{4}{x}\right)+\left(3+\frac{4}{x}\right)^2\right]+$$

$$\frac{1}{8}\sqrt{\frac{-5167+235\sqrt{517}}{40326}}\,\text{Log}\left[\sqrt{517}+\sqrt{2\left(19+\sqrt{517}\right)}\left(3+\frac{4}{x}\right)+\left(3+\frac{4}{x}\right)^2\right]$$

Result (type 7, 55 leaves):

$$\text{RootSum}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\ \frac{\text{Log}[x-\#1]}{24+16\,\#1-45\,\#1^2+32\,\#1^3}\,\&\right]$$

Problem 62: Result is not expressed in closed-form.

$$\int \frac{1}{\left(8+24\,x+8\,x^2-15\,x^3+8\,x^4\right)^2}\,dx$$

Optimal (type 3, 366 leaves, 18 steps):

$$-\frac{3\left(3359-107\left(3+\frac{4}{x}\right)^2\right)}{208\left(517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4\right)}+\frac{\left(3327931-129631\left(3+\frac{4}{x}\right)^2\right)\left(3+\frac{4}{x}\right)}{322608\left(517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4\right)}-$$

$$\frac{\sqrt{\frac{19+\sqrt{517}}{40326}}\left(1678181+74897\sqrt{517}\right)\text{ArcTan}\left[\frac{6-\sqrt{2\left(19+\sqrt{517}\right)}+\frac{8}{x}}{\sqrt{2\left(-19+\sqrt{517}\right)}}\right]}{645216}-\frac{\sqrt{\frac{19+\sqrt{517}}{40326}}\left(1678181+74897\sqrt{517}\right)\text{ArcTan}\left[\frac{6+\sqrt{2\left(19+\sqrt{517}\right)}+\frac{8}{x}}{\sqrt{2\left(-19+\sqrt{517}\right)}}\right]}{645216}+$$

$$\frac{73}{208}\sqrt{\frac{3}{13}}\,\text{ArcTan}\left[\frac{8+12\,x-5\,x^2}{\sqrt{39}\,x^2}\right]-\frac{\sqrt{\frac{-59644114671451+2623170438295\sqrt{517}}{40326}}\,\text{Log}\left[\sqrt{517}-\sqrt{2\left(19+\sqrt{517}\right)}\left(3+\frac{4}{x}\right)+\left(3+\frac{4}{x}\right)^2\right]}{645216}+$$

$$\frac{\sqrt{\frac{-59644114671451+2623170438295\sqrt{517}}{40326}}\,\text{Log}\left[\sqrt{517}+\sqrt{2\left(19+\sqrt{517}\right)}\left(3+\frac{4}{x}\right)+\left(3+\frac{4}{x}\right)^2\right]}{645216}$$

Result (type 7, 128 leaves):

$$\frac{72888+89033\,x-94314\,x^2+39280\,x^3}{161304\left(8+24\,x+8\,x^2-15\,x^3+8\,x^4\right)}+\frac{\text{RootSum}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\ \frac{74897\,\text{Log}[x-\#1]-57489\,\text{Log}[x-\#1]\,\#1+19640\,\text{Log}[x-\#1]\,\#1^2}{24+16\,\#1-45\,\#1^2+32\,\#1^3}\,\&\right]}{80652}$$

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

$$\int \left(a^5+5\,a^4\,b\,x+10\,a^3\,b^2\,x^2+10\,a^2\,b^3\,x^3+5\,a\,b^4\,x^4+b^5\,x^5\right)dx$$

Optimal (type 1, 14 leaves, 1 step):

$$\frac{(a+b\,x)^6}{6\,b}$$

Result (type 1, 61 leaves) :

$$a^5 x + \frac{5}{2} a^4 b x^2 + \frac{10}{3} a^3 b^2 x^3 + \frac{5}{2} a^2 b^3 x^4 + a b^4 x^5 + \frac{b^5 x^6}{6}$$

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

$$\int \frac{1}{1 - (c + d x)^2} \, dx$$

Optimal (type 3, 10 leaves, 2 steps) :

$$\frac{\text{ArcTanh}[c + d x]}{d}$$

Result (type 3, 32 leaves) :

$$-\frac{\text{Log}[1 - c - d x]}{2 d} + \frac{\text{Log}[1 + c + d x]}{2 d}$$

Problem 95: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 4 leaves, 2 steps) :

$$\text{ArcTanh}[1 + x]$$

Result (type 3, 15 leaves) :

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

Problem 103: Result is not expressed in closed-form.

$$\int \frac{x^3}{a + b (c + d x)^3} \, dx$$

Optimal (type 3, 234 leaves, 11 steps) :

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

Result (type 7, 132 leaves):

$$-\frac{1}{3\,b^2\,d^4}\left(-3\,b\,d\,x+\text{RootSum}\left[a+b\,c^3+3\,b\,c^2\,d\,\#1+3\,b\,c\,d^2\,\#1^2+b\,d^3\,\#1^3\,\&,\;\frac{a\,\text{Log}[x-\#1]+b\,c^3\,\text{Log}[x-\#1]+3\,b\,c^2\,d\,\text{Log}[x-\#1]\,\#1+3\,b\,c\,d^2\,\text{Log}[x-\#1]\,\#1^2}{c^2+2\,c\,d\,\#1+d^2\,\#1^2}\,\&\right]\right)$$

Problem 104: Result is not expressed in closed-form.

$$\int\frac{x^2}{a+b\,(c+d\,x)^3}\,dx$$

Optimal (type 3, 210 leaves, 9 steps):

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

Result (type 7, 81 leaves):

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

Problem 105: Result is not expressed in closed-form.

$$\int\frac{x}{a+b\,(c+d\,x)^3}\,dx$$

Optimal (type 3, 180 leaves, 7 steps):

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

Result (type 7, 79 leaves):

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

Problem 107: Result is not expressed in closed-form.

$$\int \frac{1}{x \left(a+b (c+d x)^3\right)} \, dx$$

Optimal (type 3, 224 leaves, 11 steps):

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

Result (type 7, 119 leaves):

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

Problem 108: Result is not expressed in closed-form.

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

Optimal (type 3, 314 leaves, 11 steps):

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

Result (type 7, 173 leaves):

$$\frac{1}{3 \left(a+b c^3\right)^2 x}\left(-3 \left(a+b c^3+3 b c^2 d x \,\text{Log}[x]\right)+d x \,\text{RootSum}\left[a+b c^3+3 b c^2 d \#1+3 b c d^2 \#1^2+b d^3 \#1^3 \&,\right.\right.$$
$$\left.\left.\frac{1}{c^2+2 c d \#1+d^2 \#1^2}\left(-3 a c \,\text{Log}[x-\#1]+6 b c^4 \text{Log}[x-\#1]-a d \,\text{Log}[x-\#1] \#1+8 b c^3 d \,\text{Log}[x-\#1] \#1+3 b c^2 d^2 \text{Log}[x-\#1] \#1^2\right) \&\right]\right)$$

Problem 109: Result is not expressed in closed-form.

$$\int \frac{1}{x^3 \left(a+b (c+d x)^3\right)} \, dx$$

Optimal (type 3, 393 leaves, 11 steps):

$$-\frac{1}{2 \left(a+b c^3\right) x^2}+\frac{3 b c^2 d}{\left(a+b c^3\right)^2 x}+\frac{b^{2/3} \left(a^{1/3}+b^{1/3} c\right)^3 \left(a-3 a^{2/3} b^{1/3} c+b c^3\right) d^2 \text{ArcTan}\left[\frac{a^{1/3}-2 b^{1/3} (c+d x)}{\sqrt{3} a^{1/3}}\right]}{\sqrt{3} a^{2/3} \left(a+b c^3\right)^3}-\frac{3 b c \left(a-2 b c^3\right) d^2 \text{Log}[x]}{\left(a+b c^3\right)^3}-\frac{b^{2/3} \left(a^2+6 a^{4/3} b^{2/3} c^2-7 a b c^3-3 a^{1/3} b^{5/3} c^5+b^2 c^6\right) d^2 \text{Log}\left[a^{1/3}+b^{1/3} (c+d x)\right]}{3 a^{2/3} \left(a+b c^3\right)^3}+\frac{b^{2/3} \left(a^2+6 a^{4/3} b^{2/3} c^2-7 a b c^3-3 a^{1/3} b^{5/3} c^5+b^2 c^6\right) d^2 \text{Log}\left[a^{2/3}-a^{1/3} b^{1/3} (c+d x)+b^{2/3} (c+d x)^2\right]}{6 a^{2/3} \left(a+b c^3\right)^3}+\frac{b c \left(a-2 b c^3\right) d^2 \text{Log}\left[a+b (c+d x)^3\right]}{\left(a+b c^3\right)^3}$$

Result (type 7, 244 leaves):

$$-\frac{1}{6 \left(a+b c^3\right)^3 x^2}\left(3 \left(a+b c^3\right) \left(a+b c^2 (c-6 d x)\right)+18 b c \left(a-2 b c^3\right) d^2 x^2 \text{Log}[x]+2 d^2 x^2 \text{RootSum}\left[a+b c^3+3 b c^2 d \#1+3 b c d^2 \#1^2+b d^3 \#1^3\&,\frac{1}{c^2+2 c d \#1+d^2 \#1^2}\left(a^2 \text{Log}[x-\#1]-16 a b c^3 \text{Log}[x-\#1]+10 b^2 c^6 \text{Log}[x-\#1]-12 a b c^2 d \text{Log}[x-\#1] \#1+15 b^2 c^5 d \text{Log}[x-\#1] \#1-3 a b c d^2 \text{Log}[x-\#1] \#1^2+6 b^2 c^4 d^2 \text{Log}[x-\#1] \#1^2\right)\&\right]\right)$$

Problem 110: Result is not expressed in closed-form.

$$\int \frac{x^3}{a+b (c+d x)^4} \, dx$$

Optimal (type 3, 356 leaves, 16 steps):

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

Result (type 7, 106 leaves):

$$\frac{\text{RootSum}\left[a+b\,c^4+4\,b\,c^3\,d\,\#1+6\,b\,c^2\,d^2\,\#1^2+4\,b\,c\,d^3\,\#1^3+b\,d^4\,\#1^4\,\&,\ \frac{\text{Log}[x-\#1]\,\#1^3}{c^3+3\,c^2\,d\,\#1+3\,c\,d^2\,\#1^2+d^3\,\#1^3}\,\&\right]}{4\,b\,d}$$

Problem 111: Result is not expressed in closed-form.

$$\int \frac{x^2}{a+b\,(c+d\,x)^4}\,dx$$

Optimal (type 3, 318 leaves, 14 steps):

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

Result (type 7, 106 leaves):

$$\frac{\text{RootSum}\left[a+b\,c^4+4\,b\,c^3\,d\,\#1+6\,b\,c^2\,d^2\,\#1^2+4\,b\,c\,d^3\,\#1^3+b\,d^4\,\#1^4\,\&,\ \frac{\text{Log}[x-\#1]\,\#1^2}{c^3+3\,c^2\,d\,\#1+3\,c\,d^2\,\#1^2+d^3\,\#1^3}\,\&\right]}{4\,b\,d}$$

Problem 112: Result is not expressed in closed-form.

$$\int \frac{x}{a+b\,(c+d\,x)^4}\,dx$$

Optimal (type 3, 261 leaves, 14 steps):

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

Result (type 7, 104 leaves):

$$\frac{\text{RootSum}\left[a+b\,c^4+4\,b\,c^3\,d\,\#1+6\,b\,c^2\,d^2\,\#1^2+4\,b\,c\,d^3\,\#1^3+b\,d^4\,\#1^4\,\&,\ \frac{\text{Log}[x-\#1]\,\#1}{c^3+3\,c^2\,d\,\#1+3\,c\,d^2\,\#1^2+d^3\,\#1^3}\,\&\right]}{4\,b\,d}$$

Problem 114: Result is not expressed in closed-form.

$$\int \frac{1}{x \left(a+b (c+d x)^4\right)} \, dx$$

Optimal (type 3, 393 leaves, 18 steps):

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

Result (type 7, 163 leaves):

$$-\frac{1}{4 \left(a+b c^4\right)}\left(-4 \,\text{Log}[x]+\text{RootSum}\left[a+b c^4+4 b c^3 d \,\#1+6 b c^2 d^2 \,\#1^2+4 b c d^3 \,\#1^3+b d^4 \,\#1^4 \,\&,\ \frac{4 c^3 \,\text{Log}[x-\#1]+6 c^2 d \,\text{Log}[x-\#1]\, \#1+4 c d^2 \,\text{Log}[x-\#1]\, \#1^2+d^3 \,\text{Log}[x-\#1]\, \#1^3}{c^3+3 c^2 d \,\#1+3 c d^2 \,\#1^2+d^3 \,\#1^3}\,\&\right]\right)$$

Problem 115: Result is not expressed in closed-form.

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

Optimal (type 3, 496 leaves, 18 steps):

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

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

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

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

Result (type 7, 238 leaves):

$$\frac{1}{4\left(a+b c^4\right)^2 x}\left(-4\left(a+b c^4+4 b c^3 d x \operatorname{Log}[x]\right)+\right.$$
$$d x \operatorname{RootSum}\left[a+b c^4+4 b c^3 d \#1+6 b c^2 d^2 \#1^2+4 b c d^3 \#1^3+b d^4 \#1^4 \&,\left(-6 a c^2 \operatorname{Log}[x-\#1]+10 b c^6 \operatorname{Log}[x-\#1]-4 a c d \operatorname{Log}[x-\#1] \#1+\right.\right.$$
$$\left.\left.20 b c^5 d \operatorname{Log}[x-\#1] \#1-a d^2 \operatorname{Log}[x-\#1] \#1^2+15 b c^4 d^2 \operatorname{Log}[x-\#1] \#1^2+4 b c^3 d^3 \operatorname{Log}[x-\#1] \#1^3\right) \Big/\left(c^3+3 c^2 d \#1+3 c d^2 \#1^2+d^3 \#1^3\right) \&\right]\Big)$$

Problem 120: Result is not expressed in closed-form.

$$\int \frac{1}{a+8 x-8 x^2+4 x^3-x^4}\, dx$$

Optimal (type 3, 89 leaves, 4 steps):

$$-\frac{\operatorname{ArcTan}\left[\frac{-1+x}{\sqrt{1-\sqrt{4+a}}}\right]}{2 \sqrt{4+a}\, \sqrt{1-\sqrt{4+a}}}+\frac{\operatorname{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right]}{2 \sqrt{4+a}\, \sqrt{1+\sqrt{4+a}}}$$

Result (type 7, 57 leaves):

$$-\frac{1}{4} \operatorname{RootSum}\left[a+8 \#1-8 \#1^2+4 \#1^3-\#1^4 \&,\frac{\operatorname{Log}[x-\#1]}{-2+4 \#1-3 \#1^2+\#1^3} \&\right]$$

Problem 121: Result is not expressed in closed-form.

$$\int \frac{1}{\left(a+8 x-8 x^2+4 x^3-x^4\right)^2}\, dx$$

Optimal (type 3, 169 leaves, 5 steps):

$$\frac{\left(5+a+(-1+x)^2\right)(-1+x)}{4\left(12+7a+a^2\right)\left(3+a-2(-1+x)^2-(-1+x)^4\right)}-\frac{\left(10+3a+\sqrt{4+a}\right)\text{ArcTan}\left[\frac{-1+x}{\sqrt{1-\sqrt{4+a}}}\right]}{8(3+a)(4+a)^{3/2}\sqrt{1-\sqrt{4+a}}}+\frac{\left(10+3a-\sqrt{4+a}\right)\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right]}{8(3+a)(4+a)^{3/2}\sqrt{1+\sqrt{4+a}}}$$

Result (type 7, 150 leaves):

$$\frac{(-1+x)\left(6+a-2x+x^2\right)}{4(3+a)(4+a)\left(a-x\left(-8+8x-4x^2+x^3\right)\right)}-\frac{\text{RootSum}\left[a+8\,\#1-8\,\#1^2+4\,\#1^3-\#1^4\,\&,\ \frac{12\,\text{Log}[x-\#1]+3a\,\text{Log}[x-\#1]-2\,\text{Log}[x-\#1]\,\#1+\text{Log}[x-\#1]\,\#1^2}{-2+4\,\#1-3\,\#1^2+\#1^3}\,\&\right]}{16\left(12+7a+a^2\right)}$$

Problem 122: Result is not expressed in closed-form.

$$\int\frac{1}{\left(a+8x-8x^2+4x^3-x^4\right)^3}\,dx$$

Optimal (type 3, 252 leaves, 6 steps):

$$\frac{\left(5+a+(-1+x)^2\right)(-1+x)}{8\left(12+7a+a^2\right)\left(3+a-2(-1+x)^2-(-1+x)^4\right)^2}+\frac{\left((6+a)(25+7a)+6(7+2a)(-1+x)^2\right)(-1+x)}{32(3+a)^2(4+a)^2\left(3+a-2(-1+x)^2-(-1+x)^4\right)}-$$

$$\frac{3\left(80+7a^2+14\sqrt{4+a}+a\left(47+4\sqrt{4+a}\right)\right)\text{ArcTan}\left[\frac{-1+x}{\sqrt{1-\sqrt{4+a}}}\right]}{64(3+a)^2(4+a)^{5/2}\sqrt{1-\sqrt{4+a}}}-\frac{3\left(14+4a-\frac{80+47a+7a^2}{\sqrt{4+a}}\right)\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right]}{64(3+a)^2(4+a)^2\sqrt{1+\sqrt{4+a}}}$$

Result (type 7, 254 leaves):

$$\frac{1}{128}\left(\frac{16(-1+x)\left(6+a-2x+x^2\right)}{(3+a)(4+a)\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^2}+\frac{4(-1+x)\left(7a^2+6\left(32-14x+7x^2\right)+a\left(79-24x+12x^2\right)\right)}{(3+a)^2(4+a)^2\left(a-x\left(-8+8x-4x^2+x^3\right)\right)}-\right.$$

$$\frac{1}{\left(12+7a+a^2\right)^2}3\,\text{RootSum}\left[a+8\,\#1-8\,\#1^2+4\,\#1^3-\#1^4\,\&,\ \frac{1}{-2+4\,\#1-3\,\#1^2+\#1^3}\right.$$

$$\left.\left.\left(108\,\text{Log}[x-\#1]+55a\,\text{Log}[x-\#1]+7a^2\,\text{Log}[x-\#1]-28\,\text{Log}[x-\#1]\,\#1-8a\,\text{Log}[x-\#1]\,\#1+14\,\text{Log}[x-\#1]\,\#1^2+4a\,\text{Log}[x-\#1]\,\#1^2\right)\&\right]\right)$$

Problem 127: Result is not expressed in closed-form.

$$\int\frac{x}{a+8x-8x^2+4x^3-x^4}\,dx$$

Optimal (type 3, 116 leaves, 8 steps):

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

Result (type 7, 59 leaves):

$$-\frac{1}{4}\text{RootSum}\left[a+8\,\#1-8\,\#1^2+4\,\#1^3-\#1^4\,\&,\ \frac{\text{Log}[x-\#1]\,\#1}{-2+4\,\#1-3\,\#1^2+\#1^3}\,\&\right]$$

Problem 128: Result is not expressed in closed-form.

$$\int\frac{x}{\left(a+8x-8x^2+4x^3-x^4\right)^2}\,dx$$

Optimal (type 3, 231 leaves, 10 steps):

$$\frac{1+(-1+x)^2}{4(4+a)\left(3+a-2(-1+x)^2-(-1+x)^4\right)}+\frac{\left(5+a+(-1+x)^2\right)(-1+x)}{4\left(12+7a+a^2\right)\left(3+a-2(-1+x)^2-(-1+x)^4\right)}-$$
$$\frac{\left(10+3a+\sqrt{4+a}\right)\text{ArcTan}\left[\frac{-1+x}{\sqrt{1-\sqrt{4+a}}}\right]}{8(3+a)(4+a)^{3/2}\sqrt{1-\sqrt{4+a}}}+\frac{\left(10+3a-\sqrt{4+a}\right)\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right]}{8(3+a)(4+a)^{3/2}\sqrt{1+\sqrt{4+a}}}+\frac{\text{ArcTanh}\left[\frac{1+(-1+x)^2}{\sqrt{4+a}}\right]}{4(4+a)^{3/2}}$$

Result (type 7, 166 leaves):

$$\frac{a+2x-ax+ax^2+x^3}{4(3+a)(4+a)\left(a-x\left(-8+8x-4x^2+x^3\right)\right)}-\frac{\text{RootSum}\left[a+8\,\#1-8\,\#1^2+4\,\#1^3-\#1^4\,\&,\ \frac{6\,\text{Log}[x-\#1]+a\,\text{Log}[x-\#1]+4\,\text{Log}[x-\#1]\,\#1+2\,a\,\text{Log}[x-\#1]\,\#1+\text{Log}[x-\#1]\,\#1^2}{-2+4\,\#1-3\,\#1^2+\#1^3}\,\&\right]}{16\left(12+7a+a^2\right)}$$

Problem 129: Result is not expressed in closed-form.

$$\int\frac{x}{\left(a+8x-8x^2+4x^3-x^4\right)^3}\,dx$$

Optimal (type 3, 349 leaves, 12 steps):

$$\frac{1+(-1+x)^2}{8(4+a)\left(3+a-2(-1+x)^2-(-1+x)^4\right)^2}+\frac{3\left(1+(-1+x)^2\right)}{16(4+a)^2\left(3+a-2(-1+x)^2-(-1+x)^4\right)}+$$
$$\frac{\left(5+a+(-1+x)^2\right)(-1+x)}{8\left(12+7a+a^2\right)\left(3+a-2(-1+x)^2-(-1+x)^4\right)^2}+\frac{\left((6+a)(25+7a)+6(7+2a)(-1+x)^2\right)(-1+x)}{32(3+a)^2(4+a)^2\left(3+a-2(-1+x)^2-(-1+x)^4\right)}-$$
$$\frac{3\left(80+7a^2+14\sqrt{4+a}+a\left(47+4\sqrt{4+a}\right)\right)\text{ArcTan}\left[\frac{-1+x}{\sqrt{1-\sqrt{4+a}}}\right]}{64(3+a)^2(4+a)^{5/2}\sqrt{1-\sqrt{4+a}}}-\frac{3\left(14+4a-\frac{80+47a+7a^2}{\sqrt{4+a}}\right)\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right]}{64(3+a)^2(4+a)^2\sqrt{1+\sqrt{4+a}}}+\frac{3\,\text{ArcTanh}\left[\frac{1+(-1+x)^2}{\sqrt{4+a}}\right]}{16(4+a)^{5/2}}$$

Result (type 7, 284 leaves):

$$\frac{1}{128}\left(\frac{16\left(a+2x-ax+ax^2+x^3\right)}{(3+a)(4+a)\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^2}+\frac{4\left(a^2\left(5-5x+6x^2\right)+6\left(-14+28x-12x^2+7x^3\right)+a\left(-7+31x+12x^3\right)\right)}{(3+a)^2(4+a)^2\left(a-x\left(-8+8x-4x^2+x^3\right)\right)}-\right.$$
$$\frac{1}{\left(12+7a+a^2\right)^2}3\,\text{RootSum}\left[a+8\,\sharp1-8\,\sharp1^2+4\,\sharp1^3-\sharp1^4\,\&,\ \frac{1}{-2+4\,\sharp1-3\,\sharp1^2+\sharp1^3}\left(72\,\text{Log}[x-\sharp1]+31\,a\,\text{Log}[x-\sharp1]+\right.\right.$$
$$\left.\left.\left.3a^2\,\text{Log}[x-\sharp1]+8\,\text{Log}[x-\sharp1]\,\sharp1+16\,a\,\text{Log}[x-\sharp1]\,\sharp1+4a^2\,\text{Log}[x-\sharp1]\,\sharp1+14\,\text{Log}[x-\sharp1]\,\sharp1^2+4\,a\,\text{Log}[x-\sharp1]\,\sharp1^2\right)\,\&\right]\right)$$

Problem 134: Result is not expressed in closed-form.

$$\int\frac{x^2}{a+8x-8x^2+4x^3-x^4}\,dx$$

Optimal (type 3, 99 leaves, 9 steps):

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

Result (type 7, 61 leaves):

$$-\frac{1}{4}\text{RootSum}\left[a+8\,\sharp1-8\,\sharp1^2+4\,\sharp1^3-\sharp1^4\,\&,\ \frac{\text{Log}[x-\sharp1]\,\sharp1^2}{-2+4\,\sharp1-3\,\sharp1^2+\sharp1^3}\,\&\right]$$

Problem 135: Result is not expressed in closed-form.

$$\int\frac{x^2}{\left(a+8x-8x^2+4x^3-x^4\right)^2}\,dx$$

Optimal (type 3, 225 leaves, 11 steps):

$$\frac{1+(-1+x)^2}{2\,(4+a)\,\left(3+a-2\,(-1+x)^2-(-1+x)^4\right)}+\frac{(4+a)\,\left(2+(-1+x)^2\right)\,(-1+x)}{4\,\left(12+7\,a+a^2\right)\,\left(3+a-2\,(-1+x)^2-(-1+x)^4\right)}-\frac{\left(4+a+\sqrt{4+a}\right)\,\text{ArcTan}\left[\frac{-1+x}{\sqrt{1-\sqrt{4+a}}}\right]}{8\,(3+a)\,(4+a)\,\sqrt{1-\sqrt{4+a}}}-\frac{\left(4+a-\sqrt{4+a}\right)\,\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right]}{8\,(3+a)\,(4+a)\,\sqrt{1+\sqrt{4+a}}}+\frac{\text{ArcTanh}\left[\frac{1+(-1+x)^2}{\sqrt{4+a}}\right]}{2\,(4+a)^{3/2}}$$

Result (type 7, 182 leaves):

$$\frac{2\,x\,\left(4-3\,x+2\,x^2\right)+a\,\left(1+x-x^2+x^3\right)}{4\,(3+a)\,(4+a)\,\left(a-x\,\left(-8+8\,x-4\,x^2+x^3\right)\right)}-\frac{\text{RootSum}\left[a+8\,\#1-8\,\#1^2+4\,\#1^3-\#1^4\,\&,\,\frac{-a\,\text{Log}[x-\#1]+4\,\text{Log}[x-\#1]\,\#1+2\,a\,\text{Log}[x-\#1]\,\#1+4\,\text{Log}[x-\#1]\,\#1^2+a\,\text{Log}[x-\#1]\,\#1^2}{-2+4\,\#1-3\,\#1^2+\#1^3}\,\&\right]}{16\,\left(12+7\,a+a^2\right)}$$

Problem 136: Result is not expressed in closed-form.

$$\int\frac{x^4}{27\,a^3+27\,a^2\,b\,x^2+27\,a^2\,c\,x^3+9\,a\,b^2\,x^4+b^3\,x^6}\,dx$$

Optimal (type 3, 545 leaves, 14 steps):

$$-\frac{(-1)^{1/3}\,\left(2\,(-1)^{1/3}\,b+3\,a^{1/3}\,c^{2/3}\right)\,\text{ArcTan}\left[\frac{3\,(-1)^{1/3}\,a^{2/3}\,c^{1/3}-2\,b\,x}{\sqrt{3}\,\sqrt{a}\,\sqrt{4\,b-3\,(-1)^{2/3}\,a^{1/3}\,c^{2/3}}}\right]}{3\,\sqrt{3}\,\left(1+(-1)^{1/3}\right)^2\,a^{5/6}\,b^2\,\sqrt{4\,b-3\,(-1)^{2/3}\,a^{1/3}\,c^{2/3}}\,c^{2/3}}-\frac{\left(2\,b-3\,a^{1/3}\,c^{2/3}\right)\,\text{ArcTan}\left[\frac{3\,a^{2/3}\,c^{1/3}+2\,b\,x}{\sqrt{3}\,\sqrt{a}\,\sqrt{4\,b-3\,a^{1/3}\,c^{2/3}}}\right]}{9\,\sqrt{3}\,a^{5/6}\,b^2\,\sqrt{4\,b-3\,a^{1/3}\,c^{2/3}}\,c^{2/3}}-\frac{(-1)^{2/3}\,\left(2\,b+3\,(-1)^{1/3}\,a^{1/3}\,c^{2/3}\right)\,\text{ArcTan}\left[\frac{3\,(-1)^{2/3}\,a^{2/3}\,c^{1/3}+2\,b\,x}{\sqrt{3}\,\sqrt{a}\,\sqrt{4\,b+3\,(-1)^{1/3}\,a^{1/3}\,c^{2/3}}}\right]}{3\,\sqrt{3}\,\left(1-(-1)^{1/3}\right)\,\left(1+(-1)^{1/3}\right)^2\,a^{5/6}\,b^2\,\sqrt{4\,b+3\,(-1)^{1/3}\,a^{1/3}\,c^{2/3}}\,c^{2/3}}-\frac{\text{Log}\left[3\,a+3\,a^{2/3}\,c^{1/3}\,x+b\,x^2\right]}{18\,a^{2/3}\,b^2\,c^{1/3}}+\frac{\text{Log}\left[3\,a-3\,(-1)^{1/3}\,a^{2/3}\,c^{1/3}\,x+b\,x^2\right]}{6\,\left(1+(-1)^{1/3}\right)^2\,a^{2/3}\,b^2\,c^{1/3}}+\frac{(-1)^{1/3}\,\text{Log}\left[3\,a+3\,(-1)^{2/3}\,a^{2/3}\,c^{1/3}\,x+b\,x^2\right]}{18\,a^{2/3}\,b^2\,c^{1/3}}$$

Result (type 7, 99 leaves):

$$\frac{1}{3}\,\text{RootSum}\left[27\,a^3+27\,a^2\,b\,\#1^2+27\,a^2\,c\,\#1^3+9\,a\,b^2\,\#1^4+b^3\,\#1^6\,\&,\,\frac{\text{Log}[x-\#1]\,\#1^3}{18\,a^2\,b+27\,a^2\,c\,\#1+12\,a\,b^2\,\#1^2+2\,b^3\,\#1^4}\,\&\right]$$

Problem 137: Result is not expressed in closed-form.

$$\int\frac{x^3}{27\,a^3+27\,a^2\,b\,x^2+27\,a^2\,c\,x^3+9\,a\,b^2\,x^4+b^3\,x^6}\,dx$$

Optimal (type 3, 487 leaves, 14 steps):

$$-\frac{\text{ArcTan}\left[\frac{3\,(-1)^{1/3}\,a^{2/3}\,c^{1/3}-2\,b\,x}{\sqrt{3}\,\sqrt{a}\,\sqrt{4\,b-3\,(-1)^{2/3}\,a^{1/3}\,c^{2/3}}}\right]}{3\,\sqrt{3}\,\left(1+(-1)^{1/3}\right)^2\,a^{7/6}\,b\,\sqrt{4\,b-3\,(-1)^{2/3}\,a^{1/3}\,c^{2/3}}\,c^{1/3}}-\frac{\text{ArcTan}\left[\frac{3\,a^{2/3}\,c^{1/3}+2\,b\,x}{\sqrt{3}\,\sqrt{a}\,\sqrt{4\,b-3\,a^{1/3}\,c^{2/3}}}\right]}{9\,\sqrt{3}\,a^{7/6}\,b\,\sqrt{4\,b-3\,a^{1/3}\,c^{2/3}}\,c^{1/3}}+$$

$$\frac{(-1)^{1/3}\,\text{ArcTan}\left[\frac{3\,(-1)^{2/3}\,a^{2/3}\,c^{1/3}+2\,b\,x}{\sqrt{3}\,\sqrt{a}\,\sqrt{4\,b+3\,(-1)^{1/3}\,a^{1/3}\,c^{2/3}}}\right]}{3\,\sqrt{3}\,\left(1-(-1)^{1/3}\right)\,\left(1+(-1)^{1/3}\right)^2\,a^{7/6}\,b\,\sqrt{4\,b+3\,(-1)^{1/3}\,a^{1/3}\,c^{2/3}}\,c^{1/3}}+\frac{\text{Log}\left[3\,a+3\,a^{2/3}\,c^{1/3}\,x+b\,x^2\right]}{54\,a^{4/3}\,b\,c^{2/3}}-$$

$$\frac{(-1)^{2/3}\,\text{Log}\left[3\,a-3\,(-1)^{1/3}\,a^{2/3}\,c^{1/3}\,x+b\,x^2\right]}{18\,\left(1+(-1)^{1/3}\right)^2\,a^{4/3}\,b\,c^{2/3}}+\frac{(-1)^{2/3}\,\text{Log}\left[3\,a+3\,(-1)^{2/3}\,a^{2/3}\,c^{1/3}\,x+b\,x^2\right]}{54\,a^{4/3}\,b\,c^{2/3}}$$

Result (type 7, 99 leaves):

$$\frac{1}{3}\,\text{RootSum}\left[27\,a^3+27\,a^2\,b\,\#1^2+27\,a^2\,c\,\#1^3+9\,a\,b^2\,\#1^4+b^3\,\#1^6\,\&,\ \frac{\text{Log}[x-\#1]\,\#1^2}{18\,a^2\,b+27\,a^2\,c\,\#1+12\,a\,b^2\,\#1^2+2\,b^3\,\#1^4}\,\&\right]$$

Problem 138: Result is not expressed in closed-form.

$$\int \frac{x^2}{27\,a^3+27\,a^2\,b\,x^2+27\,a^2\,c\,x^3+9\,a\,b^2\,x^4+b^3\,x^6}\,dx$$

Optimal (type 3, 334 leaves, 8 steps):

$$\frac{2\,(-1)^{2/3}\,\text{ArcTan}\left[\frac{3\,(-1)^{1/3}\,a^{2/3}\,c^{1/3}-2\,b\,x}{\sqrt{3}\,\sqrt{a}\,\sqrt{4\,b-3\,(-1)^{2/3}\,a^{1/3}\,c^{2/3}}}\right]}{9\,\sqrt{3}\,\left(1+(-1)^{1/3}\right)^2\,a^{11/6}\,\sqrt{4\,b-3\,(-1)^{2/3}\,a^{1/3}\,c^{2/3}}\,c^{2/3}}+$$

$$\frac{2\,\text{ArcTan}\left[\frac{3\,a^{2/3}\,c^{1/3}+2\,b\,x}{\sqrt{3}\,\sqrt{a}\,\sqrt{4\,b-3\,a^{1/3}\,c^{2/3}}}\right]}{27\,\sqrt{3}\,a^{11/6}\,\sqrt{4\,b-3\,a^{1/3}\,c^{2/3}}\,c^{2/3}}+\frac{2\,(-1)^{2/3}\,\text{ArcTan}\left[\frac{3\,(-1)^{2/3}\,a^{2/3}\,c^{1/3}+2\,b\,x}{\sqrt{3}\,\sqrt{a}\,\sqrt{4\,b+3\,(-1)^{1/3}\,a^{1/3}\,c^{2/3}}}\right]}{9\,\sqrt{3}\,\left(1-(-1)^{1/3}\right)\,\left(1+(-1)^{1/3}\right)^2\,a^{11/6}\,\sqrt{4\,b+3\,(-1)^{1/3}\,a^{1/3}\,c^{2/3}}\,c^{2/3}}$$

Result (type 7, 97 leaves):

$$\frac{1}{3}\,\text{RootSum}\left[27\,a^3+27\,a^2\,b\,\#1^2+27\,a^2\,c\,\#1^3+9\,a\,b^2\,\#1^4+b^3\,\#1^6\,\&,\ \frac{\text{Log}[x-\#1]\,\#1}{18\,a^2\,b+27\,a^2\,c\,\#1+12\,a\,b^2\,\#1^2+2\,b^3\,\#1^4}\,\&\right]$$

Problem 139: Result is not expressed in closed-form.

$$\int \frac{x}{27\,a^3+27\,a^2\,b\,x^2+27\,a^2\,c\,x^3+9\,a\,b^2\,x^4+b^3\,x^6}\,dx$$

Optimal (type 3, 469 leaves, 14 steps):

$$-\frac{\text{ArcTan}\left[\frac{3(-1)^{1/3}a^{2/3}c^{1/3}-2bx}{\sqrt{3}\sqrt{a}\sqrt{4b-3(-1)^{2/3}a^{1/3}c^{2/3}}}\right]}{9\sqrt{3}\left(1+(-1)^{1/3}\right)^2 a^{13/6}\sqrt{4b-3(-1)^{2/3}a^{1/3}c^{2/3}}\;c^{1/3}}-\frac{\text{ArcTan}\left[\frac{3a^{2/3}c^{1/3}+2bx}{\sqrt{3}\sqrt{a}\sqrt{4b-3a^{1/3}c^{2/3}}}\right]}{27\sqrt{3}\,a^{13/6}\sqrt{4b-3a^{1/3}c^{2/3}}\;c^{1/3}}+$$

$$\frac{(-1)^{1/3}\text{ArcTan}\left[\frac{3(-1)^{2/3}a^{2/3}c^{1/3}+2bx}{\sqrt{3}\sqrt{a}\sqrt{4b+3(-1)^{1/3}a^{1/3}c^{2/3}}}\right]}{9\sqrt{3}\left(1-(-1)^{1/3}\right)\left(1+(-1)^{1/3}\right)^2 a^{13/6}\sqrt{4b+3(-1)^{1/3}a^{1/3}c^{2/3}}\;c^{1/3}}-\frac{\text{Log}\left[3a+3a^{2/3}c^{1/3}x+bx^2\right]}{162\,a^{7/3}c^{2/3}}+$$

$$\frac{(-1)^{2/3}\text{Log}\left[3a-3(-1)^{1/3}a^{2/3}c^{1/3}x+bx^2\right]}{54\left(1+(-1)^{1/3}\right)^2 a^{7/3}c^{2/3}}-\frac{(-1)^{2/3}\text{Log}\left[3a+3(-1)^{2/3}a^{2/3}c^{1/3}x+bx^2\right]}{162\,a^{7/3}c^{2/3}}$$

Result (type 7, 95 leaves):

$$\frac{1}{3}\text{RootSum}\left[27a^3+27a^2b\,\#1^2+27a^2c\,\#1^3+9ab^2\,\#1^4+b^3\,\#1^6\;\&,\;\frac{\text{Log}[x-\#1]}{18a^2b+27a^2c\,\#1+12ab^2\,\#1^2+2b^3\,\#1^4}\;\&\right]$$

Problem 140: Result is not expressed in closed-form.

$$\int\frac{1}{27a^3+27a^2bx^2+27a^2cx^3+9ab^2x^4+b^3x^6}\,dx$$

Optimal (type 3, 522 leaves, 14 steps):

$$-\frac{(-1)^{1/3}\left(2(-1)^{1/3}b+3a^{1/3}c^{2/3}\right)\text{ArcTan}\left[\frac{3(-1)^{1/3}a^{2/3}c^{1/3}-2bx}{\sqrt{3}\sqrt{a}\sqrt{4b-3(-1)^{2/3}a^{1/3}c^{2/3}}}\right]}{27\sqrt{3}\left(1+(-1)^{1/3}\right)^2 a^{17/6}\sqrt{4b-3(-1)^{2/3}a^{1/3}c^{2/3}}\;c^{2/3}}-$$

$$\frac{\left(2b-3a^{1/3}c^{2/3}\right)\text{ArcTan}\left[\frac{3a^{2/3}c^{1/3}+2bx}{\sqrt{3}\sqrt{a}\sqrt{4b-3a^{1/3}c^{2/3}}}\right]}{81\sqrt{3}\,a^{17/6}\sqrt{4b-3a^{1/3}c^{2/3}}\;c^{2/3}}-\frac{\left(2(-1)^{2/3}b-3a^{1/3}c^{2/3}\right)\text{ArcTan}\left[\frac{3(-1)^{2/3}a^{2/3}c^{1/3}+2bx}{\sqrt{3}\sqrt{a}\sqrt{4b+3(-1)^{1/3}a^{1/3}c^{2/3}}}\right]}{27\sqrt{3}\left(1-(-1)^{1/3}\right)\left(1+(-1)^{1/3}\right)^2 a^{17/6}\sqrt{4b+3(-1)^{1/3}a^{1/3}c^{2/3}}\;c^{2/3}}+$$

$$\frac{\text{Log}\left[3a+3a^{2/3}c^{1/3}x+bx^2\right]}{162\,a^{8/3}c^{1/3}}-\frac{\text{Log}\left[3a-3(-1)^{1/3}a^{2/3}c^{1/3}x+bx^2\right]}{54\left(1+(-1)^{1/3}\right)^2 a^{8/3}c^{1/3}}-\frac{(-1)^{1/3}\text{Log}\left[3a+3(-1)^{2/3}a^{2/3}c^{1/3}x+bx^2\right]}{162\,a^{8/3}c^{1/3}}$$

Result (type 7, 99 leaves):

$$\frac{1}{3}\text{RootSum}\left[27a^3+27a^2b\,\#1^2+27a^2c\,\#1^3+9ab^2\,\#1^4+b^3\,\#1^6\;\&,\;\frac{\text{Log}[x-\#1]}{18a^2b\,\#1+27a^2c\,\#1^2+12ab^2\,\#1^3+2b^3\,\#1^5}\;\&\right]$$

Problem 141: Result is not expressed in closed-form.

$$\int \frac{1}{x\left(27 a^3+27 a^2 b x^2+27 a^2 c x^3+9 a b^2 x^4+b^3 x^6\right)}\, dx$$

Optimal (type 3, 563 leaves, 14 steps):

$$\frac{\left(b-(-1)^{2/3} a^{1/3} c^{2/3}\right) \operatorname{ArcTan}\left[\frac{3 (-1)^{1/3} a^{2/3} c^{1/3}-2 b x}{\sqrt{3} \sqrt{a} \sqrt{4 b-3 (-1)^{2/3} a^{1/3} c^{2/3}}}\right]}{9 \sqrt{3} \left(1+(-1)^{1/3}\right)^2 a^{19/6} \sqrt{4 b-3 (-1)^{2/3} a^{1/3} c^{2/3}}\, c^{1/3}}+\frac{\left(b-a^{1/3} c^{2/3}\right) \operatorname{ArcTan}\left[\frac{3 a^{2/3} c^{1/3}+2 b x}{\sqrt{3} \sqrt{a} \sqrt{4 b-3 a^{1/3} c^{2/3}}}\right]}{27 \sqrt{3} a^{19/6} \sqrt{4 b-3 a^{1/3} c^{2/3}}\, c^{1/3}}+$$
$$\frac{(-1)^{2/3} \left((-1)^{2/3} b-a^{1/3} c^{2/3}\right) \operatorname{ArcTan}\left[\frac{3 (-1)^{2/3} a^{2/3} c^{1/3}+2 b x}{\sqrt{3} \sqrt{a} \sqrt{4 b+3 (-1)^{1/3} a^{1/3} c^{2/3}}}\right]}{9 \sqrt{3} \left(1-(-1)^{1/3}\right) \left(1+(-1)^{1/3}\right)^2 a^{19/6} \sqrt{4 b+3 (-1)^{1/3} a^{1/3} c^{2/3}}\, c^{1/3}}+\frac{\operatorname{Log}[x]}{27 a^3}-\frac{\left(3 a^{1/3}-\frac{b}{c^{2/3}}\right) \operatorname{Log}\left[3 a+3 a^{2/3} c^{1/3} x+b x^2\right]}{486 a^{10/3}}-$$
$$\frac{\left(b+i \sqrt{3} b+6 a^{1/3} c^{2/3}\right) \operatorname{Log}\left[3 a-3 (-1)^{1/3} a^{2/3} c^{1/3} x+b x^2\right]}{972 a^{10/3} c^{2/3}}-\frac{\left(3 a^{1/3}-\frac{(-1)^{2/3} b}{c^{2/3}}\right) \operatorname{Log}\left[3 a+3 (-1)^{2/3} a^{2/3} c^{1/3} x+b x^2\right]}{486 a^{10/3}}$$

Result (type 7, 157 leaves):

$$-\frac{1}{81 a^3}\left(-3 \operatorname{Log}[x]+\operatorname{RootSum}\left[27 a^3+27 a^2 b \#1^2+27 a^2 c \#1^3+9 a b^2 \#1^4+b^3 \#1^6 \&,\right.\right.$$
$$\left.\left.\frac{27 a^2 b \operatorname{Log}[x-\#1]+27 a^2 c \operatorname{Log}[x-\#1] \#1+9 a b^2 \operatorname{Log}[x-\#1] \#1^2+b^3 \operatorname{Log}[x-\#1] \#1^4}{18 a^2 b+27 a^2 c \#1+12 a b^2 \#1^2+2 b^3 \#1^4} \&\right]\right)$$

Problem 142: Result is not expressed in closed-form.

$$\int \frac{1}{x^2\left(27 a^3+27 a^2 b x^2+27 a^2 c x^3+9 a b^2 x^4+b^3 x^6\right)}\, dx$$

Optimal (type 3, 645 leaves, 14 steps):

$$-\frac{1}{27 a^3 x}+\frac{\left(2 (-1)^{2/3} b^2+12 (-1)^{1/3} a^{1/3} b c^{2/3}+9 a^{2/3} c^{4/3}\right) \text{ArcTan}\left[\frac{3 (-1)^{1/3} a^{2/3} c^{1/3}-2 b x}{\sqrt{3} \sqrt{a} \sqrt{4 b-3 (-1)^{2/3} a^{1/3} c^{2/3}}}\right]}{81 \sqrt{3} \left(1+(-1)^{1/3}\right)^2 a^{23/6} \sqrt{4 b-3 (-1)^{2/3} a^{1/3} c^{2/3}}\; c^{2/3}}+$$

$$\frac{\left(2 b^2-12 a^{1/3} b c^{2/3}+9 a^{2/3} c^{4/3}\right) \text{ArcTan}\left[\frac{3 a^{2/3} c^{1/3}+2 b x}{\sqrt{3} \sqrt{a} \sqrt{4 b-3 a^{1/3} c^{2/3}}}\right]}{243 \sqrt{3}\; a^{23/6} \sqrt{4 b-3 a^{1/3} c^{2/3}}\; c^{2/3}}+$$

$$\frac{(-1)^{2/3} \left(2 b^2+12 (-1)^{1/3} a^{1/3} b c^{2/3}+9 (-1)^{2/3} a^{2/3} c^{4/3}\right) \text{ArcTan}\left[\frac{3 (-1)^{2/3} a^{2/3} c^{1/3}+2 b x}{\sqrt{3} \sqrt{a} \sqrt{4 b+3 (-1)^{1/3} a^{1/3} c^{2/3}}}\right]}{81 \sqrt{3} \left(1-(-1)^{1/3}\right) \left(1+(-1)^{1/3}\right)^2 a^{23/6} \sqrt{4 b+3 (-1)^{1/3} a^{1/3} c^{2/3}}\; c^{2/3}}-\frac{\left(2 b-3 a^{1/3} c^{2/3}\right) \text{Log}\left[3 a+3 a^{2/3} c^{1/3} x+b x^2\right]}{486 a^{11/3} c^{1/3}}+$$

$$\frac{\left(2 b-3 (-1)^{2/3} a^{1/3} c^{2/3}\right) \text{Log}\left[3 a-3 (-1)^{1/3} a^{2/3} c^{1/3} x+b x^2\right]}{162 \left(1+(-1)^{1/3}\right)^2 a^{11/3} c^{1/3}}+\frac{(-1)^{1/3} \left(2 b+3 (-1)^{1/3} a^{1/3} c^{2/3}\right) \text{Log}\left[3 a+3 (-1)^{2/3} a^{2/3} c^{1/3} x+b x^2\right]}{486 a^{11/3} c^{1/3}}$$

Result (type 7, 163 leaves):

$$-\frac{1}{81 a^3 x}\Bigg(3+x\,\text{RootSum}\Big[27 a^3+27 a^2 b \#1^2+27 a^2 c \#1^3+9 a b^2 \#1^4+b^3 \#1^6\,\&,$$
$$\frac{27 a^2 b \text{Log}[x-\#1]+27 a^2 c \text{Log}[x-\#1] \#1+9 a b^2 \text{Log}[x-\#1] \#1^2+b^3 \text{Log}[x-\#1] \#1^4}{18 a^2 b \#1+27 a^2 c \#1^2+12 a b^2 \#1^3+2 b^3 \#1^5}\,\&\Big]\Bigg)$$

Problem 143: Result is not expressed in closed-form.

$$\int \frac{x^5}{216+108 x^2+324 x^3+18 x^4+x^6}\, dx$$

Optimal (type 3, 395 leaves, 14 steps):

$$-\frac{(-2)^{1/3} \left(1+(-2)^{1/3} 3^{2/3}\right) \text{ArcTan}\left[\frac{3 (-2)^{2/3} 3^{1/3}+2 x}{\sqrt{6 \left(4+3 (-2)^{1/3} 3^{2/3}\right)}}\right]}{3^{5/6} \sqrt{8+9\, i\, 2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}}}+\frac{\left(\frac{3}{2}\right)^{1/6} \left(1-(-3)^{2/3} 2^{1/3}\right) \text{ArcTan}\left[\frac{2^{1/6} \left(3 (-3)^{1/3}-2^{1/3} x\right)}{\sqrt{3 \left(4-3 (-3)^{2/3} 2^{1/3}\right)}}\right]}{\left(1+(-1)^{1/3}\right)^2 \sqrt{4-3 (-3)^{2/3} 2^{1/3}}}-$$

$$\frac{\left(1-2^{1/3}\times 3^{2/3}\right) \text{ArcTanh}\left[\frac{2^{1/6} \left(3\times 3^{1/3}+2^{1/3} x\right)}{\sqrt{3 \left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{2^{1/6}\times 3^{5/6} \sqrt{-4+3\times 2^{1/3}\times 3^{2/3}}}+\frac{1}{216} \left(36+2^{2/3}\times 3^{1/3} \left(1+i \sqrt{3}\right)\right) \text{Log}\left[6-3 (-3)^{1/3} 2^{2/3} x+x^2\right]+$$

$$\frac{1}{108} \left(18-(-2)^{2/3} 3^{1/3}\right) \text{Log}\left[6+3 (-2)^{2/3} 3^{1/3} x+x^2\right]+\frac{1}{108} \left(18-2^{2/3}\times 3^{1/3}\right) \text{Log}\left[6+3\times 2^{2/3}\times 3^{1/3} x+x^2\right]$$

Result (type 7, 61 leaves):

$$\frac{1}{6}\,\text{RootSum}\left[216+108\,\#1^2+324\,\#1^3+18\,\#1^4+\#1^6\,\&,\ \frac{\text{Log}[x-\#1]\,\#1^4}{36+162\,\#1+12\,\#1^2+\#1^4}\,\&\right]$$

Problem 144: Result is not expressed in closed-form.

$$\int \frac{x^4}{216+108\,x^2+324\,x^3+18\,x^4+x^6}\,dx$$

Optimal (type 3, 377 leaves, 14 steps):

$$\frac{(-1)^{2/3}\left(3\,(-3)^{2/3}-2^{2/3}\right)\text{ArcTan}\left[\frac{3\,(-3)^{1/3}\,2^{2/3}-2\,x}{\sqrt{6\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}\right]}{9\times 3^{1/6}\left(1+(-1)^{1/3}\right)^2\sqrt{2\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}+\frac{\left(9-(-2)^{2/3}\,3^{1/3}\right)\text{ArcTan}\left[\frac{3\,(-2)^{2/3}\,3^{1/3}+2\,x}{\sqrt{6\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)}}\right]}{27\sqrt{3\left(8+9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}\right)}}-$$

$$\frac{\left(9-2^{2/3}\times 3^{1/3}\right)\text{ArcTanh}\left[\frac{2^{1/6}\left(3\times 3^{1/3}+2^{1/3}\,x\right)}{\sqrt{3\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{27\sqrt{6\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}+\frac{\text{Log}\left[6-3\,(-3)^{1/3}\,2^{2/3}\,x+x^2\right]}{6\times 2^{2/3}\times 3^{1/3}\left(1+(-1)^{1/3}\right)^2}+\frac{\left(-\frac{1}{3}\right)^{1/3}\text{Log}\left[6+3\,(-2)^{2/3}\,3^{1/3}\,x+x^2\right]}{18\times 2^{2/3}}-\frac{\text{Log}\left[6+3\times 2^{2/3}\times 3^{1/3}\,x+x^2\right]}{18\times 2^{2/3}\times 3^{1/3}}$$

Result (type 7, 61 leaves):

$$\frac{1}{6}\,\text{RootSum}\left[216+108\,\#1^2+324\,\#1^3+18\,\#1^4+\#1^6\,\&,\ \frac{\text{Log}[x-\#1]\,\#1^3}{36+162\,\#1+12\,\#1^2+\#1^4}\,\&\right]$$

Problem 145: Result is not expressed in closed-form.

$$\int \frac{x^3}{216+108\,x^2+324\,x^3+18\,x^4+x^6}\,dx$$

Optimal (type 3, 361 leaves, 14 steps):

$$-\frac{\text{ArcTan}\left[\frac{3\,(-3)^{1/3}\,2^{2/3}-2\,x}{\sqrt{6\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}\right]}{6\times 2^{1/6}\times 3^{5/6}\left(1+(-1)^{1/3}\right)^2\sqrt{4-3\,(-3)^{2/3}\,2^{1/3}}}+\frac{(-1)^{1/3}\,\text{ArcTan}\left[\frac{3\,(-2)^{2/3}\,3^{1/3}+2\,x}{\sqrt{6\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)}}\right]}{9\times 2^{2/3}\times 3^{5/6}\sqrt{8+9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}}}+\frac{\text{ArcTanh}\left[\frac{2^{1/6}\left(3\times 3^{1/3}+2^{1/3}\,x\right)}{\sqrt{3\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{18\times 2^{1/6}\times 3^{5/6}\sqrt{-4+3\times 2^{1/3}\times 3^{2/3}}}-$$

$$\frac{(-1)^{2/3}\,\text{Log}\left[6-3\,(-3)^{1/3}\,2^{2/3}\,x+x^2\right]}{36\times 2^{1/3}\times 3^{2/3}\left(1+(-1)^{1/3}\right)^2}+\frac{(-1)^{2/3}\,\text{Log}\left[6+3\,(-2)^{2/3}\,3^{1/3}\,x+x^2\right]}{108\times 2^{1/3}\times 3^{2/3}}+\frac{\text{Log}\left[6+3\times 2^{2/3}\times 3^{1/3}\,x+x^2\right]}{108\times 2^{1/3}\times 3^{2/3}}$$

Result (type 7, 61 leaves) :

$$\frac{1}{6}\,\text{RootSum}\left[216+108\,\#1^2+324\,\#1^3+18\,\#1^4+\#1^6\,\&,\;\frac{\text{Log}[x-\#1]\,\#1^2}{36+162\,\#1+12\,\#1^2+\#1^4}\,\&\right]$$

Problem 146: Result is not expressed in closed-form.

$$\int\frac{x^2}{216+108\,x^2+324\,x^3+18\,x^4+x^6}\,dx$$

Optimal (type 3, 248 leaves, 8 steps) :

$$\frac{(-1)^{2/3}\,\text{ArcTan}\left[\frac{3\,(-3)^{1/3}\,2^{2/3}-2\,x}{\sqrt{6\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}\right]}{27\times 2^{5/6}\times 3^{1/6}\left(1+(-1)^{1/3}\right)^2\sqrt{4-3\,(-3)^{2/3}\,2^{1/3}}}+\frac{(-1)^{2/3}\,\text{ArcTan}\left[\frac{3\,(-2)^{2/3}\,3^{1/3}+2\,x}{\sqrt{6\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)}}\right]}{81\times 2^{1/3}\times 3^{1/6}\sqrt{8+9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}}}-\frac{\text{ArcTanh}\left[\frac{2^{1/6}\left(3\times 3^{1/3}+2^{1/3}\,x\right)}{\sqrt{3\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{81\times 2^{5/6}\times 3^{1/6}\sqrt{-4+3\times 2^{1/3}\times 3^{2/3}}}$$

Result (type 7, 59 leaves) :

$$\frac{1}{6}\,\text{RootSum}\left[216+108\,\#1^2+324\,\#1^3+18\,\#1^4+\#1^6\,\&,\;\frac{\text{Log}[x-\#1]\,\#1}{36+162\,\#1+12\,\#1^2+\#1^4}\,\&\right]$$

Problem 147: Result is not expressed in closed-form.

$$\int\frac{x}{216+108\,x^2+324\,x^3+18\,x^4+x^6}\,dx$$

Optimal (type 3, 361 leaves, 14 steps) :

$$-\frac{\text{ArcTan}\left[\frac{3\,(-3)^{1/3}\,2^{2/3}-2\,x}{\sqrt{6\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}\right]}{36\times 2^{1/6}\times 3^{5/6}\left(1+(-1)^{1/3}\right)^2\sqrt{4-3\,(-3)^{2/3}\,2^{1/3}}}+\frac{(-1)^{1/3}\,\text{ArcTan}\left[\frac{3\,(-2)^{2/3}\,3^{1/3}+2\,x}{\sqrt{6\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)}}\right]}{54\times 2^{2/3}\times 3^{5/6}\sqrt{8+9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}}}+\frac{\text{ArcTanh}\left[\frac{2^{1/6}\left(3\times 3^{1/3}+2^{1/3}\,x\right)}{\sqrt{3\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{108\times 2^{1/6}\times 3^{5/6}\sqrt{-4+3\times 2^{1/3}\times 3^{2/3}}}+$$
$$\frac{(-1)^{2/3}\,\text{Log}\left[6-3\,(-3)^{1/3}\,2^{2/3}\,x+x^2\right]}{216\times 2^{1/3}\times 3^{2/3}\left(1+(-1)^{1/3}\right)^2}-\frac{(-1)^{2/3}\,\text{Log}\left[6+3\,(-2)^{2/3}\,3^{1/3}\,x+x^2\right]}{648\times 2^{1/3}\times 3^{2/3}}-\frac{\text{Log}\left[6+3\times 2^{2/3}\times 3^{1/3}\,x+x^2\right]}{648\times 2^{1/3}\times 3^{2/3}}$$

Result (type 7, 57 leaves) :

$$\frac{1}{6}\,\text{RootSum}\left[216+108\,\#1^2+324\,\#1^3+18\,\#1^4+\#1^6\,\&,\;\frac{\text{Log}[x-\#1]}{36+162\,\#1+12\,\#1^2+\#1^4}\,\&\right]$$

Problem 148: Result is not expressed in closed-form.

$$\int \frac{1}{216+108\,x^2+324\,x^3+18\,x^4+x^6}\,dx$$

Optimal (type 3, 377 leaves, 14 steps):

$$\frac{(-1)^{2/3}\left(3\,(-3)^{2/3}-2^{2/3}\right)\,\text{ArcTan}\left[\frac{3\,(-3)^{1/3}\,2^{2/3}-2\,x}{\sqrt{6\,\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}\right]}{324\times 3^{1/6}\,\left(1+(-1)^{1/3}\right)^2\,\sqrt{2\,\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}+\frac{\left(9-(-2)^{2/3}\,3^{1/3}\right)\,\text{ArcTan}\left[\frac{3\,(-2)^{2/3}\,3^{1/3}+2\,x}{\sqrt{6\,\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)}}\right]}{972\,\sqrt{3\,\left(8+9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}\right)}}-$$

$$\frac{\left(9-2^{2/3}\times 3^{1/3}\right)\,\text{ArcTanh}\left[\frac{2^{1/6}\,\left(3\times 3^{1/3}+2^{1/3}\,x\right)}{\sqrt{3\,\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{972\,\sqrt{6\,\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}-\frac{\text{Log}\left[6-3\,(-3)^{1/3}\,2^{2/3}\,x+x^2\right]}{216\times 2^{2/3}\times 3^{1/3}\,\left(1+(-1)^{1/3}\right)^2}-\frac{\left(-\frac{1}{3}\right)^{1/3}\,\text{Log}\left[6+3\,(-2)^{2/3}\,3^{1/3}\,x+x^2\right]}{648\times 2^{2/3}}+\frac{\text{Log}\left[6+3\times 2^{2/3}\times 3^{1/3}\,x+x^2\right]}{648\times 2^{2/3}\times 3^{1/3}}$$

Result (type 7, 62 leaves):

$$\frac{1}{6}\,\text{RootSum}\left[216+108\,\#1^2+324\,\#1^3+18\,\#1^4+\#1^6\,\&,\,\frac{\text{Log}[x-\#1]}{36\,\#1+162\,\#1^2+12\,\#1^3+\#1^5}\,\&\right]$$

Problem 149: Result is not expressed in closed-form.

$$\int \frac{1}{x\,\left(216+108\,x^2+324\,x^3+18\,x^4+x^6\right)}\,dx$$

Optimal (type 3, 415 leaves, 14 steps):

$$\frac{(-1)^{2/3}\left((-2)^{2/3}-2\times 3^{2/3}\right)\,\text{ArcTan}\left[\frac{3\,(-2)^{2/3}\,3^{1/3}+2\,x}{\sqrt{6\,\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)}}\right]}{216\times 2^{1/3}\times 3^{5/6}\,\sqrt{8+9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}}}-\frac{(-1)^{2/3}\left((-3)^{1/3}+3\times 2^{1/3}\right)\,\text{ArcTan}\left[\frac{2^{1/6}\,\left(3\,(-3)^{1/3}-2^{1/3}\,x\right)}{\sqrt{3\,\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}\right]}{216\times 6^{1/6}\,\left(1+(-1)^{1/3}\right)^2\,\sqrt{4-3\,(-3)^{2/3}\,2^{1/3}}}-$$

$$\frac{\left(1-2^{1/3}\times 3^{2/3}\right)\,\text{ArcTanh}\left[\frac{2^{1/6}\,\left(3\times 3^{1/3}+2^{1/3}\,x\right)}{\sqrt{3\,\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{216\times 2^{1/6}\times 3^{5/6}\,\sqrt{-4+3\times 2^{1/3}\times 3^{2/3}}}+\frac{\text{Log}[x]}{216}-\frac{\left(36+2^{2/3}\times 3^{1/3}\,\left(1+i\,\sqrt{3}\right)\right)\,\text{Log}\left[6-3\,(-3)^{1/3}\,2^{2/3}\,x+x^2\right]}{46656}-$$

$$\frac{\left(18-(-2)^{2/3}\,3^{1/3}\right)\,\text{Log}\left[6+3\,(-2)^{2/3}\,3^{1/3}\,x+x^2\right]}{23328}-\frac{\left(18-2^{2/3}\times 3^{1/3}\right)\,\text{Log}\left[6+3\times 2^{2/3}\times 3^{1/3}\,x+x^2\right]}{23328}$$

Result (type 7, 103 leaves) :

$$\frac{\text{Log}[x]}{216}-\frac{\text{RootSum}\left[216+108\,\#1^2+324\,\#1^3+18\,\#1^4+\#1^6\,\&,\ \frac{108\,\text{Log}[x-\#1]+324\,\text{Log}[x-\#1]\,\#1+18\,\text{Log}[x-\#1]\,\#1^2+\text{Log}[x-\#1]\,\#1^4}{36+162\,\#1+12\,\#1^2+\#1^4}\,\&\right]}{1296}$$

Problem 150: Result is not expressed in closed-form.

$$\int\frac{1}{x^2\,\left(216+108\,x^2+324\,x^3+18\,x^4+x^6\right)}\,dx$$

Optimal (type 3, 448 leaves, 14 steps) :

$$-\frac{1}{216\,x}-\frac{\left(27\,(-6)^{1/3}-(-2)^{2/3}+12\times 3^{2/3}\right)\,\text{ArcTan}\left[\frac{3\,(-2)^{2/3}\,3^{1/3}+2\,x}{\sqrt{6\,\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)}}\right]}{5832\times 3^{1/6}\,\sqrt{8+9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}}}-\frac{(-1)^{2/3}\,\left(6\,(-6)^{2/3}+27\,(-3)^{1/3}-2^{1/3}\right)\,\text{ArcTan}\left[\frac{2^{1/6}\,\left(3\,(-3)^{1/3}-2^{1/3}\,x\right)}{\sqrt{3\,\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}\right]}{1944\times 6^{1/6}\,\left(1+(-1)^{1/3}\right)^2\,\sqrt{4-3\,(-3)^{2/3}\,2^{1/3}}}-$$

$$\frac{\left(2^{1/3}+27\times 3^{1/3}-6\times 6^{2/3}\right)\,\text{ArcTanh}\left[\frac{2^{1/6}\,\left(3\times 3^{1/3}+2^{1/3}\,x\right)}{\sqrt{3\,\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{5832\times 6^{1/6}\,\sqrt{-4+3\times 2^{1/3}\times 3^{2/3}}}-\frac{(-1)^{2/3}\,\left(9+(-3)^{1/3}\,2^{2/3}\right)\,\text{Log}\left[6-3\,(-3)^{1/3}\,2^{2/3}\,x+x^2\right]}{1296\times 2^{1/3}\times 3^{2/3}\,\left(1+(-1)^{1/3}\right)^2}+$$

$$\frac{\left(3\,(-6)^{2/3}+2\,(-2)^{1/3}\right)\,\text{Log}\left[6+3\,(-2)^{2/3}\,3^{1/3}\,x+x^2\right]}{7776\times 3^{1/3}}-\frac{\left(2^{2/3}-3\times 3^{2/3}\right)\,\text{Log}\left[6+3\times 2^{2/3}\times 3^{1/3}\,x+x^2\right]}{3888\times 6^{1/3}}$$

Result (type 7, 109 leaves) :

$$-\frac{1}{216\,x}-\frac{\text{RootSum}\left[216+108\,\#1^2+324\,\#1^3+18\,\#1^4+\#1^6\,\&,\ \frac{108\,\text{Log}[x-\#1]+324\,\text{Log}[x-\#1]\,\#1+18\,\text{Log}[x-\#1]\,\#1^2+\text{Log}[x-\#1]\,\#1^4}{36\,\#1+162\,\#1^2+12\,\#1^3+\#1^5}\,\&\right]}{1296}$$

Problem 151: Result is not expressed in closed-form.

$$\int\frac{x^8}{\left(216+108\,x^2+324\,x^3+18\,x^4+x^6\right)^2}\,dx$$

Optimal (type 3, 1064 leaves, 23 steps) :

$$-\frac{\left(-\frac{1}{3}\right)^{1/3}\left(9\left(6+(-3)^{1/3}\,2^{2/3}\right)+\left(2-2^{2/3}\left(6\,(-6)^{2/3}+27\,(-3)^{1/3}\right)\right)x\right)}{162\times 2^{2/3}\left(1+(-1)^{1/3}\right)^4\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)\left(6-3\,(-3)^{1/3}\,2^{2/3}\,x+x^2\right)}-$$

$$\frac{\left(-\frac{1}{3}\right)^{1/3}\left(9\left(6-(-2)^{2/3}\,3^{1/3}\right)+\left(2+27\,(-2)^{2/3}\,3^{1/3}+12\,(-2)^{1/3}\,3^{2/3}\right)x\right)}{729\times 2^{2/3}\left(8+9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}\right)\left(6+3\,(-2)^{2/3}\,3^{1/3}\,x+x^2\right)}+\frac{9\left(6-2^{2/3}\times 3^{1/3}\right)+\left(2+2^{2/3}\left(27\times 3^{1/3}-6\times 6^{2/3}\right)\right)x}{1458\times 2^{2/3}\times 3^{1/3}\left(4-3\times 2^{1/3}\times 3^{2/3}\right)\left(6+3\times 2^{2/3}\times 3^{1/3}\,x+x^2\right)}-$$

$$\frac{i\left((-2)^{2/3}+6\times 3^{2/3}\right)\text{ArcTan}\left[\frac{3\,(-2)^{2/3}\,3^{1/3}+2\,x}{\sqrt{6\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)}}\right]}{162\times 2^{5/6}\times 3^{1/3}\left(1+(-1)^{1/3}\right)^5\sqrt{4+3\,(-2)^{1/3}\,3^{2/3}}}-\frac{(-1)^{1/3}\left(2+27\,(-2)^{2/3}\,3^{1/3}+12\,(-2)^{1/3}\,3^{2/3}\right)\text{ArcTan}\left[\frac{3\,(-2)^{2/3}\,3^{1/3}+2\,x}{\sqrt{6\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)}}\right]}{162\times 2^{1/6}\times 3^{5/6}\left(1-(-1)^{1/3}\right)^2\left(1+(-1)^{1/3}\right)^4\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)^{3/2}}-$$

$$\frac{(-1)^{1/3}\left(6\,(-6)^{2/3}+27\,(-3)^{1/3}-2^{1/3}\right)\text{ArcTan}\left[\frac{2^{1/6}\left(3\,(-3)^{1/3}-2^{1/3}\,x\right)}{\sqrt{3\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}\right]}{81\sqrt{2}\,3^{5/6}\left(1+(-1)^{1/3}\right)^4\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)^{3/2}}+\frac{\left(i\,2^{2/3}-9\times 3^{1/6}-3\,i\,3^{2/3}\right)\text{ArcTan}\left[\frac{2^{1/6}\left(3\,(-3)^{1/3}-2^{1/3}\,x\right)}{\sqrt{3\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}\right]}{162\times 2^{5/6}\times 3^{1/3}\left(1+(-1)^{1/3}\right)^5\sqrt{4-3\,(-3)^{2/3}\,2^{1/3}}}-$$

$$\frac{\left(1+3\times 2^{1/3}\times 3^{2/3}\right)\text{ArcTanh}\left[\frac{2^{1/6}\left(3\times 3^{1/3}+2^{1/3}\,x\right)}{\sqrt{3\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{1458\times 2^{1/6}\times 3^{5/6}\sqrt{-4+3\times 2^{1/3}\times 3^{2/3}}}+\frac{\left(2^{1/3}+27\times 3^{1/3}-6\times 6^{2/3}\right)\text{ArcTanh}\left[\frac{2^{1/6}\left(3\times 3^{1/3}+2^{1/3}\,x\right)}{\sqrt{3\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{81\sqrt{2}\,3^{5/6}\left(1-(-1)^{1/3}\right)^2\left(1+(-1)^{1/3}\right)^4\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)^{3/2}}-$$

$$\frac{\text{Log}\left[6-3\,(-3)^{1/3}\,2^{2/3}\,x+x^2\right]}{972\times 2^{1/3}\times 3^{2/3}\left(1+(-1)^{1/3}\right)^4}+\frac{i\,\text{Log}\left[6+3\,(-2)^{2/3}\,3^{1/3}\,x+x^2\right]}{972\times 2^{1/3}\times 3^{1/6}\left(1+(-1)^{1/3}\right)^5}-\frac{\text{Log}\left[6+3\times 2^{2/3}\times 3^{1/3}\,x+x^2\right]}{8748\times 2^{1/3}\times 3^{2/3}}$$

Result (type 7, 167 leaves) :

$$\frac{-7884+324\,x-3990\,x^2-11\,610\,x^3-203\,x^4-9\,x^5}{34\,182\left(216+108\,x^2+324\,x^3+18\,x^4+x^6\right)}-\frac{1}{205\,092}$$

$$\text{RootSum}\left[216+108\,\#1^2+324\,\#1^3+18\,\#1^4+\#1^6\,\&,\ \frac{324\,\text{Log}[x-\#1]-96\,\text{Log}[x-\#1]\,\#1+324\,\text{Log}[x-\#1]\,\#1^2+406\,\text{Log}[x-\#1]\,\#1^3+9\,\text{Log}[x-\#1]\,\#1^4}{36\,\#1+162\,\#1^2+12\,\#1^3+\#1^5}\,\&\right]$$

Problem 152: Result is not expressed in closed-form.

$$\int\frac{x^7}{\left(216+108\,x^2+324\,x^3+18\,x^4+x^6\right)^2}\,dx$$

Optimal (type 3, 1005 leaves, 23 steps) :

$$-\frac{2\left(2(-1)^{1/3}3^{2/3}+9\times 6^{1/3}\right)-9\left((-2)^{2/3}+2(-1)^{1/3}3^{2/3}\right)x}{972\times 2^{2/3}\left(1+(-1)^{1/3}\right)^4\left(4-3(-3)^{2/3}2^{1/3}\right)\left(6-3(-3)^{1/3}2^{2/3}x+x^2\right)}-$$

$$\frac{(-6)^{1/3}\left(9(-2)^{1/3}+2\times 3^{1/3}\right)-9\left(1+(-2)^{1/3}3^{2/3}\right)x}{4374\left(8+9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}\right)\left(6+3(-2)^{2/3}3^{1/3}x+x^2\right)}+\frac{2\left(2-3\times 2^{1/3}\times 3^{2/3}\right)-3\left(6-2^{2/3}\times 3^{1/3}\right)x}{2916\times 2^{2/3}\times 3^{1/3}\left(4-3\times 2^{1/3}\times 3^{2/3}\right)\left(6+3\times 2^{2/3}\times 3^{1/3}x+x^2\right)}+$$

$$\frac{\left(9\,i+3^{1/3}\left(2\,i\,2^{2/3}-9\times 3^{1/6}+2\times 2^{2/3}\sqrt{3}\right)\right)\text{ArcTan}\left[\frac{3(-3)^{1/3}2^{2/3}-2x}{\sqrt{6\left(4-3(-3)^{2/3}2^{1/3}\right)}}\right]}{5832\left(1+(-1)^{1/3}\right)^5\sqrt{2\left(4-3(-3)^{2/3}2^{1/3}\right)}}+\frac{\left(1+(-2)^{1/3}3^{2/3}\right)\text{ArcTan}\left[\frac{3(-2)^{2/3}3^{1/3}+2x}{\sqrt{6\left(4+3(-2)^{1/3}3^{2/3}\right)}}\right]}{54\sqrt{6}\left(1-(-1)^{1/3}\right)^2\left(1+(-1)^{1/3}\right)^4\left(4+3(-2)^{1/3}3^{2/3}\right)^{3/2}}+$$

$$\frac{\left(9\times 3^{1/6}+i\left(4\times 2^{2/3}-3\times 3^{2/3}\right)\right)\text{ArcTan}\left[\frac{3(-2)^{2/3}3^{1/3}+2x}{\sqrt{6\left(4+3(-2)^{1/3}3^{2/3}\right)}}\right]}{1944\times 3^{2/3}\left(1+(-1)^{1/3}\right)^5\sqrt{2\left(4+3(-2)^{1/3}3^{2/3}\right)}}-\frac{(-1)^{1/3}\left((-3)^{1/3}+3\times 2^{1/3}\right)\text{ArcTan}\left[\frac{2^{1/6}\left(3(-3)^{1/3}-2^{1/3}x\right)}{\sqrt{3\left(4-3(-3)^{2/3}2^{1/3}\right)}}\right]}{54\sqrt{2}\,3^{5/6}\left(1+(-1)^{1/3}\right)^4\left(4-3(-3)^{2/3}2^{1/3}\right)^{3/2}}+$$

$$\frac{\left(1-2^{1/3}\times 3^{2/3}\right)\text{ArcTanh}\left[\frac{2^{1/6}\left(3\times 3^{1/3}+2^{1/3}x\right)}{\sqrt{3\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{54\sqrt{6}\left(1-(-1)^{1/3}\right)^2\left(1+(-1)^{1/3}\right)^4\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)^{3/2}}+\frac{\left(2\times 2^{2/3}+3\times 3^{2/3}\right)\text{ArcTanh}\left[\frac{2^{1/6}\left(3\times 3^{1/3}+2^{1/3}x\right)}{\sqrt{3\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{26244\times 3^{1/6}\sqrt{2\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}+$$

$$\frac{i\,\text{Log}\left[6-3(-3)^{1/3}2^{2/3}x+x^2\right]}{648\times 2^{2/3}\times 3^{5/6}\left(1+(-1)^{1/3}\right)^5}-\frac{\left(i+\sqrt{3}\right)\text{Log}\left[6+3(-2)^{2/3}3^{1/3}x+x^2\right]}{1296\times 2^{2/3}\times 3^{5/6}\left(1+(-1)^{1/3}\right)^5}-\frac{\text{Log}\left[6+3\times 2^{2/3}\times 3^{1/3}x+x^2\right]}{17496\times 2^{2/3}\times 3^{1/3}}$$

Result (type 7, 167 leaves) :

$$\frac{648-96x+432x^2+908x^3-18x^4+73x^5}{68364\left(216+108x^2+324x^3+18x^4+x^6\right)}+\frac{1}{410184}$$

$$\text{RootSum}\left[216+108\,\#1^2+324\,\#1^3+18\,\#1^4+\#1^6\,\&,\ \frac{96\,\text{Log}[x-\#1]-216\,\text{Log}[x-\#1]\,\#1+96\,\text{Log}[x-\#1]\,\#1^2-36\,\text{Log}[x-\#1]\,\#1^3+73\,\text{Log}[x-\#1]\,\#1^4}{36\,\#1+162\,\#1^2+12\,\#1^3+\#1^5}\,\&\right]$$

Problem 153: Result is not expressed in closed-form.

$$\int\frac{x^6}{\left(216+108x^2+324x^3+18x^4+x^6\right)^2}\,dx$$

Optimal (type 3, 677 leaves, 14 steps) :

$$\frac{9\,(-2)^{2/3}+6^{1/3}\left(9+(-3)^{1/3}\,2^{2/3}\right)x}{2916\times 2^{2/3}\left(1+(-1)^{1/3}\right)^4\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)\left(6-3\,(-3)^{1/3}\,2^{2/3}\,x+x^2\right)}+\frac{9\times 2^{2/3}+(-1)^{1/3}\,3^{2/3}\left(2+3\,(-2)^{1/3}\,3^{2/3}\right)x}{13\,122\times 2^{2/3}\left(8+9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}\right)\left(6+3\,(-2)^{2/3}\,3^{1/3}\,x+x^2\right)}+$$

$$\frac{3\times 2^{2/3}\times 3^{1/3}-\left(2-3\times 2^{1/3}\times 3^{2/3}\right)x}{8748\times 2^{2/3}\times 3^{1/3}\left(4-3\times 2^{1/3}\times 3^{2/3}\right)\left(6+3\times 2^{2/3}\times 3^{1/3}\,x+x^2\right)}+\frac{(-1)^{1/3}\left(3\,(-3)^{2/3}-2^{2/3}\right)\text{ArcTan}\left[\frac{3\,(-3)^{1/3}\,2^{2/3}-2\,x}{\sqrt{6\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}\right]}{486\times 6^{5/6}\left(1+(-1)^{1/3}\right)^4\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)^{3/2}}+$$

$$\frac{\left(3\,(-3)^{2/3}+(-1)^{1/3}\,2^{2/3}\right)\text{ArcTan}\left[\frac{3\,(-2)^{2/3}\,3^{1/3}+2\,x}{\sqrt{6\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)}}\right]}{486\times 6^{5/6}\left(1-(-1)^{1/3}\right)^2\left(1+(-1)^{1/3}\right)^4\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)^{3/2}}-\frac{\left(2^{2/3}-3\times 3^{2/3}\right)\text{ArcTanh}\left[\frac{2^{1/6}\left(3\times 3^{1/3}+2^{1/3}\,x\right)}{\sqrt{3\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{486\times 6^{5/6}\left(1-(-1)^{1/3}\right)^2\left(1+(-1)^{1/3}\right)^4\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)^{3/2}}+$$

$$\frac{\left(-\frac{1}{3}\right)^{1/6}\text{Log}\left[6-3\,(-3)^{1/3}\,2^{2/3}\,x+x^2\right]}{5832\times 2^{1/3}\left(1+(-1)^{1/3}\right)^5}-\frac{i\,\text{Log}\left[6+3\,(-2)^{2/3}\,3^{1/3}\,x+x^2\right]}{5832\times 2^{1/3}\times 3^{1/6}\left(1+(-1)^{1/3}\right)^5}+\frac{\text{Log}\left[6+3\times 2^{2/3}\times 3^{1/3}\,x+x^2\right]}{52\,488\times 2^{1/3}\times 3^{2/3}}$$

Result (type 7, 167 leaves):

$$\frac{-96+108\,x-64\,x^2-72\,x^3+73\,x^4-3\,x^5}{68\,364\left(216+108\,x^2+324\,x^3+18\,x^4+x^6\right)}-\frac{1}{410\,184}$$

$$\text{RootSum}\left[216+108\,\#1^2+324\,\#1^3+18\,\#1^4+\#1^6\,\&,\ \frac{108\,\text{Log}[x-\#1]-32\,\text{Log}[x-\#1]\,\#1+108\,\text{Log}[x-\#1]\,\#1^2-146\,\text{Log}[x-\#1]\,\#1^3+3\,\text{Log}[x-\#1]\,\#1^4}{36\,\#1+162\,\#1^2+12\,\#1^3+\#1^5}\,\&\right]$$

Problem 154: Result is not expressed in closed-form.

$$\int\frac{x^5}{\left(216+108\,x^2+324\,x^3+18\,x^4+x^6\right)^2}\,dx$$

Optimal (type 3, 682 leaves, 17 steps):

$$\frac{\left(-\frac{1}{3}\right)^{1/3}\left(4-(-3)^{1/3}\,2^{2/3}\,x\right)}{1944\times 2^{2/3}\left(1+(-1)^{1/3}\right)^4\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)\left(6-3\,(-3)^{1/3}\,2^{2/3}\,x+x^2\right)}+\frac{\left(-\frac{1}{3}\right)^{1/3}\left(4+(-2)^{2/3}\,3^{1/3}\,x\right)}{8748\times 2^{2/3}\left(8+9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}\right)\left(6+3\,(-2)^{2/3}\,3^{1/3}\,x+x^2\right)}-$$

$$\frac{4+2^{2/3}\times 3^{1/3}\,x}{17496\times 2^{2/3}\times 3^{1/3}\left(4-3\times 2^{1/3}\times 3^{2/3}\right)\left(6+3\times 2^{2/3}\times 3^{1/3}\,x+x^2\right)}-\frac{\text{ArcTan}\left[\frac{3\,(-3)^{1/3}\,2^{2/3}-2\,x}{\sqrt{6\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}\right]}{4374\times 2^{5/6}\times 3^{1/6}\left(1+(-1)^{1/3}\right)^4\sqrt{4-3\,(-3)^{2/3}\,2^{1/3}}}+$$

$$\frac{\text{ArcTan}\left[\frac{3\,(-3)^{1/3}\,2^{2/3}-2\,x}{\sqrt{6\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}\right]}{4374\sqrt{3}\left(8-9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}\right)^{3/2}}-\frac{i\,\text{ArcTan}\left[\frac{3\,(-2)^{2/3}\,3^{1/3}+2\,x}{\sqrt{6\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)}}\right]}{1458\times 2^{5/6}\times 3^{2/3}\left(1+(-1)^{1/3}\right)^5\sqrt{4+3\,(-2)^{1/3}\,3^{2/3}}}-$$

$$\frac{\text{ArcTan}\left[\frac{3\,(-2)^{2/3}\,3^{1/3}+2\,x}{\sqrt{6\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)}}\right]}{4374\sqrt{3}\left(8+9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}\right)^{3/2}}-\frac{\text{ArcTanh}\left[\frac{2^{1/6}\left(3\times 3^{1/3}+2^{1/3}\,x\right)}{\sqrt{3\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{8748\sqrt{6}\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)^{3/2}}-\frac{\text{ArcTanh}\left[\frac{2^{1/6}\left(3\times 3^{1/3}+2^{1/3}\,x\right)}{\sqrt{3\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{39366\times 2^{5/6}\times 3^{1/6}\sqrt{-4+3\times 2^{1/3}\times 3^{2/3}}}$$

Result (type 7, 167 leaves):

$$\frac{972-144\,x+648\,x^2+729\,x^3-27\,x^4+4\,x^5}{615276\left(216+108\,x^2+324\,x^3+18\,x^4+x^6\right)}+\frac{1}{3691656}\text{RootSum}\Big[216+108\,\#1^2+324\,\#1^3+18\,\#1^4+\#1^6\,\&,$$
$$\frac{144\,\text{Log}[x-\#1]-324\,\text{Log}[x-\#1]\,\#1+2043\,\text{Log}[x-\#1]\,\#1^2-54\,\text{Log}[x-\#1]\,\#1^3+4\,\text{Log}[x-\#1]\,\#1^4}{36\,\#1+162\,\#1^2+12\,\#1^3+\#1^5}\,\&\Big]$$

Problem 155: Result is not expressed in closed-form.

$$\int\frac{x^4}{\left(216+108\,x^2+324\,x^3+18\,x^4+x^6\right)^2}\,dx$$

Optimal (type 3, 850 leaves, 23 steps):

$$\frac{\left(-\frac{1}{3}\right)^{1/3}\left(3\,(-3)^{1/3}\,2^{2/3}-2\,x\right)}{5832\times 2^{2/3}\left(1+(-1)^{1/3}\right)^4\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)\left(6-3\,(-3)^{1/3}\,2^{2/3}\,x+x^2\right)}-\frac{\left(-\frac{1}{3}\right)^{1/3}\left(3\,(-2)^{2/3}\,3^{1/3}+2\,x\right)}{26244\times 2^{2/3}\left(8+9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}\right)\left(6+3\,(-2)^{2/3}\,3^{1/3}\,x+x^2\right)}-$$

$$\frac{3\times 3^{1/3}+2^{1/3}\,x}{52488\left(9\times 2^{1/3}-4\times 3^{1/3}\right)\left(6+3\times 2^{2/3}\times 3^{1/3}\,x+x^2\right)}+\frac{(-1)^{1/3}\,\text{ArcTan}\left[\frac{3\,(-3)^{1/3}\,2^{2/3}-2\,x}{\sqrt{6\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}\right]}{729\times 2^{2/3}\times 3^{5/6}\left(1+(-1)^{1/3}\right)^4\left(8-9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}\right)^{3/2}}-$$

$$\frac{(-1)^{1/3}\,\text{ArcTan}\left[\frac{3\,(-2)^{2/3}\,3^{1/3}+2\,x}{\sqrt{6\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)}}\right]}{2916\times 2^{1/6}\times 3^{5/6}\left(1-(-1)^{1/3}\right)^2\left(1+(-1)^{1/3}\right)^4\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)^{3/2}}-\frac{\left(i+\sqrt{3}\right)\text{ArcTan}\left[\frac{3\,(-2)^{2/3}\,3^{1/3}+2\,x}{\sqrt{6\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)}}\right]}{11664\times 2^{1/6}\times 3^{1/3}\left(1+(-1)^{1/3}\right)^5\sqrt{4+3\,(-2)^{1/3}\,3^{2/3}}}-$$

$$\frac{i\,\text{ArcTan}\left[\frac{2^{1/6}\left(3\,(-3)^{1/3}-2^{1/3}\,x\right)}{\sqrt{3\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}\right]}{5832\times 2^{1/6}\times 3^{1/3}\left(1+(-1)^{1/3}\right)^5\sqrt{4-3\,(-3)^{2/3}\,2^{1/3}}}+\frac{\text{ArcTanh}\left[\frac{2^{1/6}\left(3\times 3^{1/3}+2^{1/3}\,x\right)}{\sqrt{3\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{26244\times 2^{1/6}\times 3^{5/6}\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)^{3/2}}+\frac{\text{ArcTanh}\left[\frac{2^{1/6}\left(3\times 3^{1/3}+2^{1/3}\,x\right)}{\sqrt{3\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{52488\times 2^{1/6}\times 3^{5/6}\sqrt{-4+3\times 2^{1/3}\times 3^{2/3}}}-$$

$$\frac{\text{Log}\left[6-3\,(-3)^{1/3}\,2^{2/3}\,x+x^2\right]}{34992\times 2^{1/3}\times 3^{2/3}\left(1+(-1)^{1/3}\right)^4}+\frac{i\,\text{Log}\left[6+3\,(-2)^{2/3}\,3^{1/3}\,x+x^2\right]}{34992\times 2^{1/3}\times 3^{1/6}\left(1+(-1)^{1/3}\right)^5}-\frac{\text{Log}\left[6+3\times 2^{2/3}\times 3^{1/3}\,x+x^2\right]}{314928\times 2^{1/3}\times 3^{2/3}}$$

Result (type 7, 167 leaves):

$$\frac{-288+324\,x-1458\,x^2-216\,x^3+8\,x^4-9\,x^5}{1230552\left(216+108\,x^2+324\,x^3+18\,x^4+x^6\right)}-\frac{1}{7383312}\text{RootSum}\Big[216+108\,\#1^2+324\,\#1^3+18\,\#1^4+\#1^6\,\&,$$
$$\frac{324\,\text{Log}[x-\#1]-2628\,\text{Log}[x-\#1]\,\#1+324\,\text{Log}[x-\#1]\,\#1^2-16\,\text{Log}[x-\#1]\,\#1^3+9\,\text{Log}[x-\#1]\,\#1^4}{36\,\#1+162\,\#1^2+12\,\#1^3+\#1^5}\,\&\Big]$$

Problem 156: Result is not expressed in closed-form.

$$\int\frac{x^3}{\left(216+108\,x^2+324\,x^3+18\,x^4+x^6\right)^2}\,dx$$

Optimal (type 3, 873 leaves, 23 steps):

$$\frac{(-6)^{1/3}\left(2\,(-3)^{1/3}+9\times 2^{1/3}\right)-3\,x}{157464\left(8-9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}\right)\left(6-3\,(-3)^{1/3}\,2^{2/3}\,x+x^2\right)}-\frac{(-6)^{1/3}\left(9\,(-2)^{1/3}+2\times 3^{1/3}\right)+3\,x}{157464\left(8+9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}\right)\left(6+3\,(-2)^{2/3}\,3^{1/3}\,x+x^2\right)}-$$

$$\frac{2\times 2^{1/3}-3\times 6^{2/3}-3^{1/3}\,x}{104976\left(9\times 2^{1/3}-4\times 3^{1/3}\right)\left(6+3\times 2^{2/3}\times 3^{1/3}\,x+x^2\right)}+\frac{\text{ArcTan}\left[\frac{3\,(-3)^{1/3}\,2^{2/3}-2\,x}{\sqrt{6\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}\right]}{26244\,\sqrt{3}\left(8-9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}\right)^{3/2}}-$$

$$\frac{\left(9\,i-3^{1/3}\left(2\,i\,2^{2/3}+9\times 3^{1/6}+2\times 2^{2/3}\,\sqrt{3}\right)\right)\text{ArcTan}\left[\frac{3\,(-3)^{1/3}\,2^{2/3}-2\,x}{\sqrt{6\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}\right]}{209952\left(1+(-1)^{1/3}\right)^5\sqrt{2\left(4-3\,(-3)^{2/3}\,2^{1/3}\right)}}-\frac{\text{ArcTan}\left[\frac{3\,(-2)^{2/3}\,3^{1/3}+2\,x}{\sqrt{6\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)}}\right]}{26244\,\sqrt{3}\left(8+9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}\right)^{3/2}}+$$

$$\frac{\left(9\,i+3^{1/3}\left(4\,i\,2^{2/3}-9\times 3^{1/6}\right)\right)\text{ArcTan}\left[\frac{3\,(-2)^{2/3}\,3^{1/3}+2\,x}{\sqrt{6\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)}}\right]}{209952\left(1+(-1)^{1/3}\right)^5\sqrt{2\left(4+3\,(-2)^{1/3}\,3^{2/3}\right)}}-\frac{\text{ArcTanh}\left[\frac{2^{1/6}\left(3\times 3^{1/3}+2^{1/3}\,x\right)}{\sqrt{3\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{52488\,\sqrt{6}\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)^{3/2}}+\frac{\left(2\times 2^{2/3}-3\times 3^{2/3}\right)\text{ArcTanh}\left[\frac{2^{1/6}\left(3\times 3^{1/3}+2^{1/3}\,x\right)}{\sqrt{3\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{944784\times 3^{1/6}\sqrt{2\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}-$$

$$\frac{i\,\text{Log}\left[6-3\,(-3)^{1/3}\,2^{2/3}\,x+x^2\right]}{23328\times 2^{2/3}\times 3^{5/6}\left(1+(-1)^{1/3}\right)^5}+\frac{\left(i+\sqrt{3}\right)\text{Log}\left[6+3\,(-2)^{2/3}\,3^{1/3}\,x+x^2\right]}{46656\times 2^{2/3}\times 3^{5/6}\left(1+(-1)^{1/3}\right)^5}+\frac{\text{Log}\left[6+3\times 2^{2/3}\times 3^{1/3}\,x+x^2\right]}{629856\times 2^{2/3}\times 3^{1/3}}$$

Result (type 7, 167 leaves):

$$\frac{972-3942\,x+648\,x^2+96\,x^3-27\,x^4+4\,x^5}{3691656\left(216+108\,x^2+324\,x^3+18\,x^4+x^6\right)}+\frac{1}{11074968}$$

$$\text{RootSum}\left[216+108\,\#1^2+324\,\#1^3+18\,\#1^4+\#1^6\,\&,\ \frac{1971\,\text{Log}[x-\#1]-162\,\text{Log}[x-\#1]\,\#1+72\,\text{Log}[x-\#1]\,\#1^2-27\,\text{Log}[x-\#1]\,\#1^3+2\,\text{Log}[x-\#1]\,\#1^4}{36\,\#1+162\,\#1^2+12\,\#1^3+\#1^5}\,\&\right]$$

Problem 157: Result is not expressed in closed-form.

$$\int\frac{x^2}{\left(216+108\,x^2+324\,x^3+18\,x^4+x^6\right)^2}\,dx$$

Optimal (type 3, 986 leaves, 23 steps):

$$-\frac{27\left(\left((-2)^{2/3}+2(-1)^{1/3}3^{2/3}\right)-6^{1/3}\left(9+(-3)^{1/3}2^{2/3}\right)x\right)}{104976\times 2^{2/3}\left(1+(-1)^{1/3}\right)^4\left(4-3(-3)^{2/3}2^{1/3}\right)\left(6-3(-3)^{1/3}2^{2/3}x+x^2\right)}-$$

$$\frac{27\times 2^{2/3}\left(1+(-2)^{1/3}3^{2/3}\right)-(-1)^{1/3}3^{2/3}\left(2+3(-2)^{1/3}3^{2/3}\right)x}{472392\times 2^{2/3}\left(8+9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}\right)\left(6+3(-2)^{2/3}3^{1/3}x+x^2\right)}+\frac{9\left(6-2^{2/3}\times 3^{1/3}\right)-\left(2-3\times 2^{1/3}\times 3^{2/3}\right)x}{314928\times 2^{2/3}\times 3^{1/3}\left(4-3\times 2^{1/3}\times 3^{2/3}\right)\left(6+3\times 2^{2/3}\times 3^{1/3}x+x^2\right)}-$$

$$\frac{\left(1+i\sqrt{3}+3\times 2^{1/3}\times 3^{2/3}\right)\text{ArcTan}\left[\frac{3(-3)^{1/3}2^{2/3}-2x}{\sqrt{6\left(4-3(-3)^{2/3}2^{1/3}\right)}}\right]}{8748\times 2^{2/3}\times 3^{5/6}\left(1+(-1)^{1/3}\right)^4\left(8-9\,i\,2^{1/3}\times 3^{1/6}+3\times 2^{1/3}\times 3^{2/3}\right)^{3/2}}+\frac{\left(3(-3)^{2/3}+(-1)^{1/3}2^{2/3}\right)\text{ArcTan}\left[\frac{3(-2)^{2/3}3^{1/3}+2x}{\sqrt{6\left(4+3(-2)^{1/3}3^{2/3}\right)}}\right]}{17496\times 6^{5/6}\left(1-(-1)^{1/3}\right)^2\left(1+(-1)^{1/3}\right)^4\left(4+3(-2)^{1/3}3^{2/3}\right)^{3/2}}+$$

$$\frac{\left(i+\sqrt{3}\right)\text{ArcTan}\left[\frac{3(-2)^{2/3}3^{1/3}+2x}{\sqrt{6\left(4+3(-2)^{1/3}3^{2/3}\right)}}\right]}{34992\times 2^{1/6}\times 3^{1/3}\left(1+(-1)^{1/3}\right)^5\sqrt{4+3(-2)^{1/3}3^{2/3}}}+\frac{i\,\text{ArcTan}\left[\frac{2^{1/6}\left(3(-3)^{1/3}-2^{1/3}x\right)}{\sqrt{3\left(4-3(-3)^{2/3}2^{1/3}\right)}}\right]}{17496\times 2^{1/6}\times 3^{1/3}\left(1+(-1)^{1/3}\right)^5\sqrt{4-3(-3)^{2/3}2^{1/3}}}-$$

$$\frac{\left(2^{2/3}-3\times 3^{2/3}\right)\text{ArcTanh}\left[\frac{2^{1/6}\left(3\times 3^{1/3}+2^{1/3}x\right)}{\sqrt{3\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{17496\times 6^{5/6}\left(1-(-1)^{1/3}\right)^2\left(1+(-1)^{1/3}\right)^4\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)^{3/2}}-\frac{\text{ArcTanh}\left[\frac{2^{1/6}\left(3\times 3^{1/3}+2^{1/3}x\right)}{\sqrt{3\left(-4+3\times 2^{1/3}\times 3^{2/3}\right)}}\right]}{157464\times 2^{1/6}\times 3^{5/6}\sqrt{-4+3\times 2^{1/3}\times 3^{2/3}}}+$$

$$\frac{\left(i+\sqrt{3}\right)\text{Log}\left[6-3(-3)^{1/3}2^{2/3}x+x^2\right]}{419904\times 2^{1/3}\times 3^{1/6}\left(1+(-1)^{1/3}\right)^5}-\frac{i\,\text{Log}\left[6+3(-2)^{2/3}3^{1/3}x+x^2\right]}{209952\times 2^{1/3}\times 3^{1/6}\left(1+(-1)^{1/3}\right)^5}+\frac{\text{Log}\left[6+3\times 2^{2/3}\times 3^{1/3}x+x^2\right]}{1889568\times 2^{1/3}\times 3^{2/3}}$$

Result (type 7, 167 leaves):

$$\frac{-7884+324x-2724x^2-216x^3+8x^4-9x^5}{7383312\left(216+108x^2+324x^3+18x^4+x^6\right)}-\frac{1}{44299872}\text{RootSum}\Big[216+108\,\#1^2+324\,\#1^3+18\,\#1^4+\#1^6\,\&,$$
$$\frac{324\,\text{Log}[x-\#1]+2436\,\text{Log}[x-\#1]\,\#1+324\,\text{Log}[x-\#1]\,\#1^2-16\,\text{Log}[x-\#1]\,\#1^3+9\,\text{Log}[x-\#1]\,\#1^4}{36\,\#1+162\,\#1^2+12\,\#1^3+\#1^5}\,\&\Big]$$

Problem 160: Result more than twice size of optimal antiderivative.

$$\int (b+2cx)\left(bx+cx^2\right)^{13}dx$$

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

$$\frac{1}{14}\left(bx+cx^2\right)^{14}$$

Result (type 1, 172 leaves):

$$\frac{b^{14} x^{14}}{14} + b^{13} c x^{15} + \frac{13}{2} b^{12} c^2 x^{16} + 26 b^{11} c^3 x^{17} + \frac{143}{2} b^{10} c^4 x^{18} + 143 b^9 c^5 x^{19} + \frac{429}{2} b^8 c^6 x^{20} + \frac{1716}{7} b^7 c^7 x^{21} + \frac{429}{2} b^6 c^8 x^{22} + 143 b^5 c^9 x^{23} + \frac{143}{2} b^4 c^{10} x^{24} + 26 b^3 c^{11} x^{25} + \frac{13}{2} b^2 c^{12} x^{26} + b c^{13} x^{27} + \frac{c^{14} x^{28}}{14}$$

Problem 161: Result more than twice size of optimal antiderivative.

$$\int x^{14} \left(b + 2 c x^2\right) \left(b x + c x^3\right)^{13} dx$$

Optimal (type 1, 16 leaves, 3 steps):

$$\frac{1}{28} x^{28} \left(b + c x^2\right)^{14}$$

Result (type 1, 182 leaves):

$$\frac{b^{14} x^{28}}{28} + \frac{1}{2} b^{13} c x^{30} + \frac{13}{4} b^{12} c^2 x^{32} + 13 b^{11} c^3 x^{34} + \frac{143}{4} b^{10} c^4 x^{36} + \frac{143}{2} b^9 c^5 x^{38} + \frac{429}{4} b^8 c^6 x^{40} + \frac{858}{7} b^7 c^7 x^{42} + \frac{429}{4} b^6 c^8 x^{44} + \frac{143}{2} b^5 c^9 x^{46} + \frac{143}{4} b^4 c^{10} x^{48} + 13 b^3 c^{11} x^{50} + \frac{13}{4} b^2 c^{12} x^{52} + \frac{1}{2} b c^{13} x^{54} + \frac{c^{14} x^{56}}{28}$$

Problem 162: Result more than twice size of optimal antiderivative.

$$\int x^{28} \left(b + 2 c x^3\right) \left(b x + c x^4\right)^{13} dx$$

Optimal (type 1, 16 leaves, 3 steps):

$$\frac{1}{42} x^{42} \left(b + c x^3\right)^{14}$$

Result (type 1, 186 leaves):

$$\frac{b^{14} x^{42}}{42} + \frac{1}{3} b^{13} c x^{45} + \frac{13}{6} b^{12} c^2 x^{48} + \frac{26}{3} b^{11} c^3 x^{51} + \frac{143}{6} b^{10} c^4 x^{54} + \frac{143}{3} b^9 c^5 x^{57} + \frac{143}{2} b^8 c^6 x^{60} + \frac{572}{7} b^7 c^7 x^{63} + \frac{143}{2} b^6 c^8 x^{66} + \frac{143}{3} b^5 c^9 x^{69} + \frac{143}{6} b^4 c^{10} x^{72} + \frac{26}{3} b^3 c^{11} x^{75} + \frac{13}{6} b^2 c^{12} x^{78} + \frac{1}{3} b c^{13} x^{81} + \frac{c^{14} x^{84}}{42}$$

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

$$\int \frac{x^{-7(-1+n)}\left(b+2 c x^n\right)}{\left(b x+c x^{1+n}\right)^8}\, dx$$

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

$$-\frac{x^{-7 n}}{7 n \left(b+c x^n\right)^7}$$

Result (type 3, 127 leaves):

$$-\frac{1}{7 b^{14} n \left(b+c x^n\right)^7} x^{-7 n} \left(b^{14}+1716 b^7 c^7 x^{7 n}+12012 b^6 c^8 x^{8 n}+36036 b^5 c^9 x^{9 n}+60060 b^4 c^{10} x^{10 n}+60060 b^3 c^{11} x^{11 n}+36036 b^2 c^{12} x^{12 n}+12012 b c^{13} x^{13 n}+1716 c^{14} x^{14 n}\right)$$

Problem 192: Result more than twice size of optimal antiderivative.

$$\int \left(b+2 c x+3 d x^2\right) \left(a+b x+c x^2+d x^3\right)^7 dx$$

Optimal (type 1, 21 leaves, 1 step):

$$\frac{1}{8} \left(a+b x+c x^2+d x^3\right)^8$$

Result (type 1, 143 leaves):

$$\frac{1}{8} x \left(b+x (c+d x)\right) \left(8 a^7+28 a^6 x \left(b+x (c+d x)\right)+56 a^5 x^2 \left(b+x (c+d x)\right)^2+70 a^4 x^3 \left(b+x (c+d x)\right)^3+56 a^3 x^4 \left(b+x (c+d x)\right)^4+28 a^2 x^5 \left(b+x (c+d x)\right)^5+8 a x^6 \left(b+x (c+d x)\right)^6+x^7 \left(b+x (c+d x)\right)^7\right)$$

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

$$\int \left(b+3 d x^2\right) \left(a+b x+d x^3\right)^7 dx$$

Optimal (type 1, 16 leaves, 1 step):

$$\frac{1}{8} \left(a+b x+d x^3\right)^8$$

Result (type 1, 127 leaves):

$$\frac{1}{8} x \left(b + d x^2\right) \left(8 a^7 + 28 a^6 x \left(b + d x^2\right) + 56 a^5 x^2 \left(b + d x^2\right)^2 + 70 a^4 x^3 \left(b + d x^2\right)^3 + 56 a^3 x^4 \left(b + d x^2\right)^4 + 28 a^2 x^5 \left(b + d x^2\right)^5 + 8 a x^6 \left(b + d x^2\right)^6 + x^7 \left(b + d x^2\right)^7\right)$$

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

$$\int \left(b + 3 d x^2\right) \left(b x + d x^3\right)^7 \, dx$$

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

$$\frac{1}{8} \left(b x + d x^3\right)^8$$

Result (type 1, 98 leaves):

$$\frac{b^8 x^8}{8} + b^7 d x^{10} + \frac{7}{2} b^6 d^2 x^{12} + 7 b^5 d^3 x^{14} + \frac{35}{4} b^4 d^4 x^{16} + 7 b^3 d^5 x^{18} + \frac{7}{2} b^2 d^6 x^{20} + b d^7 x^{22} + \frac{d^8 x^{24}}{8}$$

Problem 197: Result more than twice size of optimal antiderivative.

$$\int x^7 \left(b + d x^2\right)^7 \left(b + 3 d x^2\right) \, dx$$

Optimal (type 1, 16 leaves, 2 steps):

$$\frac{1}{8} x^8 \left(b + d x^2\right)^8$$

Result (type 1, 98 leaves):

$$\frac{b^8 x^8}{8} + b^7 d x^{10} + \frac{7}{2} b^6 d^2 x^{12} + 7 b^5 d^3 x^{14} + \frac{35}{4} b^4 d^4 x^{16} + 7 b^3 d^5 x^{18} + \frac{7}{2} b^2 d^6 x^{20} + b d^7 x^{22} + \frac{d^8 x^{24}}{8}$$

Problem 198: Result more than twice size of optimal antiderivative.

$$\int \left(2 c x + 3 d x^2\right) \left(a + c x^2 + d x^3\right)^7 \, dx$$

Optimal (type 1, 18 leaves, 1 step):

$$\frac{1}{8} \left(a + c x^2 + d x^3\right)^8$$

Result (type 1, 115 leaves):

$$\frac{1}{8} x^2 (c + d x) \left(8 a^7 + 28 a^6 x^2 (c + d x) + 56 a^5 x^4 (c + d x)^2 + 70 a^4 x^6 (c + d x)^3 + 56 a^3 x^8 (c + d x)^4 + 28 a^2 x^{10} (c + d x)^5 + 8 a x^{12} (c + d x)^6 + x^{14} (c + d x)^7\right)$$

Problem 199: Result more than twice size of optimal antiderivative.

$$\int (2 c x + 3 d x^2) (c x^2 + d x^3)^7 \, dx$$

Optimal (type 1, 17 leaves, 1 step):

$$\frac{1}{8} (c x^2 + d x^3)^8$$

Result (type 1, 98 leaves):

$$\frac{c^8 x^{16}}{8} + c^7 d x^{17} + \frac{7}{2} c^6 d^2 x^{18} + 7 c^5 d^3 x^{19} + \frac{35}{4} c^4 d^4 x^{20} + 7 c^3 d^5 x^{21} + \frac{7}{2} c^2 d^6 x^{22} + c d^7 x^{23} + \frac{d^8 x^{24}}{8}$$

Problem 200: Result more than twice size of optimal antiderivative.

$$\int x^7 (c x + d x^2)^7 (2 c x + 3 d x^2) \, dx$$

Optimal (type 1, 14 leaves, 2 steps):

$$\frac{1}{8} x^{16} (c + d x)^8$$

Result (type 1, 98 leaves):

$$\frac{c^8 x^{16}}{8} + c^7 d x^{17} + \frac{7}{2} c^6 d^2 x^{18} + 7 c^5 d^3 x^{19} + \frac{35}{4} c^4 d^4 x^{20} + 7 c^3 d^5 x^{21} + \frac{7}{2} c^2 d^6 x^{22} + c d^7 x^{23} + \frac{d^8 x^{24}}{8}$$

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

$$\int x^{14} (c + d x)^7 (2 c x + 3 d x^2) \, dx$$

Optimal (type 1, 14 leaves, 1 step):

$$\frac{1}{8} x^{16} (c + d x)^8$$

Result (type 1, 98 leaves):

$$\frac{c^8 x^{16}}{8} + c^7 d x^{17} + \frac{7}{2} c^6 d^2 x^{18} + 7 c^5 d^3 x^{19} + \frac{35}{4} c^4 d^4 x^{20} + 7 c^3 d^5 x^{21} + \frac{7}{2} c^2 d^6 x^{22} + c d^7 x^{23} + \frac{d^8 x^{24}}{8}$$

Problem 202: Result more than twice size of optimal antiderivative.

$$\int x\,(2\,c+3\,d\,x)\,\left(a+c\,x^2+d\,x^3\right)^7\,dx$$

Optimal (type 1, 18 leaves, 1 step):

$$\frac{1}{8}\left(a+c\,x^2+d\,x^3\right)^8$$

Result (type 1, 115 leaves):

$$\frac{1}{8}\,x^2\,(c+d\,x)\,\left(8\,a^7+28\,a^6\,x^2\,(c+d\,x)+56\,a^5\,x^4\,(c+d\,x)^2+70\,a^4\,x^6\,(c+d\,x)^3+56\,a^3\,x^8\,(c+d\,x)^4+28\,a^2\,x^{10}\,(c+d\,x)^5+8\,a\,x^{12}\,(c+d\,x)^6+x^{14}\,(c+d\,x)^7\right)$$

Problem 203: Result more than twice size of optimal antiderivative.

$$\int x\,(2\,c+3\,d\,x)\,\left(c\,x^2+d\,x^3\right)^7\,dx$$

Optimal (type 1, 14 leaves, 2 steps):

$$\frac{1}{8}\,x^{16}\,(c+d\,x)^8$$

Result (type 1, 98 leaves):

$$\frac{c^8\,x^{16}}{8}+c^7\,d\,x^{17}+\frac{7}{2}\,c^6\,d^2\,x^{18}+7\,c^5\,d^3\,x^{19}+\frac{35}{4}\,c^4\,d^4\,x^{20}+7\,c^3\,d^5\,x^{21}+\frac{7}{2}\,c^2\,d^6\,x^{22}+c\,d^7\,x^{23}+\frac{d^8\,x^{24}}{8}$$

Problem 204: Result more than twice size of optimal antiderivative.

$$\int x^8\,(2\,c+3\,d\,x)\,\left(c\,x+d\,x^2\right)^7\,dx$$

Optimal (type 1, 18 leaves, 1 step):

$$\frac{1}{8}\,x^8\,\left(c\,x+d\,x^2\right)^8$$

Result (type 1, 98 leaves):

$$\frac{c^8\,x^{16}}{8}+c^7\,d\,x^{17}+\frac{7}{2}\,c^6\,d^2\,x^{18}+7\,c^5\,d^3\,x^{19}+\frac{35}{4}\,c^4\,d^4\,x^{20}+7\,c^3\,d^5\,x^{21}+\frac{7}{2}\,c^2\,d^6\,x^{22}+c\,d^7\,x^{23}+\frac{d^8\,x^{24}}{8}$$

Problem 205: Result more than twice size of optimal antiderivative.

$$\int x^{15} (c+d x)^7 (2 c+3 d x) \, dx$$

Optimal (type 1, 14 leaves, 1 step):

$$\frac{1}{8} x^{16} (c+d x)^8$$

Result (type 1, 98 leaves):

$$\frac{c^8 x^{16}}{8}+c^7 d x^{17}+\frac{7}{2} c^6 d^2 x^{18}+7 c^5 d^3 x^{19}+\frac{35}{4} c^4 d^4 x^{20}+7 c^3 d^5 x^{21}+\frac{7}{2} c^2 d^6 x^{22}+c d^7 x^{23}+\frac{d^8 x^{24}}{8}$$

Problem 206: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 28 leaves, 2 steps):

$$a x+\frac{b x^2}{2}+\frac{1}{160} x^5 (2 a+b x)^5$$

Result (type 1, 80 leaves):

$$a x+\frac{b x^2}{2}+\frac{a^5 x^5}{5}+\frac{1}{2} a^4 b x^6+\frac{1}{2} a^3 b^2 x^7+\frac{1}{4} a^2 b^3 x^8+\frac{1}{16} a b^4 x^9+\frac{b^5 x^{10}}{160}$$

Problem 207: Result more than twice size of optimal antiderivative.

$$\int (a+b x) \left(1+\left(c+a x+\frac{b x^2}{2}\right)^4\right) dx$$

Optimal (type 1, 31 leaves, 2 steps):

$$a x+\frac{b x^2}{2}+\frac{1}{5} \left(c+a x+\frac{b x^2}{2}\right)^5$$

Result (type 1, 108 leaves):

$$\frac{1}{160} x (2 a+b x) \left(80+80 c^4+16 a^4 x^4+32 a^3 b x^5+24 a^2 b^2 x^6+8 a b^3 x^7+b^4 x^8+80 c^3 x (2 a+b x)+40 c^2 x^2 (2 a+b x)^2+10 c x^3 (2 a+b x)^3\right)$$

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

$$\int (a+b x)\left(1+\left(c+a x+\frac{b x^2}{2}\right)^n\right) dx$$

Optimal (type 3, 35 leaves, 2 steps):

$$a x+\frac{b x^2}{2}+\frac{\left(c+a x+\frac{b x^2}{2}\right)^{1+n}}{1+n}$$

Result (type 3, 73 leaves):

$$\frac{2 c \left(c+a x+\frac{b x^2}{2}\right)^n+2 a x \left(1+n+\left(c+a x+\frac{b x^2}{2}\right)^n\right)+b x^2 \left(1+n+\left(c+a x+\frac{b x^2}{2}\right)^n\right)}{2 (1+n)}$$

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

$$\int \left(a+c x^2\right)\left(1+\left(a x+\frac{c x^3}{3}\right)^5\right) dx$$

Optimal (type 1, 30 leaves, 2 steps):

$$a x+\frac{c x^3}{3}+\frac{1}{6}\left(a x+\frac{c x^3}{3}\right)^6$$

Result (type 1, 93 leaves):

$$a x+\frac{c x^3}{3}+\frac{a^6 x^6}{6}+\frac{1}{3} a^5 c x^8+\frac{5}{18} a^4 c^2 x^{10}+\frac{10}{81} a^3 c^3 x^{12}+\frac{5}{162} a^2 c^4 x^{14}+\frac{1}{243} a c^5 x^{16}+\frac{c^6 x^{18}}{4374}$$

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

$$\int \left(a+c x^2\right)\left(1+\left(d+a x+\frac{c x^3}{3}\right)^5\right) dx$$

Optimal (type 1, 31 leaves, 2 steps):

$$a x+\frac{c x^3}{3}+\frac{1}{6}\left(d+a x+\frac{c x^3}{3}\right)^6$$

Result (type 1, 140 leaves):

$$\frac{1}{4374} x \left(3 a+c x^2\right) \left(1458+1458 d^5+243 a^5 x^5+405 a^4 c x^7+270 a^3 c^2 x^9+90 a^2 c^3 x^{11}+15 a c^4 x^{13}+c^5 x^{15}+1215 d^4 \left(3 a x+c x^3\right)+540 d^3 \left(3 a x+c x^3\right)^2+135 d^2 \left(3 a x+c x^3\right)^3+18 d \left(3 a x+c x^3\right)^4\right)$$

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

$$\int \left(b x+c x^2\right) \left(1+\left(\frac{b x^2}{2}+\frac{c x^3}{3}\right)^5\right) dx$$

Optimal (type 1, 34 leaves, 2 steps):

$$\frac{b x^2}{2}+\frac{c x^3}{3}+\frac{x^{12} (3 b+2 c x)^6}{279936}$$

Result (type 1, 98 leaves):

$$\frac{b x^2}{2}+\frac{c x^3}{3}+\frac{b^6 x^{12}}{384}+\frac{1}{96} b^5 c x^{13}+\frac{5}{288} b^4 c^2 x^{14}+\frac{5}{324} b^3 c^3 x^{15}+\frac{5}{648} b^2 c^4 x^{16}+\frac{1}{486} b c^5 x^{17}+\frac{c^6 x^{18}}{4374}$$

Problem 213: Result more than twice size of optimal antiderivative.

$$\int \left(b x+c x^2\right) \left(1+\left(d+\frac{b x^2}{2}+\frac{c x^3}{3}\right)^5\right) dx$$

Optimal (type 1, 41 leaves, 2 steps):

$$\frac{b x^2}{2}+\frac{c x^3}{3}+\frac{1}{6} \left(d+\frac{b x^2}{2}+\frac{c x^3}{3}\right)^6$$

Result (type 1, 146 leaves):

$$\frac{1}{279936} x^2 (3 b+2 c x) \left(46656+46656 d^5+243 b^5 x^{10}+810 b^4 c x^{11}+1080 b^3 c^2 x^{12}+720 b^2 c^3 x^{13}+240 b c^4 x^{14}+32 c^5 x^{15}+19440 d^4 x^2 (3 b+2 c x)+4320 d^3 x^4 (3 b+2 c x)^2+540 d^2 x^6 (3 b+2 c x)^3+36 d x^8 (3 b+2 c x)^4\right)$$

Problem 214: Result more than twice size of optimal antiderivative.

$$\int \left(a+b x+c x^2\right) \left(1+\left(a x+\frac{b x^2}{2}+\frac{c x^3}{3}\right)^5\right) dx$$

Optimal (type 1, 46 leaves, 2 steps):

$$a x+\frac{b x^2}{2}+\frac{c x^3}{3}+\frac{1}{6}\left(a x+\frac{b x^2}{2}+\frac{c x^3}{3}\right)^6$$

Result (type 1, 244 leaves):

$$\frac{a^6 x^6}{6}+\frac{1}{6}a^5 x^7 (3 b+2 c x)+\frac{5}{72}a^4 x^8 (3 b+2 c x)^2+\frac{5}{324}a^3 x^9 (3 b+2 c x)^3+\frac{5 a^2 x^{10} (3 b+2 c x)^4}{2592}+a\left(x+\frac{b^5 x^{11}}{32}+\frac{5}{48}b^4 c x^{12}+\frac{5}{36}b^3 c^2 x^{13}+\frac{5}{54}b^2 c^3 x^{14}+\frac{5}{162}b c^4 x^{15}+\frac{c^5 x^{16}}{243}\right)+\frac{1}{279936}x^2 \left(729 b^6 x^{10}+2916 b^5 c x^{11}+4860 b^4 c^2 x^{12}+4320 b^3 c^3 x^{13}+2160 b^2 c^4 x^{14}+576 b \left(243+c^5 x^{15}\right)+64 c x \left(1458+c^5 x^{15}\right)\right)$$

Problem 215: Result more than twice size of optimal antiderivative.

$$\int (a+b x+c x^2)\left(1+\left(d+a x+\frac{b x^2}{2}+\frac{c x^3}{3}\right)^5\right)dx$$

Optimal (type 1, 47 leaves, 2 steps):

$$a x+\frac{b x^2}{2}+\frac{c x^3}{3}+\frac{1}{6}\left(d+a x+\frac{b x^2}{2}+\frac{c x^3}{3}\right)^6$$

Result (type 1, 248 leaves):

$$\frac{1}{279936}x\,(6 a+x (3 b+2 c x))\left(46656+46656 d^5+7776 a^5 x^5+243 b^5 x^{10}+810 b^4 c x^{11}+1080 b^3 c^2 x^{12}+720 b^2 c^3 x^{13}+240 b c^4 x^{14}+32 c^5 x^{15}+6480 a^4 x^6 (3 b+2 c x)+2160 a^3 x^7 (3 b+2 c x)^2+360 a^2 x^8 (3 b+2 c x)^3+30 a x^9 (3 b+2 c x)^4+19440 d^4 x (6 a+x (3 b+2 c x))+4320 d^3 x^2 (6 a+x (3 b+2 c x))^2+540 d^2 x^3 (6 a+x (3 b+2 c x))^3+36 d x^4 (6 a+x (3 b+2 c x))^4\right)$$

Problem 221: Result more than twice size of optimal antiderivative.

$$\int (1+2 x)\,(x+x^2)^3\left(-18+7 (x+x^2)^3\right)^2 dx$$

Optimal (type 1, 33 leaves, ? steps):

$$81 x^4 (1+x)^4-36 x^7 (1+x)^7+\frac{49}{10}x^{10} (1+x)^{10}$$

Result (type 1, 96 leaves):

$$81 x^4+324 x^5+486 x^6+288 x^7-171 x^8-756 x^9-\frac{12551 x^{10}}{10}-1211 x^{11}-\frac{1071 x^{12}}{2}+336 x^{13}+993 x^{14}+\frac{6174 x^{15}}{5}+1029 x^{16}+588 x^{17}+\frac{441 x^{18}}{2}+49 x^{19}+\frac{49 x^{20}}{10}$$

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

$$\int x^3 (1+x)^3 (1+2x) \left(-18+7x^3 (1+x)^3\right)^2 \, dx$$

Optimal (type 1, 33 leaves, ? steps):

$$81 x^4 (1+x)^4 - 36 x^7 (1+x)^7 + \frac{49}{10} x^{10} (1+x)^{10}$$

Result (type 1, 96 leaves) :

$$81 x^4 + 324 x^5 + 486 x^6 + 288 x^7 - 171 x^8 - 756 x^9 - \frac{12551 x^{10}}{10} - 1211 x^{11} - \frac{1071 x^{12}}{2} + 336 x^{13} + 993 x^{14} + \frac{6174 x^{15}}{5} + 1029 x^{16} + 588 x^{17} + \frac{441 x^{18}}{2} + 49 x^{19} + \frac{49 x^{20}}{10}$$

Problem 227: Result is not expressed in closed-form.

$$\int \frac{A + B x + C x^2 + D x^3}{a + b x + c x^2 + b x^3 + a x^4} \, dx$$

Optimal (type 3, 605 leaves, 9 steps) :

$$\left(\left(4 a^2 B + b \left(b - \sqrt{8 a^2 + b^2 - 4 a c}\right) D - a \left(A \left(b - \sqrt{8 a^2 + b^2 - 4 a c}\right) + b C - \sqrt{8 a^2 + b^2 - 4 a c}\ C + 2 c D\right)\right)\right.$$

$$\left.\text{ArcTan}\left[\frac{b - \sqrt{8 a^2 + b^2 - 4 a c} + 4 a x}{\sqrt{2} \sqrt{4 a^2 + 2 a c - b \left(b - \sqrt{8 a^2 + b^2 - 4 a c}\right)}}\right]\right) \Big/ \left(\sqrt{2}\ a \sqrt{8 a^2 + b^2 - 4 a c} \sqrt{4 a^2 + 2 a c - b \left(b - \sqrt{8 a^2 + b^2 - 4 a c}\right)}\right) -$$

$$\left(\left(4 a^2 B + b \left(b + \sqrt{8 a^2 + b^2 - 4 a c}\right) D - a \left(A \left(b + \sqrt{8 a^2 + b^2 - 4 a c}\right) + b C + \sqrt{8 a^2 + b^2 - 4 a c}\ C + 2 c D\right)\right)\right.$$

$$\left.\text{ArcTan}\left[\frac{b + \sqrt{8 a^2 + b^2 - 4 a c} + 4 a x}{\sqrt{2} \sqrt{4 a^2 + 2 a c - b \left(b + \sqrt{8 a^2 + b^2 - 4 a c}\right)}}\right]\right) \Big/ \left(\sqrt{2}\ a \sqrt{8 a^2 + b^2 - 4 a c} \sqrt{4 a^2 + 2 a c - b \left(b + \sqrt{8 a^2 + b^2 - 4 a c}\right)}\right) -$$

$$\frac{\left(2 a (A - C) + \left(b - \sqrt{8 a^2 + b^2 - 4 a c}\right) D\right) \text{Log}\left[2 a + \left(b - \sqrt{8 a^2 + b^2 - 4 a c}\right) x + 2 a x^2\right]}{4 a \sqrt{8 a^2 + b^2 - 4 a c}} +$$

$$\frac{\left(2 a (A - C) + \left(b + \sqrt{8 a^2 + b^2 - 4 a c}\right) D\right) \text{Log}\left[2 a + \left(b + \sqrt{8 a^2 + b^2 - 4 a c}\right) x + 2 a x^2\right]}{4 a \sqrt{8 a^2 + b^2 - 4 a c}}$$

Result (type 7, 98 leaves):

$$\text{RootSum}\left[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, \frac{A \text{Log}[x - \#1] + B \text{Log}[x - \#1] \#1 + C \text{Log}[x - \#1] \#1^2 + D \text{Log}[x - \#1] \#1^3}{b + 2 c \#1 + 3 b \#1^2 + 4 a \#1^3} \&\right]$$

Problem 250: Result is not expressed in closed-form.

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

Optimal (type 3, 307 leaves, 13 steps):

$$-\frac{1}{28}\left(35-9 i\sqrt{7}\right)x-\frac{1}{28}\left(35+9 i\sqrt{7}\right)x+\frac{1}{28}\left(7-5 i\sqrt{7}\right)x^2+\frac{1}{28}\left(7+5 i\sqrt{7}\right)x^2+\frac{1}{42}\left(7-5 i\sqrt{7}\right)x^3+$$

$$\frac{1}{42}\left(7+5 i\sqrt{7}\right)x^3+\frac{11\left(9 i+5\sqrt{7}\right)\text{ArcTan}\left[\frac{1-i\sqrt{7}+8x}{\sqrt{2\left(35+i\sqrt{7}\right)}}\right]}{4\sqrt{14\left(35+i\sqrt{7}\right)}}-\frac{11\left(9 i-5\sqrt{7}\right)\text{ArcTan}\left[\frac{1+i\sqrt{7}+8x}{\sqrt{2\left(35-i\sqrt{7}\right)}}\right]}{4\sqrt{14\left(35-i\sqrt{7}\right)}}+$$

$$\frac{3}{112}\left(7-11 i\sqrt{7}\right)\text{Log}\left[4+\left(1-i\sqrt{7}\right)x+4x^2\right]+\frac{3}{112}\left(7+11 i\sqrt{7}\right)\text{Log}\left[4+\left(1+i\sqrt{7}\right)x+4x^2\right]$$

Result (type 7, 109 leaves):

$$\frac{1}{6}\left(x\left(-15+3x+2x^2\right)+3\,\text{RootSum}\left[2+\#1+5\#1^2+\#1^3+2\#1^4\,\&,\ \frac{10\,\text{Log}[x-\#1]+\text{Log}[x-\#1]\#1+19\,\text{Log}[x-\#1]\#1^2+3\,\text{Log}[x-\#1]\#1^3}{1+10\#1+3\#1^2+8\#1^3}\,\&\right]\right)$$

Problem 251: Result is not expressed in closed-form.

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

Optimal (type 3, 269 leaves, 13 steps):

$$\frac{1}{14}\left(7-5 i\sqrt{7}\right)x+\frac{1}{14}\left(7+5 i\sqrt{7}\right)x+\frac{1}{28}\left(7-5 i\sqrt{7}\right)x^2+\frac{1}{28}\left(7+5 i\sqrt{7}\right)x^2-\frac{\left(53 i+\sqrt{7}\right)\text{ArcTan}\left[\frac{1-i\sqrt{7}+8x}{\sqrt{2\left(35+i\sqrt{7}\right)}}\right]}{2\sqrt{14\left(35+i\sqrt{7}\right)}}+$$

$$\frac{\left(53 i-\sqrt{7}\right)\text{ArcTan}\left[\frac{1+i\sqrt{7}+8x}{\sqrt{2\left(35-i\sqrt{7}\right)}}\right]}{2\sqrt{14\left(35-i\sqrt{7}\right)}}-\frac{1}{56}\left(35+9 i\sqrt{7}\right)\text{Log}\left[4+\left(1-i\sqrt{7}\right)x+4x^2\right]-\frac{1}{56}\left(35-9 i\sqrt{7}\right)\text{Log}\left[4+\left(1+i\sqrt{7}\right)x+4x^2\right]$$

Result (type 7, 101 leaves):

$$x+\frac{x^2}{2}-\text{RootSum}\left[2+\#1+5\#1^2+\#1^3+2\#1^4\,\&,\ \frac{2\,\text{Log}[x-\#1]+3\,\text{Log}[x-\#1]\#1+\text{Log}[x-\#1]\#1^2+5\,\text{Log}[x-\#1]\#1^3}{1+10\#1+3\#1^2+8\#1^3}\,\&\right]$$

Problem 252: Result is not expressed in closed-form.

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

Optimal (type 3, 230 leaves, 11 steps):

$$\frac{1}{14} \left(7-5 i \sqrt{7}\right) x+\frac{1}{14} \left(7+5 i \sqrt{7}\right) x-\frac{\left(19 i+7 \sqrt{7}\right) \text{ArcTan}\left[\frac{1-i \sqrt{7}+8 x}{\sqrt{2 \left(35+i \sqrt{7}\right)}}\right]}{\sqrt{14 \left(35+i \sqrt{7}\right)}}+$$

$$\frac{\left(19 i-7 \sqrt{7}\right) \text{ArcTan}\left[\frac{1+i \sqrt{7}+8 x}{\sqrt{2 \left(35-i \sqrt{7}\right)}}\right]}{\sqrt{14 \left(35-i \sqrt{7}\right)}}+\frac{1}{28} \left(7+5 i \sqrt{7}\right) \text{Log}\left[4+\left(1-i \sqrt{7}\right) x+4 x^2\right]+\frac{1}{28} \left(7-5 i \sqrt{7}\right) \text{Log}\left[4+\left(1+i \sqrt{7}\right) x+4 x^2\right]$$

Result (type 7, 94 leaves):

$$x+2 \,\text{RootSum}\left[2+\#1+5 \#1^2+\#1^3+2 \#1^4 \&, \frac{-\text{Log}[x-\#1]+2 \,\text{Log}[x-\#1] \#1-2 \,\text{Log}[x-\#1] \#1^2+\text{Log}[x-\#1] \#1^3}{1+10 \#1+3 \#1^2+8 \#1^3} \&\right]$$

Problem 253: Result is not expressed in closed-form.

$$\int \frac{5+x+3 x^2+2 x^3}{2+x+5 x^2+x^3+2 x^4} \, dx$$

Optimal (type 3, 198 leaves, 9 steps):

$$\frac{\left(19 i+7 \sqrt{7}\right) \text{ArcTan}\left[\frac{1-i \sqrt{7}+8 x}{\sqrt{2 \left(35+i \sqrt{7}\right)}}\right]}{\sqrt{14 \left(35+i \sqrt{7}\right)}}-\frac{\left(19 i-7 \sqrt{7}\right) \text{ArcTan}\left[\frac{1+i \sqrt{7}+8 x}{\sqrt{2 \left(35-i \sqrt{7}\right)}}\right]}{\sqrt{14 \left(35-i \sqrt{7}\right)}}+$$

$$\frac{1}{28} \left(7+5 i \sqrt{7}\right) \text{Log}\left[4+\left(1-i \sqrt{7}\right) x+4 x^2\right]+\frac{1}{28} \left(7-5 i \sqrt{7}\right) \text{Log}\left[4+\left(1+i \sqrt{7}\right) x+4 x^2\right]$$

Result (type 7, 90 leaves):

$$\text{RootSum}\left[2+\#1+5 \#1^2+\#1^3+2 \#1^4 \&, \frac{5 \,\text{Log}[x-\#1]+\text{Log}[x-\#1] \#1+3 \,\text{Log}[x-\#1] \#1^2+2 \,\text{Log}[x-\#1] \#1^3}{1+10 \#1+3 \#1^2+8 \#1^3} \&\right]$$

Problem 254: Result is not expressed in closed-form.

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

Optimal (type 3, 245 leaves, 13 steps):

$$-\frac{\left(53+i\sqrt{7}\right)\text{ArcTanh}\left[\frac{i-\sqrt{7}+8ix}{\sqrt{2\left(35-i\sqrt{7}\right)}}\right]}{2\sqrt{14\left(35-i\sqrt{7}\right)}}+\frac{\left(53-i\sqrt{7}\right)\text{ArcTanh}\left[\frac{i+\sqrt{7}+8ix}{\sqrt{2\left(35+i\sqrt{7}\right)}}\right]}{2\sqrt{14\left(35+i\sqrt{7}\right)}}+\frac{1}{28}\left(35-9i\sqrt{7}\right)\text{Log}[x]+$$
$$\frac{1}{28}\left(35+9i\sqrt{7}\right)\text{Log}[x]-\frac{1}{56}\left(35-9i\sqrt{7}\right)\text{Log}\left[4i+\left(i-\sqrt{7}\right)x+4ix^2\right]-\frac{1}{56}\left(35+9i\sqrt{7}\right)\text{Log}\left[4i+\left(i+\sqrt{7}\right)x+4ix^2\right]$$

Result (type 7, 101 leaves):

$$\frac{5\,\text{Log}[x]}{2}-\frac{1}{2}\text{RootSum}\left[2+\#1+5\#1^2+\#1^3+2\#1^4\&,\frac{3\,\text{Log}[x-\#1]+19\,\text{Log}[x-\#1]\#1+\text{Log}[x-\#1]\#1^2+10\,\text{Log}[x-\#1]\#1^3}{1+10\#1+3\#1^2+8\#1^3}\&\right]$$

Problem 255: Result is not expressed in closed-form.

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

Optimal (type 3, 281 leaves, 13 steps):

$$-\frac{35-9i\sqrt{7}}{28x}-\frac{35+9i\sqrt{7}}{28x}+\frac{11\left(9+5i\sqrt{7}\right)\text{ArcTanh}\left[\frac{i-\sqrt{7}+8ix}{\sqrt{2\left(35-i\sqrt{7}\right)}}\right]}{4\sqrt{14\left(35-i\sqrt{7}\right)}}-\frac{11\left(9-5i\sqrt{7}\right)\text{ArcTanh}\left[\frac{i+\sqrt{7}+8ix}{\sqrt{2\left(35+i\sqrt{7}\right)}}\right]}{4\sqrt{14\left(35+i\sqrt{7}\right)}}-\frac{3}{56}\left(7-11i\sqrt{7}\right)\text{Log}[x]-$$
$$\frac{3}{56}\left(7+11i\sqrt{7}\right)\text{Log}[x]+\frac{3}{112}\left(7+11i\sqrt{7}\right)\text{Log}\left[4i+\left(i-\sqrt{7}\right)x+4ix^2\right]+\frac{3}{112}\left(7-11i\sqrt{7}\right)\text{Log}\left[4i+\left(i+\sqrt{7}\right)x+4ix^2\right]$$

Result (type 7, 109 leaves):

$$-\frac{5}{2x}-\frac{3\,\text{Log}[x]}{4}+\frac{1}{4}\text{RootSum}\left[2+\#1+5\#1^2+\#1^3+2\#1^4\&,\frac{-35\,\text{Log}[x-\#1]+13\,\text{Log}[x-\#1]\#1-17\,\text{Log}[x-\#1]\#1^2+6\,\text{Log}[x-\#1]\#1^3}{1+10\#1+3\#1^2+8\#1^3}\&\right]$$

Problem 256: Result is not expressed in closed-form.

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

Optimal (type 3, 317 leaves, 13 steps):

$$-\frac{35-9 i \sqrt{7}}{56 x^2}-\frac{35+9 i \sqrt{7}}{56 x^2}+\frac{3 \left(7-11 i \sqrt{7}\right)}{56 x}+\frac{3 \left(7+11 i \sqrt{7}\right)}{56 x}+\frac{\left(355-73 i \sqrt{7}\right) \text{ArcTanh}\left[\frac{i-\sqrt{7}+8 i x}{\sqrt{2 \left(35-i \sqrt{7}\right)}}\right]}{8 \sqrt{14 \left(35-i \sqrt{7}\right)}}-\frac{\left(355+73 i \sqrt{7}\right) \text{ArcTanh}\left[\frac{i+\sqrt{7}+8 i x}{\sqrt{2 \left(35+i \sqrt{7}\right)}}\right]}{8 \sqrt{14 \left(35+i \sqrt{7}\right)}}-\frac{1}{16} \left(35-9 i \sqrt{7}\right) \text{Log}[x]-\frac{1}{16} \left(35+9 i \sqrt{7}\right) \text{Log}[x]+\frac{1}{32} \left(35-9 i \sqrt{7}\right) \text{Log}\left[4 i+\left(i-\sqrt{7}\right) x+4 i x^2\right]+\frac{1}{32} \left(35+9 i \sqrt{7}\right) \text{Log}\left[4 i+\left(i+\sqrt{7}\right) x+4 i x^2\right]$$

Result (type 7, 116 leaves):

$$-\frac{5}{4 x^2}+\frac{3}{4 x}-\frac{35 \text{Log}[x]}{8}+\frac{1}{8} \text{RootSum}\left[2+\#1+5 \#1^2+\#1^3+2 \#1^4 \&, \frac{61 \text{Log}[x-\#1]+141 \text{Log}[x-\#1] \#1+47 \text{Log}[x-\#1] \#1^2+70 \text{Log}[x-\#1] \#1^3}{1+10 \#1+3 \#1^2+8 \#1^3} \&\right]$$

Problem 257: Result is not expressed in closed-form.

$$\int \frac{x^2 \left(3 a+b x^2\right)}{a^2+2 a b x^2+b^2 x^4+c^2 x^6} \, dx$$

Optimal (type 3, 19 leaves, 2 steps):

$$\frac{\text{ArcTan}\left[\frac{c x^3}{a+b x^2}\right]}{c}$$

Result (type 7, 87 leaves):

$$\frac{1}{2} \text{RootSum}\left[a^2+2 a b \#1^2+b^2 \#1^4+c^2 \#1^6 \&, \frac{3 a \text{Log}[x-\#1] \#1+b \text{Log}[x-\#1] \#1^3}{2 a b+2 b^2 \#1^2+3 c^2 \#1^4} \&\right]$$

Problem 387: Result is not expressed in closed-form.

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

Optimal (type 3, 157 leaves, 8 steps):

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

Result (type 7, 61 leaves):

$$-\frac{1}{8}\text{RootSum}\left[-1+4\,\#1^2+6\,\#1^4+4\,\#1^6+\#1^8\,\&,\ \frac{\text{Log}[x-\#1]\,\#1}{1+3\,\#1^2+3\,\#1^4+\#1^6}\,\&\right]$$

Problem 388: Result is not expressed in closed-form.

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

Optimal (type 3, 157 leaves, 8 steps):

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

Result (type 7, 61 leaves):

$$-\frac{1}{8}\text{RootSum}\left[-1-4\,\#1^2+6\,\#1^4-4\,\#1^6+\#1^8\,\&,\ \frac{\text{Log}[x-\#1]\,\#1}{-1+3\,\#1^2-3\,\#1^4+\#1^6}\,\&\right]$$

Problem 389: Result is not expressed in closed-form.

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

Optimal (type 3, 188 leaves, 8 steps):

$$\frac{(-1)^{1/4}\sqrt{1-(-2)^{1/4}}\,\text{ArcTan}\left[\frac{x}{\sqrt{1-(-2)^{1/4}}}\right]}{4\times 2^{3/4}}-\frac{(-1)^{3/4}\sqrt{1+i\,(-2)^{1/4}}\,\text{ArcTan}\left[\frac{x}{\sqrt{1+i\,(-2)^{1/4}}}\right]}{4\times 2^{3/4}}-\frac{(-1)^{1/4}\sqrt{1+(-2)^{1/4}}\,\text{ArcTan}\left[\frac{x}{\sqrt{1+(-2)^{1/4}}}\right]}{4\times 2^{3/4}}+\frac{1}{8}\,i\left((-2)^{1/4}+\sqrt{2}\right)\sqrt{\frac{1+i}{(1+i)+2^{3/4}}}\,\text{ArcTan}\left[\sqrt{\frac{1+i}{(1+i)+2^{3/4}}}\,x\right]$$

Result (type 7, 61 leaves):

$$\frac{1}{8}\,\text{RootSum}\left[3+4\,\#1^2+6\,\#1^4+4\,\#1^6+\#1^8\,\&,\ \frac{\text{Log}[x-\#1]\,\#1}{1+3\,\#1^2+3\,\#1^4+\#1^6}\,\&\right]$$

Problem 390: Result is not expressed in closed-form.

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

Optimal (type 3, 188 leaves, 8 steps):

$$-\frac{(-1)^{1/4}\sqrt{1-(-2)^{1/4}}\,\text{ArcTanh}\left[\frac{x}{\sqrt{1-(-2)^{1/4}}}\right]}{4\times 2^{3/4}}+\frac{(-1)^{3/4}\sqrt{1+i\,(-2)^{1/4}}\,\text{ArcTanh}\left[\frac{x}{\sqrt{1+i\,(-2)^{1/4}}}\right]}{4\times 2^{3/4}}+\frac{(-1)^{1/4}\sqrt{1+(-2)^{1/4}}\,\text{ArcTanh}\left[\frac{x}{\sqrt{1+(-2)^{1/4}}}\right]}{4\times 2^{3/4}}-\frac{1}{8}\,i\left((-2)^{1/4}+\sqrt{2}\right)\sqrt{\frac{1+i}{(1+i)+2^{3/4}}}\,\text{ArcTanh}\left[\sqrt{\frac{1+i}{(1+i)+2^{3/4}}}\,x\right]$$

Result (type 7, 61 leaves):

$$\frac{1}{8}\,\text{RootSum}\left[3-4\,\#1^2+6\,\#1^4-4\,\#1^6+\#1^8\,\&,\ \frac{\text{Log}[x-\#1]\,\#1}{-1+3\,\#1^2-3\,\#1^4+\#1^6}\,\&\right]$$

Problem 391: Result is not expressed in closed-form.

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

Optimal (type 3, 663 leaves, 16 steps):

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

$$\frac{\sqrt{\sqrt{\sqrt{-a}+\sqrt{b}}-b^{1/4}}\,\text{ArcTan}\left[\frac{\sqrt{\sqrt{\sqrt{-a}+\sqrt{b}}+b^{1/4}}+\sqrt{2}\,b^{1/8}x}{\sqrt{\sqrt{\sqrt{-a}+\sqrt{b}}-b^{1/4}}}\right]}{4\sqrt{2}\sqrt{-a}\sqrt{\sqrt{-a}+\sqrt{b}}\,b^{3/8}}+\frac{\text{ArcTanh}\left[\frac{b^{1/8}x}{\sqrt{(-a)^{1/4}+b^{1/4}}}\right]}{4\sqrt{-a}\sqrt{(-a)^{1/4}+b^{1/4}}\,b^{3/8}}+$$

$$\frac{\sqrt{\sqrt{\sqrt{-a}+\sqrt{b}}+b^{1/4}}\,\text{Log}\left[\sqrt{\sqrt{-a}+\sqrt{b}}-\sqrt{2}\sqrt{\sqrt{\sqrt{-a}+\sqrt{b}}+b^{1/4}}\,b^{1/8}x+b^{1/4}x^2\right]}{8\sqrt{2}\sqrt{-a}\sqrt{\sqrt{-a}+\sqrt{b}}\,b^{3/8}}-$$

$$\frac{\sqrt{\sqrt{\sqrt{-a}+\sqrt{b}}+b^{1/4}}\,\text{Log}\left[\sqrt{\sqrt{-a}+\sqrt{b}}+\sqrt{2}\sqrt{\sqrt{\sqrt{-a}+\sqrt{b}}+b^{1/4}}\,b^{1/8}x+b^{1/4}x^2\right]}{8\sqrt{2}\sqrt{-a}\sqrt{\sqrt{-a}+\sqrt{b}}\,b^{3/8}}$$

Result (type 7, 63 leaves) :

$$-\frac{\text{RootSum}\left[a+b-4b\,\#1^2+6b\,\#1^4-4b\,\#1^6+b\,\#1^8\,\&,\ \frac{\text{Log}[x-\#1]}{\#1-2\#1^3+\#1^5}\,\&\right]}{8b}$$

Problem 392: Result is not expressed in closed-form.

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

Optimal (type 3, 663 leaves, 17 steps) :

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

$$\frac{\sqrt{\sqrt{\sqrt{-a}+\sqrt{b}}-b^{1/4}}\,\text{ArcTan}\left[\frac{\sqrt{\sqrt{\sqrt{-a}+\sqrt{b}}+b^{1/4}}+\sqrt{2}\,b^{1/8}x}{\sqrt{\sqrt{\sqrt{-a}+\sqrt{b}}-b^{1/4}}}\right]}{4\sqrt{2}\sqrt{-a}\sqrt{\sqrt{-a}+\sqrt{b}}\,b^{3/8}}+\frac{\text{ArcTanh}\left[\frac{b^{1/8}x}{\sqrt{(-a)^{1/4}+b^{1/4}}}\right]}{4\sqrt{-a}\sqrt{(-a)^{1/4}+b^{1/4}}\,b^{3/8}}+$$

$$\frac{\sqrt{\sqrt{\sqrt{-a}+\sqrt{b}}+b^{1/4}}\,\text{Log}\left[\sqrt{\sqrt{-a}+\sqrt{b}}-\sqrt{2}\sqrt{\sqrt{\sqrt{-a}+\sqrt{b}}+b^{1/4}}\,b^{1/8}x+b^{1/4}x^2\right]}{8\sqrt{2}\sqrt{-a}\sqrt{\sqrt{-a}+\sqrt{b}}\,b^{3/8}}-$$

$$\frac{\sqrt{\sqrt{\sqrt{-a}+\sqrt{b}}+b^{1/4}}\,\text{Log}\left[\sqrt{\sqrt{-a}+\sqrt{b}}+\sqrt{2}\sqrt{\sqrt{\sqrt{-a}+\sqrt{b}}+b^{1/4}}\,b^{1/8}x+b^{1/4}x^2\right]}{8\sqrt{2}\sqrt{-a}\sqrt{\sqrt{-a}+\sqrt{b}}\,b^{3/8}}$$

Result (type 7, 63 leaves):

$$-\frac{\text{RootSum}\left[a+b-4b\,\#1^2+6b\,\#1^4-4b\,\#1^6+b\,\#1^8\,\&,\ \frac{\text{Log}[x-\#1]}{\#1-2\,\#1^3+\#1^5}\,\&\right]}{8b}$$

Problem 393: Result is not expressed in closed-form.

$$\int\frac{\left(1+x^2\right)^2}{a\,x^6+b\left(1+x^2\right)^3}\,dx$$

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

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

Result (type 7, 95 leaves):

$$\frac{1}{6}\text{RootSum}\left[b+3b\,\#1^2+3b\,\#1^4+a\,\#1^6+b\,\#1^6\,\&,\ \frac{\text{Log}[x-\#1]+2\,\text{Log}[x-\#1]\,\#1^2+\text{Log}[x-\#1]\,\#1^4}{b\,\#1+2b\,\#1^3+a\,\#1^5+b\,\#1^5}\,\&\right]$$

Problem 421: Result more than twice size of optimal antiderivative.

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

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

$$-\text{ArcTanh}[2 x]$$

Result (type 3, 23 leaves):

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

Problem 491: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 188 leaves, 10 steps):

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

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

Result (type 3, 39 leaves):

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

Test results for the 1025 problems in "1.3.2 Algebraic functions.m"

Problem 1: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 145 leaves, 4 steps):

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

Result (type 4, 148 leaves):

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

Problem 2: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 160 leaves, 4 steps):

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

Result (type 4, 148 leaves):

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

Problem 3: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 163 leaves, 4 steps):

$$-\frac{2\,\text{ArcTanh}\left[\frac{\sqrt{3}\left(1-2^{1/3}x\right)}{\sqrt{-1+x^3}}\right]}{3\sqrt{3}}-\frac{2\times 2^{1/3}\sqrt{2-\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]}{3\times 3^{1/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}}$$

Result (type 4, 146 leaves):

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

Problem 4: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 156 leaves, 4 steps):

$$\frac{2\,\text{ArcTanh}\left[\frac{\sqrt{3}\left(1+2^{1/3}x\right)}{\sqrt{-1-x^3}}\right]}{3\sqrt{3}}+\frac{2\times 2^{1/3}\sqrt{2-\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]}{3\times 3^{1/4}\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\sqrt{-1-x^3}}$$

Result (type 4, 150 leaves):

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

Problem 5: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 280 leaves, 4 steps):

$$\frac{2 \operatorname{ArcTan}\left[\frac{\sqrt{3}\, a^{1/6} \left(a^{1/3}+2^{1/3} b^{1/3} x\right)}{\sqrt{a+b x^3}}\right]}{3 \sqrt{3} \sqrt{a}\, b^{1/3}}+\frac{2\times 2^{1/3} \sqrt{2+\sqrt{3}} \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\, \operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]}{3\times 3^{1/4} a^{1/3} b^{1/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}}$$

Result (type 4, 164 leaves):

$$-\frac{2 i \sqrt{\frac{a^{1/3}+b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}} \sqrt{1-\frac{b^{1/3} x}{a^{1/3}}+\frac{b^{2/3} x^2}{a^{2/3}}}\, \operatorname{EllipticPi}\left[\frac{i \sqrt{3}}{(-1)^{1/3}+2^{2/3}}, \operatorname{ArcSin}\left[\sqrt{\frac{a^{1/3}+(-1)^{2/3} b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}}\right],(-1)^{1/3}\right]}{\left((-1)^{1/3}+2^{2/3}\right) b^{1/3} \sqrt{a+b x^3}}$$

Problem 6: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 288 leaves, 4 steps):

$$-\frac{2 \operatorname{ArcTan}\left[\frac{\sqrt{3}\, a^{1/6} \left(a^{1/3}-2^{1/3} b^{1/3} x\right)}{\sqrt{a-b x^3}}\right]}{3 \sqrt{3} \sqrt{a}\, b^{1/3}}-\frac{2\times 2^{1/3} \sqrt{2+\sqrt{3}} \left(a^{1/3}-b^{1/3} x\right) \sqrt{\frac{a^{2/3}+a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}-b^{1/3} x\right)^2}}\, \operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}-b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}-b^{1/3} x}\right],-7-4 \sqrt{3}\right]}{3\times 3^{1/4} a^{1/3} b^{1/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}-b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}-b^{1/3} x\right)^2}} \sqrt{a-b x^3}}$$

Result (type 4, 166 leaves):

$$\frac{2 i \sqrt{\frac{a^{1/3}-b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}} \sqrt{1+\frac{b^{1/3} x}{a^{1/3}}+\frac{b^{2/3} x^2}{a^{2/3}}}\, \operatorname{EllipticPi}\left[\frac{i \sqrt{3}}{(-1)^{1/3}+2^{2/3}}, \operatorname{ArcSin}\left[\sqrt{\frac{a^{1/3}-(-1)^{2/3} b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}}\right],(-1)^{1/3}\right]}{\left((-1)^{1/3}+2^{2/3}\right) b^{1/3} \sqrt{a-b x^3}}$$

Problem 7: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 297 leaves, 4 steps):

$$-\frac{2 \operatorname{ArcTanh}\left[\frac{\sqrt{3} a^{1/6} \left(a^{1/3} - 2^{1/3} b^{1/3} x\right)}{\sqrt{-a+b x^3}}\right]}{3 \sqrt{3} \sqrt{a} b^{1/3}} - \frac{2 \times 2^{1/3} \sqrt{2-\sqrt{3}} \left(a^{1/3} - b^{1/3} x\right) \sqrt{\frac{a^{2/3} + a^{1/3} b^{1/3} x + b^{2/3} x^2}{\left(\left(1-\sqrt{3}\right) a^{1/3} - b^{1/3} x\right)^2}} \operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3} - b^{1/3} x}{\left(1-\sqrt{3}\right) a^{1/3} - b^{1/3} x}\right], -7 + 4\sqrt{3}\right]}{3 \times 3^{1/4} a^{1/3} b^{1/3} \sqrt{-\frac{a^{1/3} \left(a^{1/3} - b^{1/3} x\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3} - b^{1/3} x\right)^2}} \sqrt{-a + b x^3}}$$

Result (type 4, 167 leaves):

$$\frac{2 i \sqrt{\frac{a^{1/3} - b^{1/3} x}{\left(1 + (-1)^{1/3}\right) a^{1/3}}} \sqrt{1 + \frac{b^{1/3} x}{a^{1/3}} + \frac{b^{2/3} x^2}{a^{2/3}}} \operatorname{EllipticPi}\left[\frac{i \sqrt{3}}{(-1)^{1/3} + 2^{2/3}}, \operatorname{ArcSin}\left[\sqrt{\frac{a^{1/3} - (-1)^{2/3} b^{1/3} x}{\left(1 + (-1)^{1/3}\right) a^{1/3}}}\right], (-1)^{1/3}\right]}{\left((-1)^{1/3} + 2^{2/3}\right) b^{1/3} \sqrt{-a + b x^3}}$$

Problem 8: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 293 leaves, 4 steps):

$$\frac{2 \operatorname{ArcTanh}\left[\frac{\sqrt{3} a^{1/6} \left(a^{1/3} + 2^{1/3} b^{1/3} x\right)}{\sqrt{-a-b x^3}}\right]}{3 \sqrt{3} \sqrt{a} b^{1/3}} + \frac{2 \times 2^{1/3} \sqrt{2-\sqrt{3}} \left(a^{1/3} + b^{1/3} x\right) \sqrt{\frac{a^{2/3} - a^{1/3} b^{1/3} x + b^{2/3} x^2}{\left(\left(1-\sqrt{3}\right) a^{1/3} + b^{1/3} x\right)^2}} \operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3} + b^{1/3} x}{\left(1-\sqrt{3}\right) a^{1/3} + b^{1/3} x}\right], -7 + 4\sqrt{3}\right]}{3 \times 3^{1/4} a^{1/3} b^{1/3} \sqrt{-\frac{a^{1/3} \left(a^{1/3} + b^{1/3} x\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3} + b^{1/3} x\right)^2}} \sqrt{-a - b x^3}}$$

Result (type 4, 167 leaves):

$$-\frac{2 i \sqrt{\frac{a^{1/3} + b^{1/3} x}{\left(1 + (-1)^{1/3}\right) a^{1/3}}} \sqrt{1 - \frac{b^{1/3} x}{a^{1/3}} + \frac{b^{2/3} x^2}{a^{2/3}}} \operatorname{EllipticPi}\left[\frac{i \sqrt{3}}{(-1)^{1/3} + 2^{2/3}}, \operatorname{ArcSin}\left[\sqrt{\frac{a^{1/3} + (-1)^{2/3} b^{1/3} x}{\left(1 + (-1)^{1/3}\right) a^{1/3}}}\right], (-1)^{1/3}\right]}{\left((-1)^{1/3} + 2^{2/3}\right) b^{1/3} \sqrt{-a - b x^3}}$$

Problem 9: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{(c+d\,x)\,\sqrt{c^3+4\,d^3\,x^3}}\,dx$$

Optimal (type 4, 249 leaves, 4 steps):

$$\frac{2\,\text{ArcTan}\left[\frac{\sqrt{3}\,\sqrt{c}\,(c+2\,d\,x)}{\sqrt{c^3+4\,d^3\,x^3}}\right]}{3\,\sqrt{3}\,c^{3/2}\,d}+\frac{2\times 2^{1/3}\,\sqrt{2+\sqrt{3}}\,\left(c+2^{2/3}\,d\,x\right)\,\sqrt{\frac{c^2-2^{2/3}\,c\,d\,x+2\times 2^{1/3}\,d^2\,x^2}{\left(\left(1+\sqrt{3}\right)\,c+2^{2/3}\,d\,x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,c+2^{2/3}\,d\,x}{\left(1+\sqrt{3}\right)\,c+2^{2/3}\,d\,x}\right],\,-7-4\,\sqrt{3}\right]}{3\times 3^{1/4}\,c\,d\,\sqrt{\frac{c\,\left(c+2^{2/3}\,d\,x\right)}{\left(\left(1+\sqrt{3}\right)\,c+2^{2/3}\,d\,x\right)^2}}\,\sqrt{c^3+4\,d^3\,x^3}}$$

Result (type 4, 169 leaves):

$$-\left(\left(i\,2^{5/6}\,\sqrt{\frac{2^{1/3}\,c+2\,d\,x}{\left(1+(-1)^{1/3}\right)\,c}}\,\sqrt{2^{2/3}-\frac{2\times 2^{1/3}\,d\,x}{c}+\frac{4\,d^2\,x^2}{c^2}}\,\text{EllipticPi}\left[\frac{i\,2^{1/3}\,\sqrt{3}}{2+(-2)^{1/3}},\,\text{ArcSin}\left[\frac{\sqrt{\frac{2^{1/3}\,c+2\,(-1)^{2/3}\,d\,x}{\left(1+(-1)^{1/3}\right)\,c}}}{2^{1/6}}\right],\,(-1)^{1/3}\right]\right)\Big/\left(\left(2+(-2)^{1/3}\right)\,d\,\sqrt{c^3+4\,d^3\,x^3}\right)\right)$$

Problem 10: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 146 leaves, 4 steps):

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

Result (type 4, 136 leaves):

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

Problem 11: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 164 leaves, 4 steps):

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

Result (type 4, 136 leaves):

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

Problem 12: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 167 leaves, 4 steps):

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

Result (type 4, 134 leaves):

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

Problem 13: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 157 leaves, 4 steps):

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

Result (type 4, 138 leaves):

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

Problem 14: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 331 leaves, 8 steps):

$$\frac{(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{ArcTan}\left[\frac{\sqrt{\frac{13}{2}}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}}{\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}}\right]}{\sqrt{26}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}}+\frac{2\sqrt{26+15\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]}{3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}}+$$

$$\frac{4\times 3^{1/4}(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticPi}\left[97-56\sqrt{3},-\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]}{\sqrt{2-\sqrt{3}}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}}$$

Result (type 4, 128 leaves) :

$$-\frac{4\sqrt{2}\sqrt{\frac{i(1+x)}{3i+\sqrt{3}}}\sqrt{1-x+x^2}\,\text{EllipticPi}\left[\frac{2\sqrt{3}}{7i+\sqrt{3}},\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-2ix}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{3i+\sqrt{3}}\right]}{\left(7i+\sqrt{3}\right)\sqrt{1+x^3}}$$

Problem 15: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 382 leaves, 8 steps) :

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

$$\frac{4\times 3^{1/4}\sqrt{2+\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{EllipticPi}\left[\frac{1}{169}\left(553+304\sqrt{3}\right),-\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]}{13\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{1-x^3}}$$

Result (type 4, 128 leaves) :

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

Problem 16: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 376 leaves, 8 steps):

$$-\frac{(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{ArcTanh}\left[\frac{\sqrt{7}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}}{2\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}}\right]}{2\sqrt{7}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}}-\frac{2\sqrt{62-35\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]}{13\times 3^{1/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}}+$$

$$\frac{4\times 3^{1/4}\sqrt{2+\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{EllipticPi}\left[\frac{1}{169}\left(553+304\sqrt{3}\right),-\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]}{13\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}}$$

Result (type 4, 126 leaves):

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

Problem 17: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 342 leaves, 8 steps):

$$\frac{(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{ArcTan}\left[\frac{\sqrt{\frac{13}{2}}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}}{\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}}\right]}{\sqrt{26}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{-1-x^3}}+\frac{2(1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]}{3^{1/4}\sqrt{2-\sqrt{3}}\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\sqrt{-1-x^3}}+$$

$$\frac{4\times 3^{1/4}(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticPi}\left[97-56\sqrt{3},-\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]}{\sqrt{2-\sqrt{3}}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{-1-x^3}}$$

Result (type 4, 130 leaves):

$$-\frac{4\sqrt{2}\sqrt{\frac{i(1+x)}{3i+\sqrt{3}}}\sqrt{1-x+x^2}\,\text{EllipticPi}\left[\frac{2\sqrt{3}}{7i+\sqrt{3}},\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-2ix}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{3i+\sqrt{3}}\right]}{\left(7i+\sqrt{3}\right)\sqrt{-1-x^3}}$$

Problem 18: Unable to integrate problem.

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

Optimal (type 3, 139 leaves, 1 step):

$$\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{1-\frac{2^{1/3}(c-dx)}{\left(-c^3+d^3x^3\right)^{1/3}}}{\sqrt{3}}\right]}{2\times 2^{1/3}cd}+\frac{\text{Log}\left[(c-dx)(c+dx)^2\right]}{4\times 2^{1/3}cd}-\frac{3\,\text{Log}\left[d(c-dx)+2^{2/3}d\left(-c^3+d^3x^3\right)^{1/3}\right]}{4\times 2^{1/3}cd}$$

Result (type 8, 27 leaves):

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

Problem 19: Unable to integrate problem.

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

Optimal (type 3, 186 leaves, 3 steps):

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

Result (type 8, 27 leaves):

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

Problem 20: Unable to integrate problem.

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

Optimal (type 3, 187 leaves, 1 step):

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

Result (type 8, 27 leaves):

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

Problem 21: Unable to integrate problem.

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

Optimal (type 3, 147 leaves, 1 step):

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

Result (type 8, 23 leaves):

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

Problem 22: Unable to integrate problem.

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

Optimal (type 3, 159 leaves, 1 step):

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

Result (type 8, 26 leaves):

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

Problem 27: Unable to integrate problem.

$$\int \frac{\left(a+b\,x^3\right)^{1/3}}{c+d\,x}\,dx$$

Optimal (type 6, 435 leaves, 13 steps):

$$\frac{\left(a+b\,x^3\right)^{1/3}}{d}+\frac{x\,\left(a+b\,x^3\right)^{1/3}\,\text{AppellF1}\left[\frac{1}{3},-\frac{1}{3},1,\frac{4}{3},-\frac{b\,x^3}{a},-\frac{d^3\,x^3}{c^3}\right]}{c\,\left(1+\frac{b\,x^3}{a}\right)^{1/3}}+\frac{b^{1/3}\,c\,\text{ArcTan}\left[\frac{1+\frac{2\,b^{1/3}\,x}{\left(a+b\,x^3\right)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3}\,d^2}-$$

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

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

Result (type 8, 21 leaves):

$$\int \frac{\left(a+b\,x^3\right)^{1/3}}{c+d\,x}\,dx$$

Problem 28: Unable to integrate problem.

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

Optimal (type 6, 818 leaves, 20 steps):

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

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

$$\frac{b c^2 \text{Log}\left[c^3+d^3 x^3\right]}{6 d^2 \left(b c^3-a d^3\right)^{2/3}}-\frac{a d \text{Log}\left[c^3+d^3 x^3\right]}{9 c \left(b c^3-a d^3\right)^{2/3}}-\frac{\left(3 b c^3-2 a d^3\right) \text{Log}\left[c^3+d^3 x^3\right]}{18 c d^2 \left(b c^3-a d^3\right)^{2/3}}-\frac{b^{1/3} \text{Log}\left[b^{1/3} x-\left(a+b x^3\right)^{1/3}\right]}{2 d^2}+$$

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

Result (type 8, 21 leaves):

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

Problem 33: Unable to integrate problem.

$$\int \frac{1}{(c+d x) \left(a+b x^3\right)^{1/3}} \, dx$$

Optimal (type 6, 333 leaves, 10 steps):

$$-\frac{d x^2 \left(1+\frac{b x^3}{a}\right)^{1/3} \text{AppellF1}\left[\frac{2}{3},\frac{1}{3},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{d^3 x^3}{c^3}\right]}{2 c^2 \left(a+b x^3\right)^{1/3}}+\frac{\text{ArcTan}\left[\frac{1+\frac{2 \left(b c^3-a d^3\right)^{1/3} x}{c \left(a+b x^3\right)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3} \left(b c^3-a d^3\right)^{1/3}}-$$

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

Result (type 8, 21 leaves) :

$$\int \frac{1}{(c+d\,x)\,\left(a+b\,x^3\right)^{1/3}}\,dx$$

Problem 34: Unable to integrate problem.

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

Optimal (type 6, 761 leaves, 17 steps) :

$$\frac{c^2\,d^2\,\left(a+b\,x^3\right)^{2/3}}{\left(b\,c^3-a\,d^3\right)\,\left(c^3+d^3\,x^3\right)}-\frac{c\,d^3\,x\,\left(a+b\,x^3\right)^{2/3}}{\left(b\,c^3-a\,d^3\right)\,\left(c^3+d^3\,x^3\right)}-\frac{d\,x^2\,\left(1+\frac{b\,x^3}{a}\right)^{1/3}\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{3},2,\frac{5}{3},-\frac{b\,x^3}{a},-\frac{d^3\,x^3}{c^3}\right]}{c^3\,\left(a+b\,x^3\right)^{1/3}}+$$

$$\frac{d^4\,x^5\,\left(1+\frac{b\,x^3}{a}\right)^{1/3}\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{3},2,\frac{8}{3},-\frac{b\,x^3}{a},-\frac{d^3\,x^3}{c^3}\right]}{5\,c^6\,\left(a+b\,x^3\right)^{1/3}}+\frac{2\,a\,d^3\,\text{ArcTan}\left[\frac{1+\frac{2\,\left(b\,c^3-a\,d^3\right)^{1/3}\,x}{c\,\left(a+b\,x^3\right)^{1/3}}}{\sqrt{3}}\right]}{3\,\sqrt{3}\,c\,\left(b\,c^3-a\,d^3\right)^{4/3}}+\frac{\left(3\,b\,c^3-2\,a\,d^3\right)\,\text{ArcTan}\left[\frac{1+\frac{2\,\left(b\,c^3-a\,d^3\right)^{1/3}\,x}{c\,\left(a+b\,x^3\right)^{1/3}}}{\sqrt{3}}\right]}{3\,\sqrt{3}\,c\,\left(b\,c^3-a\,d^3\right)^{4/3}}-$$

$$\frac{b\,c^2\,\text{ArcTan}\left[\frac{1-\frac{2\,d\,\left(a+b\,x^3\right)^{1/3}}{\left(b\,c^3-a\,d^3\right)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3}\,\left(b\,c^3-a\,d^3\right)^{4/3}}+\frac{b\,c^2\,\text{Log}\left[c^3+d^3\,x^3\right]}{6\,\left(b\,c^3-a\,d^3\right)^{4/3}}+\frac{a\,d^3\,\text{Log}\left[c^3+d^3\,x^3\right]}{9\,c\,\left(b\,c^3-a\,d^3\right)^{4/3}}+\frac{\left(3\,b\,c^3-2\,a\,d^3\right)\,\text{Log}\left[c^3+d^3\,x^3\right]}{18\,c\,\left(b\,c^3-a\,d^3\right)^{4/3}}-$$

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

Result (type 8, 21 leaves) :

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

Problem 35: Unable to integrate problem.

$$\int \frac{1}{(c+d\,x)^3\,\left(a+b\,x^3\right)^{1/3}}\,dx$$

Optimal (type 6, 1513 leaves, 32 steps) :

$$\frac{3 c^4 d^2 \left(a+b x^3\right)^{2/3}}{2 \left(b c^3-a d^3\right) \left(c^3+d^3 x^3\right)^2}-\frac{3 c^3 d^3 x \left(a+b x^3\right)^{2/3}}{2 \left(b c^3-a d^3\right) \left(c^3+d^3 x^3\right)^2}+\frac{4 b c^4 d^2 \left(a+b x^3\right)^{2/3}}{3 \left(b c^3-a d^3\right)^2 \left(c^3+d^3 x^3\right)}-\frac{c d^2 \left(b c^3-3 a d^3\right) \left(a+b x^3\right)^{2/3}}{3 \left(b c^3-a d^3\right)^2 \left(c^3+d^3 x^3\right)}+$$

$$\frac{d^3 \left(3 b c^3-7 a d^3\right) x \left(a+b x^3\right)^{2/3}}{18 \left(b c^3-a d^3\right)^2 \left(c^3+d^3 x^3\right)}-\frac{d^3 \left(9 b c^3-5 a d^3\right) x \left(a+b x^3\right)^{2/3}}{18 \left(b c^3-a d^3\right)^2 \left(c^3+d^3 x^3\right)}-\frac{7 d^3 \left(3 b c^3+a d^3\right) x \left(a+b x^3\right)^{2/3}}{18 \left(b c^3-a d^3\right)^2 \left(c^3+d^3 x^3\right)}-$$

$$\frac{3 d x^2 \left(1+\frac{b x^3}{a}\right)^{1/3} \text{AppellF1}\left[\frac{2}{3},\frac{1}{3},3,\frac{5}{3},-\frac{b x^3}{a},-\frac{d^3 x^3}{c^3}\right]}{2 c^4 \left(a+b x^3\right)^{1/3}}+\frac{6 d^4 x^5 \left(1+\frac{b x^3}{a}\right)^{1/3} \text{AppellF1}\left[\frac{5}{3},\frac{1}{3},3,\frac{8}{3},-\frac{b x^3}{a},-\frac{d^3 x^3}{c^3}\right]}{5 c^7 \left(a+b x^3\right)^{1/3}}+\frac{2 a^2 d^6 \text{ArcTan}\left[\frac{1+\frac{2 \left(b c^3-a d^3\right)^{1/3} x}{c \left(a+b x^3\right)^{1/3}}}{\sqrt{3}}\right]}{9 \sqrt{3} c^2 \left(b c^3-a d^3\right)^{7/3}}+$$

$$\frac{7 a d^3 \left(3 b c^3-a d^3\right) \text{ArcTan}\left[\frac{1+\frac{2 \left(b c^3-a d^3\right)^{1/3} x}{c \left(a+b x^3\right)^{1/3}}}{\sqrt{3}}\right]}{9 \sqrt{3} c^2 \left(b c^3-a d^3\right)^{7/3}}+\frac{\left(9 b^2 c^6-12 a b c^3 d^3+5 a^2 d^6\right) \text{ArcTan}\left[\frac{1+\frac{2 \left(b c^3-a d^3\right)^{1/3} x}{c \left(a+b x^3\right)^{1/3}}}{\sqrt{3}}\right]}{9 \sqrt{3} c^2 \left(b c^3-a d^3\right)^{7/3}}-\frac{4 b^2 c^4 \text{ArcTan}\left[\frac{1-\frac{2 d \left(a+b x^3\right)^{1/3}}{\left(b c^3-a d^3\right)^{1/3}}}{\sqrt{3}}\right]}{3 \sqrt{3} \left(b c^3-a d^3\right)^{7/3}}+$$

$$\frac{b c \left(b c^3-3 a d^3\right) \text{ArcTan}\left[\frac{1-\frac{2 d \left(a+b x^3\right)^{1/3}}{\left(b c^3-a d^3\right)^{1/3}}}{\sqrt{3}}\right]}{3 \sqrt{3} \left(b c^3-a d^3\right)^{7/3}}+\frac{2 b^2 c^4 \text{Log}\left[c^3+d^3 x^3\right]}{9 \left(b c^3-a d^3\right)^{7/3}}+\frac{a^2 d^6 \text{Log}\left[c^3+d^3 x^3\right]}{27 c^2 \left(b c^3-a d^3\right)^{7/3}}-\frac{b c \left(b c^3-3 a d^3\right) \text{Log}\left[c^3+d^3 x^3\right]}{18 \left(b c^3-a d^3\right)^{7/3}}+$$

$$\frac{7 a d^3 \left(3 b c^3-a d^3\right) \text{Log}\left[c^3+d^3 x^3\right]}{54 c^2 \left(b c^3-a d^3\right)^{7/3}}+\frac{\left(9 b^2 c^6-12 a b c^3 d^3+5 a^2 d^6\right) \text{Log}\left[c^3+d^3 x^3\right]}{54 c^2 \left(b c^3-a d^3\right)^{7/3}}-\frac{a^2 d^6 \text{Log}\left[\frac{\left(b c^3-a d^3\right)^{1/3} x}{c}-\left(a+b x^3\right)^{1/3}\right]}{9 c^2 \left(b c^3-a d^3\right)^{7/3}}-$$

$$\frac{7 a d^3 \left(3 b c^3-a d^3\right) \text{Log}\left[\frac{\left(b c^3-a d^3\right)^{1/3} x}{c}-\left(a+b x^3\right)^{1/3}\right]}{18 c^2 \left(b c^3-a d^3\right)^{7/3}}-\frac{\left(9 b^2 c^6-12 a b c^3 d^3+5 a^2 d^6\right) \text{Log}\left[\frac{\left(b c^3-a d^3\right)^{1/3} x}{c}-\left(a+b x^3\right)^{1/3}\right]}{18 c^2 \left(b c^3-a d^3\right)^{7/3}}-$$

$$\frac{2 b^2 c^4 \text{Log}\left[\left(b c^3-a d^3\right)^{1/3}+d \left(a+b x^3\right)^{1/3}\right]}{3 \left(b c^3-a d^3\right)^{7/3}}+\frac{b c \left(b c^3-3 a d^3\right) \text{Log}\left[\left(b c^3-a d^3\right)^{1/3}+d \left(a+b x^3\right)^{1/3}\right]}{6 \left(b c^3-a d^3\right)^{7/3}}$$

Result (type 8, 21 leaves) :

$$\int \frac{1}{(c+d x)^3 \left(a+b x^3\right)^{1/3}} \, dx$$

Problem 40: Unable to integrate problem.

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

Optimal (type 6, 332 leaves, 10 steps) :

$$\frac{x\left(1+\frac{b x^3}{a}\right)^{2/3}\text{AppellF1}\left[\frac{1}{3},\frac{2}{3},1,\frac{4}{3},-\frac{b x^3}{a},-\frac{d^3 x^3}{c^3}\right]}{c\left(a+b x^3\right)^{2/3}}+\frac{d\,\text{ArcTan}\left[\frac{1+\frac{2\left(b c^3-a d^3\right)^{1/3}x}{c\left(a+b x^3\right)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3}\left(b c^3-a d^3\right)^{2/3}}-\frac{d\,\text{ArcTan}\left[\frac{1-\frac{2 d\left(a+b x^3\right)^{1/3}}{\left(b c^3-a d^3\right)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3}\left(b c^3-a d^3\right)^{2/3}}-\frac{d\,\text{Log}\left[c^3+d^3 x^3\right]}{3\left(b c^3-a d^3\right)^{2/3}}+\frac{d\,\text{Log}\left[\frac{\left(b c^3-a d^3\right)^{1/3}x}{c}-\left(a+b x^3\right)^{1/3}\right]}{2\left(b c^3-a d^3\right)^{2/3}}+\frac{d\,\text{Log}\left[\left(b c^3-a d^3\right)^{1/3}+d\left(a+b x^3\right)^{1/3}\right]}{2\left(b c^3-a d^3\right)^{2/3}}$$

Result (type 8, 21 leaves) :

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

Problem 41: Unable to integrate problem.

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

Optimal (type 6, 760 leaves, 18 steps) :

$$\frac{c^2 d^2\left(a+b x^3\right)^{1/3}}{\left(b c^3-a d^3\right)\left(c^3+d^3 x^3\right)}+\frac{d^4 x^2\left(a+b x^3\right)^{1/3}}{\left(b c^3-a d^3\right)\left(c^3+d^3 x^3\right)}+\frac{x\left(1+\frac{b x^3}{a}\right)^{2/3}\text{AppellF1}\left[\frac{1}{3},\frac{2}{3},2,\frac{4}{3},-\frac{b x^3}{a},-\frac{d^3 x^3}{c^3}\right]}{c^2\left(a+b x^3\right)^{2/3}}-\frac{d^3 x^4\left(1+\frac{b x^3}{a}\right)^{2/3}\text{AppellF1}\left[\frac{4}{3},\frac{2}{3},2,\frac{7}{3},-\frac{b x^3}{a},-\frac{d^3 x^3}{c^3}\right]}{2 c^5\left(a+b x^3\right)^{2/3}}+\frac{2 a d^4\,\text{ArcTan}\left[\frac{1+\frac{2\left(b c^3-a d^3\right)^{1/3}x}{c\left(a+b x^3\right)^{1/3}}}{\sqrt{3}}\right]}{3\sqrt{3}\,c\left(b c^3-a d^3\right)^{5/3}}+\frac{2 d\left(3 b c^3-a d^3\right)\text{ArcTan}\left[\frac{1+\frac{2\left(b c^3-a d^3\right)^{1/3}x}{c\left(a+b x^3\right)^{1/3}}}{\sqrt{3}}\right]}{3\sqrt{3}\,c\left(b c^3-a d^3\right)^{5/3}}-\frac{2 b c^2 d\,\text{ArcTan}\left[\frac{1-\frac{2 d\left(a+b x^3\right)^{1/3}}{\left(b c^3-a d^3\right)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3}\left(b c^3-a d^3\right)^{5/3}}-\frac{b c^2 d\,\text{Log}\left[c^3+d^3 x^3\right]}{3\left(b c^3-a d^3\right)^{5/3}}-\frac{a d^4\,\text{Log}\left[c^3+d^3 x^3\right]}{9 c\left(b c^3-a d^3\right)^{5/3}}-\frac{d\left(3 b c^3-a d^3\right)\text{Log}\left[c^3+d^3 x^3\right]}{9 c\left(b c^3-a d^3\right)^{5/3}}+\frac{a d^4\,\text{Log}\left[\frac{\left(b c^3-a d^3\right)^{1/3}x}{c}-\left(a+b x^3\right)^{1/3}\right]}{3 c\left(b c^3-a d^3\right)^{5/3}}+\frac{d\left(3 b c^3-a d^3\right)\text{Log}\left[\frac{\left(b c^3-a d^3\right)^{1/3}x}{c}-\left(a+b x^3\right)^{1/3}\right]}{3 c\left(b c^3-a d^3\right)^{5/3}}+\frac{b c^2 d\,\text{Log}\left[\left(b c^3-a d^3\right)^{1/3}+d\left(a+b x^3\right)^{1/3}\right]}{\left(b c^3-a d^3\right)^{5/3}}$$

Result (type 8, 21 leaves) :

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

Problem 42: Unable to integrate problem.

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

Optimal (type 6, 1357 leaves, 30 steps):

$$\frac{3\,c^4\,d^2\,\left(a+b\,x^3\right)^{1/3}}{2\,\left(b\,c^3-a\,d^3\right)\,\left(c^3+d^3\,x^3\right)^2}+\frac{3\,c^2\,d^4\,x^2\,\left(a+b\,x^3\right)^{1/3}}{2\,\left(b\,c^3-a\,d^3\right)\,\left(c^3+d^3\,x^3\right)^2}+\frac{5\,b\,c^4\,d^2\,\left(a+b\,x^3\right)^{1/3}}{3\,\left(b\,c^3-a\,d^3\right)^2\,\left(c^3+d^3\,x^3\right)}-\frac{c\,d^2\,\left(b\,c^3-6\,a\,d^3\right)\,\left(a+b\,x^3\right)^{1/3}}{6\,\left(b\,c^3-a\,d^3\right)^2\,\left(c^3+d^3\,x^3\right)}+$$

$$\frac{d^4\,\left(9\,b\,c^3-4\,a\,d^3\right)\,x^2\,\left(a+b\,x^3\right)^{1/3}}{6\,c\,\left(b\,c^3-a\,d^3\right)^2\,\left(c^3+d^3\,x^3\right)}+\frac{d^4\,\left(3\,b\,c^3+2\,a\,d^3\right)\,x^2\,\left(a+b\,x^3\right)^{1/3}}{3\,c\,\left(b\,c^3-a\,d^3\right)^2\,\left(c^3+d^3\,x^3\right)}+\frac{x\,\left(1+\frac{b\,x^3}{a}\right)^{2/3}\,\text{AppellF1}\left[\frac{1}{3},\frac{2}{3},3,\frac{4}{3},-\frac{b\,x^3}{a},-\frac{d^3\,x^3}{c^3}\right]}{c^3\,\left(a+b\,x^3\right)^{2/3}}-$$

$$\frac{7\,d^3\,x^4\,\left(1+\frac{b\,x^3}{a}\right)^{2/3}\,\text{AppellF1}\left[\frac{4}{3},\frac{2}{3},3,\frac{7}{3},-\frac{b\,x^3}{a},-\frac{d^3\,x^3}{c^3}\right]}{4\,c^6\,\left(a+b\,x^3\right)^{2/3}}+\frac{d^6\,x^7\,\left(1+\frac{b\,x^3}{a}\right)^{2/3}\,\text{AppellF1}\left[\frac{7}{3},\frac{2}{3},3,\frac{10}{3},-\frac{b\,x^3}{a},-\frac{d^3\,x^3}{c^3}\right]}{7\,c^9\,\left(a+b\,x^3\right)^{2/3}}+$$

$$\frac{2\,a\,d^4\,\left(6\,b\,c^3-a\,d^3\right)\,\text{ArcTan}\left[\frac{1+\frac{2\,\left(b\,c^3-a\,d^3\right)^{1/3}\,x}{c\,\left(a+b\,x^3\right)^{1/3}}}{\sqrt{3}}\right]}{3\,\sqrt{3}\,c^2\,\left(b\,c^3-a\,d^3\right)^{8/3}}+\frac{d\,\left(9\,b^2\,c^6-6\,a\,b\,c^3\,d^3+2\,a^2\,d^6\right)\,\text{ArcTan}\left[\frac{1+\frac{2\,\left(b\,c^3-a\,d^3\right)^{1/3}\,x}{c\,\left(a+b\,x^3\right)^{1/3}}}{\sqrt{3}}\right]}{3\,\sqrt{3}\,c^2\,\left(b\,c^3-a\,d^3\right)^{8/3}}-$$

$$\frac{10\,b^2\,c^4\,d\,\text{ArcTan}\left[\frac{1-\frac{2\,d\,\left(a+b\,x^3\right)^{1/3}}{\left(b\,c^3-a\,d^3\right)^{1/3}}}{\sqrt{3}}\right]}{3\,\sqrt{3}\,\left(b\,c^3-a\,d^3\right)^{8/3}}+\frac{b\,c\,d\,\left(b\,c^3-6\,a\,d^3\right)\,\text{ArcTan}\left[\frac{1-\frac{2\,d\,\left(a+b\,x^3\right)^{1/3}}{\left(b\,c^3-a\,d^3\right)^{1/3}}}{\sqrt{3}}\right]}{3\,\sqrt{3}\,\left(b\,c^3-a\,d^3\right)^{8/3}}-\frac{5\,b^2\,c^4\,d\,\text{Log}\left[c^3+d^3\,x^3\right]}{9\,\left(b\,c^3-a\,d^3\right)^{8/3}}+$$

$$\frac{b\,c\,d\,\left(b\,c^3-6\,a\,d^3\right)\,\text{Log}\left[c^3+d^3\,x^3\right]}{18\,\left(b\,c^3-a\,d^3\right)^{8/3}}-\frac{a\,d^4\,\left(6\,b\,c^3-a\,d^3\right)\,\text{Log}\left[c^3+d^3\,x^3\right]}{9\,c^2\,\left(b\,c^3-a\,d^3\right)^{8/3}}-\frac{d\,\left(9\,b^2\,c^6-6\,a\,b\,c^3\,d^3+2\,a^2\,d^6\right)\,\text{Log}\left[c^3+d^3\,x^3\right]}{18\,c^2\,\left(b\,c^3-a\,d^3\right)^{8/3}}+$$

$$\frac{a\,d^4\,\left(6\,b\,c^3-a\,d^3\right)\,\text{Log}\left[\frac{\left(b\,c^3-a\,d^3\right)^{1/3}\,x}{c}-\left(a+b\,x^3\right)^{1/3}\right]}{3\,c^2\,\left(b\,c^3-a\,d^3\right)^{8/3}}+\frac{d\,\left(9\,b^2\,c^6-6\,a\,b\,c^3\,d^3+2\,a^2\,d^6\right)\,\text{Log}\left[\frac{\left(b\,c^3-a\,d^3\right)^{1/3}\,x}{c}-\left(a+b\,x^3\right)^{1/3}\right]}{6\,c^2\,\left(b\,c^3-a\,d^3\right)^{8/3}}+$$

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

Result (type 8, 21 leaves):

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

Problem 43: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 326 leaves):

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

Problem 44: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 40 leaves, 2 steps):

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

Result (type 4, 327 leaves):

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

Problem 45: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 325 leaves):

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

Problem 46: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 39 leaves, 2 steps):

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

Result (type 4, 328 leaves):

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

Problem 47: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 63 leaves, 2 steps):

$$\frac{2\times 2^{2/3}\,\text{ArcTan}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}+2^{1/3}b^{1/3}x\right)}{\sqrt{a+b x^3}}\right]}{\sqrt{3}\,a^{1/6}\,b^{1/3}}$$

Result (type 4, 325 leaves):

$$\frac{1}{\sqrt{3}\, b^{1/3} \sqrt{a+b x^3}} 2 \sqrt{\frac{a^{1/3}+b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}} \left(\frac{2 \times 3^{1/4} \left((-1)^{1/3} a^{1/3}-b^{1/3} x\right) \sqrt{(-1)^{1/6}-\frac{i\, b^{1/3} x}{a^{1/3}}}\ \text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{a^{1/3}+(-1)^{2/3} b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}}\right], (-1)^{1/3}\right]}{\sqrt{\frac{a^{1/3}+(-1)^{2/3} b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}}} - \frac{1}{(-1)^{1/3}+2^{2/3}}\right.$$

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

Problem 48: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 65 leaves, 2 steps):

$$-\frac{2 \times 2^{2/3} \text{ArcTan}\left[\frac{\sqrt{3}\, a^{1/6} \left(a^{1/3}-2^{1/3} b^{1/3} x\right)}{\sqrt{a-b x^3}}\right]}{\sqrt{3}\, a^{1/6} b^{1/3}}$$

Result (type 4, 336 leaves):

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

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

Problem 49: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 66 leaves, 2 steps):

$$-\frac{2\times 2^{2/3}\,\text{ArcTanh}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}-2^{1/3}b^{1/3}x\right)}{\sqrt{-a+b x^3}}\right]}{\sqrt{3}\,a^{1/6}\,b^{1/3}}$$

Result (type 4, 390 leaves):

$$-\left(\left(2\sqrt{\frac{a^{1/3}-b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right.\right.$$

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

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

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

Problem 50: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 66 leaves, 2 steps):

$$\frac{2\times 2^{2/3}\,\text{ArcTanh}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}+2^{1/3}b^{1/3}x\right)}{\sqrt{-a-b x^3}}\right]}{\sqrt{3}\,a^{1/6}\,b^{1/3}}$$

Result (type 4, 375 leaves):

$$-\left(\left(2\sqrt{\frac{a^{1/3}+b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right.\right.$$

$$\left(-\frac{1}{3^{1/4}}2\left((-1)^{1/3}+2^{2/3}\right)\left((-1)^{1/3}a^{1/3}-b^{1/3}x\right)\sqrt{(-1)^{1/6}-\frac{i\,b^{1/3}x}{a^{1/3}}}\;\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{a^{1/3}+(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right],(-1)^{1/3}\right]+\right.$$

$$(-1)^{1/3}2^{2/3}\sqrt{3}\left(1+(-1)^{1/3}\right)a^{1/3}\sqrt{\frac{a^{1/3}+(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\sqrt{1-\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}$$

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

Problem 51: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{c-2\,d\,x}{(c+d\,x)\sqrt{c^3+4\,d^3\,x^3}}\,dx$$

Optimal (type 3, 49 leaves, 2 steps):

$$\frac{2\,\text{ArcTan}\left[\frac{\sqrt{3}\sqrt{c}\,(c+2\,d\,x)}{\sqrt{c^3+4\,d^3\,x^3}}\right]}{\sqrt{3}\sqrt{c}\,d}$$

Result (type 4, 373 leaves):

$$\left(2^{1/6}\sqrt{\frac{2^{1/3}c+2dx}{\left(1+(-1)^{1/3}\right)c}}\right.$$

$$\left(2\sqrt{\frac{(-2)^{1/3}c-2(-1)^{2/3}dx}{\left(1+(-1)^{1/3}\right)c}}\left(\left((-1)^{1/3}\left(2+(-2)^{1/3}\right)c-2\left((-1)^{1/3}+2^{2/3}\right)dx\right)\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{2^{1/3}c+2(-1)^{2/3}dx}{\left(1+(-1)^{1/3}\right)c}}}{2^{1/6}}\right],(-1)^{1/3}\right]-\right.\right.$$

$$(-1)^{1/3}2^{2/3}\sqrt{3}\left(1+(-1)^{1/3}\right)c\sqrt{\frac{2^{1/3}c+2(-1)^{2/3}dx}{\left(1+(-1)^{1/3}\right)c}}\sqrt{2^{2/3}-\frac{2\times2^{1/3}dx}{c}+\frac{4d^2x^2}{c^2}}$$

$$\left.\left.\text{EllipticPi}\left[\frac{i\,2^{1/3}\sqrt{3}}{2+(-2)^{1/3}},\text{ArcSin}\left[\frac{\sqrt{\frac{2^{1/3}c+2(-1)^{2/3}dx}{\left(1+(-1)^{1/3}\right)c}}}{2^{1/6}}\right],(-1)^{1/3}\right]\right)\right)\Big/\left(\left(2+(-2)^{1/3}\right)d\sqrt{\frac{2^{1/3}c+2(-1)^{2/3}dx}{\left(1+(-1)^{1/3}\right)c}}\sqrt{c^3+4d^3x^3}\right)$$

Problem 52: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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

$$\frac{2\left(2-3\times2^{2/3}\right)\text{ArcTan}\left[\frac{\sqrt{3}\left(1+2^{1/3}x\right)}{\sqrt{1+x^3}}\right]}{3\sqrt{3}}+\frac{2\left(3+2\times2^{1/3}\right)\sqrt{2+\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]}{3\times3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}}$$

Result (type 4, 336 leaves) :

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

Problem 53: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 173 leaves, 4 steps):

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

Result (type 4, 335 leaves):

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

Problem 54: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 176 leaves, 4 steps):

$$-\frac{2\left(2+3\times 2^{2/3}\right)\text{ArcTanh}\left[\frac{\sqrt{3}\left(1-2^{1/3}x\right)}{\sqrt{-1+x^3}}\right]}{3\sqrt{3}}+\frac{2\left(3-2\times 2^{1/3}\right)\sqrt{2-\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]}{3\times 3^{1/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}}$$

Result (type 4, 333 leaves):

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

Problem 55: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 169 leaves, 4 steps):

$$\frac{2\left(2-3\times 2^{2/3}\right)\text{ArcTanh}\left[\frac{\sqrt{3}\left(1+2^{1/3}x\right)}{\sqrt{-1-x^3}}\right]}{3\sqrt{3}}+\frac{2\left(3+2\times 2^{1/3}\right)\sqrt{2-\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]}{3\times 3^{1/4}\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\sqrt{-1-x^3}}$$

Result (type 4, 338 leaves):

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

Problem 56: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 159 leaves, 4 steps):

$$\frac{2\left(e-2^{2/3}f\right)\text{ArcTan}\left[\frac{\sqrt{3}\left(1+2^{1/3}x\right)}{\sqrt{1+x^3}}\right]}{3\sqrt{3}}+\frac{2\sqrt{2+\sqrt{3}}\left(2^{1/3}e+f\right)(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]}{3\times 3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}}$$

Result (type 4, 340 leaves):

$$\left(2\times 2^{1/6}\sqrt{\frac{\mathrm{i}\,(1+x)}{3\,\mathrm{i}+\sqrt{3}}}\left(f\sqrt{-\mathrm{i}+\sqrt{3}+2\,\mathrm{i}\,x}\left(-6-3\times 2^{1/3}-2\,\mathrm{i}\sqrt{3}+\mathrm{i}\,2^{1/3}\sqrt{3}+\left(3\times 2^{1/3}+4\,\mathrm{i}\sqrt{3}+\mathrm{i}\,2^{1/3}\sqrt{3}\right)x\right)\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\mathrm{i}+\sqrt{3}-2\,\mathrm{i}\,x}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{3\,\mathrm{i}+\sqrt{3}}\right]-2\sqrt{3}\left(2^{1/3}e-2f\right)\sqrt{\mathrm{i}+\sqrt{3}-2\,\mathrm{i}\,x}\sqrt{1-x+x^2}\,\text{EllipticPi}\left[\frac{2\sqrt{3}}{\mathrm{i}+2\,\mathrm{i}\,2^{2/3}+\sqrt{3}},\text{ArcSin}\left[\frac{\sqrt{\mathrm{i}+\sqrt{3}-2\,\mathrm{i}\,x}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{3\,\mathrm{i}+\sqrt{3}}\right]\right)\right)\Big/\left(\sqrt{3}\left(\mathrm{i}+2\,\mathrm{i}\,2^{2/3}+\sqrt{3}\right)\sqrt{\mathrm{i}+\sqrt{3}-2\,\mathrm{i}\,x}\sqrt{1+x^3}\right)$$

Problem 57: Result unnecessarily involves imaginary or complex numbers.

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

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

$$-\frac{2 \left(e+2^{2/3} f\right) \text{ArcTan}\left[\frac{\sqrt{3} \left(1-2^{1/3} x\right)}{\sqrt{1-x^3}}\right]}{3 \sqrt{3}}-\frac{2 \sqrt{2+\sqrt{3}} \left(2^{1/3} e-f\right) (1-x) \sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4 \sqrt{3}\right]}{3\times 3^{1/4} \sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}} \sqrt{1-x^3}}$$

Result (type 4, 340 leaves):

$$\left(2\times 2^{1/6} \sqrt{-\frac{i (-1+x)}{3 i+\sqrt{3}}} \left(-i f \sqrt{-i+\sqrt{3}-2 i x} \left(-6 i-3 i 2^{1/3}+2 \sqrt{3}-2^{1/3} \sqrt{3}+\left(-3 i 2^{1/3}+4 \sqrt{3}+2^{1/3} \sqrt{3}\right) x\right) \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}+2 i x}}{\sqrt{2}\, 3^{1/4}}\right],\frac{2 \sqrt{3}}{3 i+\sqrt{3}}\right]+2 \sqrt{3} \left(2^{1/3} e+2 f\right) \sqrt{i+\sqrt{3}+2 i x} \sqrt{1+x+x^2} \text{EllipticPi}\left[\frac{2 \sqrt{3}}{i+2 i 2^{2/3}+\sqrt{3}},\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}+2 i x}}{\sqrt{2}\, 3^{1/4}}\right],\frac{2 \sqrt{3}}{3 i+\sqrt{3}}\right]\right)\right)\Big/\left(\sqrt{3} \left(i+2 i 2^{2/3}+\sqrt{3}\right) \sqrt{i+\sqrt{3}+2 i x} \sqrt{1-x^3}\right)$$

Problem 58: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 178 leaves, 4 steps):

$$-\frac{2 \left(e+2^{2/3} f\right) \text{ArcTanh}\left[\frac{\sqrt{3} \left(1-2^{1/3} x\right)}{\sqrt{-1+x^3}}\right]}{3 \sqrt{3}}-\frac{2 \sqrt{2-\sqrt{3}} \left(2^{1/3} e-f\right) (1-x) \sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4 \sqrt{3}\right]}{3\times 3^{1/4} \sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}} \sqrt{-1+x^3}}$$

Result (type 4, 338 leaves):

$$\left(2\times 2^{1/6}\sqrt{-\frac{i\,(-1+x)}{3\,i+\sqrt{3}}}\left(-i\,f\,\sqrt{-i+\sqrt{3}-2\,i\,x}\,\left(-6\,i-3\,i\,2^{1/3}+2\,\sqrt{3}-2^{1/3}\,\sqrt{3}+\left(-3\,i\,2^{1/3}+4\,\sqrt{3}+2^{1/3}\,\sqrt{3}\right)x\right)\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}+2\,i\,x}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\,\sqrt{3}}{3\,i+\sqrt{3}}\right]+2\,\sqrt{3}\,\left(2^{1/3}\,e+2\,f\right)\sqrt{i+\sqrt{3}+2\,i\,x}\,\sqrt{1+x+x^2}\,\text{EllipticPi}\left[\frac{2\,\sqrt{3}}{i+2\,i\,2^{2/3}+\sqrt{3}},\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}+2\,i\,x}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\,\sqrt{3}}{3\,i+\sqrt{3}}\right]\right)\right)\Big/\left(\sqrt{3}\,\left(i+2\,i\,2^{2/3}+\sqrt{3}\right)\sqrt{i+\sqrt{3}+2\,i\,x}\,\sqrt{-1+x^3}\right)$$

Problem 59: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 170 leaves, 4 steps):

$$\frac{2\,\left(e-2^{2/3}\,f\right)\text{ArcTanh}\left[\frac{\sqrt{3}\,\left(1+2^{1/3}\,x\right)}{\sqrt{-1-x^3}}\right]}{3\,\sqrt{3}}+\frac{2\,\sqrt{2-\sqrt{3}}\,\left(2^{1/3}\,e+f\right)\,(1+x)\,\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\,\sqrt{3}\right]}{3\times 3^{1/4}\,\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\,\sqrt{-1-x^3}}$$

Result (type 4, 342 leaves):

$$\left(2\times 2^{1/6}\sqrt{\frac{i\,(1+x)}{3\,i+\sqrt{3}}}\left(f\,\sqrt{-i+\sqrt{3}+2\,i\,x}\,\left(-6-3\times 2^{1/3}-2\,i\,\sqrt{3}+i\,2^{1/3}\,\sqrt{3}+\left(3\times 2^{1/3}+4\,i\,\sqrt{3}+i\,2^{1/3}\,\sqrt{3}\right)x\right)\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-2\,i\,x}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\,\sqrt{3}}{3\,i+\sqrt{3}}\right]-2\,\sqrt{3}\,\left(2^{1/3}\,e-2\,f\right)\sqrt{i+\sqrt{3}-2\,i\,x}\,\sqrt{1-x+x^2}\,\text{EllipticPi}\left[\frac{2\,\sqrt{3}}{i+2\,i\,2^{2/3}+\sqrt{3}},\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-2\,i\,x}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\,\sqrt{3}}{3\,i+\sqrt{3}}\right]\right)\right)\Big/\left(\sqrt{3}\,\left(i+2\,i\,2^{2/3}+\sqrt{3}\right)\sqrt{i+\sqrt{3}-2\,i\,x}\,\sqrt{-1-x^3}\right)$$

Problem 60: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 316 leaves, 4 steps):

$$\frac{2 \left(b^{1/3} e-2^{2/3} a^{1/3} f\right) \text{ArcTan}\left[\frac{\sqrt{3}\, a^{1/6} \left(a^{1/3}+2^{1/3} b^{1/3} x\right)}{\sqrt{a+b x^3}}\right]}{3 \sqrt{3} \sqrt{a}\, b^{2/3}}+\left(2 \sqrt{2+\sqrt{3}} \left(2^{1/3} b^{1/3} e+a^{1/3} f\right) \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right], -7-4 \sqrt{3}\right]\right) \Big/ \left(3\times 3^{1/4} a^{1/3} b^{2/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{a+b x^3}\right)$$

Result (type 4, 336 leaves):

$$\frac{1}{\sqrt{3}\, b^{2/3} \sqrt{a+b x^3}} 2 \sqrt{\frac{a^{1/3}+b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}} \left(-\frac{3^{1/4} f \left((-1)^{1/3} a^{1/3}-b^{1/3} x\right) \sqrt{(-1)^{1/6}-\frac{i\, b^{1/3} x}{a^{1/3}}}\, \text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{a^{1/3}+(-1)^{2/3} b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}}\right], (-1)^{1/3}\right]}{\sqrt{\frac{a^{1/3}+(-1)^{2/3} b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}}}+\frac{1}{(-1)^{1/3}+2^{2/3}} (-1)^{1/3} \left(1+(-1)^{1/3}\right) \left(-b^{1/3} e+2^{2/3} a^{1/3} f\right) \sqrt{1-\frac{b^{1/3} x}{a^{1/3}}+\frac{b^{2/3} x^2}{a^{2/3}}}\, \text{EllipticPi}\left[\frac{i \sqrt{3}}{(-1)^{1/3}+2^{2/3}}, \text{ArcSin}\left[\sqrt{\frac{a^{1/3}+(-1)^{2/3} b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}}\right], (-1)^{1/3}\right]\right)$$

Problem 61: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 324 leaves, 4 steps):

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

$$\left(2 \sqrt{2+\sqrt{3}}\left(2^{1/3} b^{1/3} e-a^{1/3} f\right)\left(a^{1/3}-b^{1/3} x\right) \sqrt{\frac{a^{2/3}+a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}-b^{1/3} x\right)^2}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}-b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}-b^{1/3} x}\right],-7-4 \sqrt{3}\right]\right)\Big/$$

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

Result (type 4, 399 leaves):

$$\left(2 \sqrt{\frac{a^{1/3}-b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}}\right.$$

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

$$\frac{1}{\sqrt{3}}(-1)^{1/3}\left(1+(-1)^{1/3}\right)\left(b^{1/3} e+2^{2/3} a^{1/3} f\right) \sqrt{\frac{a^{1/3}-(-1)^{2/3} b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}} \sqrt{1+\frac{b^{1/3} x}{a^{1/3}}+\frac{b^{2/3} x^2}{a^{2/3}}}$$

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

Problem 62: Result unnecessarily involves imaginary or complex numbers.

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

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

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

$$\left(2\sqrt{2-\sqrt{3}}\,\left(2^{1/3}b^{1/3}e-a^{1/3}f\right)\left(a^{1/3}-b^{1/3}x\right)\sqrt{\frac{a^{2/3}+a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x}{\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x}\right],-7+4\sqrt{3}\right]\right)\Big/$$

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

Result (type 4, 400 leaves) :

$$\left(2\sqrt{\frac{a^{1/3}-b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right.$$

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

$$\frac{1}{\sqrt{3}}(-1)^{1/3}\left(1+(-1)^{1/3}\right)\left(b^{1/3}e+2^{2/3}a^{1/3}f\right)\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\,\sqrt{1+\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}$$

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

Problem 63: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 329 leaves, 4 steps) :

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

$$\left(2\sqrt{2-\sqrt{3}}\,\left(2^{1/3}b^{1/3}e+a^{1/3}f\right)\left(a^{1/3}+b^{1/3}x\right)\sqrt{\frac{a^{2/3}-a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x}{\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}x}\right],-7+4\sqrt{3}\right]\right)\Big/$$

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

Result (type 4, 387 leaves) :

$$\left(2\sqrt{\frac{a^{1/3}+b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(-\frac{1}{3^{1/4}}\left((-1)^{1/3}+2^{2/3}\right)f\left((-1)^{1/3}a^{1/3}-b^{1/3}x\right)\sqrt{(-1)^{1/6}-\frac{i\,b^{1/3}x}{a^{1/3}}}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{a^{1/3}+(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right],(-1)^{1/3}\right]+\right.\right.$$

$$\frac{1}{\sqrt{3}}(-1)^{1/3}\left(1+(-1)^{1/3}\right)\left(-b^{1/3}e+2^{2/3}a^{1/3}f\right)\sqrt{\frac{a^{1/3}+(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\sqrt{1-\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}$$

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

Problem 64: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{e+f\,x}{(c+d\,x)\,\sqrt{c^3+4\,d^3x^3}}\,dx$$

Optimal (type 4, 265 leaves, 4 steps) :

$$\frac{2\,(d\,e-c\,f)\,\text{ArcTan}\left[\frac{\sqrt{3}\,\sqrt{c}\,(c+2\,d\,x)}{\sqrt{c^3+4\,d^3\,x^3}}\right]}{3\,\sqrt{3}\,c^{3/2}\,d^2}+$$

$$\left(2^{1/3}\,\sqrt{2+\sqrt{3}}\,(2\,d\,e+c\,f)\,(c+2^{2/3}\,d\,x)\,\sqrt{\frac{c^2-2^{2/3}\,c\,d\,x+2\times 2^{1/3}\,d^2\,x^2}{\left(\left(1+\sqrt{3}\right)\,c+2^{2/3}\,d\,x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,c+2^{2/3}\,d\,x}{\left(1+\sqrt{3}\right)\,c+2^{2/3}\,d\,x}\right],\,-7-4\,\sqrt{3}\right]\right)\Big/$$

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

Result (type 4, 380 leaves) :

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

$$\left(-f\,\sqrt{\frac{(-2)^{1/3}\,c-2\,(-1)^{2/3}\,d\,x}{\left(1+(-1)^{1/3}\right)\,c}}\,\left(\left((-1)^{1/3}\,\left(2+(-2)^{1/3}\right)\,c-2\,\left((-1)^{1/3}+2^{2/3}\right)\,d\,x\right)\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{2^{1/3}\,c+2\,(-1)^{2/3}\,d\,x}{\left(1+(-1)^{1/3}\right)\,c}}}{2^{1/6}}\right],\,(-1)^{1/3}\right]+\right.\right.$$

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

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

Problem 65: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 145 leaves, 4 steps) :

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

Result (type 4, 207 leaves) :

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

Problem 66: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 160 leaves, 4 steps) :

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

Result (type 4, 209 leaves) :

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

Problem 67: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 163 leaves, 4 steps):

$$-\frac{2\times2^{2/3}\,\text{ArcTanh}\left[\frac{\sqrt{3}\left(1-2^{1/3}x\right)}{\sqrt{-1+x^3}}\right]}{3\sqrt{3}}+\frac{2\sqrt{2-\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]}{3\times3^{1/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}}$$

Result (type 4, 207 leaves):

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

Problem 68: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 156 leaves, 4 steps):

$$-\frac{2\times 2^{2/3}\,\text{ArcTanh}\left[\frac{\sqrt{3}\,\left(1+2^{1/3}\,x\right)}{\sqrt{-1-x^3}}\right]}{3\sqrt{3}}+\frac{2\sqrt{2-\sqrt{3}}\,\left(1+x\right)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],\,-7+4\sqrt{3}\right]}{3\times 3^{1/4}\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\,\sqrt{-1-x^3}}$$

Result (type 4, 209 leaves):

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

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

Problem 69: Result unnecessarily involves imaginary or complex numbers.

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

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

$$-\frac{2\times 2^{2/3}\,\text{ArcTan}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}+2^{1/3}\,b^{1/3}\,x\right)}{\sqrt{a+b\,x^3}}\right]}{3\sqrt{3}\,a^{1/6}\,b^{2/3}}+\frac{2\sqrt{2+\sqrt{3}}\,\left(a^{1/3}+b^{1/3}\,x\right)\sqrt{\frac{a^{2/3}-a^{1/3}\,b^{1/3}\,x+b^{2/3}\,x^2}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\,x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}\,x}{\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\,x}\right],\,-7-4\sqrt{3}\right]}{3\times 3^{1/4}\,b^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}\,x\right)^2}}\,\sqrt{a+b\,x^3}}$$

Result (type 4, 324 leaves):

$$\frac{1}{\sqrt{3}\; b^{2/3}\sqrt{a+b\,x^3}}$$

$$2\sqrt{\frac{a^{1/3}+b^{1/3}\,x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(-\frac{3^{1/4}\left((-1)^{1/3}a^{1/3}-b^{1/3}\,x\right)\sqrt{(-1)^{1/6}-\frac{i\,b^{1/3}\,x}{a^{1/3}}}\;\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{a^{1/3}+(-1)^{2/3}b^{1/3}\,x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right],\,(-1)^{1/3}\right]}{\sqrt{\frac{a^{1/3}+(-1)^{2/3}b^{1/3}\,x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}}+\frac{1}{(-1)^{1/3}+2^{2/3}}\right.$$

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

Problem 70: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 283 leaves, 4 steps):

$$-\frac{2\times 2^{2/3}\,\text{ArcTan}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}-2^{1/3}b^{1/3}\,x\right)}{\sqrt{a-b\,x^3}}\right]}{3\sqrt{3}\,a^{1/6}\,b^{2/3}}+\frac{2\sqrt{2+\sqrt{3}}\left(a^{1/3}-b^{1/3}\,x\right)\sqrt{\frac{a^{2/3}+a^{1/3}b^{1/3}\,x+b^{2/3}\,x^2}{\left(\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}\,x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}\,x}{\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}\,x}\right],\,-7-4\sqrt{3}\right]}{3\times 3^{1/4}\,b^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}-b^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}\,x\right)^2}}\sqrt{a-b\,x^3}}$$

Result (type 4, 388 leaves):

$$-\left(\left(2\sqrt{\frac{a^{1/3}-b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(\left((-1)^{1/3}+2^{2/3}\right)\left((-1)^{1/3}a^{1/3}+b^{1/3}x\right)\sqrt{\frac{(-1)^{1/3}\left(a^{1/3}+(-1)^{1/3}b^{1/3}x\right)}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right],(-1)^{1/3}\right]-\frac{1}{\sqrt{3}}(-1)^{1/3}2^{2/3}\left(1+(-1)^{1/3}\right)a^{1/3}\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\sqrt{1+\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}\,\text{EllipticPi}\left[\frac{i\sqrt{3}}{(-1)^{1/3}+2^{2/3}},\text{ArcSin}\left[\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right],(-1)^{1/3}\right]\right)\right)\Big/\left(\left((-1)^{1/3}+2^{2/3}\right)b^{2/3}\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\sqrt{a-b\,x^3}\right)\right)$$

Problem 71: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 292 leaves, 4 steps):

$$-\frac{2\times 2^{2/3}\,\text{ArcTanh}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}-2^{1/3}b^{1/3}x\right)}{\sqrt{-a+b\,x^3}}\right]}{3\sqrt{3}\,a^{1/6}b^{2/3}}+\frac{2\sqrt{2-\sqrt{3}}\left(a^{1/3}-b^{1/3}x\right)\sqrt{\frac{a^{2/3}+a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x}{\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x}\right],-7+4\sqrt{3}\right]}{3\times 3^{1/4}b^{2/3}\sqrt{-\frac{a^{1/3}\left(a^{1/3}-b^{1/3}x\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\sqrt{-a+b\,x^3}}$$

Result (type 4, 389 leaves):

$$-\left(\left(2\sqrt{\frac{a^{1/3}-b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(\left((-1)^{1/3}+2^{2/3}\right)\left((-1)^{1/3}a^{1/3}+b^{1/3}x\right)\sqrt{\frac{(-1)^{1/3}\left(a^{1/3}+(-1)^{1/3}b^{1/3}x\right)}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right],(-1)^{1/3}\right]-\frac{1}{\sqrt{3}}(-1)^{1/3}2^{2/3}\left(1+(-1)^{1/3}\right)a^{1/3}\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\sqrt{1+\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}\,\text{EllipticPi}\left[\frac{i\sqrt{3}}{(-1)^{1/3}+2^{2/3}},\text{ArcSin}\left[\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right],(-1)^{1/3}\right]\right)\right)\bigg/\left(\left((-1)^{1/3}+2^{2/3}\right)b^{2/3}\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\sqrt{-a+b x^3}\right)\right)$$

Problem 72: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 288 leaves, 4 steps):

$$-\frac{2\times 2^{2/3}\,\text{ArcTanh}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}+2^{1/3}b^{1/3}x\right)}{\sqrt{-a-b x^3}}\right]}{3\sqrt{3}\,a^{1/6}b^{2/3}}+\frac{2\sqrt{2-\sqrt{3}}\left(a^{1/3}+b^{1/3}x\right)\sqrt{\frac{a^{2/3}-a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x}{\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}x}\right],-7+4\sqrt{3}\right]}{3\times 3^{1/4}b^{2/3}\sqrt{-\frac{a^{1/3}\left(a^{1/3}+b^{1/3}x\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\sqrt{-a-b x^3}}$$

Result (type 4, 375 leaves):

$$\left(2\sqrt{\frac{a^{1/3}+b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right.$$

$$\left(-\frac{1}{3^{1/4}}\left((-1)^{1/3}+2^{2/3}\right)\left((-1)^{1/3}a^{1/3}-b^{1/3}x\right)\sqrt{(-1)^{1/6}-\frac{\mathrm{i}\,b^{1/3}x}{a^{1/3}}}\;\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{a^{1/3}+(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right],(-1)^{1/3}\right]+\frac{1}{\sqrt{3}}(-1)^{1/3}\,2^{2/3}\right.$$

$$\left.\left.\left(1+(-1)^{1/3}\right)a^{1/3}\sqrt{\frac{a^{1/3}+(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\sqrt{1-\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}\;\text{EllipticPi}\left[\frac{\mathrm{i}\sqrt{3}}{(-1)^{1/3}+2^{2/3}},\text{ArcSin}\left[\sqrt{\frac{a^{1/3}+(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right],(-1)^{1/3}\right]\right)\right)\Big/$$

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

Problem 73: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x}{(c+d\,x)\sqrt{c^3+4\,d^3x^3}}\,dx$$

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

$$-\frac{2\,\text{ArcTan}\left[\frac{\sqrt{3}\sqrt{c}\,(c+2\,d\,x)}{\sqrt{c^3+4\,d^3x^3}}\right]}{3\sqrt{3}\sqrt{c}\,d^2}+\frac{2^{1/3}\sqrt{2+\sqrt{3}}\,\left(c+2^{2/3}d\,x\right)\sqrt{\frac{c^2-2^{2/3}c\,d\,x+2\times2^{1/3}d^2x^2}{\left(\left(1+\sqrt{3}\right)c+2^{2/3}d\,x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)c+2^{2/3}d\,x}{\left(1+\sqrt{3}\right)c+2^{2/3}d\,x}\right],-7-4\sqrt{3}\right]}{3\times3^{1/4}d^2\sqrt{\frac{c\left(c+2^{2/3}d\,x\right)}{\left(\left(1+\sqrt{3}\right)c+2^{2/3}d\,x\right)^2}}\sqrt{c^3+4\,d^3x^3}}$$

Result (type 4, 372 leaves) :

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

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

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

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

Problem 74: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 265 leaves):

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

Problem 75: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 27 leaves, 2 steps):

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

Result (type 4, 262 leaves):

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

Problem 76: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 25 leaves, 2 steps):

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

Result (type 4, 260 leaves):

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

Problem 77: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 25 leaves, 2 steps):

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

Result (type 4, 267 leaves):

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

Problem 78: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 50 leaves, 2 steps):

$$\frac{2\,\text{ArcTanh}\left[\frac{\left(a^{1/3}+b^{1/3}x\right)^2}{3a^{1/6}\sqrt{a+bx^3}}\right]}{3a^{1/6}b^{1/3}}$$

Result (type 4, 407 leaves):

$$\left(2\sqrt{\frac{a^{1/3}+b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right.$$

$$\left(-\frac{1}{2\sqrt{2}}3^{1/4}\left(\left(\mathrm{i}+\sqrt{3}\right)a^{1/3}-\left(-\mathrm{i}+\sqrt{3}\right)b^{1/3}x\right)\sqrt{\mathrm{i}+\sqrt{3}-\frac{2\,\mathrm{i}\,b^{1/3}x}{a^{1/3}}}\;\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]+3\,\mathrm{i}\right.$$

$$\left.\left.a^{1/3}\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\sqrt{1-\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}\;\text{EllipticPi}\left[\frac{2\sqrt{3}}{3\,\mathrm{i}+\sqrt{3}},\text{ArcSin}\left[\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]\right)\right)\Big/$$

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

Problem 79: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 52 leaves, 2 steps):

$$-\frac{2\,\text{ArcTanh}\left[\frac{\left(a^{1/3}-b^{1/3}x\right)^2}{3\,a^{1/6}\sqrt{a-b\,x^3}}\right]}{3\,a^{1/6}\,b^{1/3}}$$

Result (type 4, 370 leaves):

$$-\left(\left(2\sqrt{\frac{a^{1/3}-b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right.\right.$$

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

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

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

Problem 80: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 53 leaves, 2 steps):

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

Result (type 4, 371 leaves):

$$-\left(\left(2\sqrt{\frac{a^{1/3}-b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right.\right.$$

$$\left(\left(-2+(-1)^{1/3}\right)\left((-1)^{1/3}a^{1/3}+b^{1/3}x\right)\sqrt{\frac{(-1)^{1/3}\left(a^{1/3}+(-1)^{1/3}b^{1/3}x\right)}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\ \texttt{EllipticF}\left[\texttt{ArcSin}\left[\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right],(-1)^{1/3}\right]+(-1)^{1/3}\sqrt{3}\right.$$

$$\left.\left.\left(1+(-1)^{1/3}\right)a^{1/3}\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\sqrt{1+\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}\ \texttt{EllipticPi}\left[\frac{2\sqrt{3}}{3\,\mathrm{i}+\sqrt{3}},\texttt{ArcSin}\left[\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right],(-1)^{1/3}\right]\right)\right)\Big/$$

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

Problem 81: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 53 leaves, 2 steps):

$$\frac{2\,\texttt{ArcTan}\left[\frac{\left(a^{1/3}+b^{1/3}x\right)^2}{3\,a^{1/6}\sqrt{-a-b\,x^3}}\right]}{3\,a^{1/6}\,b^{1/3}}$$

Result (type 4, 410 leaves):

$$\left(2\sqrt{\frac{a^{1/3}+b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(-\frac{1}{2\sqrt{2}}3^{1/4}\left(\left(\mathrm{i}+\sqrt{3}\right)a^{1/3}-\left(-\mathrm{i}+\sqrt{3}\right)b^{1/3}x\right)\sqrt{\mathrm{i}+\sqrt{3}-\frac{2\,\mathrm{i}\,b^{1/3}x}{a^{1/3}}}\;\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]+3\,\mathrm{i}\,a^{1/3}\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\sqrt{1-\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}\;\text{EllipticPi}\left[\frac{2\sqrt{3}}{3\,\mathrm{i}+\sqrt{3}},\text{ArcSin}\left[\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]\right)\right)\Big/\left(\left(-2+(-1)^{1/3}\right)b^{1/3}\sqrt{\frac{a^{1/3}+(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\sqrt{-a-b\,x^3}\right)$$

Problem 82: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{c-2\,d\,x}{(c+d\,x)\sqrt{c^3-8\,d^3x^3}}\,dx$$

Optimal (type 3, 46 leaves, 2 steps):

$$-\frac{2\,\text{ArcTanh}\left[\frac{(c-2\,d\,x)^2}{3\sqrt{c}\,\sqrt{c^3-8\,d^3x^3}}\right]}{3\sqrt{c}\,d}$$

Result (type 4, 295 leaves):

$$-\left(\left(2\sqrt{\frac{c-2\,d\,x}{\left(1+(-1)^{1/3}\right)c}}\left(\left(-2+(-1)^{1/3}\right)\left((-1)^{1/3}c+2\,d\,x\right)\sqrt{\frac{(-1)^{1/3}\left(c+2\,(-1)^{1/3}d\,x\right)}{\left(1+(-1)^{1/3}\right)c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{c-2\,(-1)^{2/3}d\,x}{\left(1+(-1)^{1/3}\right)c}}\right],(-1)^{1/3}\right]+(-1)^{1/3}\sqrt{3}\left(1+(-1)^{1/3}\right)c\sqrt{\frac{c-2\,(-1)^{2/3}d\,x}{\left(1+(-1)^{1/3}\right)c}}\sqrt{\frac{c^2+2\,c\,d\,x+4\,d^2x^2}{c^2}}\;\text{EllipticPi}\left[\frac{2\sqrt{3}}{3\,\mathrm{i}+\sqrt{3}},\text{ArcSin}\left[\sqrt{\frac{c-2\,(-1)^{2/3}d\,x}{\left(1+(-1)^{1/3}\right)c}}\right],(-1)^{1/3}\right]\right)\right)\Big/\left(\left(-2+(-1)^{1/3}\right)d\sqrt{\frac{c-2\,(-1)^{2/3}d\,x}{\left(1+(-1)^{1/3}\right)c}}\sqrt{c^3-8\,d^3x^3}\right)\right)$$

Problem 83: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{e+f x}{(2-x)\sqrt{1+x^3}}\,dx$$

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

$$\frac{2}{9}(e+2 f)\,\text{ArcTanh}\left[\frac{(1+x)^2}{3\sqrt{1+x^3}}\right]+\frac{2\sqrt{2+\sqrt{3}}\,(e-f)\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]}{3\times 3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}}$$

Result (type 4, 273 leaves):

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

Problem 84: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{e+f x}{(2+x)\sqrt{1-x^3}}\,dx$$

Optimal (type 4, 153 leaves, 4 steps):

$$-\frac{2}{9}(e-2 f)\,\text{ArcTanh}\left[\frac{(1-x)^2}{3\sqrt{1-x^3}}\right]-\frac{2\sqrt{2+\sqrt{3}}\,(e+f)\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]}{3\times 3^{1/4}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{1-x^3}}$$

Result (type 4, 271 leaves):

$$\left(2\sqrt{\frac{2}{3}}\sqrt{\frac{i(-1+x)}{-3i+\sqrt{3}}}\left(3f\sqrt{i+\sqrt{3}+2ix}\left(-1+i\sqrt{3}+x+i\sqrt{3}x\right)\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-i+\sqrt{3}-2ix}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{-3i+\sqrt{3}}\right]-2\sqrt{3}(e-2f)\sqrt{-i+\sqrt{3}-2ix}\sqrt{1+x+x^2}\,\text{EllipticPi}\left[\frac{2\sqrt{3}}{3i+\sqrt{3}},\text{ArcSin}\left[\frac{\sqrt{-i+\sqrt{3}-2ix}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{-3i+\sqrt{3}}\right]\right)\right)\Big/\left(\left(3i+\sqrt{3}\right)\sqrt{-i+\sqrt{3}-2ix}\sqrt{1-x^3}\right)$$

Problem 85: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{e+fx}{(2+x)\sqrt{-1+x^3}}\,dx$$

Optimal (type 4, 156 leaves, 4 steps):

$$-\frac{2}{9}(e-2f)\,\text{ArcTan}\left[\frac{(1-x)^2}{3\sqrt{-1+x^3}}\right]-\frac{2\sqrt{2-\sqrt{3}}\,(e+f)(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]}{3\times 3^{1/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}}$$

Result (type 4, 269 leaves):

$$\left(2\sqrt{\frac{2}{3}}\sqrt{\frac{i(-1+x)}{-3i+\sqrt{3}}}\left(3f\sqrt{i+\sqrt{3}+2ix}\left(-1+i\sqrt{3}+x+i\sqrt{3}x\right)\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-i+\sqrt{3}-2ix}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{-3i+\sqrt{3}}\right]-2\sqrt{3}(e-2f)\sqrt{-i+\sqrt{3}-2ix}\sqrt{1+x+x^2}\,\text{EllipticPi}\left[\frac{2\sqrt{3}}{3i+\sqrt{3}},\text{ArcSin}\left[\frac{\sqrt{-i+\sqrt{3}-2ix}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{-3i+\sqrt{3}}\right]\right)\right)\Big/\left(\left(3i+\sqrt{3}\right)\sqrt{-i+\sqrt{3}-2ix}\sqrt{-1+x^3}\right)$$

Problem 86: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{e+fx}{(2-x)\sqrt{-1-x^3}}\,dx$$

Optimal (type 4, 150 leaves, 4 steps):

$$\frac{2}{9}\left(e+2 f\right) \text{ArcTan}\left[\frac{(1+x)^2}{3 \sqrt{-1-x^3}}\right]+\frac{2 \sqrt{2-\sqrt{3}}\ (e-f)\ (1+x) \sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4 \sqrt{3}\right]}{3\times 3^{1/4} \sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\ \sqrt{-1-x^3}}$$

Result (type 4, 275 leaves):

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

Problem 87: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 297 leaves, 4 steps):

$$\frac{2 \left(b^{1/3} e+2 a^{1/3} f\right) \text{ArcTanh}\left[\frac{\left(a^{1/3}+b^{1/3} x\right)^2}{3 a^{1/6} \sqrt{a+b x^3}}\right]}{9 \sqrt{a}\ b^{2/3}}+$$
$$\left(2 \sqrt{2+\sqrt{3}}\ \left(b^{1/3} e-a^{1/3} f\right) \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]\right)\Bigg/$$
$$\left(3\times 3^{1/4} a^{1/3} b^{2/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\ \sqrt{a+b x^3}\right)$$

Result (type 4, 419 leaves):

$$\left(2\sqrt{\frac{a^{1/3}+b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right.$$

$$\left(-\frac{1}{2\sqrt{2}}3^{1/4}f\left(\left(\text{i}+\sqrt{3}\right)a^{1/3}-\left(-\text{i}+\sqrt{3}\right)b^{1/3}x\right)\sqrt{\text{i}+\sqrt{3}-\frac{2\,\text{i}\,b^{1/3}x}{a^{1/3}}}\ \text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{-2\,\text{i}\,a^{1/3}+\left(\text{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\text{i}+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+\text{i}\sqrt{3}\right)\right]+\right.$$

$$\text{i}\left(b^{1/3}e+2a^{1/3}f\right)\sqrt{\frac{-2\,\text{i}\,a^{1/3}+\left(\text{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\text{i}+\sqrt{3}\right)a^{1/3}}}\sqrt{1-\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}$$

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

Problem 88: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 304 leaves, 4 steps):

$$-\frac{2\left(b^{1/3}e-2a^{1/3}f\right)\text{ArcTanh}\left[\frac{\left(a^{1/3}-b^{1/3}x\right)^2}{3a^{1/6}\sqrt{a-b\,x^3}}\right]}{9\sqrt{a}\,b^{2/3}}-$$

$$\left(2\sqrt{2+\sqrt{3}}\left(b^{1/3}e+a^{1/3}f\right)\left(a^{1/3}-b^{1/3}x\right)\sqrt{\frac{a^{2/3}+a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x}{\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x}\right],-7-4\sqrt{3}\right]\right)\Bigg/$$

$$\left(3\times3^{1/4}a^{1/3}b^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}-b^{1/3}x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\sqrt{a-b\,x^3}\right)$$

Result (type 4, 447 leaves):

$$\frac{1}{\left(-2+(-1)^{1/3}\right) b^{2/3} \sqrt{\frac{a^{1/3}-(-1)^{2/3} b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}} \sqrt{a-b x^3}}$$

$$2 \sqrt{\frac{a^{1/3}-b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}} \left(-\frac{1}{2} i f \sqrt{\frac{\left(-i+\sqrt{3}\right) a^{1/3}+\left(i+\sqrt{3}\right) b^{1/3} x}{\left(-3 i+\sqrt{3}\right) a^{1/3}}} \left(\left(-3 i+\sqrt{3}\right) a^{1/3}-\left(3 i+\sqrt{3}\right) b^{1/3} x\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{-\frac{i \left(2 a^{1/3}+\left(1-i \sqrt{3}\right) b^{1/3} x\right)}{\left(-3 i+\sqrt{3}\right) a^{1/3}}}\right], \frac{1}{2} \left(1+i \sqrt{3}\right)\right]-i \left(b^{1/3} e-2 a^{1/3} f\right) \sqrt{-\frac{i \left(2 a^{1/3}+\left(1-i \sqrt{3}\right) b^{1/3} x\right)}{\left(-3 i+\sqrt{3}\right) a^{1/3}}}$$

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

Problem 89: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 313 leaves, 4 steps):

$$-\frac{2 \left(b^{1/3} e-2 a^{1/3} f\right) \text{ArcTan}\left[\frac{\left(a^{1/3}-b^{1/3} x\right)^2}{3 a^{1/6} \sqrt{-a+b x^3}}\right]}{9 \sqrt{a}\, b^{2/3}}-$$

$$\left(2 \sqrt{2-\sqrt{3}} \left(b^{1/3} e+a^{1/3} f\right) \left(a^{1/3}-b^{1/3} x\right) \sqrt{\frac{a^{2/3}+a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1-\sqrt{3}\right) a^{1/3}-b^{1/3} x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-b^{1/3} x}{\left(1-\sqrt{3}\right) a^{1/3}-b^{1/3} x}\right], -7+4 \sqrt{3}\right]\right) \Big/$$

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

Result (type 4, 448 leaves):

$$\frac{1}{\left(-2+(-1)^{1/3}\right) b^{2/3} \sqrt{\frac{a^{1/3}-(-1)^{2/3} b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}} \sqrt{-a+b x^3}}$$

$$2 \sqrt{\frac{a^{1/3}-b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}} \left(-\frac{1}{2} \mathrm{i} f \sqrt{\frac{\left(-\mathrm{i}+\sqrt{3}\right) a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right) b^{1/3} x}{\left(-3 \mathrm{i}+\sqrt{3}\right) a^{1/3}}} \left(\left(-3 \mathrm{i}+\sqrt{3}\right) a^{1/3}-\left(3 \mathrm{i}+\sqrt{3}\right) b^{1/3} x\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{-\frac{\mathrm{i}\left(2 a^{1/3}+\left(1-\mathrm{i}\sqrt{3}\right) b^{1/3} x\right)}{\left(-3 \mathrm{i}+\sqrt{3}\right) a^{1/3}}}\right], \frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]-\mathrm{i}\left(b^{1/3} e-2 a^{1/3} f\right) \sqrt{-\frac{\mathrm{i}\left(2 a^{1/3}+\left(1-\mathrm{i}\sqrt{3}\right) b^{1/3} x\right)}{\left(-3 \mathrm{i}+\sqrt{3}\right) a^{1/3}}}$$

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

Problem 90: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 310 leaves, 4 steps):

$$\frac{2\left(b^{1/3} e+2 a^{1/3} f\right) \text{ArcTan}\left[\frac{\left(a^{1/3}+b^{1/3} x\right)^2}{3 a^{1/6} \sqrt{-a-b x^3}}\right]}{9 \sqrt{a}\, b^{2/3}}+$$

$$\left(2 \sqrt{2-\sqrt{3}} \left(b^{1/3} e-a^{1/3} f\right)\left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right], -7+4\sqrt{3}\right]\right) \Big/$$

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

Result (type 4, 422 leaves):

$$\left(2\sqrt{\frac{a^{1/3}+b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right.$$

$$\left(-\frac{1}{2\sqrt{2}}3^{1/4} f\left(\left(\mathrm{i}+\sqrt{3}\right)a^{1/3}-\left(-\mathrm{i}+\sqrt{3}\right)b^{1/3}x\right)\sqrt{\mathrm{i}+\sqrt{3}-\frac{2\,\mathrm{i}\,b^{1/3}x}{a^{1/3}}}\ \text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]+\right.$$

$$\mathrm{i}\left(b^{1/3}e+2a^{1/3}f\right)\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\sqrt{1-\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}$$

$$\left.\left.\text{EllipticPi}\left[\frac{2\sqrt{3}}{3\,\mathrm{i}+\sqrt{3}},\text{ArcSin}\left[\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]\right)\right)\Bigg/\left(\left(-2+(-1)^{1/3}\right)b^{2/3}\sqrt{\frac{a^{1/3}+(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\sqrt{-a-b x^3}\right)$$

Problem 91: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{e+f x}{(c+d x)\sqrt{c^3-8 d^3 x^3}}\,dx$$

Optimal (type 4, 221 leaves, 4 steps):

$$-\frac{2\,(d e-c f)\,\text{ArcTanh}\left[\frac{(c-2 d x)^2}{3\sqrt{c}\sqrt{c^3-8 d^3 x^3}}\right]}{9\,c^{3/2}\,d^2}-\frac{\sqrt{2+\sqrt{3}}\,(2 d e+c f)\,(c-2 d x)\sqrt{\frac{c^2+2 c d x+4 d^2 x^2}{\left(\left(1+\sqrt{3}\right)c-2 d x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)c-2 d x}{\left(1+\sqrt{3}\right)c-2 d x}\right],-7-4\sqrt{3}\right]}{3\times 3^{1/4}\,c\,d^2\sqrt{\frac{c\,(c-2 d x)}{\left(\left(1+\sqrt{3}\right)c-2 d x\right)^2}}\sqrt{c^3-8 d^3 x^3}}$$

Result (type 4, 384 leaves):

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

$$\left(f\sqrt{\frac{\left(-\mathrm{i}+\sqrt{3}\right)c+2\left(\mathrm{i}+\sqrt{3}\right)d\,x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)c}}\left(\left(-3\,\mathrm{i}+\sqrt{3}\right)c-2\left(3\,\mathrm{i}+\sqrt{3}\right)d\,x\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{2}\sqrt{\frac{\mathrm{i}\,c+\mathrm{i}\,d\,x+\sqrt{3}\,d\,x}{3\,\mathrm{i}\,c-\sqrt{3}\,c}}\right],\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]+\right.$$

$$4\sqrt{2}\,(d\,e-c\,f)\sqrt{\frac{\mathrm{i}\,c+\mathrm{i}\,d\,x+\sqrt{3}\,d\,x}{3\,\mathrm{i}\,c-\sqrt{3}\,c}}\sqrt{\frac{c^2+2\,c\,d\,x+4\,d^2\,x^2}{c^2}}\,\text{EllipticPi}\left[\frac{2\sqrt{3}}{3\,\mathrm{i}+\sqrt{3}},\right.$$

$$\left.\left.\left.\text{ArcSin}\left[\sqrt{2}\sqrt{\frac{\mathrm{i}\,c+\mathrm{i}\,d\,x+\sqrt{3}\,d\,x}{3\,\mathrm{i}\,c-\sqrt{3}\,c}}\right],\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]\right)\right)\Bigg/\left(2\left(-2+(-1)^{1/3}\right)d^2\sqrt{\frac{c-2\,(-1)^{2/3}\,d\,x}{\left(1+(-1)^{1/3}\right)c}}\sqrt{c^3-8\,d^3\,x^3}\right)\right)$$

Problem 92: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 129 leaves, 4 steps):

$$\frac{4}{9}\,\text{ArcTanh}\left[\frac{(1+x)^2}{3\sqrt{1+x^3}}\right]-\frac{2\sqrt{2+\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]}{3\times3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}}$$

Result (type 4, 193 leaves):

$$\frac{1}{\sqrt{1+x^3}}2\sqrt{\frac{1+x}{1+(-1)^{1/3}}}$$

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

Problem 93: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 145 leaves, 4 steps):

$$\frac{4}{9}\,\text{ArcTanh}\left[\frac{(1-x)^2}{3\sqrt{1-x^3}}\right]-\frac{2\sqrt{2+\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]}{3\times 3^{1/4}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\,\sqrt{1-x^3}}$$

Result (type 4, 195 leaves):

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

Problem 94: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 148 leaves, 4 steps):

$$\frac{4}{9}\,\text{ArcTan}\left[\frac{(1-x)^2}{3\sqrt{-1+x^3}}\right]-\frac{2\sqrt{2-\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]}{3\times 3^{1/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\,\sqrt{-1+x^3}}$$

Result (type 4, 193 leaves):

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

Problem 95: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 140 leaves, 4 steps):

$$\frac{4}{9}\text{ArcTan}\left[\frac{(1+x)^2}{3\sqrt{-1-x^3}}\right]-\frac{2\sqrt{2-\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]}{3\times 3^{1/4}\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\sqrt{-1-x^3}}$$

Result (type 4, 195 leaves):

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

Problem 96: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 260 leaves, 4 steps):

$$\frac{4\,\text{ArcTanh}\left[\frac{\left(a^{1/3}+b^{1/3}x\right)^2}{3\,a^{1/6}\sqrt{a+b\,x^3}}\right]}{9\,a^{1/6}\,b^{2/3}}-\frac{2\sqrt{2+\sqrt{3}}\,\left(a^{1/3}+b^{1/3}x\right)\sqrt{\frac{a^{2/3}-a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}x}{\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x}\right],-7-4\sqrt{3}\right]}{3\times 3^{1/4}\,b^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3}x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\,\sqrt{a+b\,x^3}}$$

Result (type 4, 407 leaves):

$$\left(\sqrt{\frac{a^{1/3}+b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(-\sqrt{2}\,3^{1/4}\left(\left(i+\sqrt{3}\right)a^{1/3}-\left(-i+\sqrt{3}\right)b^{1/3}x\right)\sqrt{i+\sqrt{3}-\frac{2\,i\,b^{1/3}x}{a^{1/3}}}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{-2\,i\,a^{1/3}+\left(i+\sqrt{3}\right)b^{1/3}x}{\left(-3\,i+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+i\sqrt{3}\right)\right]+8\,i\,a^{1/3}\sqrt{\frac{-2\,i\,a^{1/3}+\left(i+\sqrt{3}\right)b^{1/3}x}{\left(-3\,i+\sqrt{3}\right)a^{1/3}}}\sqrt{1-\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}\,\text{EllipticPi}\left[\frac{2\sqrt{3}}{3\,i+\sqrt{3}},\text{ArcSin}\left[\sqrt{\frac{-2\,i\,a^{1/3}+\left(i+\sqrt{3}\right)b^{1/3}x}{\left(-3\,i+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+i\sqrt{3}\right)\right]\right)\right)\Big/\left(2\left(-2+(-1)^{1/3}\right)b^{2/3}\sqrt{\frac{a^{1/3}+(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\,\sqrt{a+b\,x^3}\right)$$

Problem 97: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 268 leaves, 4 steps):

$$\frac{4\,\text{ArcTanh}\left[\frac{\left(a^{1/3}-b^{1/3}x\right)^2}{3\,a^{1/6}\sqrt{a-b\,x^3}}\right]}{9\,a^{1/6}\,b^{2/3}}-\frac{2\sqrt{2+\sqrt{3}}\,\left(a^{1/3}-b^{1/3}x\right)\sqrt{\frac{a^{2/3}+a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x}{\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x}\right],-7-4\sqrt{3}\right]}{3\times 3^{1/4}\,b^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}-b^{1/3}x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\,\sqrt{a-b\,x^3}}$$

Result (type 4, 371 leaves):

$$\left(2\sqrt{\frac{a^{1/3}-b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right.$$

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

$$\frac{1}{\sqrt{3}}2(-1)^{1/3}\left(1+(-1)^{1/3}\right)a^{1/3}\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\sqrt{1+\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}$$

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

Problem 98: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 277 leaves, 4 steps):

$$\frac{4\,\text{ArcTan}\left[\frac{\left(a^{1/3}-b^{1/3}x\right)^2}{3\,a^{1/6}\sqrt{-a+b\,x^3}}\right]}{9\,a^{1/6}\,b^{2/3}}-\frac{2\sqrt{2-\sqrt{3}}\left(a^{1/3}-b^{1/3}x\right)\sqrt{\frac{a^{2/3}+a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x}{\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x}\right],-7+4\sqrt{3}\right]}{3\times3^{1/4}\,b^{2/3}\sqrt{-\frac{a^{1/3}\left(a^{1/3}-b^{1/3}x\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\sqrt{-a+b\,x^3}}$$

Result (type 4, 372 leaves):

$$\left(2\sqrt{\frac{a^{1/3}-b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right.$$

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

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

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

Problem 99: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 273 leaves, 4 steps):

$$\frac{4\,\text{ArcTan}\left[\frac{\left(a^{1/3}+b^{1/3}x\right)^2}{3\,a^{1/6}\sqrt{-a-b\,x^3}}\right]}{9\,a^{1/6}\,b^{2/3}}-\frac{2\sqrt{2-\sqrt{3}}\left(a^{1/3}+b^{1/3}x\right)\sqrt{\frac{a^{2/3}-a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x}{\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}x}\right],-7+4\sqrt{3}\right]}{3\times3^{1/4}\,b^{2/3}\sqrt{-\frac{a^{1/3}\left(a^{1/3}+b^{1/3}x\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\sqrt{-a-b\,x^3}}$$

Result (type 4, 410 leaves):

$$\left(\sqrt{\frac{a^{1/3}+b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right.$$

$$\left(-\sqrt{2}\,3^{1/4}\left(\left(\mathrm{i}+\sqrt{3}\right)a^{1/3}-\left(-\mathrm{i}+\sqrt{3}\right)b^{1/3}x\right)\sqrt{\mathrm{i}+\sqrt{3}-\frac{2\,\mathrm{i}\,b^{1/3}x}{a^{1/3}}}\ \text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]+8\,\mathrm{i}\right.$$

$$\left.\left.a^{1/3}\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\sqrt{1-\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}\ \text{EllipticPi}\left[\frac{2\sqrt{3}}{3\,\mathrm{i}+\sqrt{3}},\text{ArcSin}\left[\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]\right)\right)\Big/$$

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

Problem 100: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x}{(c+d\,x)\sqrt{c^3-8\,d^3x^3}}\,dx$$

Optimal (type 4, 202 leaves, 4 steps):

$$\frac{2\,\text{ArcTanh}\left[\frac{(c-2\,d\,x)^2}{3\sqrt{c}\sqrt{c^3-8\,d^3x^3}}\right]}{9\sqrt{c}\,d^2}-\frac{\sqrt{2+\sqrt{3}}\,(c-2\,d\,x)\sqrt{\frac{c^2+2\,c\,d\,x+4\,d^2x^2}{\left(\left(1+\sqrt{3}\right)c-2\,d\,x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)c-2\,d\,x}{\left(1+\sqrt{3}\right)c-2\,d\,x}\right],-7-4\sqrt{3}\right]}{3\times3^{1/4}d^2\sqrt{\frac{c\,(c-2\,d\,x)}{\left(\left(1+\sqrt{3}\right)c-2\,d\,x\right)^2}}\sqrt{c^3-8\,d^3x^3}}$$

Result (type 4, 295 leaves):

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

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

$$\left(\left(-2+(-1)^{1/3}\right)d^2\sqrt{\frac{c-2\,(-1)^{2/3}d\,x}{\left(1+(-1)^{1/3}\right)c}}\sqrt{c^3-8\,d^3x^3}\right)$$

Problem 101: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 42 leaves, 2 steps):

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

Result (type 4, 267 leaves):

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

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

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

Problem 102: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 46 leaves, 2 steps):

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

Result (type 4, 269 leaves):

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

Problem 103: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 44 leaves, 2 steps):

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

Result (type 4, 267 leaves):

$$\left(2\sqrt{6}\sqrt{\frac{\mathrm{i}\,(-1+x)}{-3\,\mathrm{i}+\sqrt{3}}}\left(\sqrt{\mathrm{i}+\sqrt{3}+2\,\mathrm{i}\,x}\,\left(\left(2+\mathrm{i}\right)-\sqrt{3}+\left(\left(1+2\,\mathrm{i}\right)-\mathrm{i}\sqrt{3}\right)x\right)\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-\mathrm{i}+\sqrt{3}-2\,\mathrm{i}\,x}}{\sqrt{2}\;3^{1/4}}\right],\frac{2\sqrt{3}}{-3\,\mathrm{i}+\sqrt{3}}\right]+\right.\right.$$

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

$$\left(\left(-3\,\mathrm{i}+\left(1+2\,\mathrm{i}\right)\sqrt{3}\right)\sqrt{-\mathrm{i}+\sqrt{3}-2\,\mathrm{i}\,x}\,\sqrt{-1+x^3}\right)$$

Problem 104: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 44 leaves, 2 steps):

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

Result (type 4, 269 leaves):

$$-\left(\left(2\sqrt{6}\sqrt{\frac{\mathrm{i}\,(1+x)}{3\,\mathrm{i}+\sqrt{3}}}\right.\right.$$

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

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

Problem 105: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 69 leaves, 2 steps):

$$-\frac{2 \operatorname{ArcTanh}\left[\frac{\sqrt{-3+2 \sqrt{3}}\, a^{1/6} \left(a^{1/3}+b^{1/3} x\right)}{\sqrt{a+b x^3}}\right]}{\sqrt{-3+2 \sqrt{3}}\, a^{1/6} b^{1/3}}$$

Result (type 4, 322 leaves):

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

Problem 106: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 71 leaves, 2 steps):

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

Result (type 4, 446 leaves):

$$\frac{1}{\left(-3\,\text{i}+(1+2\,\text{i})\sqrt{3}\right)b^{1/3}\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\;\sqrt{a-b\,x^3}}$$

$$2\sqrt{\frac{a^{1/3}-b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(\sqrt{\frac{\left(-\text{i}+\sqrt{3}\right)a^{1/3}+\left(\text{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\text{i}+\sqrt{3}\right)a^{1/3}}}\;\left(\left(-3+(2+\text{i})\sqrt{3}\right)a^{1/3}+\left(-3\,\text{i}+(1+2\,\text{i})\sqrt{3}\right)b^{1/3}x\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{-\frac{\text{i}\left(2\,a^{1/3}+\left(1-\text{i}\sqrt{3}\right)b^{1/3}x\right)}{\left(-3\,\text{i}+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+\text{i}\sqrt{3}\right)\right]+4\sqrt{3}\;a^{1/3}\sqrt{-\frac{2\,\text{i}\,a^{1/3}+\left(\text{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\text{i}+\sqrt{3}\right)a^{1/3}}}$$

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

Problem 107: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 72 leaves, 2 steps):

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

Result (type 4, 447 leaves):

$$\frac{1}{\left(-3\,\mathrm{i}+(1+2\,\mathrm{i})\sqrt{3}\right)b^{1/3}\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\sqrt{-a+b\,x^3}}$$

$$2\sqrt{\frac{a^{1/3}-b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(\sqrt{\frac{\left(-\mathrm{i}+\sqrt{3}\right)a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\left(\left(-3+(2+\mathrm{i})\sqrt{3}\right)a^{1/3}+\left(-3\,\mathrm{i}+(1+2\,\mathrm{i})\sqrt{3}\right)b^{1/3}x\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{-\frac{\mathrm{i}\left(2\,a^{1/3}+\left(1-\mathrm{i}\sqrt{3}\right)b^{1/3}x\right)}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]+4\sqrt{3}\,a^{1/3}\sqrt{-\frac{2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}$$

$$\left.\sqrt{1+\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}\;\text{EllipticPi}\left[\frac{2\sqrt{3}}{-3\,\mathrm{i}+(1+2\,\mathrm{i})\sqrt{3}},\text{ArcSin}\left[\sqrt{-\frac{\mathrm{i}\left(2\,a^{1/3}+\left(1-\mathrm{i}\sqrt{3}\right)b^{1/3}x\right)}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]\right)$$

Problem 108: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 72 leaves, 2 steps):

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

Result (type 4, 325 leaves):

$$\frac{1}{\sqrt{-a-b\,x^3}}$$

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

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

Problem 109: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 73 leaves, 2 steps):

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

Result (type 6, 862 leaves):

$$\frac{1}{3\left(-5+3\sqrt{3}\right)\left(2\left(-5+3\sqrt{3}\right)a-b x^3\right)\sqrt{a+b x^3}}\left(26-15\sqrt{3}\right)a x$$

$$\left(-\left(\left(96\left(-1+\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},\frac{b x^3}{-10a+6\sqrt{3}\,a}\right]\right)\Big/\left(8\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a-6\sqrt{3}\,a}\right]+\right.\right.\right.$$

$$\left.\left.\left.3 b x^3\left(\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},2,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a-6\sqrt{3}\,a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a-6\sqrt{3}\,a}\right]\right)\right)\right)+$$

$$x\left(\left(60\left(-3+\sqrt{3}\right)a\left(\frac{b}{a}\right)^{1/3}\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},\frac{b x^3}{-10a+6\sqrt{3}\,a}\right]\right)\Big/\right.$$

$$\left(10\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a-6\sqrt{3}\,a}\right]+\right.$$

$$\left.\left.3 b x^3\left(\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a-6\sqrt{3}\,a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a-6\sqrt{3}\,a}\right]\right)\right)\right)+$$

$$x\left(-\left(\left(16\sqrt{3}\,a\left(\frac{b}{a}\right)^{2/3}\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{b x^3}{a},\frac{b x^3}{-10a+6\sqrt{3}\,a}\right]\right)\Big/\left(4\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{b x^3}{a},-\frac{b x^3}{10a-6\sqrt{3}\,a}\right]+\right.\right.\right.$$

$$\left.\left.b x^3\left(\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{b x^3}{a},-\frac{b x^3}{10a-6\sqrt{3}\,a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{b x^3}{a},-\frac{b x^3}{10a-6\sqrt{3}\,a}\right]\right)\right)\right)-$$

$$\left(21 b x\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b x^3}{a},\frac{b x^3}{-10a+6\sqrt{3}\,a}\right]\right)\Big/\left(14\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a-6\sqrt{3}\,a}\right]+\right.$$

$$\left.\left.\left.3 b x^3\left(\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},2,\frac{10}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a-6\sqrt{3}\,a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},1,\frac{10}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a-6\sqrt{3}\,a}\right]\right)\right)\right)\right)$$

Problem 110: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 75 leaves, 2 steps):

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

Result (type 6, 835 leaves):

$$\frac{1}{3\left(-5+3\sqrt{3}\right)\sqrt{a-b x^3}\left(2\left(-5+3\sqrt{3}\right)a+b x^3\right)}\left(26-15\sqrt{3}\right)a x$$
$$\left(-\left(\left(96\left(-1+\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]\right)\Big/\left(8\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]-\right.\right.\right.$$
$$\left.\left.\left.3 b x^3\left(\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},2,\frac{7}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},1,\frac{7}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]\right)\right)\right)+$$
$$x\left(-\left(\left(60\left(-3+\sqrt{3}\right)a\left(\frac{b}{a}\right)^{1/3}\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]\right)\Big/\left(10\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]-\right.\right.\right.$$
$$\left.\left.\left.3 b x^3\left(\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]\right)\right)\right)+$$
$$x\left(-\left(\left(16\sqrt{3}\,a\left(\frac{b}{a}\right)^{2/3}\text{AppellF1}\left[1,\frac{1}{2},1,2,\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]\right)\Big/\left(4\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[1,\frac{1}{2},1,2,\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]-\right.\right.\right.$$
$$\left.\left.\left.b x^3\left(\text{AppellF1}\left[2,\frac{1}{2},2,3,\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[2,\frac{3}{2},1,3,\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]\right)\right)\right)+$$
$$\left(21 b x\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]\right)\Big/\left(14\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]-\right.$$
$$\left.\left.3 b x^3\left(\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},2,\frac{10}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},1,\frac{10}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]\right)\right)\right)$$

Problem 111: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 76 leaves, 2 steps):

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

Result (type 6, 836 leaves):

$$\frac{1}{3\left(-5+3\sqrt{3}\right)\sqrt{-a+b x^3}\left(2\left(-5+3\sqrt{3}\right)a+b x^3\right)}\left(26-15\sqrt{3}\right)a x$$

$$\left(-\left(\left(96\left(-1+\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]\right)\Big/\left(8\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]-\right.\right.\right.$$
$$\left.\left.\left.3 b x^3\left(\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},2,\frac{7}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},1,\frac{7}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]\right)\right)\right)+$$
$$x\left(-\left(\left(60\left(-3+\sqrt{3}\right)a\left(\frac{b}{a}\right)^{1/3}\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]\right)\Big/\left(10\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]-\right.\right.\right.$$
$$\left.\left.\left.3 b x^3\left(\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]\right)\right)\right)+$$
$$x\left(-\left(\left(16\sqrt{3}\,a\left(\frac{b}{a}\right)^{2/3}\text{AppellF1}\left[1,\frac{1}{2},1,2,\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]\right)\Big/\left(4\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[1,\frac{1}{2},1,2,\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]-\right.\right.\right.$$
$$\left.\left.\left.b x^3\left(\text{AppellF1}\left[2,\frac{1}{2},2,3,\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[2,\frac{3}{2},1,3,\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]\right)\right)\right)+$$
$$\left(21 b x\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]\right)\Big/\left(14\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]-\right.$$
$$\left.\left.3 b x^3\left(\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},2,\frac{10}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},1,\frac{10}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]\right)\right)\right)$$

Problem 112: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 76 leaves, 2 steps):

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

Result (type 6, 865 leaves):

$$\frac{1}{3\left(-5+3\sqrt{3}\right)\sqrt{-a-b x^3}\left(2\left(-5+3\sqrt{3}\right)a-b x^3\right)}\left(26-15\sqrt{3}\right)a x$$
$$\left(-\left(\left(96\left(-1+\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},\frac{b x^3}{-10 a+6\sqrt{3}a}\right]\right)\Big/\left(8\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}a}\right]+\right.\right.\right.$$
$$\left.\left.\left.3 b x^3\left(\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},2,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}a}\right]\right)\right)\right)+$$
$$x\left(\left(60\left(-3+\sqrt{3}\right)a\left(\frac{b}{a}\right)^{1/3}\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},\frac{b x^3}{-10 a+6\sqrt{3}a}\right]\right)\Big/\right.$$
$$\left(10\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}a}\right]+\right.$$
$$\left.\left.3 b x^3\left(\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}a}\right]\right)\right)\right)+$$
$$x\left(-\left(\left(16\sqrt{3}a\left(\frac{b}{a}\right)^{2/3}\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{b x^3}{a},\frac{b x^3}{-10 a+6\sqrt{3}a}\right]\right)\Big/\left(4\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}a}\right]+\right.\right.\right.$$
$$\left.\left.b x^3\left(\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}a}\right]\right)\right)\right)-$$
$$\left(21 b x\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b x^3}{a},\frac{b x^3}{-10 a+6\sqrt{3}a}\right]\right)\Big/\left(14\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}a}\right]+\right.$$
$$\left.\left.\left.3 b x^3\left(\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},2,\frac{10}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},1,\frac{10}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}a}\right]\right)\right)\right)\right)$$

Problem 113: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 42 leaves, 2 steps):

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

Result (type 4, 269 leaves):

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

Problem 114: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 46 leaves, 2 steps):

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

Result (type 4, 267 leaves):

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

Problem 115: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 44 leaves, 2 steps):

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

Result (type 4, 265 leaves):

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

Problem 116: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 44 leaves, 2 steps):

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

Result (type 4, 271 leaves):

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

Problem 117: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 69 leaves, 2 steps):

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

Result (type 4, 320 leaves):

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

Problem 118: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 71 leaves, 2 steps):

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

Result (type 4, 329 leaves):

$$\frac{1}{b^{1/3} \sqrt{a-b x^3}} 2 \sqrt{\frac{a^{1/3}-b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}} \left(\frac{\left((-1)^{1/3} a^{1/3}+b^{1/3} x\right) \sqrt{\frac{(-1)^{1/3} \left(a^{1/3}+(-1)^{1/3} b^{1/3} x\right)}{\left(1+(-1)^{1/3}\right) a^{1/3}}}\ \operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\sqrt{\frac{a^{1/3}-(-1)^{2/3} b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}}\right], (-1)^{1/3}\right]}{\sqrt{\frac{a^{1/3}-(-1)^{2/3} b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}}} - \frac{1}{3+(2+i) \sqrt{3}} 4 (-1)^{1/3} \left(1+(-1)^{1/3}\right) a^{1/3} \sqrt{1+\frac{b^{1/3} x}{a^{1/3}}+\frac{b^{2/3} x^2}{a^{2/3}}}\ \operatorname{EllipticPi}\left[\frac{2 i \sqrt{3}}{3+(2+i) \sqrt{3}}, \operatorname{ArcSin}\left[\sqrt{\frac{a^{1/3}-(-1)^{2/3} b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}}\right], (-1)^{1/3}\right]\right)$$

Problem 119: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 72 leaves, 2 steps):

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

Result (type 4, 330 leaves):

$$\frac{1}{b^{1/3}\sqrt{-a+b\,x^3}}$$

$$2\sqrt{\frac{a^{1/3}-b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(\frac{\left(\left(-1\right)^{1/3}a^{1/3}+b^{1/3}x\right)\sqrt{\frac{(-1)^{1/3}\left(a^{1/3}+(-1)^{1/3}b^{1/3}x\right)}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\;\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right],\,(-1)^{1/3}\right]}{\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}}-\frac{1}{3+(2+i)\sqrt{3}}\right.$$

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

Problem 120: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 72 leaves, 2 steps):

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

Result (type 4, 323 leaves):

$$\frac{1}{\sqrt{-a-b\,x^3}}2\sqrt{\frac{a^{1/3}+b^{1/3}\,x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(-\frac{\left((-1)^{1/3}\,a^{1/3}-b^{1/3}\,x\right)\sqrt{(-1)^{1/6}-\frac{i\,b^{1/3}\,x}{a^{1/3}}}\;\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{a^{1/3}+(-1)^{2/3}\,b^{1/3}\,x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right],(-1)^{1/3}\right]}{3^{1/4}\,b^{1/3}\sqrt{\frac{a^{1/3}+(-1)^{2/3}\,b^{1/3}\,x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}}+\frac{1}{\left(3+(2+i)\sqrt{3}\right)b^{1/3}}\right.$$

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

Problem 121: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 73 leaves, 2 steps):

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

Result (type 6, 866 leaves):

$$\frac{1}{3\left(5+3\sqrt{3}\right)\sqrt{a+b x^3}\left(2\left(5+3\sqrt{3}\right)a+b x^3\right)}\left(26+15\sqrt{3}\right)a\,x$$
$$\Bigg(-\Bigg(\Bigg(96\left(1+\sqrt{3}\right)a\,\text{AppellF1}\Big[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a+6\sqrt{3}\,a}\Big]\Bigg)\Bigg/\Bigg(8\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\Big[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a+6\sqrt{3}\,a}\Big]-$$
$$3 b x^3\Bigg(\text{AppellF1}\Big[\frac{4}{3},\frac{1}{2},2,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a+6\sqrt{3}\,a}\Big]+\left(5+3\sqrt{3}\right)\text{AppellF1}\Big[\frac{4}{3},\frac{3}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a+6\sqrt{3}\,a}\Big]\Bigg)\Bigg)\Bigg)+x$$
$$\Bigg(\Bigg(60\left(3+\sqrt{3}\right)a\left(\frac{b}{a}\right)^{1/3}\text{AppellF1}\Big[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a+6\sqrt{3}\,a}\Big]\Bigg)\Bigg/\Bigg(10\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\Big[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a+6\sqrt{3}\,a}\Big]-$$
$$3 b x^3\Bigg(\text{AppellF1}\Big[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a+6\sqrt{3}\,a}\Big]+\left(5+3\sqrt{3}\right)\text{AppellF1}\Big[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a+6\sqrt{3}\,a}\Big]\Bigg)\Bigg)\Bigg)+$$
$$x\Bigg(-\Bigg(\Bigg(16\sqrt{3}\,a\left(\frac{b}{a}\right)^{2/3}\text{AppellF1}\Big[1,\frac{1}{2},1,2,-\frac{b x^3}{a},-\frac{b x^3}{10a+6\sqrt{3}\,a}\Big]\Bigg)\Bigg/\Bigg(4\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\Big[1,\frac{1}{2},1,2,-\frac{b x^3}{a},-\frac{b x^3}{10a+6\sqrt{3}\,a}\Big]-$$
$$b x^3\Bigg(\text{AppellF1}\Big[2,\frac{1}{2},2,3,-\frac{b x^3}{a},-\frac{b x^3}{10a+6\sqrt{3}\,a}\Big]+\left(5+3\sqrt{3}\right)\text{AppellF1}\Big[2,\frac{3}{2},1,3,-\frac{b x^3}{a},-\frac{b x^3}{10a+6\sqrt{3}\,a}\Big]\Bigg)\Bigg)\Bigg)+$$
$$\Bigg(21\,b\,x\,\text{AppellF1}\Big[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a+6\sqrt{3}\,a}\Big]\Bigg)\Bigg/\Bigg(14\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\Big[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a+6\sqrt{3}\,a}\Big]-$$
$$3 b x^3\Bigg(\text{AppellF1}\Big[\frac{7}{3},\frac{1}{2},2,\frac{10}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a+6\sqrt{3}\,a}\Big]+\left(5+3\sqrt{3}\right)\text{AppellF1}\Big[\frac{7}{3},\frac{3}{2},1,\frac{10}{3},-\frac{b x^3}{a},-\frac{b x^3}{10a+6\sqrt{3}\,a}\Big]\Bigg)\Bigg)\Bigg)\Bigg)$$

Problem 122: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 75 leaves, 2 steps):

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

Result (type 6, 835 leaves):

$$\frac{1}{3\left(5+3\sqrt{3}\right)\sqrt{a-b\,x^3}\left(2\left(5+3\sqrt{3}\right)a-b\,x^3\right)}\left(26+15\sqrt{3}\right)a\,x$$

$$\left(-\left(\left(96\left(1+\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\Big/\left(8\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\right.\right.\right.$$

$$\left.\left.\left.3\,b\,x^3\left(\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},2,\frac{7}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\left(5+3\sqrt{3}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},1,\frac{7}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\right)\right)+$$

$$x\left(-\left(\left(60\left(3+\sqrt{3}\right)a\left(\frac{b}{a}\right)^{1/3}\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\Big/\left(10\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\right.\right.\right.$$

$$\left.\left.\left.3\,b\,x^3\left(\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\left(5+3\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\right)\right)+$$

$$x\left(-\left(\left(16\sqrt{3}\,a\left(\frac{b}{a}\right)^{2/3}\text{AppellF1}\left[1,\frac{1}{2},1,2,\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\Big/\left(4\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\left[1,\frac{1}{2},1,2,\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\right.\right.\right.$$

$$\left.\left.\left.b\,x^3\left(\text{AppellF1}\left[2,\frac{1}{2},2,3,\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\left(5+3\sqrt{3}\right)\text{AppellF1}\left[2,\frac{3}{2},1,3,\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\right)\right)-$$

$$\left(21\,b\,x\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\Big/\left(14\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\right.$$

$$\left.\left.\left.3\,b\,x^3\left(\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},2,\frac{10}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\left(5+3\sqrt{3}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},1,\frac{10}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\right)\right)\right)\right)$$

Problem 123: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 76 leaves, 2 steps):

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

Result (type 6, 836 leaves):

$$\frac{1}{3\left(5+3\sqrt{3}\right)\left(2\left(5+3\sqrt{3}\right)a-b\,x^3\right)\sqrt{-a+b\,x^3}}\left(26+15\sqrt{3}\right)a\,x$$

$$\left(-\left(\left(96\left(1+\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\Big/\left(8\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\right.\right.\right.$$

$$\left.\left.\left.3\,b\,x^3\left(\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},2,\frac{7}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\left(5+3\sqrt{3}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},1,\frac{7}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\right)\right)+$$

$$x\left(-\left(\left(60\left(3+\sqrt{3}\right)a\left(\frac{b}{a}\right)^{1/3}\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\Big/\left(10\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\right.\right.\right.$$

$$\left.\left.\left.3\,b\,x^3\left(\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\left(5+3\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\right)\right)+$$

$$x\left(-\left(\left(16\sqrt{3}\,a\left(\frac{b}{a}\right)^{2/3}\text{AppellF1}\left[1,\frac{1}{2},1,2,\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\Big/\left(4\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\left[1,\frac{1}{2},1,2,\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\right.\right.\right.$$

$$\left.\left.\left.b\,x^3\left(\text{AppellF1}\left[2,\frac{1}{2},2,3,\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\left(5+3\sqrt{3}\right)\text{AppellF1}\left[2,\frac{3}{2},1,3,\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\right)\right)-$$

$$\left(21\,b\,x\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\Big/\left(14\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\right.$$

$$\left.\left.\left.3\,b\,x^3\left(\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},2,\frac{10}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\left(5+3\sqrt{3}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},1,\frac{10}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\right)\right)\right)$$

Problem 124: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 76 leaves, 2 steps):

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

Result (type 6, 869 leaves):

$$\begin{aligned}&\frac{1}{3\left(5+3\sqrt{3}\right)\sqrt{-a-b x^3}\left(2\left(5+3\sqrt{3}\right)a+b x^3\right)}\left(26+15\sqrt{3}\right)a\,x\\
&\left(-\left(\left(96\left(1+\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3}\,a}\right]\right)\Big/\left(8\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3}\,a}\right]-\right.\right.\right.\\
&\left.\left.\left.3 b x^3\left(\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},2,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3}\,a}\right]+\left(5+3\sqrt{3}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3}\,a}\right]\right)\right)\right)+x\\
&\left(\left(60\left(3+\sqrt{3}\right)a\left(\frac{b}{a}\right)^{1/3}\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3}\,a}\right]\right)\Big/\left(10\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3}\,a}\right]-\right.\right.\\
&\left.\left.3 b x^3\left(\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3}\,a}\right]+\left(5+3\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3}\,a}\right]\right)\right)+\right.\\
&x\left(-\left(\left(16\sqrt{3}\,a\left(\frac{b}{a}\right)^{2/3}\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3}\,a}\right]\right)\Big/\left(4\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3}\,a}\right]-\right.\right.\right.\\
&\left.\left.\left.b x^3\left(\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3}\,a}\right]+\left(5+3\sqrt{3}\right)\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3}\,a}\right]\right)\right)\right)+\right.\\
&\left(21 b x\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3}\,a}\right]\right)\Big/\left(14\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3}\,a}\right]-\right.\\
&\left.\left.\left.\left.3 b x^3\left(\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},2,\frac{10}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3}\,a}\right]+\left(5+3\sqrt{3}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},1,\frac{10}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3}\,a}\right]\right)\right)\right)\right)\right)\end{aligned}$$

Problem 125: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 145 leaves, 4 steps):

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

Result (type 4, 269 leaves):

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

Problem 126: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 145 leaves, 4 steps):

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

Result (type 4, 267 leaves):

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

Problem 127: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 173 leaves, 4 steps):

$$\frac{\left(e-f-\sqrt{3}\,f\right)\text{ArcTan}\left[\frac{\sqrt{3+2\sqrt{3}}\,(1+x)}{\sqrt{1+x^3}}\right]}{\sqrt{3\left(3+2\sqrt{3}\right)}}+\frac{\sqrt{2+\sqrt{3}}\,\left(e-\left(1-\sqrt{3}\right)f\right)(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]}{3^{3/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\,\sqrt{1+x^3}}$$

Result (type 4, 291 leaves):

$$\left(2\sqrt{\frac{2}{3}}\sqrt{\frac{i\,(1+x)}{3\,i+\sqrt{3}}}\left(3\,f\sqrt{-i+\sqrt{3}+2\,i\,x}\,\left(\left(-2-i\right)-\sqrt{3}+\left(\left(1+2\,i\right)+i\sqrt{3}\right)x\right)\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-2\,i\,x}}{\sqrt{2}\;3^{1/4}}\right],\frac{2\sqrt{3}}{3\,i+\sqrt{3}}\right]+\right.\right.$$
$$\left.\left.2\left(-\sqrt{3}\,e+\left(3+\sqrt{3}\right)f\right)\sqrt{i+\sqrt{3}-2\,i\,x}\,\sqrt{1-x+x^2}\,\text{EllipticPi}\left[\frac{2\sqrt{3}}{3\,i+\left(1+2\,i\right)\sqrt{3}},\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-2\,i\,x}}{\sqrt{2}\;3^{1/4}}\right],\frac{2\sqrt{3}}{3\,i+\sqrt{3}}\right]\right)\right)\Big/$$
$$\left(\left(3\,i+\left(1+2\,i\right)\sqrt{3}\right)\sqrt{i+\sqrt{3}-2\,i\,x}\,\sqrt{1+x^3}\right)$$

Problem 128: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 187 leaves, 4 steps):

$$-\frac{\left(e+f+\sqrt{3}\,f\right)\text{ArcTan}\left[\frac{\sqrt{3+2\sqrt{3}}\,(1-x)}{\sqrt{1-x^3}}\right]}{\sqrt{3\left(3+2\sqrt{3}\right)}}-\frac{\sqrt{2+\sqrt{3}}\,\left(e+\left(1-\sqrt{3}\right)f\right)(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]}{3^{3/4}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\,\sqrt{1-x^3}}$$

Result (type 4, 291 leaves):

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

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

$$\left(\left(3i+(1+2i)\sqrt{3}\right)\sqrt{i+\sqrt{3}+2\,i\,x}\sqrt{1-x^3}\right)$$

Problem 129: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 190 leaves, 4 steps):

$$-\frac{\left(e+f+\sqrt{3}\,f\right)\text{ArcTanh}\left[\frac{\sqrt{3+2\sqrt{3}}\,(1-x)}{\sqrt{-1+x^3}}\right]}{\sqrt{3\left(3+2\sqrt{3}\right)}}-\frac{\sqrt{2-\sqrt{3}}\left(e+\left(1-\sqrt{3}\right)f\right)(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]}{3^{3/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}}$$

Result (type 4, 289 leaves):

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

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

$$\left(\left(3i+(1+2i)\sqrt{3}\right)\sqrt{i+\sqrt{3}+2\,i\,x}\sqrt{-1+x^3}\right)$$

Problem 130: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 183 leaves, 4 steps):

$$\frac{\left(e-\left(1+\sqrt{3}\right)f\right)\text{ArcTanh}\left[\frac{\sqrt{3+2\sqrt{3}}\,(1+x)}{\sqrt{-1-x^3}}\right]}{\sqrt{3\left(3+2\sqrt{3}\right)}}+\frac{\sqrt{2-\sqrt{3}}\,\left(e-\left(1-\sqrt{3}\right)f\right)(1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]}{3^{3/4}\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\,\sqrt{-1-x^3}}$$

Result (type 4, 293 leaves):

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

Problem 131: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 332 leaves, 4 steps):

$$-\frac{\left(b^{1/3}e-\left(1-\sqrt{3}\right)a^{1/3}f\right)\text{ArcTanh}\left[\frac{\sqrt{-3+2\sqrt{3}}\,a^{1/6}\left(a^{1/3}+b^{1/3}x\right)}{\sqrt{a+b\,x^3}}\right]}{\sqrt{3\left(-3+2\sqrt{3}\right)}\,\sqrt{a}\,b^{2/3}}-$$
$$\left(\sqrt{2+\sqrt{3}}\,\left(b^{1/3}e-\left(1+\sqrt{3}\right)a^{1/3}f\right)\left(a^{1/3}+b^{1/3}x\right)\sqrt{\frac{a^{2/3}-a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}x}{\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x}\right],-7-4\sqrt{3}\right]\right)\Big/$$
$$\left(3^{3/4}a^{1/3}b^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3}x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\,\sqrt{a+b\,x^3}\right)$$

Result (type 4, 438 leaves):

$$-\left(\left(4\sqrt{\frac{a^{1/3}+b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(-\frac{1}{2\sqrt{2}}\mathrm{i}\,3^{1/4}f\left(\left((-2-\mathrm{i})+\sqrt{3}\right)a^{1/3}+\left((1+2\,\mathrm{i})-\mathrm{i}\sqrt{3}\right)b^{1/3}x\right)\sqrt{\mathrm{i}+\sqrt{3}-\frac{2\,\mathrm{i}\,b^{1/3}x}{a^{1/3}}}\right.\right.\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]+\mathrm{i}\left(b^{1/3}e+\left(-1+\sqrt{3}\right)a^{1/3}f\right)\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}$$

$$\left.\left.\sqrt{1-\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}\,\text{EllipticPi}\left[\frac{2\sqrt{3}}{-3\,\mathrm{i}+(1+2\,\mathrm{i})\sqrt{3}},\text{ArcSin}\left[\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]\right)\right)\Big/$$

$$\left.\left(\left(3-(2-\mathrm{i})\sqrt{3}\right)b^{2/3}\sqrt{\frac{a^{1/3}+(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\sqrt{a+b\,x^3}\right)\right)$$

Problem 132: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 336 leaves, 4 steps):

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

$$\left(\sqrt{2+\sqrt{3}}\left(b^{1/3}e+\left(1+\sqrt{3}\right)a^{1/3}f\right)\left(a^{1/3}-b^{1/3}x\right)\sqrt{\frac{a^{2/3}+a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x}{\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x}\right],-7-4\sqrt{3}\right]\right)\Big/$$

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

Result (type 4, 466 leaves):

$$-\frac{1}{\left(3-(2-i)\sqrt{3}\right) b^{2/3}\sqrt{\frac{a^{1/3}-(-1)^{2/3} b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}}\sqrt{a-b x^3}}$$

$$4\sqrt{\frac{a^{1/3}-b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}}\left(\frac{1}{2} f\left(i\left(-3+(2+i)\sqrt{3}\right) a^{1/3}+\left(3-(2-i)\sqrt{3}\right) b^{1/3} x\right)\sqrt{\frac{\left(-i+\sqrt{3}\right) a^{1/3}+\left(i+\sqrt{3}\right) b^{1/3} x}{\left(-3 i+\sqrt{3}\right) a^{1/3}}}\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{-\frac{i\left(2 a^{1/3}+\left(1-i\sqrt{3}\right) b^{1/3} x\right)}{\left(-3 i+\sqrt{3}\right) a^{1/3}}}\right],\frac{1}{2}\left(1+i\sqrt{3}\right)\right]-i\left(b^{1/3} e-\left(-1+\sqrt{3}\right) a^{1/3} f\right)\sqrt{-\frac{i\left(2 a^{1/3}+\left(1-i\sqrt{3}\right) b^{1/3} x\right)}{\left(-3 i+\sqrt{3}\right) a^{1/3}}}$$

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

Problem 133: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 345 leaves, 4 steps):

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

$$\left(\sqrt{2-\sqrt{3}}\left(b^{1/3} e+\left(1+\sqrt{3}\right) a^{1/3} f\right)\left(a^{1/3}-b^{1/3} x\right)\sqrt{\frac{a^{2/3}+a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1-\sqrt{3}\right) a^{1/3}-b^{1/3} x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}-b^{1/3} x}{\left(1-\sqrt{3}\right) a^{1/3}-b^{1/3} x}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

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

Result (type 4, 467 leaves):

$$-\frac{1}{\left(3-(2-i)\sqrt{3}\right)b^{2/3}\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\sqrt{-a+b x^3}}$$

$$4\sqrt{\frac{a^{1/3}-b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(\frac{1}{2}f\left(i\left(-3+(2+i)\sqrt{3}\right)a^{1/3}+\left(3-(2-i)\sqrt{3}\right)b^{1/3}x\right)\sqrt{\frac{\left(-i+\sqrt{3}\right)a^{1/3}+\left(i+\sqrt{3}\right)b^{1/3}x}{\left(-3i+\sqrt{3}\right)a^{1/3}}}\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{-\frac{i\left(2a^{1/3}+\left(1-i\sqrt{3}\right)b^{1/3}x\right)}{\left(-3i+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+i\sqrt{3}\right)\right]-i\left(b^{1/3}e-\left(-1+\sqrt{3}\right)a^{1/3}f\right)\sqrt{-\frac{i\left(2a^{1/3}+\left(1-i\sqrt{3}\right)b^{1/3}x\right)}{\left(-3i+\sqrt{3}\right)a^{1/3}}}$$

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

Problem 134: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 345 leaves, 4 steps):

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

$$\left(\sqrt{2-\sqrt{3}}\ \left(b^{1/3}e-\left(1+\sqrt{3}\right)a^{1/3}f\right)\left(a^{1/3}+b^{1/3}x\right)\sqrt{\frac{a^{2/3}-a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x}{\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}x}\right],-7+4\sqrt{3}\right]\right)\Big/$$

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

Result (type 4, 441 leaves):

$$-\left(\left(4\sqrt{\frac{a^{1/3}+b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(-\frac{1}{2\sqrt{2}}\,\mathrm{i}\,3^{1/4}f\left(\left((-2-\mathrm{i})+\sqrt{3}\right)a^{1/3}+\left((1+2\,\mathrm{i})-\mathrm{i}\sqrt{3}\right)b^{1/3}x\right)\sqrt{\mathrm{i}+\sqrt{3}-\frac{2\,\mathrm{i}\,b^{1/3}x}{a^{1/3}}}\right.\right.\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]+\mathrm{i}\left(b^{1/3}e+\left(-1+\sqrt{3}\right)a^{1/3}f\right)\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}$$

$$\left.\left.\sqrt{1-\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}\;\text{EllipticPi}\left[\frac{2\sqrt{3}}{-3\,\mathrm{i}+(1+2\,\mathrm{i})\sqrt{3}},\text{ArcSin}\left[\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]\right)\right)\Big/$$

$$\left(\left(3-(2-\mathrm{i})\sqrt{3}\right)b^{2/3}\sqrt{\frac{a^{1/3}+(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\sqrt{-a-b\,x^3}\right)\right)$$

Problem 135: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 136 leaves, 4 steps):

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

Result (type 4, 209 leaves):

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

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

Problem 136: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 152 leaves, 4 steps):

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

Result (type 4, 232 leaves):

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

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

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

Problem 137: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 164 leaves, 4 steps):

$$-\frac{\sqrt{2}\,\text{ArcTanh}\left[\frac{\sqrt{3+2\sqrt{3}}\,(1-x)}{\sqrt{-1+x^3}}\right]}{3^{3/4}}+\frac{2\sqrt{\frac{7}{6}-\frac{2}{\sqrt{3}}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]}{3^{1/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\,\sqrt{-1+x^3}}$$

Result (type 4, 230 leaves):

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

Problem 138: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 156 leaves, 4 steps):

$$-\frac{\sqrt{2}\,\text{ArcTanh}\left[\frac{\sqrt{3+2\sqrt{3}}\,(1+x)}{\sqrt{-1-x^3}}\right]}{3^{3/4}}+\frac{2\sqrt{\frac{7}{6}-\frac{2}{\sqrt{3}}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]}{3^{1/4}\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\,\sqrt{-1-x^3}}$$

Result (type 4, 211 leaves):

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

Problem 139: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 147 leaves, 4 steps):

$$-\frac{\sqrt{2}\,\text{ArcTanh}\left[\frac{\sqrt{-3+2\sqrt{3}}\,(1+x)}{\sqrt{1+x^3}}\right]}{3^{3/4}}+\frac{2\sqrt{\frac{7}{6}+\frac{2}{\sqrt{3}}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]}{3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}}$$

Result (type 4, 225 leaves):

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

Problem 140: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 278 leaves, 4 steps):

$$-\frac{\sqrt{2}\, \text{ArcTanh}\left[\frac{\sqrt{-3+2 \sqrt{3}}\, a^{1/6} \left(a^{1/3}+b^{1/3} x\right)}{\sqrt{a+b x^3}}\right]}{3^{3/4} a^{1/6} b^{2/3}}+\frac{2 \sqrt{\frac{7}{6}+\frac{2}{\sqrt{3}}} \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7-4 \sqrt{3}\right]}{3^{1/4} b^{2/3} \sqrt{\frac{a^{1/3} \left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\, \sqrt{a+b x^3}}$$

Result (type 4, 427 leaves):

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

Problem 141: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 286 leaves, 4 steps):

$$-\frac{\sqrt{2}\,\text{ArcTanh}\left[\frac{\sqrt{-3+2\sqrt{3}}\,a^{1/6}\left(a^{1/3}-b^{1/3}x\right)}{\sqrt{a-b x^3}}\right]}{3^{3/4}\,a^{1/6}\,b^{2/3}}+\frac{2\sqrt{\frac{7}{6}+\frac{2}{\sqrt{3}}}\left(a^{1/3}-b^{1/3}x\right)\sqrt{\frac{a^{2/3}+a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x}{\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x}\right],-7-4\sqrt{3}\right]}{3^{1/4}\,b^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}-b^{1/3}x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\sqrt{a-b x^3}}$$

Result (type 4, 454 leaves):

$$-\frac{1}{\left(3-\left(2-i\right)\sqrt{3}\right)b^{2/3}\sqrt{\frac{a^{1/3}-(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\sqrt{a-b x^3}}$$

$$4\sqrt{\frac{a^{1/3}-b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(\frac{1}{2}\left(i\left(-3+\left(2+i\right)\sqrt{3}\right)a^{1/3}+\left(3-\left(2-i\right)\sqrt{3}\right)b^{1/3}x\right)\sqrt{\frac{\left(-i+\sqrt{3}\right)a^{1/3}+\left(i+\sqrt{3}\right)b^{1/3}x}{\left(-3i+\sqrt{3}\right)a^{1/3}}}\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{-\frac{i\left(2a^{1/3}+\left(1-i\sqrt{3}\right)b^{1/3}x\right)}{\left(-3i+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+i\sqrt{3}\right)\right]+i\left(-1+\sqrt{3}\right)a^{1/3}\sqrt{-\frac{i\left(2a^{1/3}+\left(1-i\sqrt{3}\right)b^{1/3}x\right)}{\left(-3i+\sqrt{3}\right)a^{1/3}}}$$

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

Problem 142: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 282 leaves, 4 steps):

$$-\frac{\sqrt{2}\,\text{ArcTan}\left[\frac{\sqrt{-3+2\sqrt{3}}\,a^{1/6}\left(a^{1/3}-b^{1/3}x\right)}{\sqrt{-a+b x^3}}\right]}{3^{3/4}\,a^{1/6}\,b^{2/3}}+\frac{\sqrt{2}\left(a^{1/3}-b^{1/3}x\right)\sqrt{\frac{a^{2/3}+a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x}{\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x}\right],-7+4\sqrt{3}\right]}{3^{3/4}\,b^{2/3}\sqrt{-\frac{a^{1/3}\left(a^{1/3}-b^{1/3}x\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\sqrt{-a+b x^3}}$$

Result (type 4, 455 leaves):

$$-\frac{1}{\left(3-(2-i)\sqrt{3}\right) b^{2/3} \sqrt{\frac{a^{1/3}-(-1)^{2/3} b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}} \sqrt{-a+b x^3}}$$

$$4 \sqrt{\frac{a^{1/3}-b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}} \left(\frac{1}{2} \left(i \left(-3+(2+i)\sqrt{3}\right) a^{1/3}+\left(3-(2-i)\sqrt{3}\right) b^{1/3} x\right) \sqrt{\frac{\left(-i+\sqrt{3}\right) a^{1/3}+\left(i+\sqrt{3}\right) b^{1/3} x}{\left(-3 i+\sqrt{3}\right) a^{1/3}}}\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{-\frac{i \left(2 a^{1/3}+\left(1-i\sqrt{3}\right) b^{1/3} x\right)}{\left(-3 i+\sqrt{3}\right) a^{1/3}}}\right], \frac{1}{2}\left(1+i\sqrt{3}\right)\right]+i\left(-1+\sqrt{3}\right) a^{1/3} \sqrt{-\frac{i \left(2 a^{1/3}+\left(1-i\sqrt{3}\right) b^{1/3} x\right)}{\left(-3 i+\sqrt{3}\right) a^{1/3}}}$$

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

Problem 143: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 278 leaves, 4 steps):

$$-\frac{\sqrt{2}\ \text{ArcTan}\left[\frac{\sqrt{-3+2\sqrt{3}}\ a^{1/6} \left(a^{1/3}+b^{1/3} x\right)}{\sqrt{-a-b x^3}}\right]}{3^{3/4} a^{1/6} b^{2/3}}+\frac{\sqrt{2}\left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right], -7+4\sqrt{3}\right]}{3^{3/4} b^{2/3} \sqrt{-\frac{a^{1/3}\left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}} \sqrt{-a-b x^3}}$$

Result (type 4, 430 leaves):

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

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{-2\,i\,a^{1/3}+\left(i+\sqrt{3}\right)b^{1/3}x}{\left(-3\,i+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+i\sqrt{3}\right)\right]+i\left(-1+\sqrt{3}\right)a^{1/3}\sqrt{\frac{-2\,i\,a^{1/3}+\left(i+\sqrt{3}\right)b^{1/3}x}{\left(-3\,i+\sqrt{3}\right)a^{1/3}}}$$

$$\left.\left.\sqrt{1-\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}\;\text{EllipticPi}\left[\frac{2\sqrt{3}}{-3\,i+(1+2\,i)\sqrt{3}},\text{ArcSin}\left[\sqrt{\frac{-2\,i\,a^{1/3}+\left(i+\sqrt{3}\right)b^{1/3}x}{\left(-3\,i+\sqrt{3}\right)a^{1/3}}}\right],\frac{1}{2}\left(1+i\sqrt{3}\right)\right]\right)\right)\Big/$$

$$\left.\left(\left(3-(2-i)\sqrt{3}\right)b^{2/3}\sqrt{\frac{a^{1/3}+(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\sqrt{-a-b\,x^3}\right)\right)$$

Problem 144: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1+\sqrt{3}+x}{(c+d\,x)\sqrt{1+x^3}}\,dx$$

Optimal (type 4, 319 leaves, 6 steps):

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

$$\frac{4\times 3^{1/4}\sqrt{2+\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\;\text{EllipticPi}\left[\frac{\left(c-\left(1+\sqrt{3}\right)d\right)^2}{\left(c-\left(1-\sqrt{3}\right)d\right)^2},-\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]}{\left(c-\left(1-\sqrt{3}\right)d\right)\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}}$$

Result (type 4, 214 leaves):

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

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

Problem 145: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 331 leaves, 6 steps):

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

$$\frac{4\times 3^{1/4}\sqrt{2+\sqrt{3}}\left(1-x\right)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\ \text{EllipticPi}\left[\frac{\left(c+d+\sqrt{3}\,d\right)^2}{\left(c+d-\sqrt{3}\,d\right)^2},-\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]}{\left(c+d-\sqrt{3}\,d\right)\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{1-x^3}}$$

Result (type 4, 235 leaves):

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

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

Problem 146: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1+\sqrt{3}-x}{(c+d x)\sqrt{-1+x^3}}\,dx$$

Optimal (type 4, 327 leaves, 6 steps):

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

$$\frac{4\times 3^{1/4}\sqrt{2+\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\ \text{EllipticPi}\left[\frac{\left(c+d+\sqrt{3}\,d\right)^2}{\left(c+d-\sqrt{3}\,d\right)^2},-\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]}{\left(c+d-\sqrt{3}\,d\right)\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}}$$

Result (type 4, 233 leaves):

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

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

Problem 147: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1+\sqrt{3}+x}{(c+d\,x)\,\sqrt{-1-x^3}}\,dx$$

Optimal (type 4, 323 leaves, 6 steps) :

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

$$\frac{4\times 3^{1/4}\,\sqrt{2+\sqrt{3}}\,(1+x)\,\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\;\text{EllipticPi}\left[\frac{\left(c-\left(1+\sqrt{3}\right)\,d\right)^2}{\left(c-\left(1-\sqrt{3}\right)\,d\right)^2},\,-\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],\,-7-4\,\sqrt{3}\right]}{\left(c-\left(1-\sqrt{3}\right)\,d\right)\,\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\,\sqrt{-1-x^3}}$$

Result (type 4, 216 leaves) :

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

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

Problem 148: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1-\sqrt{3}+x}{(c+d\,x)\sqrt{1+x^3}}\,dx$$

Optimal (type 4, 360 leaves, 6 steps):

$$-\frac{\left(c-\left(1-\sqrt{3}\right)d\right)(1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\;\text{ArcTanh}\left[\frac{2\sqrt{2+\sqrt{3}}\sqrt{c^2+c\,d+d^2}\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}}{\sqrt{c-d}\sqrt{d}\sqrt{7+4\sqrt{3}+\frac{\left(1+\sqrt{3}+x\right)^2}{\left(1-\sqrt{3}+x\right)^2}}}\right]}{\sqrt{c-d}\sqrt{d}\sqrt{c^2+c\,d+d^2}\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\sqrt{1+x^3}}+$$

$$\frac{4\times3^{1/4}\sqrt{2-\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\;\text{EllipticPi}\left[\frac{\left(c-\left(1-\sqrt{3}\right)d\right)^2}{\left(c-\left(1+\sqrt{3}\right)d\right)^2},-\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]}{\left(c-d-\sqrt{3}\,d\right)\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\sqrt{1+x^3}}$$

Result (type 4, 213 leaves):

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

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

Problem 149: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1-\sqrt{3}-x}{(c+d\,x)\sqrt{1-x^3}}\,dx$$

Optimal (type 4, 348 leaves, 6 steps):

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

$$\frac{4\times3^{1/4}\sqrt{2-\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticPi}\left[\frac{\left(c+d-\sqrt{3}\,d\right)^2}{\left(c+d+\sqrt{3}\,d\right)^2},-\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]}{\left(c+d+\sqrt{3}\,d\right)\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\sqrt{1-x^3}}$$

Result (type 4, 235 leaves):

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

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

Problem 150: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1-\sqrt{3}-x}{(c+d\,x)\sqrt{-1+x^3}}\,dx$$

Optimal (type 4, 344 leaves, 6 steps):

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

$$\frac{4\times3^{1/4}\sqrt{2-\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\ \text{EllipticPi}\left[\frac{\left(c+d-\sqrt{3}\,d\right)^2}{\left(c+d+\sqrt{3}\,d\right)^2},-\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]}{\left(c+d+\sqrt{3}\,d\right)\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\,\sqrt{-1+x^3}}$$

Result (type 4, 233 leaves):

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

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

Problem 151: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1-\sqrt{3}+x}{(c+d\,x)\sqrt{-1-x^3}}\,dx$$

Optimal (type 4, 364 leaves, 6 steps):

$$-\frac{\left(c-\left(1-\sqrt{3}\right)d\right)(1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\,\text{ArcTanh}\left[\frac{2\sqrt{2+\sqrt{3}}\,\sqrt{c^2+c\,d+d^2}\,\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}}{\sqrt{c-d}\,\sqrt{d}\,\sqrt{7+4\sqrt{3}+\frac{\left(1+\sqrt{3}+x\right)^2}{\left(1-\sqrt{3}+x\right)^2}}}\right]}{\sqrt{c-d}\,\sqrt{d}\,\sqrt{c^2+c\,d+d^2}\,\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\,\sqrt{-1-x^3}}+$$

$$\frac{4\times 3^{1/4}\sqrt{2-\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\,\text{EllipticPi}\left[\frac{\left(c-\left(1-\sqrt{3}\right)d\right)^2}{\left(c-\left(1+\sqrt{3}\right)d\right)^2},-\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]}{\left(c-d-\sqrt{3}\,d\right)\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\,\sqrt{-1-x^3}}$$

Result (type 4, 215 leaves):

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

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

Problem 152: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 125 leaves, 5 steps):

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

Result (type 4, 149 leaves):

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

Problem 153: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 139 leaves, 5 steps):

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

Result (type 4, 157 leaves):

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

Problem 154: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 142 leaves, 5 steps):

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

Result (type 4, 150 leaves):

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

Problem 155: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 136 leaves, 5 steps):

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

Result (type 4, 155 leaves):

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

Problem 156: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 127 leaves, 5 steps):

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

Result (type 4, 149 leaves):

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

Problem 157: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 141 leaves, 5 steps):

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

Result (type 4, 158 leaves):

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

Problem 158: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 144 leaves, 5 steps):

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

Result (type 4, 151 leaves):

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

Problem 159: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 138 leaves, 5 steps):

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

Result (type 4, 156 leaves):

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

Problem 160: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 334 leaves, 8 steps):

$$-\frac{3(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{ArcTan}\left[\frac{\sqrt{\frac{13}{2}}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}}{\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}}\right]}{\sqrt{26}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}}-\frac{2\sqrt{2\left(97+56\sqrt{3}\right)}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]}{3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}}-$$

$$\frac{12\times3^{1/4}(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticPi}\left[97-56\sqrt{3},-\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]}{\sqrt{2-\sqrt{3}}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}}$$

Result (type 4, 194 leaves):

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

Problem 161: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 379 leaves, 8 steps):

$$\frac{3(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{ArcTanh}\left[\frac{\sqrt{7}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}}{2\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}}\right]}{2\sqrt{7}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{1-x^3}}-\frac{2\sqrt{2\left(37+20\sqrt{3}\right)}(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]}{13\times3^{1/4}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{1-x^3}}-$$

$$\frac{12\times3^{1/4}\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{EllipticPi}\left[\frac{1}{169}\left(553+304\sqrt{3}\right),-\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]}{13\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{1-x^3}}$$

Result (type 4, 195 leaves):

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

Problem 162: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 375 leaves, 8 steps):

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

$$\frac{12 \times 3^{1/4}\sqrt{2+\sqrt{3}}(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}} \text{EllipticPi}\left[\frac{1}{169}\left(553+304\sqrt{3}\right), -\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right], -7-4\sqrt{3}\right]}{13\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}}$$

Result (type 4, 193 leaves):

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

Problem 163: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 343 leaves, 8 steps):

$$-\frac{3(1+x)\sqrt{\frac{1-x+x^2}{(1+\sqrt{3}+x)^2}}\,\text{ArcTan}\Big[\frac{\sqrt{\frac{13}{2}}\sqrt{\frac{1+x}{(1+\sqrt{3}+x)^2}}}{\sqrt{\frac{1-x+x^2}{(1+\sqrt{3}+x)^2}}}\Big]}{\sqrt{26}\sqrt{\frac{1+x}{(1+\sqrt{3}+x)^2}}\sqrt{-1-x^3}}-\frac{2\sqrt{14+8\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{(1-\sqrt{3}+x)^2}}\,\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\Big],-7+4\sqrt{3}\Big]}{3^{1/4}\sqrt{-\frac{1+x}{(1-\sqrt{3}+x)^2}}\sqrt{-1-x^3}}-$$

$$\frac{12\times 3^{1/4}(1+x)\sqrt{\frac{1-x+x^2}{(1+\sqrt{3}+x)^2}}\,\text{EllipticPi}\Big[97-56\sqrt{3},-\text{ArcSin}\Big[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\Big],-7-4\sqrt{3}\Big]}{\sqrt{2-\sqrt{3}}\sqrt{\frac{1+x}{(1+\sqrt{3}+x)^2}}\sqrt{-1-x^3}}$$

Result (type 4, 196 leaves):

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

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

Problem 164: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{e+f\,x}{(c+d\,x)\sqrt{1+x^3}}\,dx$$

Optimal (type 4, 452 leaves, 8 steps):

$$\frac{(d e - c f)(1+x)\sqrt{\frac{1-x+x^2}{(1+\sqrt{3}+x)^2}}\,\text{ArcTan}\Big[\frac{\sqrt{c^2+c d+d^2}\sqrt{\frac{1+x}{(1+\sqrt{3}+x)^2}}}{\sqrt{c-d}\sqrt{d}\sqrt{\frac{1-x+x^2}{(1+\sqrt{3}+x)^2}}}\Big]}{\sqrt{c-d}\sqrt{d}\sqrt{c^2+c d+d^2}\sqrt{\frac{1+x}{(1+\sqrt{3}+x)^2}}\sqrt{1+x^3}}+$$

$$\frac{2\sqrt{2+\sqrt{3}}\,(e-f-\sqrt{3} f)(1+x)\sqrt{\frac{1-x+x^2}{(1+\sqrt{3}+x)^2}}\,\text{EllipticF}\Big[\text{ArcSin}\Big[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\Big],-7-4\sqrt{3}\Big]}{3^{1/4}(c-d-\sqrt{3} d)\sqrt{\frac{1+x}{(1+\sqrt{3}+x)^2}}\sqrt{1+x^3}}+$$

$$\left(4\times 3^{1/4}\sqrt{2+\sqrt{3}}\,(d e-c f)(1+x)\sqrt{\frac{1-x+x^2}{(1+\sqrt{3}+x)^2}}\,\text{EllipticPi}\Big[\frac{(c-(1+\sqrt{3}) d)^2}{(c-(1-\sqrt{3}) d)^2},-\text{ArcSin}\Big[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\Big],-7-4\sqrt{3}\Big]\right)\Big/$$

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

Result (type 4, 211 leaves) :

$$\frac{1}{d\sqrt{1+x^3}}2\sqrt{\frac{1+x}{1+(-1)^{1/3}}}\left(-\frac{f\left((-1)^{1/3}-x\right)\sqrt{\frac{(-1)^{1/3}-(-1)^{2/3}x}{1+(-1)^{1/3}}}\,\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}\Big],(-1)^{1/3}\Big]}{\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}}+\right.$$

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

Problem 165: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{e+f x}{(c+d x)\sqrt{1-x^3}}\,dx$$

Optimal (type 4, 476 leaves, 8 steps) :

$$-\frac{(d e-c f)(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{ArcTanh}\left[\frac{\sqrt{c^2-c d+d^2}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}}{\sqrt{d}\sqrt{c+d}\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}}\right]}{\sqrt{d}\sqrt{c+d}\sqrt{c^2-c d+d^2}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{1-x^3}}-$$

$$\frac{2\sqrt{2+\sqrt{3}}\left(e+f+\sqrt{3}f\right)(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]}{3^{1/4}\left(c+d+\sqrt{3}d\right)\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{1-x^3}}+$$

$$\frac{4\times 3^{1/4}\sqrt{2+\sqrt{3}}(d e-c f)(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{EllipticPi}\left[\frac{\left(c+d+\sqrt{3}d\right)^2}{\left(c+d-\sqrt{3}d\right)^2},-\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]}{\left(c^2+2 c d-2 d^2\right)\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{1-x^3}}$$

Result (type 4, 233 leaves) :

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

$$\left.(-1)^{1/3}\sqrt{3}\left(1+(-1)^{1/3}\right)(-d e+c f)\sqrt{1+x+x^2}\,\text{EllipticPi}\left[\frac{i\sqrt{3}d}{-c+(-1)^{1/3}d},\text{ArcSin}\left[\sqrt{\frac{1-(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]\right)$$

Problem 166: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{e+f x}{(c+d x)\sqrt{-1+x^3}}\,dx$$

Optimal (type 4, 477 leaves, 8 steps) :

$$-\frac{(d e-c f)(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{ArcTanh}\left[\frac{\sqrt{c^2-c d+d^2}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}}{\sqrt{d}\sqrt{c+d}\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}}\right]}{\sqrt{d}\sqrt{c+d}\sqrt{c^2-c d+d^2}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}}-$$

$$\frac{2\sqrt{2-\sqrt{3}}\left(e+f+\sqrt{3} f\right)(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]}{3^{1/4}\left(c+d+\sqrt{3} d\right)\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}}+$$

$$\frac{4\times 3^{1/4}\sqrt{2+\sqrt{3}}(d e-c f)(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{EllipticPi}\left[\frac{\left(c+d+\sqrt{3} d\right)^2}{\left(c+d-\sqrt{3} d\right)^2},-\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]}{\left(c^2+2 c d-2 d^2\right)\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}}$$

Result (type 4, 231 leaves) :

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

$$\left.(-1)^{1/3}\sqrt{3}\left(1+(-1)^{1/3}\right)(-d e+c f)\sqrt{1+x+x^2}\,\text{EllipticPi}\left[\frac{i\sqrt{3} d}{-c+(-1)^{1/3} d},\text{ArcSin}\left[\sqrt{\frac{1-(-1)^{2/3} x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]\right)$$

Problem 167: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{e+f x}{(c+d x)\sqrt{-1-x^3}}\,dx$$

Optimal (type 4, 465 leaves, 8 steps) :

$$\frac{(d\,e-c\,f)\,(1+x)\,\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\;\text{ArcTan}\left[\frac{\sqrt{c^2+c\,d+d^2}\,\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}}{\sqrt{c-d}\,\sqrt{d}\,\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}}\right]}{\sqrt{c-d}\,\sqrt{d}\,\sqrt{c^2+c\,d+d^2}\,\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\,\sqrt{-1-x^3}}+$$

$$\frac{2\,\sqrt{2-\sqrt{3}}\,\left(e-f-\sqrt{3}\,f\right)\,(1+x)\,\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],\,-7+4\,\sqrt{3}\right]}{3^{1/4}\,\left(c-d-\sqrt{3}\,d\right)\,\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\,\sqrt{-1-x^3}}+$$

$$\left(4\times 3^{1/4}\,\sqrt{2+\sqrt{3}}\,(d\,e-c\,f)\,(1+x)\,\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\;\text{EllipticPi}\left[\frac{\left(c-\left(1+\sqrt{3}\right)d\right)^2}{\left(c-\left(1-\sqrt{3}\right)d\right)^2},\,-\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],\,-7-4\,\sqrt{3}\right]\right)\Bigg/$$

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

Result (type 4, 213 leaves) :

$$\frac{1}{d\,\sqrt{-1-x^3}}2\,\sqrt{\frac{1+x}{1+(-1)^{1/3}}}\left(-\frac{f\,\left((-1)^{1/3}-x\right)\,\sqrt{\frac{(-1)^{1/3}-(-1)^{2/3}\,x}{1+(-1)^{1/3}}}\;\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{1+(-1)^{2/3}\,x}{1+(-1)^{1/3}}}\right],\,(-1)^{1/3}\right]}{\sqrt{\frac{1+(-1)^{2/3}\,x}{1+(-1)^{1/3}}}}+\right.$$

$$\left.\frac{i\,(-d\,e+c\,f)\,\sqrt{1-x+x^2}\;\text{EllipticPi}\left[\frac{i\,\sqrt{3}\,d}{c+(-1)^{1/3}\,d},\,\text{ArcSin}\left[\sqrt{\frac{1+(-1)^{2/3}\,x}{1+(-1)^{1/3}}}\right],\,(-1)^{1/3}\right]}{c+(-1)^{1/3}\,d}\right)$$

Problem 168: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{e+f\,x}{x\,\sqrt{1+x^3}}\,dx$$

Optimal (type 4, 120 leaves, 6 steps) :

$$-\frac{2}{3}\,e\,\text{ArcTanh}\left[\sqrt{1+x^3}\right]+\frac{2\sqrt{2+\sqrt{3}}\;f\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]}{3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\;\sqrt{1+x^3}}$$

Result (type 4, 134 leaves):

$$-\frac{2}{3}\,e\,\text{ArcTanh}\left[\sqrt{1+x^3}\right]-\frac{2\,f\left((-1)^{1/3}-x\right)\sqrt{\frac{1+x}{1+(-1)^{1/3}}}\sqrt{-\frac{(-1)^{2/3}\left((-1)^{2/3}+x\right)}{1+(-1)^{1/3}}}\;\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]}{\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}\;\sqrt{1+x^3}}$$

Problem 169: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{e+f\,x}{x\sqrt{1-x^3}}\,dx$$

Optimal (type 4, 134 leaves, 6 steps):

$$-\frac{2}{3}\,e\,\text{ArcTanh}\left[\sqrt{1-x^3}\right]-\frac{2\sqrt{2+\sqrt{3}}\;f\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]}{3^{1/4}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\;\sqrt{1-x^3}}$$

Result (type 4, 140 leaves):

$$-\frac{2}{3}\,e\,\text{ArcTanh}\left[\sqrt{1-x^3}\right]+\frac{2\,f\sqrt{\frac{1-x}{1+(-1)^{1/3}}}\left((-1)^{1/3}+x\right)\sqrt{\frac{(-1)^{1/3}+(-1)^{2/3}x}{1+(-1)^{1/3}}}\;\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{1-(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]}{\sqrt{\frac{1-(-1)^{2/3}x}{1+(-1)^{1/3}}}\;\sqrt{1-x^3}}$$

Problem 170: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{e+f\,x}{x\sqrt{-1+x^3}}\,dx$$

Optimal (type 4, 137 leaves, 6 steps):

$$\frac{2}{3}\,e\,\text{ArcTan}\left[\sqrt{-1+x^3}\right]-\frac{2\sqrt{2-\sqrt{3}}\,f\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]}{3^{1/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}}$$

Result (type 4, 136 leaves):

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

Problem 171: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{e+f\,x}{x\sqrt{-1-x^3}}\,dx$$

Optimal (type 4, 131 leaves, 6 steps):

$$\frac{2}{3}\,e\,\text{ArcTan}\left[\sqrt{-1-x^3}\right]+\frac{2\sqrt{2-\sqrt{3}}\,f\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]}{3^{1/4}\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\sqrt{-1-x^3}}$$

Result (type 4, 138 leaves):

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

Problem 172: Unable to integrate problem.

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

Optimal (type 3, 95 leaves, 1 step):

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

Result (type 8, 33 leaves):

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

Problem 173: Unable to integrate problem.

$$\int\frac{e+f\,x}{(c+d\,x)\,(-c^3+d^3\,x^3)^{1/3}}\,dx$$

Optimal (type 3, 234 leaves, 3 steps):

$$\frac{f\,\text{ArcTan}\left[\frac{1+\frac{2\,d\,x}{(-c^3+d^3\,x^3)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3}\,d^2}+\frac{\sqrt{3}\,(d\,e-c\,f)\,\text{ArcTan}\left[\frac{1-\frac{2^{1/3}\,(c-d\,x)}{(-c^3+d^3\,x^3)^{1/3}}}{\sqrt{3}}\right]}{2\times 2^{1/3}\,c\,d^2}+\frac{(d\,e-c\,f)\,\text{Log}\left[(c-d\,x)\,(c+d\,x)^2\right]}{4\times 2^{1/3}\,c\,d^2}-$$
$$\frac{f\,\text{Log}\left[-d\,x+(-c^3+d^3\,x^3)^{1/3}\right]}{2\,d^2}-\frac{3\,(d\,e-c\,f)\,\text{Log}\left[d\,(c-d\,x)+2^{2/3}\,d\,(-c^3+d^3\,x^3)^{1/3}\right]}{4\times 2^{1/3}\,c\,d^2}$$

Result (type 8, 32 leaves):

$$\int\frac{e+f\,x}{(c+d\,x)\,(-c^3+d^3\,x^3)^{1/3}}\,dx$$

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

$$\int\frac{(a+b\,x)^n\,(c+d\,x^3)^2}{x}\,dx$$

Optimal (type 5, 209 leaves, 3 steps):

$$\frac{a^2\,d\,(2\,b^3\,c-a^3\,d)\,(a+b\,x)^{1+n}}{b^6\,(1+n)}-\frac{a\,d\,(4\,b^3\,c-5\,a^3\,d)\,(a+b\,x)^{2+n}}{b^6\,(2+n)}+\frac{2\,d\,(b^3\,c-5\,a^3\,d)\,(a+b\,x)^{3+n}}{b^6\,(3+n)}+$$
$$\frac{10\,a^2\,d^2\,(a+b\,x)^{4+n}}{b^6\,(4+n)}-\frac{5\,a\,d^2\,(a+b\,x)^{5+n}}{b^6\,(5+n)}+\frac{d^2\,(a+b\,x)^{6+n}}{b^6\,(6+n)}-\frac{c^2\,(a+b\,x)^{1+n}\,\text{Hypergeometric2F1}\left[1,1+n,2+n,1+\frac{b\,x}{a}\right]}{a\,(1+n)}$$

Result (type 5, 420 leaves):

$$(a+b x)^n \left(\frac{1}{b^3 (1+n) (2+n) (3+n)} 2 c d \left(1+\frac{b x}{a}\right)^{-n} \left(-2 a^2 b n x \left(1+\frac{b x}{a}\right)^n + a b^2 n (1+n) x^2 \left(1+\frac{b x}{a}\right)^n + b^3 \left(2+3 n+n^2\right) x^3 \left(1+\frac{b x}{a}\right)^n + 2 a^3 \left(-1+\left(1+\frac{b x}{a}\right)^n\right)\right) + \frac{1}{b^6 (1+n) (2+n) (3+n) (4+n) (5+n) (6+n)} d^2 \left(1+\frac{b x}{a}\right)^{-n} \left(120 a^5 b n x \left(1+\frac{b x}{a}\right)^n - 60 a^4 b^2 n (1+n) x^2 \left(1+\frac{b x}{a}\right)^n + 20 a^3 b^3 n \left(2+3 n+n^2\right) x^3 \left(1+\frac{b x}{a}\right)^n - 5 a^2 b^4 n \left(6+11 n+6 n^2+n^3\right) x^4 \left(1+\frac{b x}{a}\right)^n + a b^5 n \left(24+50 n+35 n^2+10 n^3+n^4\right) x^5 \left(1+\frac{b x}{a}\right)^n + b^6 \left(120+274 n+225 n^2+85 n^3+15 n^4+n^5\right) x^6 \left(1+\frac{b x}{a}\right)^n - 120 a^6 \left(-1+\left(1+\frac{b x}{a}\right)^n\right)\right) + \frac{c^2 \left(1+\frac{a}{b x}\right)^{-n} \text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{a}{b x}\right]}{n}\right)$$

Problem 182: Result more than twice size of optimal antiderivative.

$$\int x^2 (a+b x)^n \left(c+d x^3\right)^3 dx$$

Optimal (type 3, 459 leaves, 2 steps):

$$\frac{a^2 \left(b^3 c-a^3 d\right)^3 (a+b x)^{1+n}}{b^{12} (1+n)} - \frac{a \left(2 b^3 c-11 a^3 d\right) \left(b^3 c-a^3 d\right)^2 (a+b x)^{2+n}}{b^{12} (2+n)} + \frac{\left(b^3 c-a^3 d\right) \left(b^6 c^2-29 a^3 b^3 c d+55 a^6 d^2\right) (a+b x)^{3+n}}{b^{12} (3+n)} + \frac{3 a^2 d \left(10 b^6 c^2-56 a^3 b^3 c d+55 a^6 d^2\right) (a+b x)^{4+n}}{b^{12} (4+n)} - \frac{15 a d \left(b^6 c^2-14 a^3 b^3 c d+22 a^6 d^2\right) (a+b x)^{5+n}}{b^{12} (5+n)} + \frac{3 d \left(b^6 c^2-56 a^3 b^3 c d+154 a^6 d^2\right) (a+b x)^{6+n}}{b^{12} (6+n)} + \frac{42 a^2 d^2 \left(2 b^3 c-11 a^3 d\right) (a+b x)^{7+n}}{b^{12} (7+n)} - \frac{6 a d^2 \left(4 b^3 c-55 a^3 d\right) (a+b x)^{8+n}}{b^{12} (8+n)} + \frac{3 d^2 \left(b^3 c-55 a^3 d\right) (a+b x)^{9+n}}{b^{12} (9+n)} + \frac{55 a^2 d^3 (a+b x)^{10+n}}{b^{12} (10+n)} - \frac{11 a d^3 (a+b x)^{11+n}}{b^{12} (11+n)} + \frac{d^3 (a+b x)^{12+n}}{b^{12} (12+n)}$$

Result (type 3, 1134 leaves):

$$\Big((a+b x)^{1+n} \big(-39916800 a^{11} d^3+39916800 a^{10} b d^3 (1+n) x-19958400 a^9 b^2 d^3 (2+3 n+n^2) x^2+120960 a^8 b^3 d^2 (c (1320+362 n+33 n^2+n^3)+55 d (6+11 n+6 n^2+n^3) x^3)-30240 a^7 b^4 d^2 (1+n) x (4 c (1320+362 n+33 n^2+n^3)+55 d (24+26 n+9 n^2+n^3) x^3)+30240 a^6 b^5 d^2 (2+3 n+n^2) x^2 (2 c (1320+362 n+33 n^2+n^3)+11 d (60+47 n+12 n^2+n^3) x^3)-360 a^5 b^6 d (c^2 (665280+434568 n+117454 n^2+16815 n^3+1345 n^4+57 n^5+n^6)+56 c d (7920+16692 n+12100 n^2+3861 n^3+571 n^4+39 n^5+n^6) x^3+154 d^2 (720+1764 n+1624 n^2+735 n^3+175 n^4+21 n^5+n^6) x^6)+360 a^4 b^7 d (1+n) x (c^2 (665280+434568 n+117454 n^2+16815 n^3+1345 n^4+57 n^5+n^6)+14 c d (31680+43008 n+22084 n^2+5460 n^3+685 n^4+42 n^5+n^6) x^3+22 d^2 (5040+8028 n+5104 n^2+1665 n^3+295 n^4+27 n^5+n^6) x^6)-18 a^3 b^8 d (2+3 n+n^2) x^2 (10 c^2 (665280+434568 n+117454 n^2+16815 n^3+1345 n^4+57 n^5+n^6)+56 c d (79200+83760 n+34834 n^2+7275 n^3+805 n^4+45 n^5+n^6) x^3+55 d^2 (20160+24552 n+12154 n^2+3135 n^3+445 n^4+33 n^5+n^6) x^6)+b^{11} (246400+593520 n+541508 n^2+251352 n^3+66489 n^4+10440 n^5+962 n^6+48 n^7+n^8) x^2 (c^3 (648+234 n+27 n^2+n^3)+3 c^2 d (324+171 n+24 n^2+n^3) x^3+3 c d^2 (216+126 n+21 n^2+n^3) x^6+d^3 (162+99 n+18 n^2+n^3) x^9)-a b^{10} (280+418 n+159 n^2+22 n^3+n^4) x (2 c^3 (285120+221544 n+70254 n^2+11645 n^3+1065 n^4+51 n^5+n^6)+15 c^2 d (57024+70920 n+32574 n^2+7115 n^3+801 n^4+45 n^5+n^6) x^3+24 c d^2 (23760+32652 n+17160 n^2+4421 n^3+591 n^4+39 n^5+n^6) x^6+11 d^3 (12960+18612 n+10404 n^2+2915 n^3+435 n^4+33 n^5+n^6) x^9)+2 a^2 b^9 (c^3 (79833600+101378880 n+56231712 n^2+17893196 n^3+3602088 n^4+476049 n^5+41328 n^6+2274 n^7+72 n^8+n^9)+30 c^2 d (3991680+9925488 n+9476652 n^2+4665572 n^3+1332327 n^4+233481 n^5+25518 n^6+1698 n^7+63 n^8+n^9) x^3+84 c d^2 (950400+2589120 n+2806008 n^2+1617020 n^3+552426 n^4+116949 n^5+15432 n^6+1230 n^7+54 n^8+n^9) x^6+55 d^3 (362880+1026576 n+1172700 n^2+723680 n^3+269325 n^4+63273 n^5+9450 n^6+870 n^7+45 n^8+n^9) x^9)\big)\Big)\Big/\big(b^{12} (1+n) (2+n) (3+n) (4+n) (5+n) (6+n) (7+n) (8+n) (9+n) (10+n) (11+n) (12+n)\big)$$

Problem 183: Result more than twice size of optimal antiderivative.

$$\int x (a+b x)^n (c+d x^3)^3 \, dx$$

Optimal (type 3, 396 leaves, 2 steps):

$$-\frac{a (b^3 c-a^3 d)^3 (a+b x)^{1+n}}{b^{11} (1+n)}+\frac{(b^3 c-10 a^3 d) (b^3 c-a^3 d)^2 (a+b x)^{2+n}}{b^{11} (2+n)}+\frac{9 a^2 d (2 b^3 c-5 a^3 d) (b^3 c-a^3 d) (a+b x)^{3+n}}{b^{11} (3+n)}-\frac{3 a d (4 b^6 c^2-35 a^3 b^3 c d+40 a^6 d^2) (a+b x)^{4+n}}{b^{11} (4+n)}+\frac{3 d (b^6 c^2-35 a^3 b^3 c d+70 a^6 d^2) (a+b x)^{5+n}}{b^{11} (5+n)}+\frac{63 a^2 d^2 (b^3 c-4 a^3 d) (a+b x)^{6+n}}{b^{11} (6+n)}-\frac{21 a d^2 (b^3 c-10 a^3 d) (a+b x)^{7+n}}{b^{11} (7+n)}+\frac{3 d^2 (b^3 c-40 a^3 d) (a+b x)^{8+n}}{b^{11} (8+n)}+\frac{45 a^2 d^3 (a+b x)^{9+n}}{b^{11} (9+n)}-\frac{10 a d^3 (a+b x)^{10+n}}{b^{11} (10+n)}+\frac{d^3 (a+b x)^{11+n}}{b^{11} (11+n)}$$

Result (type 3, 903 leaves):

$$\Big(\big(a+b\,x\big)^{1+n}\,\big(3\,628\,800\,a^{10}\,d^3-3\,628\,800\,a^9\,b\,d^3\,(1+n)\,x+$$
$$1\,814\,400\,a^8\,b^2\,d^3\,\left(2+3\,n+n^2\right)\,x^2-15\,120\,a^7\,b^3\,d^2\,\left(c\,\left(990+299\,n+30\,n^2+n^3\right)+40\,d\,\left(6+11\,n+6\,n^2+n^3\right)\,x^3\right)+$$
$$15\,120\,a^6\,b^4\,d^2\,(1+n)\,x\,\left(c\,\left(990+299\,n+30\,n^2+n^3\right)+10\,d\,\left(24+26\,n+9\,n^2+n^3\right)\,x^3\right)-7560\,a^5\,b^5\,d^2\,\left(2+3\,n+n^2\right)\,x^2$$
$$\left(c\,\left(990+299\,n+30\,n^2+n^3\right)+4\,d\,\left(60+47\,n+12\,n^2+n^3\right)\,x^3\right)+72\,a^4\,b^6\,d\,\left(c^2\,\left(332\,640+245\,004\,n+74\,524\,n^2+11\,985\,n^3+1075\,n^4+51\,n^5+n^6\right)+\right.$$
$$\left.35\,c\,d\,\left(5940+12\,684\,n+9409\,n^2+3120\,n^3+490\,n^4+36\,n^5+n^6\right)\,x^3+70\,d^2\,\left(720+1764\,n+1624\,n^2+735\,n^3+175\,n^4+21\,n^5+n^6\right)\,x^6\right)-$$
$$18\,a^3\,b^7\,d\,(1+n)\,x\,\left(4\,c^2\,\left(332\,640+245\,004\,n+74\,524\,n^2+11\,985\,n^3+1075\,n^4+51\,n^5+n^6\right)+\right.$$
$$\left.35\,c\,d\,\left(23\,760+32\,916\,n+17\,404\,n^2+4485\,n^3+595\,n^4+39\,n^5+n^6\right)\,x^3+40\,d^2\,\left(5040+8028\,n+5104\,n^2+1665\,n^3+295\,n^4+27\,n^5+n^6\right)\,x^6\right)+$$
$$18\,a^2\,b^8\,d\,\left(2+3\,n+n^2\right)\,x^2\,\left(2\,c^2\,\left(332\,640+245\,004\,n+74\,524\,n^2+11\,985\,n^3+1075\,n^4+51\,n^5+n^6\right)+\right.$$
$$\left.7\,c\,d\,\left(59\,400+64\,470\,n+27\,733\,n^2+6048\,n^3+706\,n^4+42\,n^5+n^6\right)\,x^3+5\,d^2\,\left(20\,160+24\,552\,n+12\,154\,n^2+3135\,n^3+445\,n^4+33\,n^5+n^6\right)\,x^6\right)+$$
$$b^{10}\,\left(45\,360+95\,436\,n+72\,180\,n^2+27\,109\,n^3+5620\,n^4+654\,n^5+40\,n^6+n^7\right)\,x\,\left(c^3\,\left(440+183\,n+24\,n^2+n^3\right)+\right.$$
$$\left.3\,c^2\,d\,\left(176+126\,n+21\,n^2+n^3\right)\,x^3+3\,c\,d^2\,\left(110+87\,n+18\,n^2+n^3\right)\,x^6+d^3\,\left(80+66\,n+15\,n^2+n^3\right)\,x^9\right)-a\,b^9\,\left(162+99\,n+18\,n^2+n^3\right)$$
$$\left(c^3\,\left(123\,200+111\,960\,n+41\,214\,n^2+7875\,n^3+825\,n^4+45\,n^5+n^6\right)+12\,c^2\,d\,\left(12\,320+24\,132\,n+15\,600\,n^2+4341\,n^3+591\,n^4+39\,n^5+n^6\right)\,x^3+\right.$$
$$\left.21\,c\,d^2\,\left(4400+9420\,n+7068\,n^2+2427\,n^3+411\,n^4+33\,n^5+n^6\right)\,x^6+10\,d^3\,\left(2240+4968\,n+3954\,n^2+1485\,n^3+285\,n^4+27\,n^5+n^6\right)\,x^9\right)\big)\Big)\Big/$$
$$\left(b^{11}\,(1+n)\,(2+n)\,(3+n)\,(4+n)\,(5+n)\,(6+n)\,(7+n)\,(8+n)\,(9+n)\,(10+n)\,(11+n)\right)$$

Problem 184: Result more than twice size of optimal antiderivative.

$$\int (a+b\,x)^n\,\left(c+d\,x^3\right)^3\,dx$$

Optimal (type 3, 337 leaves, 2 steps):

$$\frac{\left(b^3\,c-a^3\,d\right)^3\,(a+b\,x)^{1+n}}{b^{10}\,(1+n)}+\frac{9\,a^2\,d\,\left(b^3\,c-a^3\,d\right)^2\,(a+b\,x)^{2+n}}{b^{10}\,(2+n)}-\frac{9\,a\,d\,\left(b^3\,c-4\,a^3\,d\right)\,\left(b^3\,c-a^3\,d\right)\,(a+b\,x)^{3+n}}{b^{10}\,(3+n)}+$$
$$\frac{3\,d\,\left(b^6\,c^2-20\,a^3\,b^3\,c\,d+28\,a^6\,d^2\right)\,(a+b\,x)^{4+n}}{b^{10}\,(4+n)}+\frac{9\,a^2\,d^2\,\left(5\,b^3\,c-14\,a^3\,d\right)\,(a+b\,x)^{5+n}}{b^{10}\,(5+n)}-\frac{18\,a\,d^2\,\left(b^3\,c-7\,a^3\,d\right)\,(a+b\,x)^{6+n}}{b^{10}\,(6+n)}+$$
$$\frac{3\,d^2\,\left(b^3\,c-28\,a^3\,d\right)\,(a+b\,x)^{7+n}}{b^{10}\,(7+n)}+\frac{36\,a^2\,d^3\,(a+b\,x)^{8+n}}{b^{10}\,(8+n)}-\frac{9\,a\,d^3\,(a+b\,x)^{9+n}}{b^{10}\,(9+n)}+\frac{d^3\,(a+b\,x)^{10+n}}{b^{10}\,(10+n)}$$

Result (type 3, 706 leaves):

$$\Big((a+b x)^{1+n} \big(-362880 a^9 d^3+362880 a^8 b d^3 (1+n) x-181440 a^7 b^2 d^3 (2+3 n+n^2) x^2+2160 a^6 b^3 d^2 (c (720+242 n+27 n^2+n^3)+28 d (6+11 n+6 n^2+n^3) x^3)- 2160 a^5 b^4 d^2 (1+n) x (c (720+242 n+27 n^2+n^3)+7 d (24+26 n+9 n^2+n^3) x^3)+ 216 a^4 b^5 d^2 (2+3 n+n^2) x^2 (5 c (720+242 n+27 n^2+n^3)+14 d (60+47 n+12 n^2+n^3) x^3)-9 a b^8 d (80+146 n+81 n^2+16 n^3+n^4) x^2 (c^2 (3780+1968 n+379 n^2+32 n^3+n^4)+2 c d (1080+858 n+235 n^2+26 n^3+n^4) x^3+d^2 (504+450 n+145 n^2+20 n^3+n^4) x^6)- 18 a^3 b^6 d (c^2 (151200+127860 n+44524 n^2+8175 n^3+835 n^4+45 n^5+n^6)+20 c d (4320+9372 n+7144 n^2+2475 n^3+415 n^4+33 n^5+n^6) x^3+ 28 d^2 (720+1764 n+1624 n^2+735 n^3+175 n^4+21 n^5+n^6) x^6)+18 a^2 b^7 d (1+n) x (c^2 (151200+127860 n+44524 n^2+8175 n^3+835 n^4+45 n^5+n^6)+5 c d (17280+24528 n+13420 n^2+3624 n^3+511 n^4+36 n^5+n^6) x^3+ 4 d^2 (5040+8028 n+5104 n^2+1665 n^3+295 n^4+27 n^5+n^6) x^6)+b^9 (12960+18612 n+10404 n^2+2915 n^3+435 n^4+33 n^5+n^6) (c^3 (280+138 n+21 n^2+n^3)+3 c^2 d (70+87 n+18 n^2+n^3) x^3+3 c d^2 (40+54 n+15 n^2+n^3) x^6+d^3 (28+39 n+12 n^2+n^3) x^9)\big)\Big)\Big/ \big(b^{10} (1+n) (2+n) (3+n) (4+n) (5+n) (6+n) (7+n) (8+n) (9+n) (10+n)\big)$$

Problem 185: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b x)^n (c+d x^3)^3}{x} \, dx$$

Optimal (type 5, 358 leaves, 3 steps):

$$\frac{a^2 d (3 b^6 c^2-3 a^3 b^3 c d+a^6 d^2) (a+b x)^{1+n}}{b^9 (1+n)}-\frac{a d (6 b^6 c^2-15 a^3 b^3 c d+8 a^6 d^2) (a+b x)^{2+n}}{b^9 (2+n)}+\frac{d (3 b^6 c^2-30 a^3 b^3 c d+28 a^6 d^2) (a+b x)^{3+n}}{b^9 (3+n)}+ \frac{2 a^2 d^2 (15 b^3 c-28 a^3 d) (a+b x)^{4+n}}{b^9 (4+n)}-\frac{5 a d^2 (3 b^3 c-14 a^3 d) (a+b x)^{5+n}}{b^9 (5+n)}+\frac{d^2 (3 b^3 c-56 a^3 d) (a+b x)^{6+n}}{b^9 (6+n)}+ \frac{28 a^2 d^3 (a+b x)^{7+n}}{b^9 (7+n)}-\frac{8 a d^3 (a+b x)^{8+n}}{b^9 (8+n)}+\frac{d^3 (a+b x)^{9+n}}{b^9 (9+n)}-\frac{c^3 (a+b x)^{1+n} \text{Hypergeometric2F1}\left[1,1+n,2+n,1+\frac{b x}{a}\right]}{a (1+n)}$$

Result (type 5, 856 leaves):

$$(a+b x)^n \left(\frac{1}{b^3 (1+n) (2+n) (3+n)} 3 c^2 d \left(1+\frac{b x}{a}\right)^{-n} \left(-2 a^2 b n x \left(1+\frac{b x}{a}\right)^n + a b^2 n (1+n) x^2 \left(1+\frac{b x}{a}\right)^n + b^3 \left(2+3 n+n^2\right) x^3 \left(1+\frac{b x}{a}\right)^n + 2 a^3 \left(-1+\left(1+\frac{b x}{a}\right)^n\right)\right) + \frac{1}{b^6 (1+n) (2+n) (3+n) (4+n) (5+n) (6+n)} 3 c d^2 \left(1+\frac{b x}{a}\right)^{-n} \left(120 a^5 b n x \left(1+\frac{b x}{a}\right)^n - 60 a^4 b^2 n (1+n) x^2 \left(1+\frac{b x}{a}\right)^n + 20 a^3 b^3 n \left(2+3 n+n^2\right) x^3 \left(1+\frac{b x}{a}\right)^n - 5 a^2 b^4 n \left(6+11 n+6 n^2+n^3\right) x^4 \left(1+\frac{b x}{a}\right)^n + a b^5 n \left(24+50 n+35 n^2+10 n^3+n^4\right) x^5 \left(1+\frac{b x}{a}\right)^n + b^6 \left(120+274 n+225 n^2+85 n^3+15 n^4+n^5\right) x^6 \left(1+\frac{b x}{a}\right)^n - 120 a^6 \left(-1+\left(1+\frac{b x}{a}\right)^n\right)\right) + \frac{1}{b^9 (1+n) (2+n) (3+n) (4+n) (5+n) (6+n) (7+n) (8+n) (9+n)} d^3 \left(1+\frac{b x}{a}\right)^{-n} \left(-40320 a^8 b n x \left(1+\frac{b x}{a}\right)^n + 20160 a^7 b^2 n (1+n) x^2 \left(1+\frac{b x}{a}\right)^n - 6720 a^6 b^3 n \left(2+3 n+n^2\right) x^3 \left(1+\frac{b x}{a}\right)^n + 1680 a^5 b^4 n \left(6+11 n+6 n^2+n^3\right) x^4 \left(1+\frac{b x}{a}\right)^n - 336 a^4 b^5 n \left(24+50 n+35 n^2+10 n^3+n^4\right) x^5 \left(1+\frac{b x}{a}\right)^n + 56 a^3 b^6 n \left(120+274 n+225 n^2+85 n^3+15 n^4+n^5\right) x^6 \left(1+\frac{b x}{a}\right)^n - 8 a^2 b^7 n \left(720+1764 n+1624 n^2+735 n^3+175 n^4+21 n^5+n^6\right) x^7 \left(1+\frac{b x}{a}\right)^n + a b^8 n \left(5040+13068 n+13132 n^2+6769 n^3+1960 n^4+322 n^5+28 n^6+n^7\right) x^8 \left(1+\frac{b x}{a}\right)^n + b^9 \left(40320+109584 n+118124 n^2+67284 n^3+22449 n^4+4536 n^5+546 n^6+36 n^7+n^8\right) x^9 \left(1+\frac{b x}{a}\right)^n + 40320 a^9 \left(-1+\left(1+\frac{b x}{a}\right)^n\right)\right) + \frac{c^3 \left(1+\frac{a}{b x}\right)^{-n} \text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{a}{b x}\right]}{n}\right)$$

Problem 186: Result is not expressed in closed-form.

$$\int \frac{x^5 (e+f x)^n}{a+b x^3} \, dx$$

Optimal (type 5, 324 leaves, 7 steps):

$$\frac{e^2 (e+f x)^{1+n}}{b f^3 (1+n)} - \frac{2 e (e+f x)^{2+n}}{b f^3 (2+n)} + \frac{(e+f x)^{3+n}}{b f^3 (3+n)} + \frac{a (e+f x)^{1+n} \text{Hypergeometric2F1}\left[1,1+n,2+n,\frac{b^{1/3} (e+f x)}{b^{1/3} e-a^{1/3} f}\right]}{3 b^{5/3} \left(b^{1/3} e-a^{1/3} f\right) (1+n)} + \frac{a (e+f x)^{1+n} \text{Hypergeometric2F1}\left[1,1+n,2+n,\frac{b^{1/3} (e+f x)}{b^{1/3} e+(-1)^{1/3} a^{1/3} f}\right]}{3 b^{5/3} \left(b^{1/3} e+(-1)^{1/3} a^{1/3} f\right) (1+n)} + \frac{a (e+f x)^{1+n} \text{Hypergeometric2F1}\left[1,1+n,2+n,\frac{b^{1/3} (e+f x)}{b^{1/3} e-(-1)^{2/3} a^{1/3} f}\right]}{3 b^{5/3} \left(b^{1/3} e-(-1)^{2/3} a^{1/3} f\right) (1+n)}$$

Result (type 7, 423 leaves):

$$\frac{1}{3\,b\,f^3}(e+f\,x)^n\left(\frac{3\left(-2\,e^2\,f\,n\,x+e\,f^2\,n\,(1+n)\,x^2+f^3\,(2+3\,n+n^2)\,x^3+e^3\left(2-2\left(1+\frac{f\,x}{e}\right)^{-n}\right)\right)}{6+11\,n+6\,n^2+n^3}-\frac{1}{b\,n}a\,f^3\left(e^2\,\text{RootSum}\left[b\,e^3-a\,f^3-3\,b\,e^2\,\sharp1+3\,b\,e\,\sharp1^2-b\,\sharp1^3\,\&,\frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\sharp1}{e+f\,x-\sharp1}\right]\left(\frac{e+f\,x}{e+f\,x-\sharp1}\right)^{-n}}{e^2-2\,e\,\sharp1+\sharp1^2}\,\&\right]-2\,e\,\text{RootSum}\left[b\,e^3-a\,f^3-3\,b\,e^2\,\sharp1+3\,b\,e\,\sharp1^2-b\,\sharp1^3\,\&,\frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\sharp1}{e+f\,x-\sharp1}\right]\left(\frac{e+f\,x}{e+f\,x-\sharp1}\right)^{-n}\sharp1}{e^2-2\,e\,\sharp1+\sharp1^2}\,\&\right]+\text{RootSum}\left[b\,e^3-a\,f^3-3\,b\,e^2\,\sharp1+3\,b\,e\,\sharp1^2-b\,\sharp1^3\,\&,\frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\sharp1}{e+f\,x-\sharp1}\right]\left(\frac{e+f\,x}{e+f\,x-\sharp1}\right)^{-n}\sharp1^2}{e^2-2\,e\,\sharp1+\sharp1^2}\,\&\right]\right)\right)$$

Problem 187: Result is not expressed in closed-form.

$$\int\frac{x^4\,(e+f\,x)^n}{a+b\,x^3}\,dx$$

Optimal (type 5, 332 leaves, 7 steps):

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

Result (type 7, 298 leaves):

$$\frac{1}{3\,b\,f^2}(e+f\,x)^n\left(-\frac{3\left(-e\,f\,n\,x-f^2\,(1+n)\,x^2+e^2\left(1-\left(1+\frac{f\,x}{e}\right)^{-n}\right)\right)}{2+3\,n+n^2}+\right.$$

$$\frac{a\,e\,f^3\,\text{RootSum}\left[b\,e^3-a\,f^3-3\,b\,e^2\,\#1+3\,b\,e\,\#1^2-b\,\#1^3\,\&,\ \frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{e+f\,x-\#1}\right]\left(\frac{e+f\,x}{e+f\,x-\#1}\right)^{-n}}{e^2-2\,e\,\#1+\#1^2}\,\&\right]}{b\,n}-$$

$$\left.\frac{a\,f^3\,\text{RootSum}\left[b\,e^3-a\,f^3-3\,b\,e^2\,\#1+3\,b\,e\,\#1^2-b\,\#1^3\,\&,\ \frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{e+f\,x-\#1}\right]\left(\frac{e+f\,x}{e+f\,x-\#1}\right)^{-n}\#1}{e^2-2\,e\,\#1+\#1^2}\,\&\right]}{b\,n}\right)$$

Problem 188: Result is not expressed in closed-form.

$$\int\frac{x^3\,(e+f\,x)^n}{a+b\,x^3}\,dx$$

Optimal (type 5, 293 leaves, 7 steps):

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

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

Result (type 7, 142 leaves):

$$\frac{(e+f\,x)^n\left(\frac{3\,b\,(e+f\,x)}{1+n}-\frac{a\,f^3\,\text{RootSum}\left[b\,e^3-a\,f^3-3\,b\,e^2\,\#1+3\,b\,e\,\#1^2-b\,\#1^3\&,\frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{e+f\,x-\#1}\right]\left(\frac{e+f\,x}{e+f\,x-\#1}\right)^{-n}}{e^2-2\,e\,\#1+\#1^2}\&\right]}{n}\right)}{3\,b^2\,f}$$

Problem 189: Result is not expressed in closed-form.

$$\int\frac{x^2\,(e+f\,x)^n}{a+b\,x^3}\,dx$$

Optimal (type 5, 253 leaves, 5 steps):

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

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

Result (type 7, 337 leaves):

$$\frac{1}{3 b n}(e+f x)^n\left(e^2\,\text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3\,\&,\,\frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{e+f x-\#1}\right]\left(\frac{e+f x}{e+f x-\#1}\right)^{-n}}{e^2-2 e \#1+\#1^2}\,\&\right]-\right.$$

$$2 e\,\text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3\,\&,\,\frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{e+f x-\#1}\right]\left(\frac{e+f x}{e+f x-\#1}\right)^{-n}\#1}{e^2-2 e \#1+\#1^2}\,\&\right]+$$

$$\left.\text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3\,\&,\,\frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{e+f x-\#1}\right]\left(\frac{e+f x}{e+f x-\#1}\right)^{-n}\#1^2}{e^2-2 e \#1+\#1^2}\,\&\right]\right)$$

Problem 190: Result is not expressed in closed-form.

$$\int\frac{x\,(e+f x)^n}{a+b x^3}\,dx$$

Optimal (type 5, 288 leaves, 5 steps):

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

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

Result (type 7, 229 leaves):

$$-\frac{1}{3 b n}f\,(e+f x)^n\left(e\,\text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3\,\&,\,\frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{e+f x-\#1}\right]\left(\frac{e+f x}{e+f x-\#1}\right)^{-n}}{e^2-2 e \#1+\#1^2}\,\&\right]-\right.$$

$$\left.\text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3\,\&,\,\frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{e+f x-\#1}\right]\left(\frac{e+f x}{e+f x-\#1}\right)^{-n}\#1}{e^2-2 e \#1+\#1^2}\,\&\right]\right)$$

Problem 191: Result is not expressed in closed-form.

$$\int \frac{(e+f x)^n}{a+b x^3} \, dx$$

Optimal (type 5, 263 leaves, 5 steps):

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

Result (type 7, 122 leaves):

$$\frac{1}{3 b n} f^2 (e+f x)^n \text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3 \&, \frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{e+f x-\#1}\right] \left(\frac{e+f x}{e+f x-\#1}\right)^{-n}}{e^2-2 e \#1+\#1^2} \&\right]$$

Problem 192: Result is not expressed in closed-form.

$$\int \frac{(e+f x)^n}{x \left(a+b x^3\right)} \, dx$$

Optimal (type 5, 300 leaves, 8 steps):

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

Result (type 7, 377 leaves):

$$\frac{1}{3\,a\,n}(e+f x)^n \left(3 \left(1+\frac{e}{f x}\right)^{-n} \text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{e}{f x}\right] - e^2\,\text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3\&, \frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{e+f x-\#1}\right]\left(\frac{e+f x}{e+f x-\#1}\right)^{-n}}{e^2-2 e \#1+\#1^2}\&\right] + 2 e\,\text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3\&, \frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{e+f x-\#1}\right]\left(\frac{e+f x}{e+f x-\#1}\right)^{-n}\#1}{e^2-2 e \#1+\#1^2}\&\right] - \text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3\&, \frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{e+f x-\#1}\right]\left(\frac{e+f x}{e+f x-\#1}\right)^{-n}\#1^2}{e^2-2 e \#1+\#1^2}\&\right]\right)$$

Problem 193: Result is not expressed in closed-form.

$$\int \frac{(e+f x)^n}{x^2\left(a+b x^3\right)}\,dx$$

Optimal (type 5, 326 leaves, 8 steps):

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

Result (type 7, 280 leaves):

$$\frac{1}{3 a}(e+f x)^n \left(\frac{3\left(1+\frac{e}{f x}\right)^{-n}\text{Hypergeometric2F1}\left[1-n,-n,2-n,-\frac{e}{f x}\right]}{(-1+n)\,x} + \frac{e f\,\text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3\&, \frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{e+f x-\#1}\right]\left(\frac{e+f x}{e+f x-\#1}\right)^{-n}}{e^2-2 e \#1+\#1^2}\&\right]}{n} - \frac{f\,\text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3\&, \frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{e+f x-\#1}\right]\left(\frac{e+f x}{e+f x-\#1}\right)^{-n}\#1}{e^2-2 e \#1+\#1^2}\&\right]}{n}\right)$$

Problem 194: Result is not expressed in closed-form.

$$\int \frac{x^2 (c+d x)^{1+n}}{a+b x^3} \, dx$$

Optimal (type 5, 253 leaves, 5 steps):

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

Result (type 7, 375 leaves):

$$\frac{1}{3 b^2 n (1+n)} (c+d x)^n \left(\left(b c^3-a d^3\right) (1+n) \text{RootSum}\left[b c^3-a d^3-3 b c^2 \#1+3 b c \#1^2-b \#1^3 \&, \frac{\text{Hypergeometric2F1}\left[-n, -n, 1-n, -\frac{\#1}{c+d x-\#1}\right] \left(\frac{c+d x}{c+d x-\#1}\right)^{-n}}{c^2-2 c \#1+\#1^2} \&\right] + b \left(3 n (c+d x)-2 c^2 (1+n) \text{RootSum}\left[b c^3-a d^3-3 b c^2 \#1+3 b c \#1^2-b \#1^3 \&, \frac{\text{Hypergeometric2F1}\left[-n, -n, 1-n, -\frac{\#1}{c+d x-\#1}\right] \left(\frac{c+d x}{c+d x-\#1}\right)^{-n} \#1}{c^2-2 c \#1+\#1^2} \&\right] + c (1+n) \text{RootSum}\left[b c^3-a d^3-3 b c^2 \#1+3 b c \#1^2-b \#1^3 \&, \frac{\text{Hypergeometric2F1}\left[-n, -n, 1-n, -\frac{\#1}{c+d x-\#1}\right] \left(\frac{c+d x}{c+d x-\#1}\right)^{-n} \#1^2}{c^2-2 c \#1+\#1^2} \&\right]\right)\right)$$

Problem 195: Unable to integrate problem.

$$\int \frac{x^m (e+f x)^n}{a+b x^3} \, dx$$

Optimal (type 6, 211 leaves, 8 steps):

$$\frac{x^{1+m} (e+f x)^n \left(1+\frac{f x}{e}\right)^{-n} \text{AppellF1}\left[1+m, -n, 1, 2+m, -\frac{f x}{e}, -\frac{b^{1/3} x}{a^{1/3}}\right]}{3 a (1+m)} + \frac{x^{1+m} (e+f x)^n \left(1+\frac{f x}{e}\right)^{-n} \text{AppellF1}\left[1+m, -n, 1, 2+m, -\frac{f x}{e}, \frac{(-1)^{1/3} b^{1/3} x}{a^{1/3}}\right]}{3 a (1+m)} + \frac{x^{1+m} (e+f x)^n \left(1+\frac{f x}{e}\right)^{-n} \text{AppellF1}\left[1+m, -n, 1, 2+m, -\frac{f x}{e}, -\frac{(-1)^{2/3} b^{1/3} x}{a^{1/3}}\right]}{3 a (1+m)}$$

Result (type 8, 22 leaves):

$$\int \frac{x^m (e + f x)^n}{a + b x^3} \, dx$$

Problem 196: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{c + d x^3}}{a + b x} \, dx$$

Optimal (type 4, 1482 leaves, 13 steps):

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

$$\left. \text{ArcTanh}\left[\frac{\sqrt{2 - \sqrt{3}} \sqrt{b^2 c^{2/3} + a b c^{1/3} d^{1/3} + a^2 d^{2/3}} \sqrt{1 - \frac{\left(\left(1-\sqrt{3}\right) c^{1/3}+d^{1/3} x\right)^2}{\left(\left(1+\sqrt{3}\right) c^{1/3}+d^{1/3} x\right)^2}}}{3^{1/4} \sqrt{b} \, c^{1/6} \sqrt{b c^{1/3} - a d^{1/3}} \sqrt{7 - 4 \sqrt{3} + \frac{\left(\left(1-\sqrt{3}\right) c^{1/3}+d^{1/3} x\right)^2}{\left(\left(1+\sqrt{3}\right) c^{1/3}+d^{1/3} x\right)^2}}}\right]\right) \Bigg/ \left(b^{5/2} \sqrt{\frac{c^{1/3} \left(c^{1/3} + d^{1/3} x\right)}{\left(\left(1 + \sqrt{3}\right) c^{1/3} + d^{1/3} x\right)^2}} \sqrt{c + d x^3}\right) +$$

$$\left(3^{1/4} \sqrt{2 - \sqrt{3}} \, a c^{1/3} d^{1/3} \left(c^{1/3} + d^{1/3} x\right) \sqrt{\frac{c^{2/3} - c^{1/3} d^{1/3} x + d^{2/3} x^2}{\left(\left(1 + \sqrt{3}\right) c^{1/3} + d^{1/3} x\right)^2}} \, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\left(1 - \sqrt{3}\right) c^{1/3} + d^{1/3} x}{\left(1 + \sqrt{3}\right) c^{1/3} + d^{1/3} x}\right], -7 - 4 \sqrt{3}\right]\right) \Bigg/$$

$$\left(b^2 \sqrt{\frac{c^{1/3} \left(c^{1/3} + d^{1/3} x\right)}{\left(\left(1 + \sqrt{3}\right) c^{1/3} + d^{1/3} x\right)^2}} \sqrt{c + d x^3}\right) +$$

$$\left(2 \sqrt{2 + \sqrt{3}} \, a \left(\left(1 - \sqrt{3}\right) b c^{1/3} + a d^{1/3}\right) d^{1/3} \left(c^{1/3} + d^{1/3} x\right) \sqrt{\frac{c^{2/3} - c^{1/3} d^{1/3} x + d^{2/3} x^2}{\left(\left(1 + \sqrt{3}\right) c^{1/3} + d^{1/3} x\right)^2}} \, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1 - \sqrt{3}\right) c^{1/3} + d^{1/3} x}{\left(1 + \sqrt{3}\right) c^{1/3} + d^{1/3} x}\right], -7 - 4 \sqrt{3}\right]\right) \Bigg/$$

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

$$\left(2\sqrt{2+\sqrt{3}}\,\left(b^3 c-a^3 d\right)\,\left(c^{1/3}+d^{1/3} x\right)\sqrt{\frac{c^{2/3}-c^{1/3} d^{1/3} x+d^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) c^{1/3}+d^{1/3} x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) c^{1/3}+d^{1/3} x}{\left(1+\sqrt{3}\right) c^{1/3}+d^{1/3} x}\right],-7-4\sqrt{3}\right]\right)\Big/$$

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

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

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

Result (type 4, 820 leaves) :

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

$$3^{3/4}\,a^2\,d^{2/3}\,\left((-1)^{1/3}\,c^{1/3}-d^{1/3}\,x\right)\,\sqrt{\frac{c^{1/3}+d^{1/3}\,x}{\left(1+(-1)^{1/3}\right)\,c^{1/3}}}\,\sqrt{(-1)^{1/6}-\frac{i\,d^{1/3}\,x}{c^{1/3}}}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{c^{1/3}+(-1)^{2/3}\,d^{1/3}\,x}{\left(1+(-1)^{1/3}\right)\,c^{1/3}}}\right],\,(-1)^{1/3}\right]+$$

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

$$\left(\left(-1+(-1)^{2/3}\right)\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{(-1)^{1/6}-\frac{i\,d^{1/3}\,x}{c^{1/3}}}}{3^{1/4}}\right],\,\frac{(-1)^{1/3}}{-1+(-1)^{1/3}}\right]+\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{(-1)^{1/6}-\frac{i\,d^{1/3}\,x}{c^{1/3}}}}{3^{1/4}}\right],\,\frac{(-1)^{1/3}}{-1+(-1)^{1/3}}\right]\right)-$$

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

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

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

Problem 197: Unable to integrate problem.

$$\int\frac{\left(d^3+e^3\,x^3\right)^p}{d+e\,x}\,dx$$

Optimal (type 6, 135 leaves, ? steps):

$$\frac{\left(d^3+e^3 x^3\right)^p \left(1+\frac{2 (d+e x)}{\left(-3+i \sqrt{3}\right) d}\right)^{-p} \left(1-\frac{2 (d+e x)}{\left(3+i \sqrt{3}\right) d}\right)^{-p} \text{AppellF1}\left[p,-p,-p,1+p,-\frac{2 (d+e x)}{\left(-3+i \sqrt{3}\right) d},\frac{2 (d+e x)}{\left(3+i \sqrt{3}\right) d}\right]}{e\, p}$$

Result (type 8, 23 leaves) :

$$\int \frac{\left(d^3+e^3 x^3\right)^p}{d+e x} \, dx$$

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

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

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

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

Result (type 4, 296 leaves) :

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

Problem 199: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 280 leaves):

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

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

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

Problem 200: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 18 leaves, 2 steps):

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

Result (type 4, 278 leaves):

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

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

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

Problem 201: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 18 leaves, 2 steps):

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

Result (type 4, 298 leaves):

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

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

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

Problem 202: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 424 leaves):

$$\frac{1}{3\sqrt{1+x^3}}\sqrt{\frac{1+x}{1+(-1)^{1/3}}}\sqrt{1-x+x^2}$$

$$\left(\frac{2\sqrt{3}\left(1+(-1)^{1/3}\right)\left((-1)^{1/3}-x\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]}{1+(-1)^{2/3}x}-\frac{1}{\left(2+(-1)^{2/3}+d+(-1)^{1/3}d\right)\sqrt{-8-4d+d^2}}\right.$$

$$3\,i\left(\left(8+8(-1)^{1/3}-\left(1+(-1)^{1/3}\right)d^2+4\sqrt{-8-4d+d^2}-2(-1)^{1/3}\sqrt{-8-4d+d^2}+\left(1+(-1)^{1/3}\right)d\left(4+\sqrt{-8-4d+d^2}\right)\right)\right.$$

$$\text{EllipticPi}\left[\frac{2\,i\sqrt{3}}{2(-1)^{1/3}+d-\sqrt{-8-4d+d^2}},\text{ArcSin}\left[\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]+$$

$$\left(\left(1+(-1)^{1/3}\right)d^2+\left(1+(-1)^{1/3}\right)d\left(-4+\sqrt{-8-4d+d^2}\right)-2\left(4+4(-1)^{1/3}-2\sqrt{-8-4d+d^2}+(-1)^{1/3}\sqrt{-8-4d+d^2}\right)\right)$$

$$\left.\left.\text{EllipticPi}\left[\frac{2\,i\sqrt{3}}{2(-1)^{1/3}+d+\sqrt{-8-4d+d^2}},\text{ArcSin}\left[\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]\right)\right)$$

Problem 203: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 427 leaves):

$$\frac{1}{3\sqrt{1-x^3}}\sqrt{\frac{1-x}{1+(-1)^{1/3}}}\sqrt{1+x+x^2}$$

$$\left(\frac{2\sqrt{3}\left(1+(-1)^{1/3}\right)\left((-1)^{1/3}+x\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{1-(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]}{-1+(-1)^{2/3}x}+\frac{1}{\left(-2-(-1)^{2/3}+d+(-1)^{1/3}d\right)\sqrt{-8+4d+d^2}}\right.$$

$$3\,i\left(\left(8+8(-1)^{1/3}-\left(1+(-1)^{1/3}\right)d^2-4\sqrt{-8+4d+d^2}+2(-1)^{1/3}\sqrt{-8+4d+d^2}+\left(1+(-1)^{1/3}\right)d\left(-4+\sqrt{-8+4d+d^2}\right)\right)\right.$$

$$\text{EllipticPi}\left[\frac{2\,i\sqrt{3}}{2(-1)^{1/3}-d+\sqrt{-8+4d+d^2}},\text{ArcSin}\left[\sqrt{\frac{1-(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]+$$

$$\left(-8-8(-1)^{1/3}+\left(1+(-1)^{1/3}\right)d^2-4\sqrt{-8+4d+d^2}+2(-1)^{1/3}\sqrt{-8+4d+d^2}+\left(1+(-1)^{1/3}\right)d\left(4+\sqrt{-8+4d+d^2}\right)\right)$$

$$\left.\left.\text{EllipticPi}\left[-\frac{2\,i\sqrt{3}}{-2(-1)^{1/3}+d+\sqrt{-8+4d+d^2}},\text{ArcSin}\left[\sqrt{\frac{1-(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]\right)\right)$$

Problem 204: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 36 leaves, 2 steps):

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

Result (type 4, 425 leaves):

$$\frac{1}{3\sqrt{-1+x^3}}\sqrt{\frac{1-x}{1+(-1)^{1/3}}}\sqrt{1+x+x^2}$$

$$\left(\frac{2\sqrt{3}\left(1+(-1)^{1/3}\right)\left((-1)^{1/3}+x\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{1-(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]}{-1+(-1)^{2/3}x}+\frac{1}{\left(-2-(-1)^{2/3}+d+(-1)^{1/3}d\right)\sqrt{-8+4d+d^2}}\right.$$

$$3\,i\left(\left(8+8(-1)^{1/3}-\left(1+(-1)^{1/3}\right)d^2-4\sqrt{-8+4d+d^2}+2(-1)^{1/3}\sqrt{-8+4d+d^2}+\left(1+(-1)^{1/3}\right)d\left(-4+\sqrt{-8+4d+d^2}\right)\right)\right.$$

$$\text{EllipticPi}\left[\frac{2\,i\sqrt{3}}{2(-1)^{1/3}-d+\sqrt{-8+4d+d^2}},\text{ArcSin}\left[\sqrt{\frac{1-(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]+$$

$$\left(-8-8(-1)^{1/3}+\left(1+(-1)^{1/3}\right)d^2-4\sqrt{-8+4d+d^2}+2(-1)^{1/3}\sqrt{-8+4d+d^2}+\left(1+(-1)^{1/3}\right)d\left(4+\sqrt{-8+4d+d^2}\right)\right)$$

$$\left.\left.\text{EllipticPi}\left[-\frac{2\,i\sqrt{3}}{-2(-1)^{1/3}+d+\sqrt{-8+4d+d^2}},\text{ArcSin}\left[\sqrt{\frac{1-(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]\right)\right)$$

Problem 205: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 32 leaves, 2 steps):

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

Result (type 4, 426 leaves):

$$\frac{1}{3\sqrt{-1-x^3}}\sqrt{\frac{1+x}{1+(-1)^{1/3}}}\sqrt{1-x+x^2}$$

$$\left(\frac{2\sqrt{3}\left(1+(-1)^{1/3}\right)\left((-1)^{1/3}-x\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]}{1+(-1)^{2/3}x}-\frac{1}{\left(2+(-1)^{2/3}+d+(-1)^{1/3}d\right)\sqrt{-8-4d+d^2}}\right.$$

$$3\,\mathrm{i}\left(\left(8+8(-1)^{1/3}-\left(1+(-1)^{1/3}\right)d^2+4\sqrt{-8-4d+d^2}-2(-1)^{1/3}\sqrt{-8-4d+d^2}+\left(1+(-1)^{1/3}\right)d\left(4+\sqrt{-8-4d+d^2}\right)\right)\right.$$

$$\text{EllipticPi}\left[\frac{2\,\mathrm{i}\sqrt{3}}{2(-1)^{1/3}+d-\sqrt{-8-4d+d^2}},\text{ArcSin}\left[\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]+$$

$$\left(\left(1+(-1)^{1/3}\right)d^2+\left(1+(-1)^{1/3}\right)d\left(-4+\sqrt{-8-4d+d^2}\right)-2\left(4+4(-1)^{1/3}-2\sqrt{-8-4d+d^2}+(-1)^{1/3}\sqrt{-8-4d+d^2}\right)\right)$$

$$\left.\left.\text{EllipticPi}\left[\frac{2\,\mathrm{i}\sqrt{3}}{2(-1)^{1/3}+d+\sqrt{-8-4d+d^2}},\text{ArcSin}\left[\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]\right)\right)$$

Problem 206: Result unnecessarily involves imaginary or complex numbers.

$$\int (d+e\,x)^3\sqrt{a+c\,x^4}\,dx$$

Optimal (type 4, 355 leaves, 11 steps):

$$\frac{3}{4} d^2 e x^2 \sqrt{a+c x^4}+\frac{6 a d e^2 x \sqrt{a+c x^4}}{5 \sqrt{c} \left(\sqrt{a}+\sqrt{c} x^2\right)}+\frac{1}{15} d x \left(5 d^2+9 e^2 x^2\right) \sqrt{a+c x^4}+\frac{e^3 \left(a+c x^4\right)^{3/2}}{6 c}+$$

$$\frac{3 a d^2 e \,\text{ArcTanh}\left[\frac{\sqrt{c} x^2}{\sqrt{a+c x^4}}\right]}{4 \sqrt{c}}-\frac{6 a^{5/4} d e^2 \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \,\text{EllipticE}\left[2 \,\text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{2}\right]}{5 c^{3/4} \sqrt{a+c x^4}}+$$

$$\frac{a^{3/4} d \left(5 \sqrt{c} d^2+9 \sqrt{a} e^2\right) \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \,\text{EllipticF}\left[2 \,\text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{2}\right]}{15 c^{3/4} \sqrt{a+c x^4}}$$

Result (type 4, 310 leaves):

$$\frac{1}{60 \sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} c \sqrt{a+c x^4}}$$

$$\left(\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} \left(10 a^2 e^3+c^2 x^5 \left(20 d^3+45 d^2 e x+36 d e^2 x^2+10 e^3 x^3\right)+a c x \left(20 d^3+45 d^2 e x+36 d e^2 x^2+20 e^3 x^3\right)+45 a \sqrt{c} d^2 e \sqrt{a+c x^4}\right.\right.$$

$$\left.\text{ArcTanh}\left[\frac{\sqrt{c} x^2}{\sqrt{a+c x^4}}\right]\right)+72 a^{3/2} \sqrt{c} d e^2 \sqrt{1+\frac{c x^4}{a}} \,\text{EllipticE}\left[i \,\text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} x\right], -1\right]-$$

$$\left.8 a \sqrt{c} d \left(5 i \sqrt{c} d^2+9 \sqrt{a} e^2\right) \sqrt{1+\frac{c x^4}{a}} \,\text{EllipticF}\left[i \,\text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} x\right], -1\right]\right)$$

Problem 207: Result unnecessarily involves imaginary or complex numbers.

$$\int (d+e x)^2 \sqrt{a+c x^4} \, dx$$

Optimal (type 4, 326 leaves, 10 steps):

$$\frac{1}{2} d e x^2 \sqrt{a+c x^4}+\frac{2 a e^2 x \sqrt{a+c x^4}}{5 \sqrt{c} \left(\sqrt{a}+\sqrt{c} x^2\right)}+\frac{1}{15} x \left(5 d^2+3 e^2 x^2\right) \sqrt{a+c x^4}+$$
$$\frac{a d e \text{ArcTanh}\left[\frac{\sqrt{c} x^2}{\sqrt{a+c x^4}}\right]}{2 \sqrt{c}}-\frac{2 a^{5/4} e^2 \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{5 c^{3/4} \sqrt{a+c x^4}}+$$
$$\frac{a^{3/4} \left(5 \sqrt{c} d^2+3 \sqrt{a} e^2\right) \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{15 c^{3/4} \sqrt{a+c x^4}}$$

Result (type 4, 247 leaves):

$$\frac{1}{30 \sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} \sqrt{c} \sqrt{a+c x^4}}\left(\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} \left(\sqrt{c} x \left(10 d^2+15 d e x+6 e^2 x^2\right) \left(a+c x^4\right)+15 a d e \sqrt{a+c x^4} \text{ArcTanh}\left[\frac{\sqrt{c} x^2}{\sqrt{a+c x^4}}\right]\right)+\right.$$
$$\left.12 a^{3/2} e^2 \sqrt{1+\frac{c x^4}{a}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} x\right],-1\right]-4 a \left(5 i \sqrt{c} d^2+3 \sqrt{a} e^2\right) \sqrt{1+\frac{c x^4}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} x\right],-1\right]\right)$$

Problem 208: Result unnecessarily involves imaginary or complex numbers.

$$\int (d+e x) \sqrt{a+c x^4} \, dx$$

Optimal (type 4, 158 leaves, 8 steps):

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

Result (type 4, 132 leaves):

$$\frac{1}{12}\left(x (4 d+3 e x) \sqrt{a+c x^4}+\frac{3 a e \text{ArcTanh}\left[\frac{\sqrt{c} x^2}{\sqrt{a+c x^4}}\right]}{\sqrt{c}}-\frac{8 i a d \sqrt{1+\frac{c x^4}{a}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} x\right],-1\right]}{\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} \sqrt{a+c x^4}}\right)$$

Problem 209: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{a + c x^4} \, dx$$

Optimal (type 4, 105 leaves, 2 steps):

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

Result (type 4, 89 leaves):

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

Problem 210: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a + c x^4}}{d + e x} \, dx$$

Optimal (type 4, 730 leaves, 15 steps):

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

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

$$\frac{a^{1/4} c^{1/4} d \left(\frac{\sqrt{c}\, d^2}{\sqrt{a}}+e^2\right) \left(\sqrt{a}+\sqrt{c}\, x^2\right) \sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c}\, x^2\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{2}\right]}{2 e^4 \sqrt{a+c x^4}}+$$

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

$$\left(\left(\sqrt{c}\, d^2-\sqrt{a}\, e^2\right) \left(c d^4+a e^4\right) \left(\sqrt{a}+\sqrt{c}\, x^2\right) \sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c}\, x^2\right)^2}}\, \text{EllipticPi}\left[\frac{\left(\sqrt{c}\, d^2+\sqrt{a}\, e^2\right)^2}{4 \sqrt{a} \sqrt{c}\, d^2 e^2}, 2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{2}\right]\right) \Big/$$

$$\left(4 a^{1/4} c^{1/4} d e^4 \left(\sqrt{c}\, d^2+\sqrt{a}\, e^2\right) \sqrt{a+c x^4}\right)$$

Result (type 4, 451 leaves):

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

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

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

$$\left.\left.\left.\text{Log}\left[-d^2+e^2 x^2\right]+\sqrt{c}\, d^2 \sqrt{a+c x^4}\, \text{Log}\left[c x^2+\sqrt{c}\, \sqrt{a+c x^4}\right]-\sqrt{c d^4+a e^4}\, \sqrt{a+c x^4}\, \text{Log}\left[a e^2+c d^2 x^2+\sqrt{c d^4+a e^4}\, \sqrt{a+c x^4}\right]\right)\right)\right)$$

Problem 211: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a + c\,x^4}}{(d + e\,x)^2}\, dx$$

Optimal (type 4, 1221 leaves, 32 steps):

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

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

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

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

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

$$\frac{c^{1/4}\left(c\,d^4+a\,e^4\right)\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}x}{a^{1/4}}\right],\frac{1}{2}\right]}{2\,a^{1/4}e^4\left(\sqrt{c}\,d^2+\sqrt{a}\,e^2\right)\sqrt{a+c\,x^4}}+$$

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

$$\left(\left(\sqrt{c}\,d^2-\sqrt{a}\,e^2\right)\left(c\,d^4+a\,e^4\right)\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticPi}\left[\frac{\left(\sqrt{c}\,d^2+\sqrt{a}\,e^2\right)^2}{4\sqrt{a}\sqrt{c}\,d^2e^2},2\,\text{ArcTan}\left[\frac{c^{1/4}x}{a^{1/4}}\right],\frac{1}{2}\right]\right)\Big/$$

$$\left(4\,a^{1/4}c^{1/4}d^2e^4\left(\sqrt{c}\,d^2+\sqrt{a}\,e^2\right)\sqrt{a+c\,x^4}\right)$$

Result (type 4, 531 leaves) :

$$\frac{1}{e^4\sqrt{a+c\,x^4}}\left(-2\,i\,a\,\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\;e^2\sqrt{1+\frac{c\,x^4}{a}}\;\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\;x\right],-1\right]-\right.$$

$$\frac{2\sqrt{c}\left(i\sqrt{c}\;d^2+\sqrt{a}\;e^2\right)\sqrt{1+\frac{c\,x^4}{a}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\;x\right],-1\right]}{\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}}+$$

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

$$c\,e^2\sqrt{c\,d^4+a\,e^4}\;x^4+c\,d^3\,(d+e\,x)\sqrt{a+c\,x^4}\;\text{Log}\left[-d^2+e^2x^2\right]+\sqrt{c}\;d\sqrt{c\,d^4+a\,e^4}\;(d+e\,x)\sqrt{a+c\,x^4}\;\text{Log}\left[c\,x^2+\sqrt{c}\;\sqrt{a+c\,x^4}\right]-$$

$$\left.\left.c\,d^4\sqrt{a+c\,x^4}\;\text{Log}\left[a\,e^2+c\,d^2x^2+\sqrt{c\,d^4+a\,e^4}\;\sqrt{a+c\,x^4}\right]-c\,d^3\,e\,x\sqrt{a+c\,x^4}\;\text{Log}\left[a\,e^2+c\,d^2x^2+\sqrt{c\,d^4+a\,e^4}\;\sqrt{a+c\,x^4}\right]\right)\right)$$

Problem 212: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(d+e\,x)^3}{\sqrt{a+c\,x^4}}\,dx$$

Optimal (type 4, 295 leaves, 9 steps):

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

$$\frac{d\left(\sqrt{c}\;d^2+3\sqrt{a}\;e^2\right)\left(\sqrt{a}+\sqrt{c}\;x^2\right)\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\;x^2\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}x}{a^{1/4}}\right],\frac{1}{2}\right]}{2\,a^{1/4}\,c^{3/4}\sqrt{a+c\,x^4}}$$

Result (type 4, 240 leaves):

$$\frac{1}{2\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,c\,\sqrt{a+c\,x^4}}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,e\left(e^2\left(a+c\,x^4\right)+3\sqrt{c}\,d^2\sqrt{a+c\,x^4}\,\text{ArcTanh}\left[\frac{\sqrt{c}\,x^2}{\sqrt{a+c\,x^4}}\right]\right)+6\sqrt{a}\,\sqrt{c}\,d\,e^2\sqrt{1+\frac{c\,x^4}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]-2\sqrt{c}\,d\left(i\sqrt{c}\,d^2+3\sqrt{a}\,e^2\right)\sqrt{1+\frac{c\,x^4}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]\right)$$

Problem 213: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(d+e\,x)^2}{\sqrt{a+c\,x^4}}\,dx$$

Optimal (type 4, 263 leaves, 8 steps):

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

Result (type 4, 204 leaves):

$$\frac{1}{\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,\sqrt{c}\,\sqrt{a+c\,x^4}}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,d\,e\,\sqrt{a+c\,x^4}\,\text{ArcTanh}\left[\frac{\sqrt{c}\,x^2}{\sqrt{a+c\,x^4}}\right]+\sqrt{a}\,e^2\sqrt{1+\frac{c\,x^4}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]-\left(i\sqrt{c}\,d^2+\sqrt{a}\,e^2\right)\sqrt{1+\frac{c\,x^4}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]\right)$$

Problem 214: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{d+e\,x}{\sqrt{a+c\,x^4}}\,dx$$

Optimal (type 4, 121 leaves, 6 steps):

$$\frac{e\,\text{ArcTanh}\left[\frac{\sqrt{c}\,x^2}{\sqrt{a+c\,x^4}}\right]}{2\,\sqrt{c}}+\frac{d\,\left(\sqrt{a}+\sqrt{c}\,x^2\right)\,\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]}{2\,a^{1/4}\,c^{1/4}\,\sqrt{a+c\,x^4}}$$

Result (type 4, 107 leaves):

$$\frac{e\,\text{ArcTanh}\left[\frac{\sqrt{c}\,x^2}{\sqrt{a+c\,x^4}}\right]}{2\,\sqrt{c}}-\frac{i\,d\,\sqrt{1+\frac{c\,x^4}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]}{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{a}}}\,\sqrt{a+c\,x^4}}$$

Problem 215: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{a+c\,x^4}}\,dx$$

Optimal (type 4, 88 leaves, 1 step):

$$\frac{\left(\sqrt{a}+\sqrt{c}\,x^2\right)\,\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]}{2\,a^{1/4}\,c^{1/4}\,\sqrt{a+c\,x^4}}$$

Result (type 4, 74 leaves):

$$-\frac{i\,\sqrt{1+\frac{c\,x^4}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]}{\sqrt{\frac{i\,\sqrt{c}}{\sqrt{a}}}\,\sqrt{a+c\,x^4}}$$

Problem 216: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{(d+e\,x)\,\sqrt{a+c\,x^4}}\,dx$$

Optimal (type 4, 405 leaves, 7 steps):

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

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

Result (type 4, 200 leaves):

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

Problem 217: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{(d+e x)^2\sqrt{a+c x^4}}\,dx$$

Optimal (type 4, 610 leaves, 11 steps):

$$-\frac{e^3\sqrt{a+c x^4}}{\left(c d^4+a e^4\right)(d+e x)}+\frac{\sqrt{c}\, e^2 x \sqrt{a+c x^4}}{\left(c d^4+a e^4\right)\left(\sqrt{a}+\sqrt{c}\, x^2\right)}-\frac{c d^3 e \operatorname{ArcTan}\left[\frac{\sqrt{-c d^4-a e^4}\, x}{d e \sqrt{a+c x^4}}\right]}{\left(-c d^4-a e^4\right)^{3/2}}-\frac{c d^3 e \operatorname{ArcTanh}\left[\frac{a e^2+c d^2 x^2}{\sqrt{c d^4+a e^4}\sqrt{a+c x^4}}\right]}{\left(c d^4+a e^4\right)^{3/2}}-$$

$$\frac{a^{1/4} c^{1/4} e^2\left(\sqrt{a}+\sqrt{c}\, x^2\right)\sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c}\, x^2\right)^2}}\ \operatorname{EllipticE}\left[2 \operatorname{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{2}\right]}{\left(c d^4+a e^4\right)\sqrt{a+c x^4}}+\frac{c^{1/4}\left(\sqrt{a}+\sqrt{c}\, x^2\right)\sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c}\, x^2\right)^2}}\ \operatorname{EllipticF}\left[2 \operatorname{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{2}\right]}{2 a^{1/4}\left(\sqrt{c}\, d^2+\sqrt{a}\, e^2\right)\sqrt{a+c x^4}}-$$

$$\frac{c^{3/4} d^2\left(\sqrt{c}\, d^2-\sqrt{a}\, e^2\right)\left(\sqrt{a}+\sqrt{c}\, x^2\right)\sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c}\, x^2\right)^2}}\ \operatorname{EllipticPi}\left[\frac{\left(\sqrt{c}\, d^2+\sqrt{a}\, e^2\right)^2}{4\sqrt{a}\sqrt{c}\, d^2 e^2}, 2 \operatorname{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{2}\right]}{2 a^{1/4}\left(\sqrt{c}\, d^2+\sqrt{a}\, e^2\right)\left(c d^4+a e^4\right)\sqrt{a+c x^4}}$$

Result (type 4, 462 leaves) :

$$\frac{1}{\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\left(c d^4+a e^4\right)^{3/2}(d+e x)\sqrt{a+c x^4}}\left(\sqrt{a}\sqrt{c}\, e^2\sqrt{c d^4+a e^4}\,(d+e x)\sqrt{1+\frac{c x^4}{a}}\ \operatorname{EllipticE}\left[i \operatorname{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\, x\right], -1\right]+\right.$$

$$i\sqrt{c}\left(\sqrt{c}\, d^2+i\sqrt{a}\, e^2\right)\sqrt{c d^4+a e^4}\,(d+e x)\sqrt{1+\frac{c x^4}{a}}\ \operatorname{EllipticF}\left[i \operatorname{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\, x\right], -1\right]-$$

$$\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\left(e^3\sqrt{c d^4+a e^4}\left(a+c x^4\right)+2(-1)^{1/4} a^{1/4} c^{3/4} d^2\sqrt{c d^4+a e^4}\,(d+e x)\sqrt{1+\frac{c x^4}{a}}\ \operatorname{EllipticPi}\left[\frac{i\sqrt{a}\, e^2}{\sqrt{c}\, d^2}, \operatorname{ArcSin}\left[\frac{(-1)^{3/4} c^{1/4} x}{a^{1/4}}\right], -1\right]-\right.$$

$$\left.\left.c d^3 e\,(d+e x)\sqrt{a+c x^4}\ \operatorname{Log}\left[-d^2+e^2 x^2\right]+c d^3 e\,(d+e x)\sqrt{a+c x^4}\ \operatorname{Log}\left[a e^2+c d^2 x^2+\sqrt{c d^4+a e^4}\sqrt{a+c x^4}\right]\right)\right)$$

Problem 218: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{(d+e x)^3\sqrt{a+c x^4}}\, dx$$

Optimal (type 4, 659 leaves, 12 steps) :

$$-\frac{e^3\sqrt{a+c\,x^4}}{2\left(c\,d^4+a\,e^4\right)\left(d+e\,x\right)^2}-\frac{3\,c\,d^3\,e^3\sqrt{a+c\,x^4}}{\left(c\,d^4+a\,e^4\right)^2\left(d+e\,x\right)}+\frac{3\,c^{3/2}\,d^3\,e^2\,x\sqrt{a+c\,x^4}}{\left(c\,d^4+a\,e^4\right)^2\left(\sqrt{a}+\sqrt{c}\,x^2\right)}+\frac{3\,c\,d^2\,e\left(c\,d^4-a\,e^4\right)\text{ArcTan}\left[\frac{\sqrt{-c\,d^4-a\,e^4}\,x}{d\,e\sqrt{a+c\,x^4}}\right]}{2\left(-c\,d^4-a\,e^4\right)^{5/2}}-$$

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

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

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

$$\left(4\,a^{1/4}\left(c\,d^4+a\,e^4\right)^2\sqrt{a+c\,x^4}\right)$$

Result (type 4, 884 leaves) :

$$\frac{1}{2\left(c\,d^4+a\,e^4\right)^{5/2}(d+e\,x)^2\sqrt{a+c\,x^4}}$$

$$\Bigg(-e^3\left(c\,d^4+a\,e^4\right)^{3/2}\left(a+c\,x^4\right)-6\,c\,d^3\,e^3\sqrt{c\,d^4+a\,e^4}\,(d+e\,x)\left(a+c\,x^4\right)-6\,\mathrm{i}\,a\sqrt{\frac{\mathrm{i}\sqrt{c}}{\sqrt{a}}}\,c\,d^3\,e^2\sqrt{c\,d^4+a\,e^4}\,(d+e\,x)^2\sqrt{1+\frac{c\,x^4}{a}}$$

$$\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]+\frac{4\,\mathrm{i}\,c^2\,d^5\sqrt{c\,d^4+a\,e^4}\,(d+e\,x)^2\sqrt{1+\frac{c\,x^4}{a}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]}{\sqrt{\frac{\mathrm{i}\sqrt{c}}{\sqrt{a}}}}+$$

$$6\,\mathrm{i}\,a\sqrt{\frac{\mathrm{i}\sqrt{c}}{\sqrt{a}}}\,c\,d^3\,e^2\sqrt{c\,d^4+a\,e^4}\,(d+e\,x)^2\sqrt{1+\frac{c\,x^4}{a}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]-$$

$$\frac{2\,\mathrm{i}\,a\,c\,d\,e^4\sqrt{c\,d^4+a\,e^4}\,(d+e\,x)^2\sqrt{1+\frac{c\,x^4}{a}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]}{\sqrt{\frac{\mathrm{i}\sqrt{c}}{\sqrt{a}}}}-$$

$$6\,(-1)^{1/4}\,a^{1/4}\,c^{7/4}\,d^5\sqrt{c\,d^4+a\,e^4}\,(d+e\,x)^2\sqrt{1+\frac{c\,x^4}{a}}\,\text{EllipticPi}\left[\frac{\mathrm{i}\sqrt{a}\,e^2}{\sqrt{c}\,d^2},\text{ArcSin}\left[\frac{(-1)^{3/4}\,c^{1/4}\,x}{a^{1/4}}\right],-1\right]+$$

$$6\,(-1)^{1/4}\,a^{5/4}\,c^{3/4}\,d\,e^4\sqrt{c\,d^4+a\,e^4}\,(d+e\,x)^2\sqrt{1+\frac{c\,x^4}{a}}\,\text{EllipticPi}\left[\frac{\mathrm{i}\sqrt{a}\,e^2}{\sqrt{c}\,d^2},\text{ArcSin}\left[\frac{(-1)^{3/4}\,c^{1/4}\,x}{a^{1/4}}\right],-1\right]+$$

$$3\,c^2\,d^6\,e\,(d+e\,x)^2\sqrt{a+c\,x^4}\,\text{Log}\left[-d^2+e^2\,x^2\right]-3\,a\,c\,d^2\,e^5\,(d+e\,x)^2\sqrt{a+c\,x^4}\,\text{Log}\left[-d^2+e^2\,x^2\right]-3\,c^2\,d^6\,e\,(d+e\,x)^2\sqrt{a+c\,x^4}$$

$$\text{Log}\left[a\,e^2+c\,d^2\,x^2+\sqrt{c\,d^4+a\,e^4}\,\sqrt{a+c\,x^4}\right]+3\,a\,c\,d^2\,e^5\,(d+e\,x)^2\sqrt{a+c\,x^4}\,\text{Log}\left[a\,e^2+c\,d^2\,x^2+\sqrt{c\,d^4+a\,e^4}\,\sqrt{a+c\,x^4}\right]\Bigg)$$

Problem 219: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(d+e x)^3}{\left(a+c x^4\right)^{3/2}} \, dx$$

Optimal (type 4, 298 leaves, 4 steps):

$$-\frac{3 d e^2 x \sqrt{a+c x^4}}{2 a \sqrt{c} \left(\sqrt{a}+\sqrt{c} x^2\right)}-\frac{a e^3-c x \left(d^3+3 d^2 e x+3 d e^2 x^2\right)}{2 a c \sqrt{a+c x^4}}+\frac{3 d e^2 \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{2 a^{3/4} c^{3/4} \sqrt{a+c x^4}}+\frac{d \left(\sqrt{c} d^2-3 \sqrt{a} e^2\right) \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{4 a^{5/4} c^{3/4} \sqrt{a+c x^4}}$$

Result (type 4, 215 leaves):

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

Problem 220: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(d+e x)^2}{\left(a+c x^4\right)^{3/2}} \, dx$$

Optimal (type 4, 270 leaves, 4 steps):

$$\frac{x (d+e x)^2}{2 a \sqrt{a+c x^4}}-\frac{e^2 x \sqrt{a+c x^4}}{2 a \sqrt{c} \left(\sqrt{a}+\sqrt{c} x^2\right)}+\frac{e^2 \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{2 a^{3/4} c^{3/4} \sqrt{a+c x^4}}+\frac{\left(\sqrt{c} d^2-\sqrt{a} e^2\right) \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{4 a^{5/4} c^{3/4} \sqrt{a+c x^4}}$$

Result (type 4, 188 leaves):

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

Problem 221: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{d+e\,x}{(a+c\,x^4)^{3/2}}\,dx$$

Optimal (type 4, 114 leaves, 3 steps):

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

Result (type 4, 90 leaves):

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

Problem 222: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 108 leaves, 2 steps):

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

Result (type 4, 102 leaves):

$$\frac{\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\, x - i\sqrt{1+\frac{c x^4}{a}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\, x\right], -1\right]}{2 a \sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\, \sqrt{a+c x^4}}$$

Problem 223: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 818 leaves, 14 steps):

$$\frac{e\left(a e^2-c d^2 x^2\right)}{2 a\left(c d^4+a e^4\right)\sqrt{a+c x^4}}+\frac{c d x\left(d^2+e^2 x^2\right)}{2 a\left(c d^4+a e^4\right)\sqrt{a+c x^4}}-\frac{\sqrt{c}\, d e^2 x \sqrt{a+c x^4}}{2 a\left(c d^4+a e^4\right)\left(\sqrt{a}+\sqrt{c}\, x^2\right)}-\frac{e^5\, \text{ArcTan}\left[\frac{\sqrt{-c d^4-a e^4}\, x}{d e \sqrt{a+c x^4}}\right]}{2\left(-c d^4-a e^4\right)^{3/2}}-$$

$$\frac{e^5\, \text{ArcTanh}\left[\frac{a e^2+c d^2 x^2}{\sqrt{c d^4+a e^4}\, \sqrt{a+c x^4}}\right]}{2\left(c d^4+a e^4\right)^{3/2}}+\frac{c^{1/4} d e^2\left(\sqrt{a}+\sqrt{c}\, x^2\right)\sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c}\, x^2\right)^2}}\, \text{EllipticE}\left[2\, \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{2}\right]}{2 a^{3/4}\left(c d^4+a e^4\right)\sqrt{a+c x^4}}+$$

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

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

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

Result (type 4, 464 leaves):

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

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

$$\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} \Bigg(-2 (-1)^{1/4} a^{5/4} e^4 \sqrt{c d^4+a e^4} \sqrt{1+\frac{c x^4}{a}}\, \text{EllipticPi}\left[\frac{i \sqrt{a}\, e^2}{\sqrt{c}\, d^2},\text{ArcSin}\left[\frac{(-1)^{3/4} c^{1/4} x}{a^{1/4}}\right],-1\right]+c^{1/4} d$$

$$\left(\sqrt{c d^4+a e^4} \left(a e^3+c d x \left(d^2-d e x+e^2 x^2\right)\right)+a e^5 \sqrt{a+c x^4}\, \text{Log}\left[-d^2+e^2 x^2\right]-a e^5 \sqrt{a+c x^4}\, \text{Log}\left[a e^2+c d^2 x^2+\sqrt{c d^4+a e^4} \sqrt{a+c x^4}\right]\right)\Bigg)\Bigg)$$

Problem 224: Result is not expressed in closed-form.

$$\int \frac{x^3 (c+d x)^n}{a+b x^4}\, dx$$

Optimal (type 5, 349 leaves, 10 steps):

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

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

Result (type 7, 526 leaves):

$$\frac{1}{4\,b\,n}\left(c+d\,x\right)^n\left(c^3\,\text{RootSum}\left[b\,c^4+a\,d^4-4\,b\,c^3\,\#1+6\,b\,c^2\,\#1^2-4\,b\,c\,\#1^3+b\,\#1^4\,\&,\ \frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{c+d\,x-\#1}\right]\left(\frac{c+d\,x}{c+d\,x-\#1}\right)^{-n}}{c^3-3\,c^2\,\#1+3\,c\,\#1^2-\#1^3}\,\&\right]-\right.$$

$$3\,c^2\,\text{RootSum}\left[b\,c^4+a\,d^4-4\,b\,c^3\,\#1+6\,b\,c^2\,\#1^2-4\,b\,c\,\#1^3+b\,\#1^4\,\&,\ \frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{c+d\,x-\#1}\right]\left(\frac{c+d\,x}{c+d\,x-\#1}\right)^{-n}\#1}{c^3-3\,c^2\,\#1+3\,c\,\#1^2-\#1^3}\,\&\right]+$$

$$3\,c\,\text{RootSum}\left[b\,c^4+a\,d^4-4\,b\,c^3\,\#1+6\,b\,c^2\,\#1^2-4\,b\,c\,\#1^3+b\,\#1^4\,\&,\ \frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{c+d\,x-\#1}\right]\left(\frac{c+d\,x}{c+d\,x-\#1}\right)^{-n}\#1^2}{c^3-3\,c^2\,\#1+3\,c\,\#1^2-\#1^3}\,\&\right]-$$

$$\left.\text{RootSum}\left[b\,c^4+a\,d^4-4\,b\,c^3\,\#1+6\,b\,c^2\,\#1^2-4\,b\,c\,\#1^3+b\,\#1^4\,\&,\ \frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{c+d\,x-\#1}\right]\left(\frac{c+d\,x}{c+d\,x-\#1}\right)^{-n}\#1^3}{c^3-3\,c^2\,\#1+3\,c\,\#1^2-\#1^3}\,\&\right]\right)$$

Problem 225: Result is not expressed in closed-form.

$$\int\frac{x^3\left(c+d\,x\right)^{1+n}}{a+b\,x^4}\,dx$$

Optimal (type 5, 349 leaves, 10 steps):

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

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

Result (type 7, 691 leaves):

$$\frac{1}{4 b^2 n (1+n)} (c+d x)^n \left((b c^4+a d^4)(1+n)\, \text{RootSum}\left[b c^4+a d^4-4 b c^3 \#1+6 b c^2 \#1^2-4 b c \#1^3+b \#1^4 \&, \frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{c+d x-\#1}\right] \left(\frac{c+d x}{c+d x-\#1}\right)^{-n}}{c^3-3 c^2 \#1+3 c \#1^2-\#1^3} \&\right] - b \left(-4 c n-4 d n x+3 c^3 (1+n) \text{RootSum}\left[b c^4+a d^4-4 b c^3 \#1+6 b c^2 \#1^2-4 b c \#1^3+b \#1^4 \&, \frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{c+d x-\#1}\right] \left(\frac{c+d x}{c+d x-\#1}\right)^{-n} \#1}{c^3-3 c^2 \#1+3 c \#1^2-\#1^3} \&\right] - 3 c^2 (1+n)\, \text{RootSum}\left[b c^4+a d^4-4 b c^3 \#1+6 b c^2 \#1^2-4 b c \#1^3+b \#1^4 \&, \frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{c+d x-\#1}\right] \left(\frac{c+d x}{c+d x-\#1}\right)^{-n} \#1^2}{c^3-3 c^2 \#1+3 c \#1^2-\#1^3} \&\right] + c\, \text{RootSum}\left[b c^4+a d^4-4 b c^3 \#1+6 b c^2 \#1^2-4 b c \#1^3+b \#1^4 \&, \frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{c+d x-\#1}\right] \left(\frac{c+d x}{c+d x-\#1}\right)^{-n} \#1^3}{c^3-3 c^2 \#1+3 c \#1^2-\#1^3} \&\right] + c n\, \text{RootSum}\left[b c^4+a d^4-4 b c^3 \#1+6 b c^2 \#1^2-4 b c \#1^3+b \#1^4 \&, \frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{c+d x-\#1}\right] \left(\frac{c+d x}{c+d x-\#1}\right)^{-n} \#1^3}{c^3-3 c^2 \#1+3 c \#1^2-\#1^3} \&\right]\right)\right)$$

Problem 226: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{(c+d x+e x^2)\sqrt{a+b x^4}}\, dx$$

Optimal (type 4, 1605 leaves, 16 steps):

$$-\frac{e^2 \text{ArcTan}\left[\frac{\sqrt{2}\sqrt{-b d^4+4 b c d^2 e-2 b c^2 e^2-2 a e^4-b d \sqrt{d^2-4 c e}\,(d^2-2 c e)}\; x}{e\left(d+\sqrt{d^2-4 c e}\right)\sqrt{a+b x^4}}\right]}{\sqrt{2}\sqrt{d^2-4 c e}\sqrt{-2 a e^4-b\left(d^4-4 c d^2 e+2 c^2 e^2+d^3\sqrt{d^2-4 c e}-2 c d e\sqrt{d^2-4 c e}\right)}} + \frac{e^2 \text{ArcTan}\left[\frac{\sqrt{2}\sqrt{-b d^4+4 b c d^2 e-2 b c^2 e^2-2 a e^4+b d \sqrt{d^2-4 c e}\,(d^2-2 c e)}\; x}{e\left(d-\sqrt{d^2-4 c e}\right)\sqrt{a+b x^4}}\right]}{\sqrt{2}\sqrt{d^2-4 c e}\sqrt{-2 a e^4-b\left(d^4-4 c d^2 e+2 c^2 e^2-d^3\sqrt{d^2-4 c e}+2 c d e\sqrt{d^2-4 c e}\right)}} -$$

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

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

$$\frac{b^{1/4} e \left(d-\sqrt{d^2-4 c e}\right) \left(\sqrt{a}+\sqrt{b} x^2\right) \sqrt{\frac{a+b x^4}{\left(\sqrt{a}+\sqrt{b} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{2 a^{1/4} \sqrt{d^2-4 c e} \left(2 \sqrt{a} e^2+\sqrt{b} \left(d^2-2 c e-d \sqrt{d^2-4 c e}\right)\right) \sqrt{a+b x^4}}-$$

$$\frac{b^{1/4} e \left(d+\sqrt{d^2-4 c e}\right) \left(\sqrt{a}+\sqrt{b} x^2\right) \sqrt{\frac{a+b x^4}{\left(\sqrt{a}+\sqrt{b} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{b^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]}{2 a^{1/4} \sqrt{d^2-4 c e} \left(2 \sqrt{a} e^2+\sqrt{b} \left(d^2-2 c e+d \sqrt{d^2-4 c e}\right)\right) \sqrt{a+b x^4}}+\left(e \left(2 \sqrt{a} e^2-\sqrt{b} \left(d^2-2 c e-d \sqrt{d^2-4 c e}\right)\right)\right.$$

$$\left.\left(\sqrt{a}+\sqrt{b} x^2\right) \sqrt{\frac{a+b x^4}{\left(\sqrt{a}+\sqrt{b} x^2\right)^2}} \text{EllipticPi}\left[\frac{\left(2 \sqrt{a} e^2+\sqrt{b} \left(d^2-2 c e-d \sqrt{d^2-4 c e}\right)\right)^2}{4 \sqrt{a} \sqrt{b} e^2 \left(d-\sqrt{d^2-4 c e}\right)^2},2 \text{ArcTan}\left[\frac{b^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]\right)\Big/$$

$$\left(2 a^{1/4} b^{1/4} \sqrt{d^2-4 c e} \left(d-\sqrt{d^2-4 c e}\right) \left(2 \sqrt{a} e^2+\sqrt{b} \left(d^2-2 c e-d \sqrt{d^2-4 c e}\right)\right) \sqrt{a+b x^4}\right)-\left(e \left(2 \sqrt{a} e^2-\sqrt{b} \left(d^2-2 c e+d \sqrt{d^2-4 c e}\right)\right)\right.$$

$$\left.\left(\sqrt{a}+\sqrt{b} x^2\right) \sqrt{\frac{a+b x^4}{\left(\sqrt{a}+\sqrt{b} x^2\right)^2}} \text{EllipticPi}\left[\frac{\left(2 \sqrt{a} e^2+\sqrt{b} \left(d^2-2 c e+d \sqrt{d^2-4 c e}\right)\right)^2}{4 \sqrt{a} \sqrt{b} e^2 \left(d+\sqrt{d^2-4 c e}\right)^2},2 \text{ArcTan}\left[\frac{b^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]\right)\Big/$$

$$\left(2 a^{1/4} b^{1/4} \sqrt{d^2-4 c e} \left(d+\sqrt{d^2-4 c e}\right) \left(2 \sqrt{a} e^2+\sqrt{b} \left(d^2-2 c e+d \sqrt{d^2-4 c e}\right)\right) \sqrt{a+b x^4}\right)$$

Result (type 4, 653 leaves) :

$$-\left(\left(\left((-1)^{1/4}\sqrt{2}\sqrt{-\frac{i\left((-1)^{1/4}a^{1/4}+b^{1/4}x\right)}{(-1)^{1/4}a^{1/4}-b^{1/4}x}}\left(i\sqrt{a}+\sqrt{b}\,x^2\right)\right.\right.\right.$$

$$\left(b^{1/4}\left(-\sqrt{b}\,c+(-1)^{1/4}a^{1/4}b^{1/4}d-i\sqrt{a}\,e\right)\sqrt{d^2-4ce}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{-\frac{i\left((-1)^{1/4}a^{1/4}+b^{1/4}x\right)}{(-1)^{1/4}a^{1/4}-b^{1/4}x}}\right],-1\right]+\right.$$

$$(-1)^{1/4}a^{1/4}\left(-\left(-2i\sqrt{a}\,e^2+\sqrt{b}\left(d^2-2ce+d\sqrt{d^2-4ce}\right)\right)\text{EllipticPi}\left[\frac{2(-1)^{3/4}a^{1/4}e-i\,b^{1/4}\left(-d+\sqrt{d^2-4ce}\right)}{2(-1)^{1/4}a^{1/4}e+b^{1/4}\left(-d+\sqrt{d^2-4ce}\right)},\right.\right.$$

$$\left.\text{ArcSin}\left[\sqrt{-\frac{i\left((-1)^{1/4}a^{1/4}+b^{1/4}x\right)}{(-1)^{1/4}a^{1/4}-b^{1/4}x}}\right],-1\right]-\left(2i\sqrt{a}\,e^2+\sqrt{b}\left(-d^2+2ce+d\sqrt{d^2-4ce}\right)\right)$$

$$\left.\left.\left.\left.\text{EllipticPi}\left[-\frac{i\left(2(-1)^{1/4}a^{1/4}e+b^{1/4}\left(d+\sqrt{d^2-4ce}\right)\right)}{-2(-1)^{1/4}a^{1/4}e+b^{1/4}\left(d+\sqrt{d^2-4ce}\right)},\text{ArcSin}\left[\sqrt{-\frac{i\left((-1)^{1/4}a^{1/4}+b^{1/4}x\right)}{(-1)^{1/4}a^{1/4}-b^{1/4}x}}\right],-1\right]\right)\right)\right)\right)\Big/$$

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

Problem 253: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 117 leaves, 7 steps):

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

Result (type 5, 67 leaves):

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

Problem 254: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 73 leaves):

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

Problem 255: Result unnecessarily involves higher level functions.

$$\int x^2\left(c\sqrt{a+b\,x^2}\right)^{3/2}dx$$

Optimal (type 4, 152 leaves, 5 steps):

$$\frac{2\,a\,x\left(c\sqrt{a+b\,x^2}\right)^{3/2}}{15\,b}+\frac{2}{9}\,x^3\left(c\sqrt{a+b\,x^2}\right)^{3/2}-\frac{4\,a^2\,x\left(c\sqrt{a+b\,x^2}\right)^{3/2}}{15\,b\left(a+b\,x^2\right)}+\frac{4\,a^{3/2}\left(c\sqrt{a+b\,x^2}\right)^{3/2}\text{EllipticE}\left[\frac{1}{2}\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right],2\right]}{15\,b^{3/2}\left(1+\frac{b\,x^2}{a}\right)^{3/4}}$$

Result (type 5, 88 leaves):

$$\frac{2\,c^2\left(3\,a^2\,x+8\,a\,b\,x^3+5\,b^2\,x^5-3\,a^2\,x\left(1+\frac{b\,x^2}{a}\right)^{1/4}\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b\,x^2}{a}\right]\right)}{45\,b\sqrt{c\sqrt{a+b\,x^2}}}$$

Problem 256: Result unnecessarily involves higher level functions.

$$\int\left(c\sqrt{a+b\,x^2}\right)^{3/2}dx$$

Optimal (type 4, 119 leaves, 4 steps):

$$\frac{2}{5} x \left(c \sqrt{a+b x^2}\right)^{3/2}+\frac{6 a x \left(c \sqrt{a+b x^2}\right)^{3/2}}{5 \left(a+b x^2\right)}-\frac{6 \sqrt{a} \left(c \sqrt{a+b x^2}\right)^{3/2} \text{EllipticE}\left[\frac{1}{2} \text{ArcTan}\left[\frac{\sqrt{b} x}{\sqrt{a}}\right],2\right]}{5 \sqrt{b} \left(1+\frac{b x^2}{a}\right)^{3/4}}$$

Result (type 5, 71 leaves):

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

Problem 257: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 76 leaves):

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

Problem 258: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 154 leaves, 5 steps):

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

Result (type 5, 92 leaves):

$$-\frac{c^2 \left(4 a^2+10 a b x^2+6 b^2 x^4-3 b^2 x^4 \left(1+\frac{b x^2}{a}\right)^{1/4} \text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]\right)}{12 a x^3 \sqrt{c \sqrt{a+b x^2}}}$$

Problem 260: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 48 leaves, 6 steps):

$$\frac{1}{3} x \sqrt{3-2 x^2-x^4}-\frac{2 \,\text{EllipticE}\left[\text{ArcSin}[x],-\frac{1}{3}\right]}{\sqrt{3}}+\frac{4 \,\text{EllipticF}\left[\text{ArcSin}[x],-\frac{1}{3}\right]}{\sqrt{3}}$$

Result (type 4, 59 leaves):

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

Problem 262: Result unnecessarily involves imaginary or complex numbers.

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

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

$$\frac{\text{EllipticF}\left[\text{ArcSin}[x],-\frac{1}{3}\right]}{\sqrt{3}}$$

Result (type 4, 18 leaves):

$$-i \,\text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{x}{\sqrt{3}}\right],-3\right]$$

Problem 266: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{\frac{e \left(a+b x^2\right)}{c+d x^2}}}{x}\, dx$$

Optimal (type 3, 112 leaves, 5 steps):

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

Result (type 6, 245 leaves):

$$\left(5\,a\,(b\,c-a\,d)\,(a+b\,x^2)\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1,\frac{5}{2},\frac{d\,(a+b\,x^2)}{-b\,c+a\,d},1+\frac{b\,x^2}{a}\right]\right)\Big/$$
$$\left(3\,b\,x^2\left(5\,a\,(b\,c-a\,d)\,\text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1,\frac{5}{2},\frac{d\,(a+b\,x^2)}{-b\,c+a\,d},1+\frac{b\,x^2}{a}\right]-\right.\right.$$
$$\left.\left.(a+b\,x^2)\left((-2\,b\,c+2\,a\,d)\,\text{AppellF1}\left[\frac{5}{2},\frac{1}{2},2,\frac{7}{2},\frac{d\,(a+b\,x^2)}{-b\,c+a\,d},1+\frac{b\,x^2}{a}\right]+a\,d\,\text{AppellF1}\left[\frac{5}{2},\frac{3}{2},1,\frac{7}{2},\frac{d\,(a+b\,x^2)}{-b\,c+a\,d},1+\frac{b\,x^2}{a}\right]\right)\right)\right)$$

Problem 267: Result unnecessarily involves higher level functions.

$$\int\frac{\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{x^3}\,dx$$

Optimal (type 3, 127 leaves, 4 steps):

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

Result (type 6, 190 leaves):

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

Problem 268: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{x^5}\,dx$$

Optimal (type 3, 208 leaves, 5 steps):

$$-\frac{(b\,c-a\,d)^2\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{4\,c^2\left(a-\frac{c\,(a+b\,x^2)}{c+d\,x^2}\right)^2}+\frac{(b\,c-5\,a\,d)\,(b\,c-a\,d)\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{8\,a\,c^2\left(a-\frac{c\,(a+b\,x^2)}{c+d\,x^2}\right)}+\frac{(b\,c-a\,d)\,(b\,c+3\,a\,d)\,\sqrt{e}\,\text{ArcTanh}\left[\frac{\sqrt{c}\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{\sqrt{a}\,\sqrt{e}}\right]}{8\,a^{3/2}\,c^{5/2}}$$

Result (type 6, 224 leaves):

$$-\frac{1}{8\,a\,c^2\,x^4}\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\left((c+d\,x^2)\,(2\,a\,c+b\,c\,x^2-3\,a\,d\,x^2)+\left(2\,b\,d\,(b^2\,c^2+2\,a\,b\,c\,d-3\,a^2\,d^2)\,x^6\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]\right)\Big/\left((a+b\,x^2)\left(-4\,b\,d\,x^2\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]+b\,c\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]+a\,d\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]\right)\right)\right)$$

Problem 269: Result unnecessarily involves higher level functions.

$$\int \frac{\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{x^7}\,dx$$

Optimal (type 3, 318 leaves, 6 steps):

$$\frac{(b\,c-a\,d)^2\,(b\,c+3\,a\,d)\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{8\,a\,c^3\left(a-\frac{c\,(a+b\,x^2)}{c+d\,x^2}\right)^2}-\frac{(b\,c-a\,d)\,(b^2\,c^2+2\,a\,b\,c\,d-11\,a^2\,d^2)\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{16\,a^2\,c^3\left(a-\frac{c\,(a+b\,x^2)}{c+d\,x^2}\right)}+$$

$$\frac{(b\,c-a\,d)^3\,e^2\left(\frac{e\,(a+b\,x^2)}{c+d\,x^2}\right)^{3/2}}{6\,a\,c^2\left(a\,e-\frac{c\,e\,(a+b\,x^2)}{c+d\,x^2}\right)^3}-\frac{(b\,c-a\,d)\,(b^2\,c^2+2\,a\,b\,c\,d+5\,a^2\,d^2)\,\sqrt{e}\,\text{ArcTanh}\left[\frac{\sqrt{c}\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{\sqrt{a}\,\sqrt{e}}\right]}{16\,a^{5/2}\,c^{7/2}}$$

Result (type 6, 272 leaves):

$$\frac{1}{48\,a^2\,c^3\,x^6}\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,\Big((c+d\,x^2)\,(3\,b^2\,c^2\,x^4-2\,a\,b\,c\,x^2\,(c-2\,d\,x^2)+a^2\,(-8\,c^2+10\,c\,d\,x^2-15\,d^2\,x^4))+\Big(6\,b\,d\,(b^3\,c^3+a\,b^2\,c^2\,d+3\,a^2\,b\,c\,d^2-5\,a^3\,d^3)\,x^8\,\text{AppellF1}\Big[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\Big]\Big)\Big/\Big((a+b\,x^2)\Big(-4\,b\,d\,x^2\,\text{AppellF1}\Big[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\Big]+b\,c\,\text{AppellF1}\Big[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\Big]+a\,d\,\text{AppellF1}\Big[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\Big]\Big)\Big)\Big)$$

Problem 270: Result unnecessarily involves imaginary or complex numbers.

$$\int x^4\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,dx$$

Optimal (type 4, 357 leaves, 7 steps):

$$\frac{(8\,b^2\,c^2-3\,a\,b\,c\,d-2\,a^2\,d^2)\,x\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{15\,b^2\,d^2}-\frac{(4\,b\,c-a\,d)\,x\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,(c+d\,x^2)}{15\,b\,d^2}+\frac{x^3\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,(c+d\,x^2)}{5\,d}-\frac{\sqrt{c}\,(8\,b^2\,c^2-3\,a\,b\,c\,d-2\,a^2\,d^2)\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,\text{EllipticE}\Big[\text{ArcTan}\Big[\frac{\sqrt{d}\,x}{\sqrt{c}}\Big],1-\frac{b\,c}{a\,d}\Big]}{15\,b^2\,d^{5/2}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}}+\frac{c^{3/2}\,(4\,b\,c-a\,d)\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,\text{EllipticF}\Big[\text{ArcTan}\Big[\frac{\sqrt{d}\,x}{\sqrt{c}}\Big],1-\frac{b\,c}{a\,d}\Big]}{15\,b\,d^{5/2}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}}$$

Result (type 4, 255 leaves):

$$\frac{1}{15\,b\,\sqrt{\frac{b}{a}}\,d^3\,(a+b\,x^2)}\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,\Big(\sqrt{\frac{b}{a}}\,d\,x\,(a+b\,x^2)\,(c+d\,x^2)\,(-4\,b\,c+a\,d+3\,b\,d\,x^2)+i\,c\,(-8\,b^2\,c^2+3\,a\,b\,c\,d+2\,a^2\,d^2)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\Big[i\,\text{ArcSinh}\Big[\sqrt{\frac{b}{a}}\,x\Big],\frac{a\,d}{b\,c}\Big]-i\,c\,(-8\,b^2\,c^2+7\,a\,b\,c\,d+a^2\,d^2)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\Big[i\,\text{ArcSinh}\Big[\sqrt{\frac{b}{a}}\,x\Big],\frac{a\,d}{b\,c}\Big]\Big)$$

Problem 271: Result unnecessarily involves imaginary or complex numbers.

$$\int x^2 \sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,dx$$

Optimal (type 4, 266 leaves, 6 steps):

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

Result (type 4, 208 leaves):

$$\frac{1}{3\,\sqrt{\frac{b}{a}}\,d^2\,(a+b\,x^2)}\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\left(\sqrt{\frac{b}{a}}\,d\,x\,(a+b\,x^2)\,(c+d\,x^2)-\mathrm{i}\,c\,(-2\,b\,c+a\,d)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]+2\,\mathrm{i}\,c\,(-b\,c+a\,d)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)$$

Problem 274: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{x^4}\,dx$$

Optimal (type 4, 321 leaves, 7 steps):

$$\frac{d\,(b\,c-2\,a\,d)\,x\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{3\,a\,c^2}-\frac{\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,(c+d\,x^2)}{3\,c\,x^3}-\frac{(b\,c-2\,a\,d)\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,(c+d\,x^2)}{3\,a\,c^2\,x}-$$

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

Result (type 4, 238 leaves) :

$$-\frac{1}{3\,b\,c^2\,x^3\,(a+b\,x^2)\,\sqrt{\frac{b}{a}}}\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}$$

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

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

Problem 275: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{x^6}\,dx$$

Optimal (type 4, 424 leaves, 8 steps) :

$$-\frac{d\left(2 b^2 c^2+3 a b c d-8 a^2 d^2\right) x \sqrt{\frac{e\left(a+b x^2\right)}{c+d x^2}}}{15 a^2 c^3}-\frac{\sqrt{\frac{e\left(a+b x^2\right)}{c+d x^2}}\left(c+d x^2\right)}{5 c x^5}-\frac{(b c-4 a d) \sqrt{\frac{e\left(a+b x^2\right)}{c+d x^2}}\left(c+d x^2\right)}{15 a c^2 x^3}+\frac{\left(2 b^2 c^2+3 a b c d-8 a^2 d^2\right) \sqrt{\frac{e\left(a+b x^2\right)}{c+d x^2}}\left(c+d x^2\right)}{15 a^2 c^3 x}+$$

$$\frac{\sqrt{d}\left(2 b^2 c^2+3 a b c d-8 a^2 d^2\right) \sqrt{\frac{e\left(a+b x^2\right)}{c+d x^2}} \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]}{15 a^2 c^{5/2} \sqrt{\frac{c\left(a+b x^2\right)}{a\left(c+d x^2\right)}}}-\frac{b \sqrt{d}(b c-4 a d) \sqrt{\frac{e\left(a+b x^2\right)}{c+d x^2}} \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]}{15 a^2 c^{3/2} \sqrt{\frac{c\left(a+b x^2\right)}{a\left(c+d x^2\right)}}}$$

Result (type 4, 302 leaves):

$$-\frac{1}{15 a^2 \sqrt{\frac{b}{a}} c^3 x^5\left(a+b x^2\right)} \sqrt{\frac{e\left(a+b x^2\right)}{c+d x^2}}\left(\sqrt{\frac{b}{a}}\left(a+b x^2\right)\left(c+d x^2\right)\left(-2 b^2 c^2 x^4+a b c x^2\left(c-3 d x^2\right)+a^2\left(3 c^2-4 c d x^2+8 d^2 x^4\right)\right)+\right.$$

$$i b c\left(-2 b^2 c^2-3 a b c d+8 a^2 d^2\right) x^5 \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right]-$$

$$\left.2 i b c\left(-b^2 c^2-a b c d+2 a^2 d^2\right) x^5 \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right]\right)$$

Problem 279: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{\left(\frac{e\left(a+b x^2\right)}{c+d x^2}\right)^{3/2}}{x} \, dx$$

Optimal (type 3, 151 leaves, 6 steps):

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

Result (type 6, 330 leaves):

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

Problem 280: Result unnecessarily involves higher level functions.

$$\int\frac{\left(\frac{e\,(a+b\,x^2)}{c+d\,x^2}\right)^{3/2}}{x^3}\,dx$$

Optimal (type 3, 165 leaves, 5 steps):

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

Result (type 6, 210 leaves):

$$\frac{1}{2\,c^2\,x^2\,(a+b\,x^2)}e\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\left(-(a+b\,x^2)\,(-2\,b\,c\,x^2+a\,(c+3\,d\,x^2))+\left(6\,a\,b\,d\,(b\,c-a\,d)\,x^4\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]\right)\Big/\left(-4\,b\,d\,x^2\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]+b\,c\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]+a\,d\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]\right)\right)$$

Problem 281: Result unnecessarily involves higher level functions.

$$\int\frac{\left(\frac{e\,(a+b\,x^2)}{c+d\,x^2}\right)^{3/2}}{x^5}\,dx$$

Optimal (type 3, 256 leaves, 6 steps):

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

$$\frac{(5\,b\,c-9\,a\,d)\,(b\,c-a\,d)\,e^2\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{8\,c^3\,\left(a\,e-\frac{c\,e\,(a+b\,x^2)}{c+d\,x^2}\right)}-\frac{3\,(b\,c-5\,a\,d)\,(b\,c-a\,d)\,e^{3/2}\,\text{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{\sqrt{a}\,\sqrt{e}}\right]}{8\,\sqrt{a}\,c^{7/2}}$$

Result (type 6, 245 leaves):

$$\frac{1}{8\,c^3\,x^4\,(a+b\,x^2)}e\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}$$

$$\left((a+b\,x^2)\,\left(-b\,c\,x^2\,(5\,c+13\,d\,x^2)+a\,(-2\,c^2+5\,c\,d\,x^2+15\,d^2\,x^4)\right)+\left(6\,b\,d\,(b^2\,c^2-6\,a\,b\,c\,d+5\,a^2\,d^2)\,x^6\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]\right)\Big/\right.$$

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

Problem 282: Result unnecessarily involves higher level functions.

$$\int\frac{\left(\frac{e\,(a+b\,x^2)}{c+d\,x^2}\right)^{3/2}}{x^7}\,dx$$

Optimal (type 3, 366 leaves, 7 steps):

$$\frac{d^2\,(b\,c-a\,d)\,e\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{c^4}+\frac{(b\,c-a\,d)^3\,e^2\,\left(\frac{e\,(a+b\,x^2)}{c+d\,x^2}\right)^{5/2}}{6\,a\,c^2\,\left(a\,e-\frac{c\,e\,(a+b\,x^2)}{c+d\,x^2}\right)^3}+\frac{(b\,c-a\,d)^2\,(b\,c+11\,a\,d)\,e^3\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{24\,c^4\,\left(a\,e-\frac{c\,e\,(a+b\,x^2)}{c+d\,x^2}\right)^2}-$$

$$\frac{(b\,c-a\,d)\,(5\,b^2\,c^2+50\,a\,b\,c\,d-79\,a^2\,d^2)\,e^2\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{48\,a\,c^4\,\left(a\,e-\frac{c\,e\,(a+b\,x^2)}{c+d\,x^2}\right)}+\frac{(b\,c-a\,d)\,(b^2\,c^2+10\,a\,b\,c\,d-35\,a^2\,d^2)\,e^{3/2}\,\text{ArcTanh}\left[\frac{\sqrt{c}\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{\sqrt{a}\,\sqrt{e}}\right]}{16\,a^{3/2}\,c^{9/2}}$$

Result (type 6, 305 leaves):

$$-\frac{1}{48\,a\,c^4\,x^6\,\left(a+b\,x^2\right)}e\,\sqrt{\frac{e\,\left(a+b\,x^2\right)}{c+d\,x^2}}\,\left(\left(a+b\,x^2\right)\,\left(3\,b^2\,c^2\,x^4\,\left(c+d\,x^2\right)+2\,a\,b\,c\,x^2\,\left(7\,c^2-19\,c\,d\,x^2-50\,d^2\,x^4\right)+a^2\,\left(8\,c^3-14\,c^2\,d\,x^2+35\,c\,d^2\,x^4+105\,d^3\,x^6\right)\right)+\left(6\,b\,d\,\left(b^3\,c^3+9\,a\,b^2\,c^2\,d-45\,a^2\,b\,c\,d^2+35\,a^3\,d^3\right)\,x^8\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]\right)\Big/\left(-4\,b\,d\,x^2\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]+b\,c\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]+a\,d\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]\right)\right)$$

Problem 283: Result unnecessarily involves imaginary or complex numbers.

$$\int x^4\left(\frac{e\,\left(a+b\,x^2\right)}{c+d\,x^2}\right)^{3/2}\,dx$$

Optimal (type 4, 391 leaves, 8 steps):

$$-\frac{\left(16\,a\,c-\frac{16\,b\,c^2}{d}-\frac{a^2\,d}{b}\right)\,e\,x\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{5\,d^2}-\frac{e\,x^3\,\left(a+b\,x^2\right)\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}{d}-\frac{\left(8\,b\,c-7\,a\,d\right)\,e\,x\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,\left(c+d\,x^2\right)}{5\,d^3}+\frac{6\,b\,e\,x^3\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,\left(c+d\,x^2\right)}{5\,d^2}-\frac{\sqrt{c}\,\left(16\,b^2\,c^2-16\,a\,b\,c\,d+a^2\,d^2\right)\,e\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{5\,b\,d^{7/2}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}}+\frac{c^{3/2}\,\left(8\,b\,c-7\,a\,d\right)\,e\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{5\,d^{7/2}\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}}$$

Result (type 4, 290 leaves):

$$\frac{1}{5\sqrt{\frac{b}{a}}\,d^4\left(a+b\,x^2\right)}e\sqrt{\frac{e\left(a+b\,x^2\right)}{c+d\,x^2}}$$

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

$$\left.\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]+8\,i\,c\left(2\,b^2\,c^2-3\,a\,b\,c\,d+a^2\,d^2\right)\sqrt{1+\frac{b\,x^2}{a}}\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)$$

Problem 284: Result unnecessarily involves imaginary or complex numbers.

$$\int x^2\left(\frac{e\left(a+b\,x^2\right)}{c+d\,x^2}\right)^{3/2}dx$$

Optimal (type 4, 310 leaves, 7 steps):

$$-\frac{(8\,b\,c-7\,a\,d)\,e\,x\sqrt{\frac{e\left(a+b\,x^2\right)}{c+d\,x^2}}}{3\,d^2}-\frac{e\,x\left(a+b\,x^2\right)\sqrt{\frac{e\left(a+b\,x^2\right)}{c+d\,x^2}}}{d}+\frac{4\,b\,e\,x\sqrt{\frac{e\left(a+b\,x^2\right)}{c+d\,x^2}}\left(c+d\,x^2\right)}{3\,d^2}+$$

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

Result (type 4, 235 leaves):

$$-\frac{1}{3\sqrt{\frac{b}{a}}\,d^3\,(a+b\,x^2)}\,e\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\left(\sqrt{\frac{b}{a}}\,d\,x\,(a+b\,x^2)\,(3\,a\,d-b\,(4\,c+d\,x^2))+\mathrm{i}\,b\,c\,(-8\,b\,c+7\,a\,d)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]+\right.$$
$$\left.\mathrm{i}\,(8\,b^2\,c^2-11\,a\,b\,c\,d+3\,a^2\,d^2)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)$$

Problem 285: Result unnecessarily involves imaginary or complex numbers.

$$\int\left(\frac{e\,(a+b\,x^2)}{c+d\,x^2}\right)^{3/2}dx$$

Optimal (type 4, 262 leaves, 6 steps):

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

Result (type 4, 206 leaves):

$$\frac{1}{\sqrt{\frac{b}{a}}\,c\,d^2\,(a+b\,x^2)}e\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\left(\mathrm{i}\,b\,c\,(-2\,b\,c+a\,d)\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]+\right.$$
$$\left.(-b\,c+a\,d)\left(\sqrt{\frac{b}{a}}\,d\,x\,(a+b\,x^2)-2\,\mathrm{i}\,b\,c\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)\right)$$

Problem 286: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(\frac{e\,(a+b\,x^2)}{c+d\,x^2}\right)^{3/2}}{x^2}\,dx$$

Optimal (type 4, 307 leaves, 7 steps):

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

Result (type 4, 228 leaves):

$$-\frac{1}{\sqrt{\frac{b}{a}}\,c^2\,d\,x\,(a+b\,x^2)}$$
$$e\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\left(\sqrt{\frac{b}{a}}\,d\,(a+b\,x^2)\,(a\,c-b\,c\,x^2+2\,a\,d\,x^2)+i\,b\,c\,(-b\,c+2\,a\,d)\,x\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]-\right.$$
$$\left.i\,b\,c\,(-b\,c+a\,d)\,x\,\sqrt{1+\frac{b\,x^2}{a}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)$$

Problem 287: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(\frac{e\,(a+b\,x^2)}{c+d\,x^2}\right)^{3/2}}{x^4}\,dx$$

Optimal (type 4, 383 leaves, 8 steps):

$$-\frac{(b c-a d) e \sqrt{\frac{e (a+b x^2)}{c+d x^2}}}{c d x^3}+\frac{d (7 b c-8 a d) e x \sqrt{\frac{e (a+b x^2)}{c+d x^2}}}{3 c^3}+\frac{(3 b c-4 a d) e \sqrt{\frac{e (a+b x^2)}{c+d x^2}} (c+d x^2)}{3 c^2 d x^3}-\frac{(7 b c-8 a d) e \sqrt{\frac{e (a+b x^2)}{c+d x^2}} (c+d x^2)}{3 c^3 x}-$$

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

Result (type 4, 275 leaves) :

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

$$\left.\sqrt{1+\frac{d x^2}{c}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right]-4 i b c (-b c+a d) x^3 \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{b}{a}} x\right], \frac{a d}{b c}\right]\right)$$

Problem 288: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(\frac{e (a+b x^2)}{c+d x^2}\right)^{3/2}}{x^6} \, dx$$

Optimal (type 4, 480 leaves, 9 steps) :

$$-\frac{(b c-a d)\, e\sqrt{\frac{e(a+b x^2)}{c+d x^2}}}{c d x^5}+\frac{d\left(b^2 c^2-16 a b c d+16 a^2 d^2\right) e\, x\sqrt{\frac{e(a+b x^2)}{c+d x^2}}}{5 a c^4}+\frac{(5 b c-6 a d)\, e\sqrt{\frac{e(a+b x^2)}{c+d x^2}}\,(c+d x^2)}{5 c^2 d x^5}-$$

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

$$\frac{\sqrt{d}\left(b^2 c^2-16 a b c d+16 a^2 d^2\right) e\sqrt{\frac{e(a+b x^2)}{c+d x^2}}\;\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{5 a c^{7/2}\sqrt{\frac{c(a+b x^2)}{a(c+d x^2)}}}-$$

$$\frac{b\sqrt{d}\,(7 b c-8 a d)\, e\sqrt{\frac{e(a+b x^2)}{c+d x^2}}\;\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{5 a c^{5/2}\sqrt{\frac{c(a+b x^2)}{a(c+d x^2)}}}$$

Result (type 4, 357 leaves):

$$-\frac{1}{5 b c^4 x^5 (a+b x^2)\sqrt{\frac{b}{a}}}\, e\sqrt{\frac{e(a+b x^2)}{c+d x^2}}\left(\sqrt{\frac{b}{a}}\right.$$

$$\left(b^3 c^2 x^6 (c+d x^2)+a b^2 c x^4 \left(3 c^2-8 c d x^2-16 d^2 x^4\right)+a^2 b x^2\left(3 c^3-11 c^2 d x^2-8 c d^2 x^4+16 d^3 x^6\right)+a^3\left(c^3-2 c^2 d x^2+8 c d^2 x^4+16 d^3 x^6\right)\right)+$$

$$i\, b c\left(b^2 c^2-16 a b c d+16 a^2 d^2\right) x^5\sqrt{1+\frac{b x^2}{a}}\sqrt{1+\frac{d x^2}{c}}\;\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right],\frac{a d}{b c}\right]-$$

$$\left. i\, b c\left(b^2 c^2-9 a b c d+8 a^2 d^2\right) x^5\sqrt{1+\frac{b x^2}{a}}\sqrt{1+\frac{d x^2}{c}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right],\frac{a d}{b c}\right]\right)$$

Problem 299: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{1}{x\sqrt{\frac{e(a+b x^2)}{c+d x^2}}}\, dx$$

Optimal (type 3, 112 leaves, 5 steps):

$$-\frac{\sqrt{c}\ \text{ArcTanh}\left[\frac{\sqrt{c}\sqrt{\frac{e\left(a+b x^2\right)}{c+d x^2}}}{\sqrt{a}\ \sqrt{e}}\right]}{\sqrt{a}\ \sqrt{e}}+\frac{\sqrt{d}\ \text{ArcTanh}\left[\frac{\sqrt{d}\sqrt{\frac{e\left(a+b x^2\right)}{c+d x^2}}}{\sqrt{b}\ \sqrt{e}}\right]}{\sqrt{b}\ \sqrt{e}}$$

Result (type 6, 244 leaves):

$$\left(3 a \left(b c-a d\right) \left(a+b x^2\right) \text{AppellF1}\left[\frac{1}{2},-\frac{1}{2},1,\frac{3}{2},\frac{d\left(a+b x^2\right)}{-b c+a d},1+\frac{b x^2}{a}\right]\right)\Big/$$
$$\left(b x^2 \sqrt{\frac{e\left(a+b x^2\right)}{c+d x^2}} \left(3 a \left(b c-a d\right) \text{AppellF1}\left[\frac{1}{2},-\frac{1}{2},1,\frac{3}{2},\frac{d\left(a+b x^2\right)}{-b c+a d},1+\frac{b x^2}{a}\right]-\right.\right.$$
$$\left.\left.\left(a+b x^2\right)\left(\left(-2 b c+2 a d\right) \text{AppellF1}\left[\frac{3}{2},-\frac{1}{2},2,\frac{5}{2},\frac{d\left(a+b x^2\right)}{-b c+a d},1+\frac{b x^2}{a}\right]-a d\, \text{AppellF1}\left[\frac{3}{2},\frac{1}{2},1,\frac{5}{2},\frac{d\left(a+b x^2\right)}{-b c+a d},1+\frac{b x^2}{a}\right]\right)\right)\right)$$

Problem 300: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 130 leaves, 4 steps):

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

Result (type 6, 190 leaves):

$$\frac{-a-b x^2+\frac{2 b d \left(-b c+a d\right) x^4 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]}{\left(c+d x^2\right)\left(-4 b d x^2 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+b c\, \text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+a d\, \text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)}}{2 a x^2 \sqrt{\frac{e\left(a+b x^2\right)}{c+d x^2}}}$$

Problem 301: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^5 \sqrt{\frac{e (a+b x^2)}{c+d x^2}}} \, dx$$

Optimal (type 3, 218 leaves, 5 steps):

$$-\frac{(b c-a d)^2 e \sqrt{\frac{e (a+b x^2)}{c+d x^2}}}{4 a c \left(a e-\frac{c e (a+b x^2)}{c+d x^2}\right)^2}-\frac{(b c-a d) (3 b c+a d) \sqrt{\frac{e (a+b x^2)}{c+d x^2}}}{8 a^2 c \left(a e-\frac{c e (a+b x^2)}{c+d x^2}\right)}-\frac{(b c-a d) (3 b c+a d) \text{ArcTanh}\left[\frac{\sqrt{c} \sqrt{\frac{e (a+b x^2)}{c+d x^2}}}{\sqrt{a} \sqrt{e}}\right]}{8 a^{5/2} c^{3/2} \sqrt{e}}$$

Result (type 6, 224 leaves):

$$-\frac{1}{8 a^2 c x^4 \sqrt{\frac{e (a+b x^2)}{c+d x^2}}}\left((a+b x^2) (2 a c-3 b c x^2+a d x^2)+\left(2 b d (-3 b^2 c^2+2 a b c d+a^2 d^2) x^6 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\Big/\left((c+d x^2)\left(-4 b d x^2 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+b c \text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+a d \text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\right)\right)$$

Problem 302: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^4}{\sqrt{\frac{e (a+b x^2)}{c+d x^2}}} \, dx$$

Optimal (type 4, 403 leaves, 7 steps):

$$\frac{(b c-4 a d) x (a+b x^2)}{15 b^2 d \sqrt{\frac{e (a+b x^2)}{c+d x^2}}}+\frac{x^3 (a+b x^2)}{5 b \sqrt{\frac{e (a+b x^2)}{c+d x^2}}}-\frac{(2 b^2 c^2+3 a b c d-8 a^2 d^2) x (a+b x^2)}{15 b^3 d \sqrt{\frac{e (a+b x^2)}{c+d x^2}} (c+d x^2)}+$$

$$\frac{\sqrt{c} (2 b^2 c^2+3 a b c d-8 a^2 d^2) (a+b x^2) \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{15 b^3 d^{3/2} \sqrt{\frac{c (a+b x^2)}{a (c+d x^2)}} \sqrt{\frac{e (a+b x^2)}{c+d x^2}} (c+d x^2)}-\frac{c^{3/2} (b c-4 a d) (a+b x^2) \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],1-\frac{b c}{a d}\right]}{15 b^2 d^{3/2} \sqrt{\frac{c (a+b x^2)}{a (c+d x^2)}} \sqrt{\frac{e (a+b x^2)}{c+d x^2}} (c+d x^2)}$$

Result (type 4, 258 leaves):

$$\left(-\sqrt{\frac{b}{a}}\, d\, x\, (a+b x^2)\, (c+d x^2)\, (4 a d - b (c+3 d x^2)) - i c\, (-2 b^2 c^2 - 3 a b c d + 8 a^2 d^2) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticE}\left[i \,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right] + 2 i c\, (-b^2 c^2 - a b c d + 2 a^2 d^2) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticF}\left[i \,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]\right) \Big/ \left(15 a^2 \left(\frac{b}{a}\right)^{5/2} d^2 \sqrt{\frac{e (a+b x^2)}{c+d x^2}}\, (c+d x^2)\right)$$

Problem 303: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2}{\sqrt{\frac{e (a+b x^2)}{c+d x^2}}}\, dx$$

Optimal (type 4, 312 leaves, 6 steps):

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

Result (type 4, 212 leaves):

$$\left(\sqrt{\frac{b}{a}}\, d\, x\, (a+b x^2)\, (c+d x^2) + i c\, (-b c + 2 a d) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticE}\left[i \,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right] - i c\, (-b c + a d) \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticF}\left[i \,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right], \frac{a d}{b c}\right]\right) \Big/ \left(3 b \sqrt{\frac{b}{a}}\, d \sqrt{\frac{e (a+b x^2)}{c+d x^2}}\, (c+d x^2)\right)$$

Problem 306: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^4 \sqrt{\frac{e (a+b x^2)}{c+d x^2}}}\, dx$$

Optimal (type 4, 372 leaves, 7 steps):

$$-\frac{a+b x^2}{3 a x^3 \sqrt{\frac{e (a+b x^2)}{c+d x^2}}}+\frac{(2 b c-a d) (a+b x^2)}{3 a^2 c x \sqrt{\frac{e (a+b x^2)}{c+d x^2}}}-\frac{d (2 b c-a d) x (a+b x^2)}{3 a^2 c \sqrt{\frac{e (a+b x^2)}{c+d x^2}} (c+d x^2)}+$$

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

Result (type 4, 238 leaves):

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

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

Problem 310: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{1}{x \left(\frac{e (a+b x^2)}{c+d x^2}\right)^{3/2}} \, dx$$

Optimal (type 3, 152 leaves, 6 steps):

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

Result (type 6, 332 leaves):

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

Problem 311: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^3 \left(\frac{e \left(a+b x^2\right)}{c+d x^2}\right)^{3/2}}\, dx$$

Optimal (type 3, 170 leaves, 5 steps):

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

Result (type 6, 212 leaves):

$$\frac{1}{2 a^2 e^2 x^2 \left(a+b x^2\right)} \sqrt{\frac{e \left(a+b x^2\right)}{c+d x^2}} \left(-\left(c+d x^2\right) \left(3 b c x^2+a \left(c-2 d x^2\right)\right)+\left(6 b c d \left(-b c+a d\right) x^4 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right) \Big/\right.$$
$$\left.\left(-4 b d x^2 \text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+b c\, \text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]+a d\, \text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b x^2},-\frac{c}{d x^2}\right]\right)\right)$$

Problem 312: Result unnecessarily involves higher level functions.

$$\int \frac{1}{x^5 \left(\frac{e \left(a+b x^2\right)}{c+d x^2}\right)^{3/2}}\, dx$$

Optimal (type 3, 255 leaves, 6 steps):

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

Result (type 6, 247 leaves) :

$$\frac{1}{8\,a^3\,e^2\,x^4\,(a+b\,x^2)}\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}$$

$$\left(\left(c+d\,x^2\right)\,\left(15\,b^2\,c\,x^4+a\,b\,x^2\,\left(5\,c-13\,d\,x^2\right)-a^2\,\left(2\,c+5\,d\,x^2\right)\right)+\left(6\,b\,d\,\left(5\,b^2\,c^2-6\,a\,b\,c\,d+a^2\,d^2\right)\,x^6\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]\right)\Big/\right.$$
$$\left.\left(-4\,b\,d\,x^2\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]+b\,c\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]+a\,d\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-\frac{a}{b\,x^2},-\frac{c}{d\,x^2}\right]\right)\right)$$

Problem 313: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^4}{\left(\frac{e\,(a+b\,x^2)}{c+d\,x^2}\right)^{3/2}}\,dx$$

Optimal (type 4, 453 leaves, 8 steps) :

$$\frac{(7\,b\,c-8\,a\,d)\,x\,(a+b\,x^2)}{5\,b^3\,e\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}+\frac{6\,d\,x^3\,(a+b\,x^2)}{5\,b^2\,e\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}+\frac{(b^2\,c^2-16\,a\,b\,c\,d+16\,a^2\,d^2)\,x\,(a+b\,x^2)}{5\,b^4\,e\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,(c+d\,x^2)}-\frac{x^3\,(c+d\,x^2)}{b\,e\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}}-$$
$$\frac{\sqrt{c}\,(b^2\,c^2-16\,a\,b\,c\,d+16\,a^2\,d^2)\,(a+b\,x^2)\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{5\,b^4\,\sqrt{d}\,e\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,(c+d\,x^2)}-\frac{c^{3/2}\,(7\,b\,c-8\,a\,d)\,(a+b\,x^2)\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{5\,b^3\,\sqrt{d}\,e\,\sqrt{\frac{c\,(a+b\,x^2)}{a\,(c+d\,x^2)}}\,\sqrt{\frac{e\,(a+b\,x^2)}{c+d\,x^2}}\,(c+d\,x^2)}$$

Result (type 4, 271 leaves) :

$$\frac{1}{5\,b^3\sqrt{\frac{b}{a}}\,d\,e^2\left(a+b\,x^2\right)}\sqrt{\frac{e\left(a+b\,x^2\right)}{c+d\,x^2}}\left(\sqrt{\frac{b}{a}}\,d\,x\left(c+d\,x^2\right)\left(-8\,a^2\,d+a\,b\left(7\,c-2\,d\,x^2\right)+b^2\,x^2\left(2\,c+d\,x^2\right)\right)-i\,c\left(b^2\,c^2-16\,a\,b\,c\,d+16\,a^2\,d^2\right)\sqrt{1+\frac{b\,x^2}{a}}\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]+i\,c\left(b^2\,c^2-9\,a\,b\,c\,d+8\,a^2\,d^2\right)\sqrt{1+\frac{b\,x^2}{a}}\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)$$

Problem 314: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2}{\left(\frac{e\left(a+b\,x^2\right)}{c+d\,x^2}\right)^{3/2}}\,dx$$

Optimal (type 4, 378 leaves, 7 steps):

$$\frac{4\,d\,x\left(a+b\,x^2\right)}{3\,b^2\,e\sqrt{\frac{e\left(a+b\,x^2\right)}{c+d\,x^2}}}+\frac{d\left(7\,b\,c-8\,a\,d\right)x\left(a+b\,x^2\right)}{3\,b^3\,e\sqrt{\frac{e\left(a+b\,x^2\right)}{c+d\,x^2}}\left(c+d\,x^2\right)}-\frac{x\left(c+d\,x^2\right)}{b\,e\sqrt{\frac{e\left(a+b\,x^2\right)}{c+d\,x^2}}}-\frac{\sqrt{c}\,\sqrt{d}\left(7\,b\,c-8\,a\,d\right)\left(a+b\,x^2\right)\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{3\,b^3\,e\sqrt{\frac{c\left(a+b\,x^2\right)}{a\left(c+d\,x^2\right)}}\sqrt{\frac{e\left(a+b\,x^2\right)}{c+d\,x^2}}\left(c+d\,x^2\right)}+\frac{c^{3/2}\left(3\,b\,c-4\,a\,d\right)\left(a+b\,x^2\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],1-\frac{b\,c}{a\,d}\right]}{3\,a\,b^2\sqrt{d}\,e\sqrt{\frac{c\left(a+b\,x^2\right)}{a\left(c+d\,x^2\right)}}\sqrt{\frac{e\left(a+b\,x^2\right)}{c+d\,x^2}}\left(c+d\,x^2\right)}$$

Result (type 4, 219 leaves):

$$\frac{1}{3\,a^2\left(\frac{b}{a}\right)^{5/2}e^2\left(a+b\,x^2\right)}\sqrt{\frac{e\left(a+b\,x^2\right)}{c+d\,x^2}}\left(\sqrt{\frac{b}{a}}\,x\left(c+d\,x^2\right)\left(-3\,b\,c+4\,a\,d+b\,d\,x^2\right)+i\,c\left(-7\,b\,c+8\,a\,d\right)\sqrt{1+\frac{b\,x^2}{a}}\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]-4\,i\,c\left(-b\,c+a\,d\right)\sqrt{1+\frac{b\,x^2}{a}}\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\,x\right],\frac{a\,d}{b\,c}\right]\right)$$

Problem 315: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\left(\frac{e(a+b x^2)}{c+d x^2}\right)^{3/2}} \, dx$$

Optimal (type 4, 327 leaves, 6 steps):

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

Result (type 4, 203 leaves):

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

Problem 316: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^2 \left(\frac{e(a+b x^2)}{c+d x^2}\right)^{3/2}} \, dx$$

Optimal (type 4, 380 leaves, 7 steps):

$$\frac{b c-a d}{a b e x \sqrt{\frac{e (a+b x^2)}{c+d x^2}}}-\frac{(2 b c-a d) (a+b x^2)}{a^2 b e x \sqrt{\frac{e (a+b x^2)}{c+d x^2}}}+\frac{d (2 b c-a d) x (a+b x^2)}{a^2 b e \sqrt{\frac{e (a+b x^2)}{c+d x^2}} (c+d x^2)}-$$

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

Result (type 4, 223 leaves) :

$$\frac{1}{a^2 \sqrt{\frac{b}{a}} e^2 x (a+b x^2)}$$

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

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

Problem 317: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 444 leaves, 8 steps) :

$$\frac{b c-a d}{a b e x^3 \sqrt{\frac{e (a+b x^2)}{c+d x^2}}}-\frac{(4 b c-3 a d) (a+b x^2)}{3 a^2 b e x^3 \sqrt{\frac{e (a+b x^2)}{c+d x^2}}}+\frac{(8 b c-7 a d) (a+b x^2)}{3 a^3 e x \sqrt{\frac{e (a+b x^2)}{c+d x^2}}}-\frac{d (8 b c-7 a d) x (a+b x^2)}{3 a^3 e \sqrt{\frac{e (a+b x^2)}{c+d x^2}} (c+d x^2)}+$$

$$\frac{\sqrt{c} \sqrt{d} (8 b c-7 a d) (a+b x^2) \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]}{3 a^3 e \sqrt{\frac{c (a+b x^2)}{a (c+d x^2)}} \sqrt{\frac{e (a+b x^2)}{c+d x^2}} (c+d x^2)}-\frac{\sqrt{c} \sqrt{d} (4 b c-3 a d) (a+b x^2) \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], 1-\frac{b c}{a d}\right]}{3 a^3 e \sqrt{\frac{c (a+b x^2)}{a (c+d x^2)}} \sqrt{\frac{e (a+b x^2)}{c+d x^2}} (c+d x^2)}$$

Result (type 4, 266 leaves) :

$$\frac{1}{3 a^3 \sqrt{\frac{b}{a}}\, e^2 x^3 \left(a+b x^2\right)}\sqrt{\frac{e \left(a+b x^2\right)}{c+d x^2}} \left(-\sqrt{\frac{b}{a}} \left(c+d x^2\right) \left(-8 b^2 c x^4+a^2 \left(c+4 d x^2\right)+a b \left(-4 c x^2+7 d x^4\right)\right)-\text{i}\, b c \left(-8 b c+7 a d\right) x^3 \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\right.$$
$$\left.\text{EllipticE}\left[\text{i}\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right],\frac{a d}{b c}\right]-\text{i}\left(8 b^2 c^2-11 a b c d+3 a^2 d^2\right) x^3 \sqrt{1+\frac{b x^2}{a}} \sqrt{1+\frac{d x^2}{c}}\ \text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\sqrt{\frac{b}{a}}\, x\right],\frac{a d}{b c}\right]\right)$$

Problem 321: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{a+\frac{b}{c+d x^2}}}{x}\, dx$$

Optimal (type 3, 96 leaves, 6 steps):

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

Result (type 3, 210 leaves):

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

Problem 322: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{a+\frac{b}{c+d x^2}}}{x^3}\, dx$$

Optimal (type 3, 104 leaves, 5 steps):

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

Result (type 3, 212 leaves) :

$$\left(\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\left(-2\sqrt{c\left(b+a c\right)}\left(c+d x^2\right)\left(b+a c+a d x^2\right)-2 b d x^2\sqrt{\left(c+d x^2\right)\left(b+a\left(c+d x^2\right)\right)}\operatorname{Log}[x]+b d x^2\sqrt{\left(c+d x^2\right)\left(b+a c+a d x^2\right)}\operatorname{Log}\left[2 a c\left(c+d x^2\right)+b\left(2 c+d x^2\right)+2\sqrt{c\left(b+a c\right)}\sqrt{\left(c+d x^2\right)\left(b+a c+a d x^2\right)}\right]\right)\right)\Big/\left(4 c\sqrt{c\left(b+a c\right)}\,x^2\left(b+a\left(c+d x^2\right)\right)\right)$$

Problem 325: Result unnecessarily involves imaginary or complex numbers.

$$\int x^4\sqrt{a+\frac{b}{c+d x^2}}\,dx$$

Optimal (type 4, 368 leaves, 8 steps) :

$$-\frac{\left(2 b^2+7 a b c-3 a^2 c^2\right) x\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{15 a^2 d^2}+\frac{\left(b-3 a c\right) x\left(c+d x^2\right)\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{15 a d^2}+\frac{x^3\left(c+d x^2\right)\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{5 d}+\frac{\sqrt{c}\left(2 b^2+7 a b c-3 a^2 c^2\right)\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\operatorname{EllipticE}\left[\operatorname{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],\frac{b}{b+a c}\right]}{15 a^2 d^{5/2}\sqrt{\frac{c\left(b+a c+a d x^2\right)}{\left(b+a c\right)\left(c+d x^2\right)}}}-\frac{c^{3/2}\left(b-3 a c\right)\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\operatorname{EllipticF}\left[\operatorname{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],\frac{b}{b+a c}\right]}{15 a d^{5/2}\sqrt{\frac{c\left(b+a c+a d x^2\right)}{\left(b+a c\right)\left(c+d x^2\right)}}}$$

Result (type 4, 293 leaves) :

$$\left(\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\left(\sqrt{\frac{a d}{b+a c}}\, x\left(c+d x^2\right)\left(b^2-2 a b\left(c-2 d x^2\right)-3 a^2\left(c^2-d^2 x^4\right)\right)+\right.\right.$$
$$i c\left(2 b^2+7 a b c-3 a^2 c^2\right)\sqrt{\frac{b+a c+a d x^2}{b+a c}}\sqrt{1+\frac{d x^2}{c}}\,\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{a d}{b+a c}}\, x\right],1+\frac{b}{a c}\right]-$$
$$\left.\left. i b c\left(b+9 a c\right)\sqrt{\frac{b+a c+a d x^2}{b+a c}}\sqrt{1+\frac{d x^2}{c}}\,\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{a d}{b+a c}}\, x\right],1+\frac{b}{a c}\right]\right)\right)\Big/\left(15 a d^2\sqrt{\frac{a d}{b+a c}}\left(b+a\left(c+d x^2\right)\right)\right)$$

Problem 326: Result unnecessarily involves imaginary or complex numbers.

$$\int x^2\sqrt{a+\frac{b}{c+d x^2}}\, dx$$

Optimal (type 4, 282 leaves, 7 steps):

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

Result (type 4, 250 leaves):

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

Problem 328: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a+\frac{b}{c+d x^2}}}{x^2}\, dx$$

Optimal (type 4, 265 leaves, 8 steps):

$$\frac{d x \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{c}-\frac{\left(c+d x^2\right) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{c x}-\frac{\sqrt{d} \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\ \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right],\frac{b}{b+a c}\right]}{\sqrt{c} \sqrt{\frac{c \left(b+a c+a d x^2\right)}{(b+a c) \left(c+d x^2\right)}}}+\frac{a \sqrt{c} \sqrt{d} \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\ \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\, x}{\sqrt{c}}\right],\frac{b}{b+a c}\right]}{(b+a c) \sqrt{\frac{c \left(b+a c+a d x^2\right)}{(b+a c) \left(c+d x^2\right)}}}$$

Result (type 4, 141 leaves):

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

Problem 329: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a+\frac{b}{c+d x^2}}}{x^4}\, dx$$

Optimal (type 4, 362 leaves, 8 steps):

$$-\frac{(2b+ac)\,d^2\,x\,\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}}{3\,c^2\,(b+a\,c)}-\frac{(c+d\,x^2)\,\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}}{3\,c\,x^3}+\frac{(2b+ac)\,d\,(c+d\,x^2)\,\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}}{3\,c^2\,(b+a\,c)\,x}+$$

$$\frac{(2b+ac)\,d^{3/2}\,\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}\;\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],\frac{b}{b+a\,c}\right]}{3\,c^{3/2}\,(b+a\,c)\,\sqrt{\frac{c\,(b+a\,c+a\,d\,x^2)}{(b+a\,c)\,(c+d\,x^2)}}}-\frac{a\,d^{3/2}\,\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}\;\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],\frac{b}{b+a\,c}\right]}{3\,\sqrt{c}\,(b+a\,c)\,\sqrt{\frac{c\,(b+a\,c+a\,d\,x^2)}{(b+a\,c)\,(c+d\,x^2)}}}$$

Result (type 4, 314 leaves) :

$$-\left(\left(\sqrt{\frac{a\,d}{b+a\,c}}\,\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}\left(\sqrt{\frac{a\,d}{b+a\,c}}\,(c+d\,x^2)\,\left(b^2\,(c-2\,d\,x^2)+a^2\,c\,(c^2-d^2\,x^4)+2\,a\,b\,(c^2-c\,d\,x^2-d^2\,x^4)\right)-\right.\right.\right.$$

$$\mathbb{i}\,a\,c\,(2\,b+a\,c)\,d^2\,x^3\,\sqrt{\frac{b+a\,c+a\,d\,x^2}{b+a\,c}}\,\sqrt{1+\frac{d\,x^2}{c}}\;\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\sqrt{\frac{a\,d}{b+a\,c}}\,x\right],1+\frac{b}{a\,c}\right]+$$

$$\left.\left.\left.\mathbb{i}\,a\,b\,c\,d^2\,x^3\,\sqrt{\frac{b+a\,c+a\,d\,x^2}{b+a\,c}}\,\sqrt{1+\frac{d\,x^2}{c}}\;\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\sqrt{\frac{a\,d}{b+a\,c}}\,x\right],1+\frac{b}{a\,c}\right]\right)\right)\Big/\left(3\,a\,c^2\,d\,x^3\,\left(b+a\,(c+d\,x^2)\right)\right)\right)$$

Problem 330: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{a+\frac{b}{c+d\,x^2}}}{x^6}\,dx$$

Optimal (type 4, 466 leaves, 9 steps) :

$$\frac{\left(8 b^2+13 a b c+3 a^2 c^2\right) d^3 x \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{15 c^3 (b+a c)^2}-\frac{\left(c+d x^2\right) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{5 c x^5}+$$

$$\frac{(4 b+3 a c) d \left(c+d x^2\right) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{15 c^2 (b+a c) x^3}-\frac{\left(8 b^2+13 a b c+3 a^2 c^2\right) d^2 \left(c+d x^2\right) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{15 c^3 (b+a c)^2 x}-$$

$$\frac{\left(8 b^2+13 a b c+3 a^2 c^2\right) d^{5/2} \sqrt{\frac{b+a c+a d x^2}{c+d x^2}} \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], \frac{b}{b+a c}\right]}{15 c^{5/2} (b+a c)^2 \sqrt{\frac{c \left(b+a c+a d x^2\right)}{(b+a c) \left(c+d x^2\right)}}}+\frac{a (4 b+3 a c) d^{5/2} \sqrt{\frac{b+a c+a d x^2}{c+d x^2}} \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], \frac{b}{b+a c}\right]}{15 c^{3/2} (b+a c)^2 \sqrt{\frac{c \left(b+a c+a d x^2\right)}{(b+a c) \left(c+d x^2\right)}}}$$

Result (type 4, 402 leaves):

$$-\frac{1}{15 c^3 (b+a c)^2 \sqrt{\frac{a d}{b+a c}} x^5 \left(b+a \left(c+d x^2\right)\right)} \sqrt{\frac{b+a c+a d x^2}{c+d x^2}} \left(\sqrt{\frac{a d}{b+a c}} \left(c+d x^2\right)\right.$$

$$\left(b^3 \left(3 c^2-4 c d x^2+8 d^2 x^4\right)+3 a^3 c^2 \left(c^3+d^3 x^6\right)+a b^2 \left(9 c^3-8 c^2 d x^2+17 c d^2 x^4+8 d^3 x^6\right)+a^2 b c \left(9 c^3-4 c^2 d x^2+9 c d^2 x^4+13 d^3 x^6\right)\right)+$$

$$i a c \left(8 b^2+13 a b c+3 a^2 c^2\right) d^3 x^5 \sqrt{\frac{b+a c+a d x^2}{b+a c}} \sqrt{1+\frac{d x^2}{c}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{a d}{b+a c}} x\right], 1+\frac{b}{a c}\right]-$$

$$\left.2 i a b c (2 b+3 a c) d^3 x^5 \sqrt{\frac{b+a c+a d x^2}{b+a c}} \sqrt{1+\frac{d x^2}{c}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{a d}{b+a c}} x\right], 1+\frac{b}{a c}\right]\right)$$

Problem 338: Result unnecessarily involves imaginary or complex numbers.

$$\int x^4 \left(a+\frac{b}{c+d x^2}\right)^{3/2} dx$$

Optimal (type 4, 405 leaves, 9 steps):

$$\frac{\left(b^2-14\,a\,b\,c+a^2\,c^2\right)x\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}}{5\,a\,d^2}+\frac{(7\,b-a\,c)\,x\left(c+d\,x^2\right)\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}}{5\,d^2}+\frac{6\,a\,x^3\left(c+d\,x^2\right)\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}}{5\,d}-\frac{x^3\left(b+a\,c+a\,d\,x^2\right)\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}}{d}-$$

$$\frac{\sqrt{c}\left(b^2-14\,a\,b\,c+a^2\,c^2\right)\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}\;\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],\frac{b}{b+a\,c}\right]}{5\,a\,d^{5/2}\sqrt{\frac{c\,(b+a\,c+a\,d\,x^2)}{(b+a\,c)\,(c+d\,x^2)}}}-\frac{c^{3/2}\,(7\,b-a\,c)\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}\;\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],\frac{b}{b+a\,c}\right]}{5\,d^{5/2}\sqrt{\frac{c\,(b+a\,c+a\,d\,x^2)}{(b+a\,c)\,(c+d\,x^2)}}}$$

Result (type 4, 308 leaves) :

$$\left(\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}\left(\sqrt{\frac{a\,d}{b+a\,c}}\,x\left(-a^2\left(c-d\,x^2\right)\left(c+d\,x^2\right)^2+b^2\left(7\,c+2\,d\,x^2\right)+3\,a\,b\left(2\,c^2+3\,c\,d\,x^2+d^2\,x^4\right)\right)-\right.\right.$$

$$i\,c\left(b^2-14\,a\,b\,c+a^2\,c^2\right)\sqrt{\frac{b+a\,c+a\,d\,x^2}{b+a\,c}}\sqrt{1+\frac{d\,x^2}{c}}\;\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a\,d}{b+a\,c}}\,x\right],1+\frac{b}{a\,c}\right]+$$

$$\left.\left.8\,i\,b\,c\,(b-a\,c)\sqrt{\frac{b+a\,c+a\,d\,x^2}{b+a\,c}}\sqrt{1+\frac{d\,x^2}{c}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a\,d}{b+a\,c}}\,x\right],1+\frac{b}{a\,c}\right]\right)\right)\Big/\left(5\,d^2\sqrt{\frac{a\,d}{b+a\,c}}\left(b+a\left(c+d\,x^2\right)\right)\right)$$

Problem 339: Result unnecessarily involves imaginary or complex numbers.

$$\int x^2\left(a+\frac{b}{c+d\,x^2}\right)^{3/2}dx$$

Optimal (type 4, 331 leaves, 8 steps) :

$$\frac{(7\,b-a\,c)\,x\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}}{3\,d}+\frac{4\,a\,x\left(c+d\,x^2\right)\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}}{3\,d}-\frac{x\left(b+a\,c+a\,d\,x^2\right)\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}}{d}-$$

$$\frac{\sqrt{c}\,(7\,b-a\,c)\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}\;\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],\frac{b}{b+a\,c}\right]}{3\,d^{3/2}\sqrt{\frac{c\,(b+a\,c+a\,d\,x^2)}{(b+a\,c)\,(c+d\,x^2)}}}+\frac{\sqrt{c}\,(3\,b-a\,c)\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}\;\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],\frac{b}{b+a\,c}\right]}{3\,d^{3/2}\sqrt{\frac{c\,(b+a\,c+a\,d\,x^2)}{(b+a\,c)\,(c+d\,x^2)}}}$$

Result (type 4, 270 leaves) :

$$\left(\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}\left(\sqrt{\frac{a\,d}{b+a\,c}}\;x\left(-3\,b^2-2\,a\,b\left(c+d\,x^2\right)+a^2\left(c+d\,x^2\right)^2\right)+\right.\right.$$
$$i\,a\,c\,(-7\,b+a\,c)\sqrt{\frac{b+a\,c+a\,d\,x^2}{b+a\,c}}\sqrt{1+\frac{d\,x^2}{c}}\;\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a\,d}{b+a\,c}}\;x\right],1+\frac{b}{a\,c}\right]+$$
$$\left.\left.i\,b\,(-3\,b+5\,a\,c)\sqrt{\frac{b+a\,c+a\,d\,x^2}{b+a\,c}}\sqrt{1+\frac{d\,x^2}{c}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a\,d}{b+a\,c}}\;x\right],1+\frac{b}{a\,c}\right]\right)\right)\Big/\left(3\,d\sqrt{\frac{a\,d}{b+a\,c}}\left(b+a\left(c+d\,x^2\right)\right)\right)$$

Problem 340: Result unnecessarily involves imaginary or complex numbers.

$$\int\left(a+\frac{b}{c+d\,x^2}\right)^{3/2}dx$$

Optimal (type 4, 260 leaves, 7 steps):

$$\frac{b\,x\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}}{c}-\frac{(b-a\,c)\,x\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}}{c}+$$
$$\frac{(b-a\,c)\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}\;\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\;x}{\sqrt{c}}\right],\frac{b}{b+a\,c}\right]}{\sqrt{c}\;\sqrt{d}\;\sqrt{\frac{c\,(b+a\,c+a\,d\,x^2)}{(b+a\,c)\,(c+d\,x^2)}}}+\frac{a\sqrt{c}\;\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}\;\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\;x}{\sqrt{c}}\right],\frac{b}{b+a\,c}\right]}{\sqrt{d}\;\sqrt{\frac{c\,(b+a\,c+a\,d\,x^2)}{(b+a\,c)\,(c+d\,x^2)}}}$$

Result (type 4, 243 leaves):

$$\left(\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}\left(b\sqrt{\frac{a\,d}{b+a\,c}}\;x\left(b+a\left(c+d\,x^2\right)\right)-i\,a\,c\,(-b+a\,c)\sqrt{\frac{b+a\,c+a\,d\,x^2}{b+a\,c}}\sqrt{1+\frac{d\,x^2}{c}}\;\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a\,d}{b+a\,c}}\;x\right],1+\frac{b}{a\,c}\right]-\right.\right.$$
$$\left.\left.2\,i\,a\,b\,c\sqrt{\frac{b+a\,c+a\,d\,x^2}{b+a\,c}}\sqrt{1+\frac{d\,x^2}{c}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a\,d}{b+a\,c}}\;x\right],1+\frac{b}{a\,c}\right]\right)\right)\Big/\left(c\sqrt{\frac{a\,d}{b+a\,c}}\left(b+a\left(c+d\,x^2\right)\right)\right)$$

Problem 341: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+\frac{b}{c+d x^2}\right)^{3/2}}{x^2}\,dx$$

Optimal (type 4, 312 leaves, 8 steps):

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

Result (type 4, 278 leaves):

$$-\left(\left(\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\left(\sqrt{\frac{a d}{b+a c}}\left(2 a b\left(c+d x^2\right)^2+a^2 c\left(c+d x^2\right)^2+b^2\left(c+2 d x^2\right)\right)+\right.\right.\right.$$
$$i a c (2 b+a c)\, d x\sqrt{\frac{b+a c+a d x^2}{b+a c}}\sqrt{1+\frac{d x^2}{c}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a d}{b+a c}}\, x\right],1+\frac{b}{a c}\right]-$$
$$\left.\left.\left. i a b c d x\sqrt{\frac{b+a c+a d x^2}{b+a c}}\sqrt{1+\frac{d x^2}{c}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a d}{b+a c}}\, x\right],1+\frac{b}{a c}\right]\right)\right)\Big/\left(c^2\sqrt{\frac{a d}{b+a c}}\, x\left(b+a\left(c+d x^2\right)\right)\right)\right)$$

Problem 342: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(a+\frac{b}{c+d x^2}\right)^{3/2}}{x^4}\,dx$$

Optimal (type 4, 388 leaves, 9 steps):

$$\frac{b\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{c x^3}-\frac{(8 b+a c) d^2 x\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{3 c^3}-\frac{(4 b+a c)\left(c+d x^2\right)\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{3 c^2 x^3}+\frac{(8 b+a c) d\left(c+d x^2\right)\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{3 c^3 x}+$$

$$\frac{(8 b+a c) d^{3/2}\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],\frac{b}{b+a c}\right]}{3 c^{5/2}\sqrt{\frac{c\left(b+a c+a d x^2\right)}{(b+a c)\left(c+d x^2\right)}}}-\frac{a(4 b+a c) d^{3/2}\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],\frac{b}{b+a c}\right]}{3 c^{3/2}(b+a c)\sqrt{\frac{c\left(b+a c+a d x^2\right)}{(b+a c)\left(c+d x^2\right)}}}$$

Result (type 4, 329 leaves) :

$$-\frac{1}{3 c^3\sqrt{\frac{a d}{b+a c}}\,x^3\left(b+a\left(c+d x^2\right)\right)}\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\left(\sqrt{\frac{a d}{b+a c}}\left(a^2 c\left(c-d x^2\right)\left(c+d x^2\right)^2+b^2\left(c^2-4 c d x^2-8 d^2 x^4\right)+a b\left(2 c^3-3 c^2 d x^2-13 c d^2 x^4-8 d^3 x^6\right)\right)-\right.$$

$$i\, a c(8 b+a c) d^2 x^3\sqrt{\frac{b+a c+a d x^2}{b+a c}}\sqrt{1+\frac{d x^2}{c}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a d}{b+a c}}\,x\right],1+\frac{b}{a c}\right]+$$

$$\left.4\, i\, a b c d^2 x^3\sqrt{\frac{b+a c+a d x^2}{b+a c}}\sqrt{1+\frac{d x^2}{c}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a d}{b+a c}}\,x\right],1+\frac{b}{a c}\right]\right)$$

Problem 343: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+\frac{b}{c+d x^2}\right)^{3/2}}{x^6}\,dx$$

Optimal (type 4, 494 leaves, 10 steps) :

$$\frac{b\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{c x^5}+\frac{\left(16 b^2+16 a b c+a^2 c^2\right) d^3 x \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{5 c^4 (b+a c)}-\frac{(6 b+a c) \left(c+d x^2\right) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{5 c^2 x^5}+$$
$$\frac{(8 b+a c) d \left(c+d x^2\right) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{5 c^3 x^3}-\frac{\left(16 b^2+16 a b c+a^2 c^2\right) d^2 \left(c+d x^2\right) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}{5 c^4 (b+a c) x}-$$
$$\frac{\left(16 b^2+16 a b c+a^2 c^2\right) d^{5/2} \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\ \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\ x}{\sqrt{c}}\right],\frac{b}{b+a c}\right]}{5 c^{7/2} (b+a c) \sqrt{\frac{c \left(b+a c+a d x^2\right)}{(b+a c) \left(c+d x^2\right)}}}+\frac{a (8 b+a c) d^{5/2} \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\ \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\ x}{\sqrt{c}}\right],\frac{b}{b+a c}\right]}{5 c^{5/2} (b+a c) \sqrt{\frac{c \left(b+a c+a d x^2\right)}{(b+a c) \left(c+d x^2\right)}}}$$

Result (type 4, 430 leaves):

$$-\frac{1}{5 a c^4 d x^5 \left(b+a \left(c+d x^2\right)\right) \sqrt{\frac{a d}{b+a c}}}\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}$$
$$\left(\sqrt{\frac{a d}{b+a c}} \left(b^3 \left(c^3-2 c^2 d x^2+8 c d^2 x^4+16 d^3 x^6\right)+a^3 c^2 \left(c^4+c^3 d x^2+c d^3 x^6+d^4 x^8\right)+a^2 b c \left(3 c^4+5 c^2 d^2 x^4+24 c d^3 x^6+16 d^4 x^8\right)+\right.\right.$$
$$\left.a b^2 \left(3 c^4-3 c^3 d x^2+13 c^2 d^2 x^4+40 c d^3 x^6+16 d^4 x^8\right)\right)+$$
$$i a c \left(16 b^2+16 a b c+a^2 c^2\right) d^3 x^5 \sqrt{\frac{b+a c+a d x^2}{b+a c}} \sqrt{1+\frac{d x^2}{c}}\ \text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a d}{b+a c}}\ x\right],1+\frac{b}{a c}\right]-$$
$$\left.i a b c (8 b+7 a c) d^3 x^5 \sqrt{\frac{b+a c+a d x^2}{b+a c}} \sqrt{1+\frac{d x^2}{c}}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a d}{b+a c}}\ x\right],1+\frac{b}{a c}\right]\right)$$

Problem 347: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{x \sqrt{a+\frac{b}{c+d x^2}}}\, dx$$

Optimal (type 3, 96 leaves, 6 steps):

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

Result (type 3, 210 leaves):

$$\left(\sqrt{b+a\left(c+d x^2\right)}\ \left(\sqrt{a}\ \sqrt{c}\ \text{Log}\left[x^2\right]+2\sqrt{b+a c}\ \text{Log}\left[a\sqrt{c+d x^2}+\sqrt{a}\ \sqrt{b+a c+a d x^2}\right]-\sqrt{a}\ \sqrt{c}\ \text{Log}\left[2 a c\left(c+d x^2\right)+b\left(2 c+d x^2\right)+2\sqrt{c}\ \sqrt{b+a c}\ \sqrt{c+d x^2}\ \sqrt{b+a c+a d x^2}\right]\right)\right)\Big/\left(2\sqrt{a}\ \sqrt{b+a c}\ \sqrt{c+d x^2}\ \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\right)$$

Problem 350: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^4}{\sqrt{a+\frac{b}{c+d x^2}}}\,dx$$

Optimal (type 4, 443 leaves, 8 steps):

$$-\frac{(4 b+3 a c)\ x\left(b+a c+a d x^2\right)}{15 a^2 d^2\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}+\frac{x^3\left(b+a c+a d x^2\right)}{5 a d\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}+\frac{\left(8 b^2+13 a b c+3 a^2 c^2\right)\ x\left(b+a c+a d x^2\right)}{15 a^3 d^2\left(c+d x^2\right)\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}-$$
$$\frac{\sqrt{c}\ \left(8 b^2+13 a b c+3 a^2 c^2\right)\left(b+a c+a d x^2\right)\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\ x}{\sqrt{c}}\right],\frac{b}{b+a c}\right]}{15 a^3 d^{5/2}\left(c+d x^2\right)\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\ \sqrt{\frac{c\left(b+a c+a d x^2\right)}{(b+a c)\left(c+d x^2\right)}}}+\frac{c^{3/2}\left(4 b+3 a c\right)\left(b+a c+a d x^2\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\ x}{\sqrt{c}}\right],\frac{b}{b+a c}\right]}{15 a^2 d^{5/2}\left(c+d x^2\right)\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\ \sqrt{\frac{c\left(b+a c+a d x^2\right)}{(b+a c)\left(c+d x^2\right)}}}$$

Result (type 4, 297 leaves):

$$-\left(\left(\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\ \left(\sqrt{\frac{a d}{b+a c}}\ x\left(c+d x^2\right)\left(4 b^2+a b\left(7 c+d x^2\right)+3 a^2\left(c^2-d^2 x^4\right)\right)+\right.\right.\right.$$
$$i\,c\left(8 b^2+13 a b c+3 a^2 c^2\right)\sqrt{\frac{b+a c+a d x^2}{b+a c}}\ \sqrt{1+\frac{d x^2}{c}}\ \text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a d}{b+a c}}\ x\right],1+\frac{b}{a c}\right]-$$
$$\left.\left.\left.2\,i\,b c\left(2 b+3 a c\right)\sqrt{\frac{b+a c+a d x^2}{b+a c}}\ \sqrt{1+\frac{d x^2}{c}}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a d}{b+a c}}\ x\right],1+\frac{b}{a c}\right]\right)\right)\Big/\left(15 a^2 d^2\sqrt{\frac{a d}{b+a c}}\ \left(b+a\left(c+d x^2\right)\right)\right)\right)$$

Problem 351: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2}{\sqrt{a+\frac{b}{c+d x^2}}} \, dx$$

Optimal (type 4, 354 leaves, 7 steps):

$$\frac{x \left(b+a c+a d x^2\right)}{3 a d \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}-\frac{(2 b+a c) x \left(b+a c+a d x^2\right)}{3 a^2 d \left(c+d x^2\right) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}+$$

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

Result (type 4, 253 leaves):

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

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

Problem 354: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^4 \sqrt{a+\frac{b}{c+d x^2}}} \, dx$$

Optimal (type 4, 431 leaves, 8 steps):

$$-\frac{b+a c+a d x^2}{3 (b+a c) x^3 \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}-\frac{(b-a c) d \left(b+a c+a d x^2\right)}{3 c (b+a c)^2 x \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}+\frac{(b-a c) d^2 x \left(b+a c+a d x^2\right)}{3 c (b+a c)^2 \left(c+d x^2\right) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}-$$

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

Result (type 4, 314 leaves):

$$\left(\sqrt{\frac{b+a c+a d x^2}{c+d x^2}} \left(-\sqrt{\frac{a d}{b+a c}} \left(c+d x^2\right) \left(b^2 \left(c+d x^2\right)+a^2 c \left(c^2-d^2 x^4\right)+a b \left(2 c^2+c d x^2+d^2 x^4\right)\right)+\right.\right.$$

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

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

Problem 358: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 134 leaves, 7 steps):

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

Result (type 3, 306 leaves):

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

Problem 361: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^4}{\left(a+\frac{b}{c+d\,x^2}\right)^{3/2}}\,dx$$

Optimal (type 4, 482 leaves, 9 steps):

$$-\frac{x^3\,(c+d\,x^2)}{a\,d\,\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}}-\frac{(8\,b+a\,c)\,x\,(b+a\,c+a\,d\,x^2)}{5\,a^3\,d^2\,\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}}+\frac{6\,x^3\,(b+a\,c+a\,d\,x^2)}{5\,a^2\,d\,\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}}+\frac{(16\,b^2+16\,a\,b\,c+a^2\,c^2)\,x\,(b+a\,c+a\,d\,x^2)}{5\,a^4\,d^2\,(c+d\,x^2)\,\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}}-\frac{\sqrt{c}\,(16\,b^2+16\,a\,b\,c+a^2\,c^2)\,(b+a\,c+a\,d\,x^2)\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],\frac{b}{b+a\,c}\right]}{5\,a^4\,d^{5/2}\,(c+d\,x^2)\,\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}\,\sqrt{\frac{c\,(b+a\,c+a\,d\,x^2)}{(b+a\,c)\,(c+d\,x^2)}}}+\frac{c^{3/2}\,(8\,b+a\,c)\,(b+a\,c+a\,d\,x^2)\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d}\,x}{\sqrt{c}}\right],\frac{b}{b+a\,c}\right]}{5\,a^3\,d^{5/2}\,(c+d\,x^2)\,\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}\,\sqrt{\frac{c\,(b+a\,c+a\,d\,x^2)}{(b+a\,c)\,(c+d\,x^2)}}}$$

Result (type 4, 296 leaves):

$$-\left(\left(\sqrt{\frac{b+a\,c+a\,d\,x^2}{c+d\,x^2}}\,\left(\sqrt{\frac{a\,d}{b+a\,c}}\,x\,(c+d\,x^2)\,\left(8\,b^2+a\,b\,(9\,c+2\,d\,x^2)+a^2\,(c^2-d^2\,x^4)\right)+i\,c\,(16\,b^2+16\,a\,b\,c+a^2\,c^2)\,\sqrt{\frac{b+a\,c+a\,d\,x^2}{b+a\,c}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a\,d}{b+a\,c}}\,x\right],1+\frac{b}{a\,c}\right]-i\,b\,c\,(8\,b+7\,a\,c)\,\sqrt{\frac{b+a\,c+a\,d\,x^2}{b+a\,c}}\,\sqrt{1+\frac{d\,x^2}{c}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{a\,d}{b+a\,c}}\,x\right],1+\frac{b}{a\,c}\right]\right)\right)\Bigg/\left(5\,a^3\,d^2\,\sqrt{\frac{a\,d}{b+a\,c}}\,\left(b+a\,(c+d\,x^2)\right)\right)\right)$$

Problem 362: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2}{\left(a+\frac{b}{c+d x^2}\right)^{3/2}} \, dx$$

Optimal (type 4, 409 leaves, 8 steps):

$$-\frac{x \left(c+d x^2\right)}{a d \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}+\frac{4 x \left(b+a c+a d x^2\right)}{3 a^2 d \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}-\frac{(8 b+a c) x \left(b+a c+a d x^2\right)}{3 a^3 d \left(c+d x^2\right) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}+$$
$$\frac{\sqrt{c} (8 b+a c) \left(b+a c+a d x^2\right) \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],\frac{b}{b+a c}\right]}{3 a^3 d^{3/2} \left(c+d x^2\right) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}} \sqrt{\frac{c \left(b+a c+a d x^2\right)}{(b+a c) \left(c+d x^2\right)}}}-\frac{c^{3/2} (4 b+a c) \left(b+a c+a d x^2\right) \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right],\frac{b}{b+a c}\right]}{3 a^2 (b+a c) d^{3/2} \left(c+d x^2\right) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}} \sqrt{\frac{c \left(b+a c+a d x^2\right)}{(b+a c) \left(c+d x^2\right)}}}$$

Result (type 4, 255 leaves):

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

Problem 363: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 356 leaves, 7 steps):

$$-\frac{b x}{a (b+a c) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}+\frac{(2 b+a c) x \left(b+a c+a d x^2\right)}{a^2 (b+a c) \left(c+d x^2\right) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}-$$

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

Result (type 4, 241 leaves) :

$$-\frac{1}{a^2 d \left(b+a \left(c+d x^2\right)\right)}$$

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

$$\left.i b c \sqrt{\frac{b+a c+a d x^2}{b+a c}} \sqrt{1+\frac{d x^2}{c}}\, \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{a d}{b+a c}}\, x\right], 1+\frac{b}{a c}\right]\right)$$

Problem 364: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 410 leaves, 8 steps) :

$$-\frac{b}{a (b+a c) x \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}+\frac{(b-a c) \left(b+a c+a d x^2\right)}{a (b+a c)^2 x \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}-\frac{(b-a c) d x \left(b+a c+a d x^2\right)}{a (b+a c)^2 \left(c+d x^2\right) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}+$$

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

Result (type 4, 268 leaves) :

$$-\left(\left(\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\left(\sqrt{\frac{a d}{b+a c}}\left(c+d x^2\right)\left(b\left(c-d x^2\right)+a c\left(c+d x^2\right)\right)+\right.\right.\right.$$
$$i c(-b+a c) d x \sqrt{\frac{b+a c+a d x^2}{b+a c}} \sqrt{1+\frac{d x^2}{c}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{a d}{b+a c}} x\right], 1+\frac{b}{a c}\right]+$$
$$\left.\left.\left.2 i b c d x \sqrt{\frac{b+a c+a d x^2}{b+a c}} \sqrt{1+\frac{d x^2}{c}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{a d}{b+a c}} x\right], 1+\frac{b}{a c}\right]\right)\right) \Big/ \left((b+a c)^2 \sqrt{\frac{a d}{b+a c}} x\left(b+a\left(c+d x^2\right)\right)\right)\right)$$

Problem 365: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^4\left(a+\frac{b}{c+d x^2}\right)^{3/2}} dx$$

Optimal (type 4, 490 leaves, 9 steps):

$$-\frac{b}{a(b+a c) x^3 \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}+\frac{(3 b-a c)\left(b+a c+a d x^2\right)}{3 a(b+a c)^2 x^3 \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}-\frac{(7 b-a c) d\left(b+a c+a d x^2\right)}{3(b+a c)^3 x \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}+\frac{(7 b-a c) d^2 x\left(b+a c+a d x^2\right)}{3(b+a c)^3\left(c+d x^2\right) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}}}-$$
$$\frac{\sqrt{c}(7 b-a c) d^{3/2}\left(b+a c+a d x^2\right) \text{EllipticE}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], \frac{b}{b+a c}\right]}{3(b+a c)^3\left(c+d x^2\right) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}} \sqrt{\frac{c\left(b+a c+a d x^2\right)}{(b+a c)\left(c+d x^2\right)}}}+\frac{\sqrt{c}(3 b-a c) d^{3/2}\left(b+a c+a d x^2\right) \text{EllipticF}\left[\text{ArcTan}\left[\frac{\sqrt{d} x}{\sqrt{c}}\right], \frac{b}{b+a c}\right]}{3(b+a c)^3\left(c+d x^2\right) \sqrt{\frac{b+a c+a d x^2}{c+d x^2}} \sqrt{\frac{c\left(b+a c+a d x^2\right)}{(b+a c)\left(c+d x^2\right)}}}$$

Result (type 4, 319 leaves):

$$-\left(\left(\sqrt{\frac{b+a c+a d x^2}{c+d x^2}}\left(\sqrt{\frac{a d}{b+a c}}\left(c+d x^2\right)\left(b^2\left(c+4 d x^2\right)+a^2 c\left(c^2-d^2 x^4\right)+a b\left(2 c^2+4 c d x^2+7 d^2 x^4\right)\right)-\right.\right.\right.$$
$$i a c(-7 b+a c) d^2 x^3 \sqrt{\frac{b+a c+a d x^2}{b+a c}} \sqrt{1+\frac{d x^2}{c}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{a d}{b+a c}} x\right], 1+\frac{b}{a c}\right]+i b(3 b-5 a c) d^2 x^3$$
$$\left.\left.\left.\sqrt{\frac{b+a c+a d x^2}{b+a c}} \sqrt{1+\frac{d x^2}{c}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{a d}{b+a c}} x\right], 1+\frac{b}{a c}\right]\right)\right) \Big/ \left(3(b+a c)^3 \sqrt{\frac{a d}{b+a c}} x^3\left(b+a\left(c+d x^2\right)\right)\right)\right)$$

Problem 366: Unable to integrate problem.

$$\int \frac{\sqrt{a x^{23}}}{\sqrt{1+x^5}} \, dx$$

Optimal (type 3, 75 leaves, 6 steps):

$$-\frac{3 \sqrt{a x^{23}} \sqrt{1+x^5}}{20 x^9}+\frac{\sqrt{a x^{23}} \sqrt{1+x^5}}{10 x^4}+\frac{3 \sqrt{a x^{23}} \operatorname{ArcSinh}\left[x^{5/2}\right]}{20 x^{23/2}}$$

Result (type 8, 21 leaves):

$$\int \frac{\sqrt{a x^{23}}}{\sqrt{1+x^5}} \, dx$$

Problem 367: Unable to integrate problem.

$$\int \frac{\sqrt{a x^{13}}}{\sqrt{1+x^5}} \, dx$$

Optimal (type 3, 50 leaves, 5 steps):

$$\frac{\sqrt{a x^{13}} \sqrt{1+x^5}}{5 x^4}-\frac{\sqrt{a x^{13}} \operatorname{ArcSinh}\left[x^{5/2}\right]}{5 x^{13/2}}$$

Result (type 8, 21 leaves):

$$\int \frac{\sqrt{a x^{13}}}{\sqrt{1+x^5}} \, dx$$

Problem 368: Unable to integrate problem.

$$\int \frac{\sqrt{a x^3}}{\sqrt{1+x^5}} \, dx$$

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

$$\frac{2 \sqrt{a x^3} \operatorname{ArcSinh}\left[x^{5/2}\right]}{5 x^{3/2}}$$

Result (type 8, 21 leaves):

$$\int \frac{\sqrt{a x^3}}{\sqrt{1+x^5}} \, dx$$

Problem 374: Unable to integrate problem.

$$\int \left(\frac{1}{1-x^4} - \frac{\sqrt{a x^6}}{x \left(1-x^4\right)}\right) dx$$

Optimal (type 3, 49 leaves, 8 steps):

$$\frac{\text{ArcTan}[x]}{2} + \frac{\sqrt{a x^6}\, \text{ArcTan}[x]}{2 x^3} + \frac{\text{ArcTanh}[x]}{2} - \frac{\sqrt{a x^6}\, \text{ArcTanh}[x]}{2 x^3}$$

Result (type 8, 35 leaves):

$$\int \left(\frac{1}{1-x^4} - \frac{\sqrt{a x^6}}{x \left(1-x^4\right)}\right) dx$$

Problem 375: Unable to integrate problem.

$$\int \left(\frac{1}{1-x^4} - \frac{\sqrt{a x^6}}{x-x^5}\right) dx$$

Optimal (type 3, 49 leaves, 9 steps):

$$\frac{\text{ArcTan}[x]}{2} + \frac{\sqrt{a x^6}\, \text{ArcTan}[x]}{2 x^3} + \frac{\text{ArcTanh}[x]}{2} - \frac{\sqrt{a x^6}\, \text{ArcTanh}[x]}{2 x^3}$$

Result (type 8, 32 leaves):

$$\int \left(\frac{1}{1-x^4} - \frac{\sqrt{a x^6}}{x-x^5}\right) dx$$

Problem 378: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 77 leaves) :

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

Problem 380: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 58 leaves) :

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

Problem 381: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 54 leaves, 3 steps) :

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

Result (type 4, 57 leaves) :

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

Problem 383: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 159 leaves, 6 steps):

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

Result (type 4, 74 leaves):

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

Problem 386: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{a\,x^3}}{\sqrt{1+x^3}}\,dx$$

Optimal (type 4, 292 leaves, 5 steps):

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

$$\frac{\left(1-\sqrt{3}\right)\sqrt{a x^3}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\left(1+\sqrt{3}\right)x\right)^2}}\,\text{EllipticF}\left[\text{ArcCos}\left[\frac{1+\left(1-\sqrt{3}\right)x}{1+\left(1+\sqrt{3}\right)x}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]}{2\times 3^{1/4}x\sqrt{\frac{x(1+x)}{\left(1+\left(1+\sqrt{3}\right)x\right)^2}}\sqrt{1+x^3}}$$

Result (type 4, 174 leaves):

$$\frac{1}{\sqrt{a x^3}\sqrt{1+x^3}}a x\left(1+x^3+\frac{1}{\sqrt{6}}\left(1-(-1)^{2/3}\right)x^2\sqrt{\frac{-(-1)^{1/3}+x}{\left(1+(-1)^{1/3}\right)x}}\sqrt{\frac{(1+x)\left(-1+i\sqrt{3}+2x\right)}{x^2}}\right.$$

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

Problem 387: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 260 leaves, 4 steps):

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

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

Result (type 4, 134 leaves):

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

Problem 389: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{\frac{a}{x}}}{\sqrt{1+x^3}}\,dx$$

Optimal (type 4, 116 leaves, 3 steps):

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

Result (type 4, 106 leaves):

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

Problem 391: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{\frac{a}{x^3}}}{\sqrt{1+x^3}}\,dx$$

Optimal (type 4, 312 leaves, 6 steps):

$$-2\sqrt{\frac{a}{x^3}}\,x\sqrt{1+x^3}+\frac{2\left(1+\sqrt{3}\right)\sqrt{\frac{a}{x^3}}\,x^2\sqrt{1+x^3}}{1+\left(1+\sqrt{3}\right)x}-\frac{2\times 3^{1/4}\sqrt{\frac{a}{x^3}}\,x^2\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\left(1+\sqrt{3}\right)x\right)^2}}\,\text{EllipticE}\left[\text{ArcCos}\left[\frac{1+\left(1-\sqrt{3}\right)x}{1+\left(1+\sqrt{3}\right)x}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]}{\sqrt{\frac{x\,(1+x)}{\left(1+\left(1+\sqrt{3}\right)x\right)^2}}\sqrt{1+x^3}}-$$

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

Result (type 4, 165 leaves):

$$-\frac{1}{\sqrt{\frac{a}{x^3}}\sqrt{1+x^3}}\sqrt{\frac{2}{3}}\left(-1+(-1)^{2/3}\right)a\sqrt{\frac{-(-1)^{1/3}+x}{\left(1+(-1)^{1/3}\right)x}}\sqrt{\frac{(1+x)\left(-1+i\sqrt{3}+2x\right)}{x^2}}$$

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

Problem 392: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 281 leaves, 5 steps):

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

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

Result (type 4, 146 leaves) :

$$\frac{1}{3\sqrt{1+x^3}}\sqrt{\frac{a}{x^4}}\,x\left(-3\left(1+x^3\right)-3^{3/4}x\sqrt{-(-1)^{1/6}\left((-1)^{2/3}+x\right)}\sqrt{1+(-1)^{1/3}x+(-1)^{2/3}x^2}\right.$$
$$\left.\left(\sqrt{3}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}(1+x)}}{3^{1/4}}\right],(-1)^{1/3}\right]+(-1)^{5/6}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}(1+x)}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)$$

Problem 397: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{a\,x}}{\sqrt{d+e\,x}\,\sqrt{e+f\,x}}\,dx$$

Optimal (type 4, 114 leaves, 2 steps) :

$$\frac{2\sqrt{-e^2+d\,f}\,\sqrt{a\,x}\,\sqrt{\frac{e\,(e+f\,x)}{e^2-d\,f}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{f}\,\sqrt{d+e\,x}}{\sqrt{-e^2+d\,f}}\right],1-\frac{e^2}{d\,f}\right]}{e\,\sqrt{f}\,\sqrt{-\frac{e\,x}{d}}\,\sqrt{e+f\,x}}$$

Result (type 4, 106 leaves) :

$$-\frac{2\,i\,e\,\sqrt{a\,x}\,\sqrt{1+\frac{f\,x}{e}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{e\,x}{d}}\right],\frac{d\,f}{e^2}\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{e\,x}{d}}\right],\frac{d\,f}{e^2}\right]\right)}{f\,\sqrt{\frac{e\,x}{d+e\,x}}\,\sqrt{d+e\,x}\,\sqrt{e+f\,x}}$$

Problem 423: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 32 leaves, 6 steps) :

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

Result (type 3, 84 leaves) :

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

Problem 425: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 34 leaves, 6 steps):

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

Result (type 3, 88 leaves):

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

Problem 448: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 32 leaves, 7 steps):

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

Result (type 3, 84 leaves):

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

Problem 450: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 33 leaves, 7 steps):

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

Result (type 3, 85 leaves):

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

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

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

Optimal (type 3, 28 leaves, 15 steps):

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

Result (type 3, 82 leaves):

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

Problem 453: Unable to integrate problem.

$$\int \left(d+e\,x+f\sqrt{a+\frac{e^2 x^2}{f^2}}\right)^n dx$$

Optimal (type 5, 121 leaves, 4 steps):

$$\frac{\left(d+e\,x+f\sqrt{a+\frac{e^2 x^2}{f^2}}\right)^{1+n}}{2\,e\,(1+n)}+\frac{a\,f^2\left(d+e\,x+f\sqrt{a+\frac{e^2 x^2}{f^2}}\right)^{1+n}\text{Hypergeometric2F1}\left[2,\,1+n,\,2+n,\,\frac{d+e\,x+f\sqrt{a+\frac{e^2 x^2}{f^2}}}{d}\right]}{2\,d^2\,e\,(1+n)}$$

Result (type 8, 27 leaves):

$$\int \left(d+e\,x+f\sqrt{a+\frac{e^2 x^2}{f^2}}\right)^n dx$$

Problem 460: Unable to integrate problem.

$$\int \left(d+e\,x+f\sqrt{a+\frac{e^2 x^2}{f^2}}\right)^{5/2} dx$$

Optimal (type 3, 225 leaves, 6 steps):

$$\frac{2\,a\,d\,f^2\sqrt{d+e\,x+f\sqrt{a+\frac{e^2 x^2}{f^2}}}}{e}-\frac{a\,d^2\,f^2\sqrt{d+e\,x+f\sqrt{a+\frac{e^2 x^2}{f^2}}}}{2\,e\left(e\,x+f\sqrt{a+\frac{e^2 x^2}{f^2}}\right)}+$$

$$\frac{a\,f^2\left(d+e\,x+f\sqrt{a+\frac{e^2 x^2}{f^2}}\right)^{3/2}}{3\,e}+\frac{\left(d+e\,x+f\sqrt{a+\frac{e^2 x^2}{f^2}}\right)^{7/2}}{7\,e}-\frac{5\,a\,d^{3/2}\,f^2\,\text{ArcTanh}\left[\frac{\sqrt{d+e\,x+f\sqrt{a+\frac{e^2 x^2}{f^2}}}}{\sqrt{d}}\right]}{2\,e}$$

Result (type 8, 29 leaves):

$$\int\left(d+e\,x+f\sqrt{a+\frac{e^2 x^2}{f^2}}\right)^{5/2}dx$$

Problem 461: Unable to integrate problem.

$$\int\left(d+e\,x+f\sqrt{a+\frac{e^2 x^2}{f^2}}\right)^{3/2}dx$$

Optimal (type 3, 183 leaves, 6 steps):

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

Result (type 8, 29 leaves):

$$\int\left(d+e\,x+f\sqrt{a+\frac{e^2 x^2}{f^2}}\right)^{3/2}dx$$

Problem 464: Unable to integrate problem.

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

Optimal (type 3, 158 leaves, 5 steps):

$$-\frac{1+\frac{a\,f^2}{d^2}}{e\,\sqrt{d+e\,x+f\,\sqrt{a+\frac{e^2\,x^2}{f^2}}}}-\frac{a\,f^2\,\sqrt{d+e\,x+f\,\sqrt{a+\frac{e^2\,x^2}{f^2}}}}{2\,d^2\,e\,\left(e\,x+f\,\sqrt{a+\frac{e^2\,x^2}{f^2}}\right)}+\frac{3\,a\,f^2\,\text{ArcTanh}\left[\frac{\sqrt{d+e\,x+f\,\sqrt{a+\frac{e^2\,x^2}{f^2}}}}{\sqrt{d}}\right]}{2\,d^{5/2}\,e}$$

Result (type 8, 29 leaves):

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

Problem 465: Unable to integrate problem.

$$\int \frac{1}{\left(d+e\,x+f\,\sqrt{a+\frac{e^2\,x^2}{f^2}}\right)^{5/2}}\,dx$$

Optimal (type 3, 199 leaves, 6 steps):

$$-\frac{1+\frac{a\,f^2}{d^2}}{3\,e\,\left(d+e\,x+f\,\sqrt{a+\frac{e^2\,x^2}{f^2}}\right)^{3/2}}-\frac{2\,a\,f^2}{d^3\,e\,\sqrt{d+e\,x+f\,\sqrt{a+\frac{e^2\,x^2}{f^2}}}}-\frac{a\,f^2\,\sqrt{d+e\,x+f\,\sqrt{a+\frac{e^2\,x^2}{f^2}}}}{2\,d^3\,e\,\left(e\,x+f\,\sqrt{a+\frac{e^2\,x^2}{f^2}}\right)}+\frac{5\,a\,f^2\,\text{ArcTanh}\left[\frac{\sqrt{d+e\,x+f\,\sqrt{a+\frac{e^2\,x^2}{f^2}}}}{\sqrt{d}}\right]}{2\,d^{7/2}\,e}$$

Result (type 8, 29 leaves):

$$\int \frac{1}{\left(d+e\,x+f\,\sqrt{a+\frac{e^2\,x^2}{f^2}}\right)^{5/2}}\,dx$$

Problem 472: Unable to integrate problem.

$$\int \left(d+e\,x+f\,\sqrt{a+b\,x+\frac{e^2\,x^2}{f^2}}\right)^n\,dx$$

Optimal (type 5, 166 leaves, 4 steps):

$$\frac{\left(d+e\,x+f\,\sqrt{a+b\,x+\frac{e^2\,x^2}{f^2}}\right)^{1+n}}{2\,e\,(1+n)}+\frac{1}{2\,e\,\left(2\,d\,e-b\,f^2\right)^2\,(1+n)}$$

$$f^2\,\left(4\,a\,e^2-b^2\,f^2\right)\,\left(d+e\,x+f\,\sqrt{a+b\,x+\frac{e^2\,x^2}{f^2}}\right)^{1+n}\,\text{Hypergeometric2F1}\left[2,\,1+n,\,2+n,\,\frac{2\,e\,\left(d+e\,x+f\,\sqrt{a+b\,x+\frac{e^2\,x^2}{f^2}}\right)}{2\,d\,e-b\,f^2}\right]$$

Result (type 8, 30 leaves):

$$\int \left(d+e\,x+f\,\sqrt{a+b\,x+\frac{e^2\,x^2}{f^2}}\right)^n\,dx$$

Problem 478: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 330 leaves, 3 steps):

$$-\frac{d^2 e - b d f^2 + a e f^2}{\left(2 d e - b f^2\right)^2 \left(d + e x + f \sqrt{a + b x + \frac{e^2 x^2}{f^2}}\right)^2} - \frac{2 f^2 \left(4 a e^2 - b^2 f^2\right)}{\left(2 d e - b f^2\right)^3 \left(d + e x + f \sqrt{a + b x + \frac{e^2 x^2}{f^2}}\right)} - \frac{2 e f^2 \left(4 a e^2 - b^2 f^2\right)}{\left(2 d e - b f^2\right)^3 \left(b f^2 + 2 e \left(e x + f \sqrt{a + \frac{x (b f^2 + e^2 x)}{f^2}}\right)\right)} +$$

$$\frac{6 e f^2 \left(4 a e^2 - b^2 f^2\right) \operatorname{Log}\left[d + e x + f \sqrt{a + b x + \frac{e^2 x^2}{f^2}}\right]}{\left(2 d e - b f^2\right)^4} - \frac{6 e f^2 \left(4 a e^2 - b^2 f^2\right) \operatorname{Log}\left[b f^2 + 2 e \left(e x + f \sqrt{a + \frac{x (b f^2 + e^2 x)}{f^2}}\right)\right]}{\left(2 d e - b f^2\right)^4}$$

Result (type 3, 665 leaves):

$$\frac{4 e^3 x}{\left(2 d e - b f^2\right)^3} - \frac{2 \left(d^2 e - b d f^2 + a e f^2\right)^3}{\left(-2 d e + b f^2\right)^4 \left(d^2 + 2 d e x - f^2 (a + b x)\right)^2} - \frac{3 \left(4 a^2 e^3 f^4 + b^2 d f^4 \left(-d e + b f^2\right) + a e f^2 \left(4 d^2 e^2 - 4 b d e f^2 - b^2 f^4\right)\right)}{\left(-2 d e + b f^2\right)^4 \left(d^2 + 2 d e x - f^2 (a + b x)\right)} -$$

$$\left(2 f \sqrt{a + x \left(b + \frac{e^2 x}{f^2}\right)} \left(b^3 f^6 x + b e f^2 \left(-3 d^3 - a d f^2 + d^2 e x - 9 a e f^2 x + 8 d e^2 x^2\right) + b^2 \left(a f^6 - e f^4 x (d + 2 e x)\right) - \right.\right.$$

$$\left.\left. 2 e^2 \left(3 a^2 f^4 + d^2 e x (3 d + 4 e x) - a d f^2 (5 d + 9 e x)\right)\right)\right) \Big/ \left(\left(-2 d e + b f^2\right)^3 \left(d^2 + 2 d e x - f^2 (a + b x)\right)^2\right) -$$

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

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

$$\operatorname{Log}\left[b^2 f^4 x + 2 d^2 e \left(e x - f \sqrt{a + x \left(b + \frac{e^2 x}{f^2}\right)}\right) - 2 a e f^2 \left(2 d + e x + f \sqrt{a + x \left(b + \frac{e^2 x}{f^2}\right)}\right) + b f^2 \left(d^2 + a f^2 - 2 d e x + 2 d f \sqrt{a + x \left(b + \frac{e^2 x}{f^2}\right)}\right)\right]$$

Problem 479: Unable to integrate problem.

$$\int \left(d + e x + f \sqrt{a + b x + \frac{e^2 x^2}{f^2}}\right)^{5/2} dx$$

Optimal (type 3, 370 leaves, 6 steps):

$$\frac{f^2\left(2de-bf^2\right)\left(4ae^2-b^2f^2\right)\sqrt{d+ex+f\sqrt{a+bx+\frac{e^2x^2}{f^2}}}}{4e^4}+\frac{f^2\left(4ae^2-b^2f^2\right)\left(d+ex+f\sqrt{a+bx+\frac{e^2x^2}{f^2}}\right)^{3/2}}{12e^3}+\frac{\left(d+ex+f\sqrt{a+bx+\frac{e^2x^2}{f^2}}\right)^{7/2}}{7e}-$$

$$\frac{f^2\left(2de-bf^2\right)^2\left(4ae^2-b^2f^2\right)\sqrt{d+ex+f\sqrt{a+bx+\frac{e^2x^2}{f^2}}}}{16e^4\left(bf^2+2e\left(ex+f\sqrt{a+\frac{x\left(bf^2+e^2x\right)}{f^2}}\right)\right)}-\frac{5f^2\left(2de-bf^2\right)^{3/2}\left(4ae^2-b^2f^2\right)\text{ArcTanh}\left[\frac{\sqrt{2}\sqrt{e}\sqrt{d+ex+f\sqrt{a+bx+\frac{e^2x^2}{f^2}}}}{\sqrt{2de-bf^2}}\right]}{16\sqrt{2}\,e^{9/2}}$$

Result (type 8, 32 leaves):

$$\int\left(d+ex+f\sqrt{a+bx+\frac{e^2x^2}{f^2}}\right)^{5/2}dx$$

Problem 480: Unable to integrate problem.

$$\int\left(d+ex+f\sqrt{a+bx+\frac{e^2x^2}{f^2}}\right)^{3/2}dx$$

Optimal (type 3, 302 leaves, 6 steps):

$$\frac{f^2\left(4ae^2-b^2f^2\right)\sqrt{d+ex+f\sqrt{a+bx+\frac{e^2x^2}{f^2}}}}{4e^3}+\frac{\left(d+ex+f\sqrt{a+bx+\frac{e^2x^2}{f^2}}\right)^{5/2}}{5e}-$$

$$\frac{f^2\left(2de-bf^2\right)\left(4ae^2-b^2f^2\right)\sqrt{d+ex+f\sqrt{a+bx+\frac{e^2x^2}{f^2}}}}{8e^3\left(bf^2+2e\left(ex+f\sqrt{a+\frac{x\left(bf^2+e^2x\right)}{f^2}}\right)\right)}-\frac{3f^2\sqrt{2de-bf^2}\left(4ae^2-b^2f^2\right)\text{ArcTanh}\left[\frac{\sqrt{2}\sqrt{e}\sqrt{d+ex+f\sqrt{a+bx+\frac{e^2x^2}{f^2}}}}{\sqrt{2de-bf^2}}\right]}{8\sqrt{2}\,e^{7/2}}$$

Result (type 8, 32 leaves):

$$\int\left(d+e\,x+f\,\sqrt{a+b\,x+\frac{e^2\,x^2}{f^2}}\right)^{3/2}dx$$

Problem 483: Unable to integrate problem.

$$\int\frac{1}{\left(d+e\,x+f\,\sqrt{a+b\,x+\frac{e^2\,x^2}{f^2}}\right)^{3/2}}\,dx$$

Optimal (type 3, 269 leaves, 5 steps):

$$-\frac{4\left(d^2\,e-b\,d\,f^2+a\,e\,f^2\right)}{\left(2\,d\,e-b\,f^2\right)^2\sqrt{d+e\,x+f\,\sqrt{a+b\,x+\frac{e^2\,x^2}{f^2}}}}-$$

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

Result (type 8, 32 leaves):

$$\int\frac{1}{\left(d+e\,x+f\,\sqrt{a+b\,x+\frac{e^2\,x^2}{f^2}}\right)^{3/2}}\,dx$$

Problem 484: Unable to integrate problem.

$$\int\frac{1}{\left(d+e\,x+f\,\sqrt{a+b\,x+\frac{e^2\,x^2}{f^2}}\right)^{5/2}}\,dx$$

Optimal (type 3, 335 leaves, 6 steps):

$$-\frac{4\left(d^2 e-b d f^2+a e f^2\right)}{3\left(2 d e-b f^2\right)^2\left(d+e x+f \sqrt{a+b x+\frac{e^2 x^2}{f^2}}\right)^{3/2}}-\frac{4 f^2\left(4 a e^2-b^2 f^2\right)}{\left(2 d e-b f^2\right)^3 \sqrt{d+e x+f \sqrt{a+b x+\frac{e^2 x^2}{f^2}}}}-$$

$$\frac{2 e f^2\left(4 a e^2-b^2 f^2\right) \sqrt{d+e x+f \sqrt{a+b x+\frac{e^2 x^2}{f^2}}}}{\left(2 d e-b f^2\right)^3\left(b f^2+2 e\left(e x+f \sqrt{a+\frac{x\left(b f^2+e^2 x\right)}{f^2}}\right)\right)}+\frac{5 \sqrt{2} \sqrt{e} f^2\left(4 a e^2-b^2 f^2\right) \operatorname{ArcTanh}\left[\frac{\sqrt{2} \sqrt{e} \sqrt{d+e x+f \sqrt{a+b x+\frac{e^2 x^2}{f^2}}}}{\sqrt{2 d e-b f^2}}\right]}{\left(2 d e-b f^2\right)^{7/2}}$$

Result (type 8, 32 leaves) :

$$\int \frac{1}{\left(d+e x+f \sqrt{a+b x+\frac{e^2 x^2}{f^2}}\right)^{5/2}} \, dx$$

Problem 485: Result more than twice size of optimal antiderivative.

$$\int \left(a+x^2\right)^2\left(x+\sqrt{a+x^2}\right)^n \, dx$$

Optimal (type 3, 164 leaves, 3 steps) :

$$-\frac{a^5\left(x+\sqrt{a+x^2}\right)^{-5+n}}{32(5-n)}-\frac{5 a^4\left(x+\sqrt{a+x^2}\right)^{-3+n}}{32(3-n)}-\frac{5 a^3\left(x+\sqrt{a+x^2}\right)^{-1+n}}{16(1-n)}+\frac{5 a^2\left(x+\sqrt{a+x^2}\right)^{1+n}}{16(1+n)}+\frac{5 a\left(x+\sqrt{a+x^2}\right)^{3+n}}{32(3+n)}+\frac{\left(x+\sqrt{a+x^2}\right)^{5+n}}{32(5+n)}$$

Result (type 3, 338 leaves) :

$$\frac{1}{2}\left(x+\sqrt{a+x^2}\right)^n\left(-\frac{2a^2\left(x-n\sqrt{a+x^2}\right)}{-1+n^2}+\right.$$

$$\frac{1}{16}\left(\frac{a^5}{(-5+n)\left(x+\sqrt{a+x^2}\right)^5}-\frac{3a^4}{(-3+n)\left(x+\sqrt{a+x^2}\right)^3}+\frac{2a^3}{(-1+n)\left(x+\sqrt{a+x^2}\right)}+\frac{2a^2\left(x+\sqrt{a+x^2}\right)}{1+n}-\frac{3a\left(x+\sqrt{a+x^2}\right)^3}{3+n}+\frac{\left(x+\sqrt{a+x^2}\right)^5}{5+n}\right)+$$

$$\left(4a\sqrt{a+x^2}\left(2a^3n+a^2(-3+n)nx\left((-3+n)x-2\sqrt{a+x^2}\right)+4\left(3-n-3n^2+n^3\right)x^5\left(x+\sqrt{a+x^2}\right)+\right.\right.$$

$$\left.\left.\left.a\left(3-4n+n^2\right)x^3\left((3+5n)x+(1+3n)\sqrt{a+x^2}\right)\right)\right)\Big/\left((-3+n)(-1+n)(1+n)(3+n)\left(x+\sqrt{a+x^2}\right)^2\left(a+x\left(x+\sqrt{a+x^2}\right)\right)\right)\right)$$

Problem 488: Unable to integrate problem.

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

Optimal (type 5, 59 leaves, 2 steps):

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

Result (type 8, 23 leaves):

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

Problem 489: Unable to integrate problem.

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

Optimal (type 5, 59 leaves, 2 steps):

$$\frac{8\left(x+\sqrt{a+x^2}\right)^{3+n}\text{Hypergeometric2F1}\left[3,\frac{3+n}{2},\frac{5+n}{2},-\frac{\left(x+\sqrt{a+x^2}\right)^2}{a}\right]}{a^3(3+n)}$$

Result (type 8, 23 leaves):

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

Problem 490: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 176 leaves, 3 steps):

$$-\frac{a^5 \left(x-\sqrt{a+x^2}\right)^{-5+n}}{32\,(5-n)}-\frac{5\,a^4 \left(x-\sqrt{a+x^2}\right)^{-3+n}}{32\,(3-n)}-\frac{5\,a^3 \left(x-\sqrt{a+x^2}\right)^{-1+n}}{16\,(1-n)}+\frac{5\,a^2 \left(x-\sqrt{a+x^2}\right)^{1+n}}{16\,(1+n)}+\frac{5\,a \left(x-\sqrt{a+x^2}\right)^{3+n}}{32\,(3+n)}+\frac{\left(x-\sqrt{a+x^2}\right)^{5+n}}{32\,(5+n)}$$

Result (type 3, 361 leaves):

$$\frac{1}{2}\left(x-\sqrt{a+x^2}\right)^n \left(-\frac{2\,a^2 \left(x+n\sqrt{a+x^2}\right)}{-1+n^2}+\frac{1}{16}\left(\frac{a^5}{(-5+n)\left(x-\sqrt{a+x^2}\right)^5}+\frac{2\,a^3}{(-1+n)\left(x-\sqrt{a+x^2}\right)}+\frac{2\,a^2\left(x-\sqrt{a+x^2}\right)}{1+n}+\frac{\left(x-\sqrt{a+x^2}\right)^5}{5+n}+\frac{3\,a^4}{(-3+n)\left(-x+\sqrt{a+x^2}\right)^3}+\frac{3\,a\left(-x+\sqrt{a+x^2}\right)^3}{3+n}\right)+\left(4\,a\sqrt{a+x^2}\left(2\,a^3\,n-4\left(3-n-3\,n^2+n^3\right)x^5\left(-x+\sqrt{a+x^2}\right)+a^2\,(-3+n)\,n\,x\left((-3+n)\,x+2\sqrt{a+x^2}\right)-a\left(3-4\,n+n^2\right)x^3\left(-(3+5\,n)\,x+(1+3\,n)\sqrt{a+x^2}\right)\right)\right)\Big/\left((-3+n)\,(-1+n)\,(1+n)\,(3+n)\left(x-\sqrt{a+x^2}\right)^2\left(-a+x\left(-x+\sqrt{a+x^2}\right)\right)\right)\right)$$

Problem 493: Unable to integrate problem.

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

Optimal (type 5, 63 leaves, 2 steps):

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

Result (type 8, 25 leaves):

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

Problem 494: Unable to integrate problem.

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

Optimal (type 5, 63 leaves, 2 steps):

$$\frac{8\left(x-\sqrt{a+x^2}\right)^{3+n}\text{Hypergeometric2F1}\left[3,\frac{3+n}{2},\frac{5+n}{2},-\frac{\left(x-\sqrt{a+x^2}\right)^2}{a}\right]}{a^3\,(3+n)}$$

Result (type 8, 25 leaves):

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

Problem 495: Result more than twice size of optimal antiderivative.

$$\int \left(a+x^2\right)^{5/2}\left(x+\sqrt{a+x^2}\right)^n\,dx$$

Optimal (type 3, 187 leaves, 3 steps):

$$-\frac{a^6\left(x+\sqrt{a+x^2}\right)^{-6+n}}{64\,(6-n)}-\frac{3\,a^5\left(x+\sqrt{a+x^2}\right)^{-4+n}}{32\,(4-n)}-\frac{15\,a^4\left(x+\sqrt{a+x^2}\right)^{-2+n}}{64\,(2-n)}+$$
$$\frac{5\,a^3\left(x+\sqrt{a+x^2}\right)^{n}}{16\,n}+\frac{15\,a^2\left(x+\sqrt{a+x^2}\right)^{2+n}}{64\,(2+n)}+\frac{3\,a\left(x+\sqrt{a+x^2}\right)^{4+n}}{32\,(4+n)}+\frac{\left(x+\sqrt{a+x^2}\right)^{6+n}}{64\,(6+n)}$$

Result (type 3, 659 leaves):

$$\left(\left(x+\sqrt{a+x^2}\right)^{9+n}\left(a+x\left(x+\sqrt{a+x^2}\right)\right)\left(\frac{4a^3}{n}+\frac{a^6}{(-6+n)\left(x+\sqrt{a+x^2}\right)^6}-\frac{2a^5}{(-4+n)\left(x+\sqrt{a+x^2}\right)^4}-\frac{a^4}{(-2+n)\left(x+\sqrt{a+x^2}\right)^2}-\frac{a^2\left(x+\sqrt{a+x^2}\right)^2}{2+n}-\frac{2a\left(x+\sqrt{a+x^2}\right)^4}{4+n}+\frac{\left(x+\sqrt{a+x^2}\right)^6}{6+n}\right)\right)\Big/$$

$$\left(64\left(512x^{10}\left(x+\sqrt{a+x^2}\right)+a^5\left(10x+\sqrt{a+x^2}\right)+256ax^8\left(6x+5\sqrt{a+x^2}\right)+10a^4x^2\left(17x+5\sqrt{a+x^2}\right)+16a^3x^4\left(52x+25\sqrt{a+x^2}\right)+32a^2x^6\left(53x+35\sqrt{a+x^2}\right)\right)\right)+$$

$$\left(2a\sqrt{a+x^2}\left(x+\sqrt{a+x^2}\right)^{4+n}\left(2a^4+a^3(-4+n)x\left((-4+n)x-2\sqrt{a+x^2}\right)+8(-4+n)nx^7\left(x+\sqrt{a+x^2}\right)+4a(-4+n)nx^5\left(4x+3\sqrt{a+x^2}\right)+a^2(-4+n)x^3\left((-4+9n)x+4(-1+n)\sqrt{a+x^2}\right)\right)\right)\Big/\left((-4+n)n(4+n)\left(128x^8\left(x+\sqrt{a+x^2}\right)+a^4\left(8x+\sqrt{a+x^2}\right)+64ax^6\left(5x+4\sqrt{a+x^2}\right)+8a^3x^2\left(11x+4\sqrt{a+x^2}\right)+16a^2x^4\left(17x+10\sqrt{a+x^2}\right)\right)\right)+$$

$$\left(a^2\left(a+x^2\right)\left(x+\sqrt{a+x^2}\right)^n\left(a^2\left(-2+n^2\right)+2(-2+n)nx^3\left(x+\sqrt{a+x^2}\right)+a(-2+n)x\left((2+3n)x+2(1+n)\sqrt{a+x^2}\right)\right)\right)\Big/\left(n\left(-4+n^2\right)\left(a+x\left(x+\sqrt{a+x^2}\right)\right)^2\right)$$

Problem 496: Result more than twice size of optimal antiderivative.

$$\int\left(a+x^2\right)^{3/2}\left(x+\sqrt{a+x^2}\right)^n\,dx$$

Optimal (type 3, 131 leaves, 3 steps):

$$-\frac{a^4\left(x+\sqrt{a+x^2}\right)^{-4+n}}{16(4-n)}-\frac{a^3\left(x+\sqrt{a+x^2}\right)^{-2+n}}{4(2-n)}+\frac{3a^2\left(x+\sqrt{a+x^2}\right)^n}{8n}+\frac{a\left(x+\sqrt{a+x^2}\right)^{2+n}}{4(2+n)}+\frac{\left(x+\sqrt{a+x^2}\right)^{4+n}}{16(4+n)}$$

Result (type 3, 355 leaves):

$$\frac{1}{n}\sqrt{a+x^2}\left(x+\sqrt{a+x^2}\right)^n \left(\left(\left(\left(x+\sqrt{a+x^2}\right)^4 \left(2 a^4+a^3 (-4+n) x \left((-4+n) x-2 \sqrt{a+x^2}\right)+8 (-4+n) n x^7 \left(x+\sqrt{a+x^2}\right)+4 a (-4+n) n x^5 \left(4 x+3 \sqrt{a+x^2}\right)+a^2 (-4+n) x^3 \left((-4+9 n) x+4 (-1+n) \sqrt{a+x^2}\right)\right)\right)\Big/\left((-4+n) (4+n) \left(128 x^8 \left(x+\sqrt{a+x^2}\right)+a^4 \left(8 x+\sqrt{a+x^2}\right)+64 a x^6 \left(5 x+4 \sqrt{a+x^2}\right)+8 a^3 x^2 \left(11 x+4 \sqrt{a+x^2}\right)+16 a^2 x^4 \left(17 x+10 \sqrt{a+x^2}\right)\right)\right)+\left(a \sqrt{a+x^2} \left(a^2 \left(-2+n^2\right)+2 (-2+n) n x^3 \left(x+\sqrt{a+x^2}\right)+a (-2+n) x \left((2+3 n) x+2 (1+n) \sqrt{a+x^2}\right)\right)\right)\Big/\left(\left(-4+n^2\right) \left(a+x \left(x+\sqrt{a+x^2}\right)\right)^2\right)\right)$$

Problem 499: Unable to integrate problem.

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

Optimal (type 5, 59 leaves, 2 steps):

$$\frac{4 \left(x+\sqrt{a+x^2}\right)^{2+n} \text{Hypergeometric2F1}\left[2,\frac{2+n}{2},\frac{4+n}{2},-\frac{\left(x+\sqrt{a+x^2}\right)^2}{a}\right]}{a^2 (2+n)}$$

Result (type 8, 25 leaves):

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

Problem 500: Unable to integrate problem.

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

Optimal (type 5, 59 leaves, 2 steps):

$$\frac{16 \left(x+\sqrt{a+x^2}\right)^{4+n} \text{Hypergeometric2F1}\left[4,\frac{4+n}{2},\frac{6+n}{2},-\frac{\left(x+\sqrt{a+x^2}\right)^2}{a}\right]}{a^4 (4+n)}$$

Result (type 8, 25 leaves):

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

Problem 501: Result more than twice size of optimal antiderivative.

$$\int \left(a+x^2\right)^{5/2}\left(x-\sqrt{a+x^2}\right)^n\,dx$$

Optimal (type 3, 201 leaves, 3 steps):

$$\frac{a^6\left(x-\sqrt{a+x^2}\right)^{-6+n}}{64\,(6-n)}+\frac{3\,a^5\left(x-\sqrt{a+x^2}\right)^{-4+n}}{32\,(4-n)}+\frac{15\,a^4\left(x-\sqrt{a+x^2}\right)^{-2+n}}{64\,(2-n)}-\frac{5\,a^3\left(x-\sqrt{a+x^2}\right)^{n}}{16\,n}-\frac{15\,a^2\left(x-\sqrt{a+x^2}\right)^{2+n}}{64\,(2+n)}-\frac{3\,a\left(x-\sqrt{a+x^2}\right)^{4+n}}{32\,(4+n)}-\frac{\left(x-\sqrt{a+x^2}\right)^{6+n}}{64\,(6+n)}$$

Result (type 3, 692 leaves):

$$\left(\left(x-\sqrt{a+x^2}\right)^{9+n}\left(a+x\left(x-\sqrt{a+x^2}\right)\right)\left(\frac{4\,a^3}{n}+\frac{a^6}{(-6+n)\left(x-\sqrt{a+x^2}\right)^6}-\frac{2\,a^5}{(-4+n)\left(x-\sqrt{a+x^2}\right)^4}-\frac{a^4}{(-2+n)\left(x-\sqrt{a+x^2}\right)^2}-\frac{a^2\left(x-\sqrt{a+x^2}\right)^2}{2+n}-\frac{2\,a\left(x-\sqrt{a+x^2}\right)^4}{4+n}+\frac{\left(x-\sqrt{a+x^2}\right)^6}{6+n}\right)\right)\Big/$$
$$\left(64\left(a^5\left(-10\,x+\sqrt{a+x^2}\right)+512\,x^{10}\left(-x+\sqrt{a+x^2}\right)+10\,a^4\,x^2\left(-17\,x+5\sqrt{a+x^2}\right)+256\,a\,x^8\left(-6\,x+5\sqrt{a+x^2}\right)+16\,a^3\,x^4\left(-52\,x+25\sqrt{a+x^2}\right)+32\,a^2\,x^6\left(-53\,x+35\sqrt{a+x^2}\right)\right)\right)+$$
$$\left(2\,a\sqrt{a+x^2}\left(x-\sqrt{a+x^2}\right)^{4+n}\left(-2\,a^4+8\,(-4+n)\,n\,x^7\left(-x+\sqrt{a+x^2}\right)-a^3\,(-4+n)\,x\left((-4+n)\,x+2\sqrt{a+x^2}\right)+4\,a\,(-4+n)\,n\,x^5\left(-4\,x+3\sqrt{a+x^2}\right)+a^2\,(-4+n)\,x^3\left((4-9\,n)\,x+4\,(-1+n)\sqrt{a+x^2}\right)\right)\right)\Big/\left((-4+n)\,n\,(4+n)\right.$$
$$\left.\left(a^4\left(-8\,x+\sqrt{a+x^2}\right)+128\,x^8\left(-x+\sqrt{a+x^2}\right)+8\,a^3\,x^2\left(-11\,x+4\sqrt{a+x^2}\right)+64\,a\,x^6\left(-5\,x+4\sqrt{a+x^2}\right)+16\,a^2\,x^4\left(-17\,x+10\sqrt{a+x^2}\right)\right)\right)+$$
$$\left(a^2\left(a+x^2\right)\left(x-\sqrt{a+x^2}\right)^n\left(-a^2\left(-2+n^2\right)+2\,(-2+n)\,n\,x^3\left(-x+\sqrt{a+x^2}\right)+a\,(-2+n)\,x\left(-(2+3\,n)\,x+2\,(1+n)\sqrt{a+x^2}\right)\right)\right)\Big/$$
$$\left(n\left(-4+n^2\right)\left(a+x\left(x-\sqrt{a+x^2}\right)\right)^2\right)$$

Problem 502: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 141 leaves, 3 steps):

$$\frac{a^4 \left(x-\sqrt{a+x^2}\right)^{-4+n}}{16 (4-n)}+\frac{a^3 \left(x-\sqrt{a+x^2}\right)^{-2+n}}{4 (2-n)}-\frac{3 a^2 \left(x-\sqrt{a+x^2}\right)^n}{8 n}-\frac{a \left(x-\sqrt{a+x^2}\right)^{2+n}}{4 (2+n)}-\frac{\left(x-\sqrt{a+x^2}\right)^{4+n}}{16 (4+n)}$$

Result (type 3, 366 leaves):

$$\frac{1}{n}\left(x-\sqrt{a+x^2}\right)^n \Bigg(\Bigg(\sqrt{a+x^2} \left(x-\sqrt{a+x^2}\right)^4 \Big(-2 a^4+8 (-4+n) n x^7 \left(-x+\sqrt{a+x^2}\right)-a^3 (-4+n) x \left((-4+n) x+2 \sqrt{a+x^2}\right)+4 a (-4+n) n x^5 \left(-4 x+3 \sqrt{a+x^2}\right)+ a^2 (-4+n) x^3 \left((4-9 n) x+4 (-1+n) \sqrt{a+x^2}\right)\Big)\Bigg) \Big/ \Bigg((-4+n) (4+n) \left(a^4 \left(-8 x+\sqrt{a+x^2}\right)+128 x^8 \left(-x+\sqrt{a+x^2}\right)+8 a^3 x^2 \left(-11 x+4 \sqrt{a+x^2}\right)+64 a x^6 \left(-5 x+4 \sqrt{a+x^2}\right)+16 a^2 x^4 \left(-17 x+10 \sqrt{a+x^2}\right)\right)\Bigg)+ \left(a \left(a+x^2\right) \left(-a^2 \left(-2+n^2\right)+2 (-2+n) n x^3 \left(-x+\sqrt{a+x^2}\right)+a (-2+n) x \left(-(2+3 n) x+2 (1+n) \sqrt{a+x^2}\right)\right)\right) \Big/ \left(\left(-4+n^2\right) \left(a+x \left(x-\sqrt{a+x^2}\right)\right)^2\right)\Bigg)$$

Problem 505: Unable to integrate problem.

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

Optimal (type 5, 63 leaves, 2 steps):

$$-\frac{4 \left(x-\sqrt{a+x^2}\right)^{2+n} \text{Hypergeometric2F1}\left[2,\frac{2+n}{2},\frac{4+n}{2},-\frac{\left(x-\sqrt{a+x^2}\right)^2}{a}\right]}{a^2 (2+n)}$$

Result (type 8, 27 leaves):

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

Problem 506: Unable to integrate problem.

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

Optimal (type 5, 63 leaves, 2 steps):

$$-\frac{16\left(x-\sqrt{a+x^2}\right)^{4+n}\,\text{Hypergeometric2F1}\left[4,\frac{4+n}{2},\frac{6+n}{2},-\frac{\left(x-\sqrt{a+x^2}\right)^2}{a}\right]}{a^4\,(4+n)}$$

Result (type 8, 27 leaves):

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

Problem 507: Unable to integrate problem.

$$\int \left(a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}\right)^2\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n\,dx$$

Optimal (type 3, 365 leaves, 4 steps):

$$\frac{\left(d^2-a\,f^2\right)^5\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{-5+n}}{32\,e\,f^4\,(5-n)}-\frac{5\left(d^2-a\,f^2\right)^4\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{-3+n}}{32\,e\,f^4\,(3-n)}+\frac{5\left(d^2-a\,f^2\right)^3\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{-1+n}}{16\,e\,f^4\,(1-n)}+$$

$$\frac{5\left(d^2-a\,f^2\right)^2\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{1+n}}{16\,e\,f^4\,(1+n)}-\frac{5\left(d^2-a\,f^2\right)\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{3+n}}{32\,e\,f^4\,(3+n)}+\frac{\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{5+n}}{32\,e\,f^4\,(5+n)}$$

Result (type 8, 58 leaves):

$$\int \left(a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}\right)^2\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n\,dx$$

Problem 508: Unable to integrate problem.

$$\int \left(a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}\right) \left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^n dx$$

Optimal (type 3, 239 leaves, 4 steps):

$$\frac{\left(d^2-a f^2\right)^3 \left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^{-3+n}}{8 e f^2 (3-n)}-\frac{3 \left(d^2-a f^2\right)^2 \left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^{-1+n}}{8 e f^2 (1-n)}-\frac{3 \left(d^2-a f^2\right) \left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^{1+n}}{8 e f^2 (1+n)}+\frac{\left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^{3+n}}{8 e f^2 (3+n)}$$

Result (type 8, 56 leaves):

$$\int \left(a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}\right) \left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^n dx$$

Problem 509: Unable to integrate problem.

$$\int \left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^n dx$$

Optimal (type 3, 107 leaves, 4 steps):

$$\frac{\left(d^2-a f^2\right) \left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^{-1+n}}{2 e (1-n)}+\frac{\left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^{1+n}}{2 e (1+n)}$$

Result (type 8, 35 leaves):

$$\int \left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^n dx$$

Problem 510: Unable to integrate problem.

$$\int \frac{\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n}{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\,dx$$

Optimal (type 5, 122 leaves, 2 steps):

$$-\frac{2\,f^2\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{1+n}\text{Hypergeometric2F1}\left[1,\frac{1+n}{2},\frac{3+n}{2},\frac{\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^2}{d^2-a\,f^2}\right]}{e\left(d^2-a\,f^2\right)(1+n)}$$

Result (type 8, 58 leaves):

$$\int \frac{\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n}{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\,dx$$

Problem 511: Unable to integrate problem.

$$\int \frac{\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n}{\left(a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}\right)^2}\,dx$$

Optimal (type 5, 122 leaves, 3 steps):

$$-\frac{8\,f^4\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{3+n}\text{Hypergeometric2F1}\left[3,\frac{3+n}{2},\frac{5+n}{2},\frac{\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^2}{d^2-a\,f^2}\right]}{e\left(d^2-a\,f^2\right)^3(3+n)}$$

Result (type 8, 58 leaves):

$$\int \frac{\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n}{\left(a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}\right)^2}\,dx$$

Problem 512: Unable to integrate problem.

$$\int \left(d+e\,x+f\,\sqrt{\frac{a\,f^2+e\,x\,(2\,d+e\,x)}{f^2}}\right)^n\,dx$$

Optimal (type 3, 107 leaves, 5 steps):

$$\frac{\left(d^2-a\,f^2\right)\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{-1+n}}{2\,e\,(1-n)}+\frac{\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{1+n}}{2\,e\,(1+n)}$$

Result (type 8, 35 leaves):

$$\int \left(d+e\,x+f\,\sqrt{\frac{a\,f^2+e\,x\,(2\,d+e\,x)}{f^2}}\right)^n\,dx$$

Problem 513: Unable to integrate problem.

$$\int \frac{\left(d+e\,x+f\,\sqrt{\frac{a\,f^2+e\,x\,(2\,d+e\,x)}{f^2}}\right)^n}{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\,dx$$

Optimal (type 5, 122 leaves, 3 steps):

$$-\frac{2\,f^2\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{1+n}\,\text{Hypergeometric2F1}\left[1,\frac{1+n}{2},\frac{3+n}{2},\frac{\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^2}{d^2-a\,f^2}\right]}{e\,\left(d^2-a\,f^2\right)\,(1+n)}$$

Result (type 8, 58 leaves):

$$\int \frac{\left(d+e\,x+f\,\sqrt{\frac{a\,f^2+e\,x\,(2\,d+e\,x)}{f^2}}\right)^n}{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\,dx$$

Problem 514: Unable to integrate problem.

$$\int \left(a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}\right)^{3/2}\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n\,dx$$

Optimal (type 3, 297 leaves, 4 steps):

$$-\frac{\left(d^2-a\,f^2\right)^4\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{-4+n}}{16\,e\,f^3\,(4-n)}+\frac{\left(d^2-a\,f^2\right)^3\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{-2+n}}{4\,e\,f^3\,(2-n)}+$$

$$\frac{3\,\left(d^2-a\,f^2\right)^2\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{n}}{8\,e\,f^3\,n}-\frac{\left(d^2-a\,f^2\right)\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{2+n}}{4\,e\,f^3\,(2+n)}+\frac{\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{4+n}}{16\,e\,f^3\,(4+n)}$$

Result (type 8, 60 leaves):

$$\int \left(a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}\right)^{3/2}\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n\,dx$$

Problem 515: Unable to integrate problem.

$$\int \sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\,\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n\,dx$$

Optimal (type 3, 171 leaves, 4 steps):

$$-\frac{\left(d^2-a\,f^2\right)^2\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{-2+n}}{4\,e\,f\,(2-n)}-\frac{\left(d^2-a\,f^2\right)\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{n}}{2\,e\,f\,n}+\frac{\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{2+n}}{4\,e\,f\,(2+n)}$$

Result (type 8, 60 leaves):

$$\int \sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\,\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n\,dx$$

Problem 516: Unable to integrate problem.

$$\int \frac{\left(d+e\,x+f\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n}{\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}}\,dx$$

Optimal (type 3, 41 leaves, 3 steps):

$$\frac{f\left(d+e\,x+f\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n}{e\,n}$$

Result (type 8, 60 leaves):

$$\int \frac{\left(d+e\,x+f\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n}{\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}}\,dx$$

Problem 517: Unable to integrate problem.

$$\int \frac{\left(d+e\,x+f\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n}{\left(a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}\right)^{3/2}}\,dx$$

Optimal (type 5, 122 leaves, 3 steps):

$$\frac{4\,f^3\left(d+e\,x+f\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{2+n}\text{Hypergeometric2F1}\left[2,\frac{2+n}{2},\frac{4+n}{2},\frac{\left(d+e\,x+f\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^2}{d^2-a\,f^2}\right]}{e\left(d^2-a\,f^2\right)^2(2+n)}$$

Result (type 8, 60 leaves):

$$\int \frac{\left(d+e\,x+f\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n}{\left(a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}\right)^{3/2}}\,dx$$

Problem 518: Unable to integrate problem.

$$\int \frac{\left(d+e\,x+f\sqrt{\frac{a\,f^2+e\,x\,(2\,d+e\,x)}{f^2}}\right)^n}{\sqrt{\frac{a\,f^2+e\,x\,(2\,d+e\,x)}{f^2}}}\,dx$$

Optimal (type 3, 41 leaves, 4 steps):

$$\frac{f\left(d+e\,x+f\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n}{e\,n}$$

Result (type 8, 60 leaves):

$$\int \frac{\left(d+e\,x+f\sqrt{\frac{a\,f^2+e\,x\,(2\,d+e\,x)}{f^2}}\right)^n}{\sqrt{\frac{a\,f^2+e\,x\,(2\,d+e\,x)}{f^2}}}\,dx$$

Problem 519: Unable to integrate problem.

$$\int \sqrt{a\,g+\frac{2\,d\,e\,g\,x}{f^2}+\frac{e^2\,g\,x^2}{f^2}}\left(d+e\,x+f\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n dx$$

Optimal (type 3, 327 leaves, 5 steps):

$$-\frac{\left(d^2-a\,f^2\right)^2\sqrt{a\,g+\frac{2\,d\,e\,g\,x}{f^2}+\frac{e^2\,g\,x^2}{f^2}}\left(d+e\,x+f\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{-2+n}}{4\,e\,f\,(2-n)\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}}-$$

$$\frac{\left(d^2-a\,f^2\right)\sqrt{a\,g+\frac{2\,d\,e\,g\,x}{f^2}+\frac{e^2\,g\,x^2}{f^2}}\left(d+e\,x+f\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^n}{2\,e\,f\,n\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}}+\frac{\sqrt{a\,g+\frac{2\,d\,e\,g\,x}{f^2}+\frac{e^2\,g\,x^2}{f^2}}\left(d+e\,x+f\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{2+n}}{4\,e\,f\,(2+n)\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}}$$

Result (type 8, 64 leaves):

$$\int \sqrt{a g+\frac{2 d e g x}{f^2}+\frac{e^2 g x^2}{f^2}} \left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^n \, dx$$

Problem 520: Unable to integrate problem.

$$\int \frac{\left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^n}{\sqrt{a g+\frac{2 d e g x}{f^2}+\frac{e^2 g x^2}{f^2}}} \, dx$$

Optimal (type 3, 93 leaves, 4 steps):

$$\frac{f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}} \left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^n}{e n \sqrt{a g+\frac{2 d e g x}{f^2}+\frac{e^2 g x^2}{f^2}}}$$

Result (type 8, 64 leaves):

$$\int \frac{\left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^n}{\sqrt{a g+\frac{2 d e g x}{f^2}+\frac{e^2 g x^2}{f^2}}} \, dx$$

Problem 521: Unable to integrate problem.

$$\int \frac{\left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^n}{\left(a g+\frac{2 d e g x}{f^2}+\frac{e^2 g x^2}{f^2}\right)^{3/2}} \, dx$$

Optimal (type 5, 177 leaves, 4 steps):

$$\left(4 f^3 \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}} \left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^{2+n} \text{Hypergeometric2F1}\left[2, \frac{2+n}{2}, \frac{4+n}{2}, \frac{\left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^2}{d^2-a f^2}\right]\right) \Bigg/$$

$$\left(e \left(d^2-a f^2\right)^2 g (2+n) \sqrt{a g+\frac{2 d e g x}{f^2}+\frac{e^2 g x^2}{f^2}}\right)$$

Result (type 8, 64 leaves):

$$\int \frac{\left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^n}{\left(a g+\frac{2 d e g x}{f^2}+\frac{e^2 g x^2}{f^2}\right)^{3/2}} \, dx$$

Problem 522: Unable to integrate problem.

$$\int \frac{\left(d+e x+f \sqrt{\frac{a f^2+e x (2 d+e x)}{f^2}}\right)^n}{\sqrt{\frac{a f^2 g+e g x (2 d+e x)}{f^2}}} \, dx$$

Optimal (type 3, 93 leaves, 5 steps):

$$\frac{f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}} \left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^n}{e n \sqrt{a g+\frac{2 d e g x}{f^2}+\frac{e^2 g x^2}{f^2}}}$$

Result (type 8, 62 leaves):

$$\int \frac{\left(d+e x+f \sqrt{\frac{a f^2+e x (2 d+e x)}{f^2}}\right)^n}{\sqrt{\frac{a f^2 g+e g x (2 d+e x)}{f^2}}} \, dx$$

Problem 523: Unable to integrate problem.

$$\int \frac{1}{(a+b x)\sqrt{c+d x^2}\sqrt{e+f x^2}}\,dx$$

Optimal (type 4, 191 leaves, 7 steps):

$$-\frac{b\,\text{ArcTanh}\left[\frac{\sqrt{b^2 e+a^2 f}\sqrt{c+d x^2}}{\sqrt{b^2 c+a^2 d}\sqrt{e+f x^2}}\right]}{\sqrt{b^2 c+a^2 d}\sqrt{b^2 e+a^2 f}}+\frac{\sqrt{-c}\sqrt{1+\frac{d x^2}{c}}\sqrt{1+\frac{f x^2}{e}}\,\text{EllipticPi}\left[-\frac{b^2 c}{a^2 d},\text{ArcSin}\left[\frac{\sqrt{d}\,x}{\sqrt{-c}}\right],\frac{c f}{d e}\right]}{a\sqrt{d}\sqrt{c+d x^2}\sqrt{e+f x^2}}$$

Result (type 8, 32 leaves):

$$\int \frac{1}{(a+b x)\sqrt{c+d x^2}\sqrt{e+f x^2}}\,dx$$

Problem 524: Result more than twice size of optimal antiderivative.

$$\int \frac{e-2 f x^2}{e^2+4 d f x^2+4 e f x^2+4 f^2 x^4}\,dx$$

Optimal (type 3, 81 leaves, 4 steps):

$$-\frac{\text{Log}\left[e-2\sqrt{-d}\sqrt{f}\,x+2 f x^2\right]}{4\sqrt{-d}\sqrt{f}}+\frac{\text{Log}\left[e+2\sqrt{-d}\sqrt{f}\,x+2 f x^2\right]}{4\sqrt{-d}\sqrt{f}}$$

Result (type 3, 191 leaves):

$$\frac{-\frac{\left(-d-2 e+\sqrt{d}\sqrt{d+2 e}\right)\text{ArcTan}\left[\frac{\sqrt{2}\sqrt{f}\,x}{\sqrt{d+e-\sqrt{d}\sqrt{d+2 e}}}\right]}{\sqrt{d+e-\sqrt{d}\sqrt{d+2 e}}}-\frac{\left(d+2 e+\sqrt{d}\sqrt{d+2 e}\right)\text{ArcTan}\left[\frac{\sqrt{2}\sqrt{f}\,x}{\sqrt{d+e+\sqrt{d}\sqrt{d+2 e}}}\right]}{\sqrt{d+e+\sqrt{d}\sqrt{d+2 e}}}}{2\sqrt{2}\sqrt{d}\sqrt{d+2 e}\sqrt{f}}$$

Problem 525: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{e-2 f x^2}{e^2-4 d f x^2+4 e f x^2+4 f^2 x^4}\,dx$$

Optimal (type 3, 73 leaves, 4 steps):

$$-\frac{\text{Log}\left[e-2\sqrt{d}\sqrt{f}\,x+2 f x^2\right]}{4\sqrt{d}\sqrt{f}}+\frac{\text{Log}\left[e+2\sqrt{d}\sqrt{f}\,x+2 f x^2\right]}{4\sqrt{d}\sqrt{f}}$$

Result (type 3, 233 leaves):

$$-\frac{\frac{\left(-i d+2 i e+\sqrt{d} \sqrt{-d+2 e}\right) \text{ArcTan}\left[\frac{\sqrt{2} \sqrt{f} x}{\sqrt{-d+e-i \sqrt{d} \sqrt{-d+2 e}}}\right]}{\sqrt{-d+e-i \sqrt{d} \sqrt{-d+2 e}}}-\frac{\left(i d-2 i e+\sqrt{d} \sqrt{-d+2 e}\right) \text{ArcTan}\left[\frac{\sqrt{2} \sqrt{f} x}{\sqrt{-d+e+i \sqrt{d} \sqrt{-d+2 e}}}\right]}{\sqrt{-d+e+i \sqrt{d} \sqrt{-d+2 e}}}}{2 \sqrt{2} \sqrt{d} \sqrt{-d+2 e} \sqrt{f}}$$

Problem 526: Result is not expressed in closed-form.

$$\int \frac{e-4 f x^3}{e^2+4 d f x^2+4 e f x^3+4 f^2 x^6} \, dx$$

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

$$\frac{\text{ArcTan}\left[\frac{2 \sqrt{d} \sqrt{f} x}{e+2 f x^3}\right]}{2 \sqrt{d} \sqrt{f}}$$

Result (type 7, 87 leaves):

$$-\frac{\text{RootSum}\left[e^2+4 d f \#1^2+4 e f \#1^3+4 f^2 \#1^6 \&, \frac{-e \text{Log}[x-\#1]+4 f \text{Log}[x-\#1] \#1^3}{2 d \#1+3 e \#1^2+6 f \#1^5} \&\right]}{4 f}$$

Problem 527: Result is not expressed in closed-form.

$$\int \frac{e-4 f x^3}{e^2-4 d f x^2+4 e f x^3+4 f^2 x^6} \, dx$$

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

$$\frac{\text{ArcTanh}\left[\frac{2 \sqrt{d} \sqrt{f} x}{e+2 f x^3}\right]}{2 \sqrt{d} \sqrt{f}}$$

Result (type 7, 87 leaves):

$$-\frac{\text{RootSum}\left[e^2-4 d f \#1^2+4 e f \#1^3+4 f^2 \#1^6 \&, \frac{-e \text{Log}[x-\#1]+4 f \text{Log}[x-\#1] \#1^3}{-2 d \#1+3 e \#1^2+6 f \#1^5} \&\right]}{4 f}$$

Problem 528: Unable to integrate problem.

$$\int \frac{e-2 f (-1+n) x^n}{e^2+4 d f x^2+4 e f x^n+4 f^2 x^{2 n}} \, dx$$

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

$$\frac{\text{ArcTan}\left[\frac{2\sqrt{d}\sqrt{f}\,x}{e+2\,f\,x^n}\right]}{2\sqrt{d}\sqrt{f}}$$

Result (type 8, 44 leaves):

$$\int\frac{e-2\,f\,(-1+n)\,x^n}{e^2+4\,d\,f\,x^2+4\,e\,f\,x^n+4\,f^2\,x^{2\,n}}\,dx$$

Problem 529: Unable to integrate problem.

$$\int\frac{e-2\,f\,(-1+n)\,x^n}{e^2-4\,d\,f\,x^2+4\,e\,f\,x^n+4\,f^2\,x^{2\,n}}\,dx$$

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

$$\frac{\text{ArcTanh}\left[\frac{2\sqrt{d}\sqrt{f}\,x}{e+2\,f\,x^n}\right]}{2\sqrt{d}\sqrt{f}}$$

Result (type 8, 44 leaves):

$$\int\frac{e-2\,f\,(-1+n)\,x^n}{e^2-4\,d\,f\,x^2+4\,e\,f\,x^n+4\,f^2\,x^{2\,n}}\,dx$$

Problem 532: Result is not expressed in closed-form.

$$\int\frac{x^2\,(3\,e+2\,f\,x^2)}{e^2+4\,e\,f\,x^2+4\,f^2\,x^4+4\,d\,f\,x^6}\,dx$$

Optimal (type 3, 40 leaves, 2 steps):

$$\frac{\text{ArcTan}\left[\frac{2\sqrt{d}\sqrt{f}\,x^3}{e+2\,f\,x^2}\right]}{2\sqrt{d}\sqrt{f}}$$

Result (type 7, 85 leaves):

$$\frac{\text{RootSum}\left[e^2+4\,e\,f\,\#1^2+4\,f^2\,\#1^4+4\,d\,f\,\#1^6\,\&,\ \frac{3\,e\,\text{Log}[x-\#1]\,\#1+2\,f\,\text{Log}[x-\#1]\,\#1^3}{e+2\,f\,\#1^2+3\,d\,\#1^4}\,\&\right]}{8\,f}$$

Problem 533: Result is not expressed in closed-form.

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

Optimal (type 3, 40 leaves, 2 steps):

$$\frac{\text{ArcTanh}\left[\frac{2 \sqrt{d} \sqrt{f} x^3}{e+2 f x^2}\right]}{2 \sqrt{d} \sqrt{f}}$$

Result (type 7, 85 leaves):

$$\frac{\text{RootSum}\left[e^2 + 4 e f \#1^2 + 4 f^2 \#1^4 - 4 d f \#1^6 \&, \frac{3 e \text{Log}[x-\#1] \#1+2 f \text{Log}[x-\#1] \#1^3}{e+2 f \#1^2-3 d \#1^4} \&\right]}{8 f}$$

Problem 536: Result is not expressed in closed-form.

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

Optimal (type 3, 40 leaves, 2 steps):

$$\frac{\text{ArcTan}\left[\frac{2 \sqrt{d} \sqrt{f} x^2}{e+2 f x^3}\right]}{2 \sqrt{d} \sqrt{f}}$$

Result (type 7, 86 leaves):

$$-\frac{\text{RootSum}\left[e^2 + 4 e f \#1^3 + 4 d f \#1^4 + 4 f^2 \#1^6 \&, \frac{-e \text{Log}[x-\#1]+f \text{Log}[x-\#1] \#1^3}{3 e \#1+4 d \#1^2+6 f \#1^4} \&\right]}{2 f}$$

Problem 537: Result is not expressed in closed-form.

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

Optimal (type 3, 40 leaves, 2 steps):

$$\frac{\text{ArcTanh}\left[\frac{2 \sqrt{d} \sqrt{f} x^2}{e+2 f x^3}\right]}{2 \sqrt{d} \sqrt{f}}$$

Result (type 7, 86 leaves):

$$-\frac{\text{RootSum}\left[e^2+4\,e\,f\,\sharp1^3-4\,d\,f\,\sharp1^4+4\,f^2\,\sharp1^6\,\&,\ \frac{-e\,\text{Log}[x-\sharp1]+f\,\text{Log}[x-\sharp1]\,\sharp1^3}{3\,e\,\sharp1-4\,d\,\sharp1^2+6\,f\,\sharp1^4}\,\&\right]}{2\,f}$$

Problem 542: Unable to integrate problem.

$$\int \frac{x^m\left(e\,(1+m)+2\,f\,(1+m-n)\,x^n\right)}{e^2+4\,d\,f\,x^{2+2\,m}+4\,e\,f\,x^n+4\,f^2\,x^{2\,n}}\,dx$$

Optimal (type 3, 42 leaves, 2 steps):

$$\frac{\text{ArcTan}\left[\frac{2\,\sqrt{d}\,\sqrt{f}\,x^{1+m}}{e+2\,f\,x^n}\right]}{2\,\sqrt{d}\,\sqrt{f}}$$

Result (type 8, 58 leaves):

$$\int \frac{x^m\left(e\,(1+m)+2\,f\,(1+m-n)\,x^n\right)}{e^2+4\,d\,f\,x^{2+2\,m}+4\,e\,f\,x^n+4\,f^2\,x^{2\,n}}\,dx$$

Problem 543: Unable to integrate problem.

$$\int \frac{x^m\left(e\,(1+m)+2\,f\,(1+m-n)\,x^n\right)}{e^2-4\,d\,f\,x^{2+2\,m}+4\,e\,f\,x^n+4\,f^2\,x^{2\,n}}\,dx$$

Optimal (type 3, 42 leaves, 2 steps):

$$\frac{\text{ArcTanh}\left[\frac{2\,\sqrt{d}\,\sqrt{f}\,x^{1+m}}{e+2\,f\,x^n}\right]}{2\,\sqrt{d}\,\sqrt{f}}$$

Result (type 8, 58 leaves):

$$\int \frac{x^m\left(e\,(1+m)+2\,f\,(1+m-n)\,x^n\right)}{e^2-4\,d\,f\,x^{2+2\,m}+4\,e\,f\,x^n+4\,f^2\,x^{2\,n}}\,dx$$

Problem 547: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 88 leaves, 7 steps):

$$\frac{d\,\text{ArcTanh}\left[\frac{\sqrt{a+b x^2}}{\sqrt{a}}\right]}{\sqrt{a}\,\left(a c^2-d^2\right)}+\frac{c\,\text{Log}[x]}{a c^2-d^2}-\frac{c\,\text{Log}\left[d+c\sqrt{a+b x^2}\right]}{a c^2-d^2}$$

Result (type 3, 282 leaves):

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

Problem 548: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 151 leaves, 8 steps):

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

Result (type 3, 430 leaves):

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

Problem 555: Unable to integrate problem.

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

Optimal (type 3, 93 leaves, 7 steps):

$$\frac{2 d \operatorname{ArcTanh}\left[\frac{\sqrt{a+b x^3}}{\sqrt{a}}\right]}{3 \sqrt{a} \left(a c^2 - d^2\right)} + \frac{c \operatorname{Log}[x]}{a c^2 - d^2} - \frac{2 c \operatorname{Log}\left[d + c \sqrt{a + b x^3}\right]}{3 \left(a c^2 - d^2\right)}$$

Result (type 8, 31 leaves):

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

Problem 556: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 154 leaves, 8 steps):

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

Result (type 6, 596 leaves):

$$\frac{1}{9}\left(\left(6 b^2 c^2 d x^3 \text{AppellF1}\left[1, \frac{1}{2}, 1, 2, -\frac{b x^3}{a}, -\frac{b c^2 x^3}{a c^2-d^2}\right]\right) \Big/ \left(\sqrt{a+b x^3} \left(a c^2-d^2+b c^2 x^3\right) \left(4 a \left(a c^2-d^2\right) \text{AppellF1}\left[1, \frac{1}{2}, 1, 2, -\frac{b x^3}{a}, -\frac{b c^2 x^3}{a c^2-d^2}\right] + b x^3 \left(-2 a c^2 \text{AppellF1}\left[2, \frac{1}{2}, 2, 3, -\frac{b x^3}{a}, -\frac{b c^2 x^3}{a c^2-d^2}\right] + \left(-a c^2+d^2\right) \text{AppellF1}\left[2, \frac{3}{2}, 1, 3, -\frac{b x^3}{a}, -\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\right)\right) + \frac{1}{a x^3}\left(-\left(\left(5 b^2 c^2 d \left(3 a c^2-d^2\right) x^6 \text{AppellF1}\left[\frac{3}{2}, \frac{1}{2}, 1, \frac{5}{2}, -\frac{a}{b x^3}, \frac{-a c^2+d^2}{b c^2 x^3}\right]\right) \Big/ \left(\left(a c^2-d^2\right) \sqrt{a+b x^3} \left(a c^2-d^2+b c^2 x^3\right) \left(5 b c^2 x^3 \text{AppellF1}\left[\frac{3}{2}, \frac{1}{2}, 1, \frac{5}{2}, -\frac{a}{b x^3}, \frac{-a c^2+d^2}{b c^2 x^3}\right] + \left(-2 a c^2+2 d^2\right) \text{AppellF1}\left[\frac{5}{2}, \frac{1}{2}, 2, \frac{7}{2}, -\frac{a}{b x^3}, \frac{-a c^2+d^2}{b c^2 x^3}\right] - a c^2 \text{AppellF1}\left[\frac{5}{2}, \frac{3}{2}, 1, \frac{7}{2}, -\frac{a}{b x^3}, \frac{-a c^2+d^2}{b c^2 x^3}\right]\right)\right)\right) + \frac{-3 \left(a c^2-d^2\right) \left(a c-d \sqrt{a+b x^3}\right) - 9 a b c^3 x^3 \text{Log}[x] + 3 a b c^3 x^3 \text{Log}\left[a c^2-d^2+b c^2 x^3\right]}{\left(-a c^2+d^2\right)^2}\right)\right)$$

Problem 558: Unable to integrate problem.

$$\int \frac{x}{a c+b c x^3+d \sqrt{a+b x^3}} \, dx$$

Optimal (type 6, 304 leaves, 9 steps):

$$-\frac{d x^2 \sqrt{1+\frac{b x^3}{a}} \text{AppellF1}\left[\frac{2}{3}, \frac{1}{2}, 1, \frac{5}{3}, -\frac{b x^3}{a}, -\frac{b c^2 x^3}{a c^2-d^2}\right]}{2 \left(a c^2-d^2\right) \sqrt{a+b x^3}} - \frac{\text{ArcTan}\left[\frac{1-\frac{2 b^{1/3} c^{2/3} x}{\left(a c^2-d^2\right)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3} b^{2/3} c^{1/3} \left(a c^2-d^2\right)^{1/3}} - \frac{\text{Log}\left[\left(a c^2-d^2\right)^{1/3}+b^{1/3} c^{2/3} x\right]}{3 b^{2/3} c^{1/3} \left(a c^2-d^2\right)^{1/3}} + \frac{\text{Log}\left[\left(a c^2-d^2\right)^{2/3}-b^{1/3} c^{2/3} \left(a c^2-d^2\right)^{1/3} x+b^{2/3} c^{4/3} x^2\right]}{6 b^{2/3} c^{1/3} \left(a c^2-d^2\right)^{1/3}}$$

Result (type 8, 29 leaves):

$$\int \frac{x}{a c+b c x^3+d \sqrt{a+b x^3}} \, dx$$

Problem 559: Unable to integrate problem.

$$\int \frac{1}{a c + b c x^3 + d \sqrt{a + b x^3}} \, dx$$

Optimal (type 6, 300 leaves, 9 steps):

$$-\frac{d x \sqrt{1 + \frac{b x^3}{a}} \text{AppellF1}\left[\frac{1}{3}, \frac{1}{2}, 1, \frac{4}{3}, -\frac{b x^3}{a}, -\frac{b c^2 x^3}{a c^2 - d^2}\right]}{\left(a c^2 - d^2\right) \sqrt{a + b x^3}} - \frac{c^{1/3} \text{ArcTan}\left[\frac{1 - \frac{2 b^{1/3} c^{2/3} x}{\left(a c^2 - d^2\right)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3} b^{1/3} \left(a c^2 - d^2\right)^{2/3}} + \frac{c^{1/3} \text{Log}\left[\left(a c^2 - d^2\right)^{1/3} + b^{1/3} c^{2/3} x\right]}{3 b^{1/3} \left(a c^2 - d^2\right)^{2/3}} - \frac{c^{1/3} \text{Log}\left[\left(a c^2 - d^2\right)^{2/3} - b^{1/3} c^{2/3} \left(a c^2 - d^2\right)^{1/3} x + b^{2/3} c^{4/3} x^2\right]}{6 b^{1/3} \left(a c^2 - d^2\right)^{2/3}}$$

Result (type 8, 27 leaves):

$$\int \frac{1}{a c + b c x^3 + d \sqrt{a + b x^3}} \, dx$$

Problem 560: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 319 leaves, 10 steps):

$$-\frac{c}{\left(a c^2 - d^2\right) x} + \frac{d \sqrt{1 + \frac{b x^3}{a}} \text{AppellF1}\left[-\frac{1}{3}, \frac{1}{2}, 1, \frac{2}{3}, -\frac{b x^3}{a}, -\frac{b c^2 x^3}{a c^2 - d^2}\right]}{\left(a c^2 - d^2\right) x \sqrt{a + b x^3}} + \frac{b^{1/3} c^{5/3} \text{ArcTan}\left[\frac{1 - \frac{2 b^{1/3} c^{2/3} x}{\left(a c^2 - d^2\right)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3} \left(a c^2 - d^2\right)^{4/3}} + \frac{b^{1/3} c^{5/3} \text{Log}\left[\left(a c^2 - d^2\right)^{1/3} + b^{1/3} c^{2/3} x\right]}{3 \left(a c^2 - d^2\right)^{4/3}} - \frac{b^{1/3} c^{5/3} \text{Log}\left[\left(a c^2 - d^2\right)^{2/3} - b^{1/3} c^{2/3} \left(a c^2 - d^2\right)^{1/3} x + b^{2/3} c^{4/3} x^2\right]}{6 \left(a c^2 - d^2\right)^{4/3}}$$

Result (type 6, 1029 leaves):

$$-\frac{c}{a c^2 x-d^2 x}+\frac{d \sqrt{a+b x^3}}{a^2 c^2 x-a d^2 x}+\left(5 a b c^2 d x^2 \text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\Big/$$

$$\Bigg(2 \sqrt{a+b x^3}\, \left(a c^2-d^2+b c^2 x^3\right) \Bigg(10 a \left(a c^2-d^2\right) \text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]-$$

$$3 b x^3 \left(2 a c^2 \text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]+\left(a c^2-d^2\right) \text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\Bigg)\Bigg)+$$

$$\left(5 b d^3 x^2 \text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\Big/\Bigg(2 \sqrt{a+b x^3}\, \left(a c^2-d^2+b c^2 x^3\right)$$

$$\Bigg(10 a \left(a c^2-d^2\right) \text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]-$$

$$3 b x^3 \left(2 a c^2 \text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]+\left(a c^2-d^2\right) \text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\Bigg)\Bigg)+$$

$$\left(8 b^2 c^2 d x^5 \text{AppellF1}\left[\frac{5}{3},\frac{1}{2},1,\frac{8}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\Big/\Bigg(5 \sqrt{a+b x^3}\, \left(a c^2-d^2+b c^2 x^3\right)$$

$$\Bigg(-16 a \left(a c^2-d^2\right) \text{AppellF1}\left[\frac{5}{3},\frac{1}{2},1,\frac{8}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]+$$

$$3 b x^3 \left(2 a c^2 \text{AppellF1}\left[\frac{8}{3},\frac{1}{2},2,\frac{11}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]+\left(a c^2-d^2\right) \text{AppellF1}\left[\frac{8}{3},\frac{3}{2},1,\frac{11}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\Bigg)\Bigg)-$$

$$\frac{b^{1/3} c^{5/3} \text{ArcTan}\left[\frac{-1+\frac{2 b^{1/3} c^{2/3} x}{\left(a c^2-d^2\right)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3} \left(a c^2-d^2\right)^{4/3}}+\frac{b^{1/3} c^{5/3} \text{Log}\left[\left(a c^2-d^2\right)^{1/3}+b^{1/3} c^{2/3} x\right]}{3 \left(a c^2-d^2\right)^{4/3}}-\frac{b^{1/3} c^{5/3} \text{Log}\left[\left(a c^2-d^2\right)^{2/3}-b^{1/3} c^{2/3} \left(a c^2-d^2\right)^{1/3} x+b^{2/3} c^{4/3} x^2\right]}{6 \left(a c^2-d^2\right)^{4/3}}$$

Problem 561: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 324 leaves, 10 steps):

$$-\frac{c}{2 \left(a c^2-d^2\right) x^2}+\frac{d \sqrt{1+\frac{b x^3}{a}}\, \text{AppellF1}\left[-\frac{2}{3},\frac{1}{2},1,\frac{1}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]}{2 \left(a c^2-d^2\right) x^2 \sqrt{a+b x^3}}+\frac{b^{2/3} c^{7/3} \text{ArcTan}\left[\frac{1-\frac{2 b^{1/3} c^{2/3} x}{\left(a c^2-d^2\right)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3} \left(a c^2-d^2\right)^{5/3}}-$$

$$\frac{b^{2/3} c^{7/3} \text{Log}\left[\left(a c^2-d^2\right)^{1/3}+b^{1/3} c^{2/3} x\right]}{3 \left(a c^2-d^2\right)^{5/3}}+\frac{b^{2/3} c^{7/3} \text{Log}\left[\left(a c^2-d^2\right)^{2/3}-b^{1/3} c^{2/3} \left(a c^2-d^2\right)^{1/3} x+b^{2/3} c^{4/3} x^2\right]}{6 \left(a c^2-d^2\right)^{5/3}}$$

Result (type 6, 1044 leaves):

$$-\frac{c}{2\left(a c^2-d^2\right) x^2}+\frac{d \sqrt{a+b x^3}}{2 a \left(a c^2-d^2\right) x^2}+\left(10 a b c^2 d x \text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\Big/$$
$$\left(\sqrt{a+b x^3} \left(a c^2-d^2+b c^2 x^3\right) \left(8 a \left(a c^2-d^2\right) \text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]-\right.\right.$$
$$\left.\left.3 b x^3 \left(2 a c^2 \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},2,\frac{7}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]+\left(a c^2-d^2\right) \text{AppellF1}\left[\frac{4}{3},\frac{3}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\right)\right)-$$
$$\left(2 b d^3 x \text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\Big/\left(\sqrt{a+b x^3} \left(a c^2-d^2+b c^2 x^3\right) \left(8 a \left(a c^2-d^2\right) \text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]-\right.\right.$$
$$\left.\left.3 b x^3 \left(2 a c^2 \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},2,\frac{7}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]+\left(a c^2-d^2\right) \text{AppellF1}\left[\frac{4}{3},\frac{3}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\right)\right)+$$
$$\left(7 b^2 c^2 d x^4 \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\Big/\left(8 \sqrt{a+b x^3} \left(a c^2-d^2+b c^2 x^3\right)\right.$$
$$\left(14 a \left(a c^2-d^2\right) \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]-\right.$$
$$\left.\left.3 b x^3 \left(2 a c^2 \text{AppellF1}\left[\frac{7}{3},\frac{1}{2},2,\frac{10}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]+\left(a c^2-d^2\right) \text{AppellF1}\left[\frac{7}{3},\frac{3}{2},1,\frac{10}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\right)\right)-$$
$$\frac{b^{2/3} c^{7/3} \text{ArcTan}\left[\frac{-\left(a c^2-d^2\right)^{1/3}+2 b^{1/3} c^{2/3} x}{\sqrt{3} \left(a c^2-d^2\right)^{1/3}}\right]}{\sqrt{3} \left(a c^2-d^2\right)^{5/3}}-\frac{b^{2/3} c^{7/3} \text{Log}\left[\left(a c^2-d^2\right)^{1/3}+b^{1/3} c^{2/3} x\right]}{3 \left(a c^2-d^2\right)^{5/3}}+$$
$$\frac{b^{2/3} c^{7/3} \text{Log}\left[\left(a c^2-d^2\right)^{2/3}-b^{1/3} c^{2/3} \left(a c^2-d^2\right)^{1/3} x+b^{2/3} c^{4/3} x^2\right]}{6 \left(a c^2-d^2\right)^{5/3}}$$

Problem 562: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{a c+b c x^n+d \sqrt{a+b x^n}} \, dx$$

Optimal (type 6, 135 leaves, 4 steps):

$$-\frac{d x \sqrt{1+\frac{b x^n}{a}} \text{AppellF1}\left[\frac{1}{n},\frac{1}{2},1,1+\frac{1}{n},-\frac{b x^n}{a},-\frac{b c^2 x^n}{a c^2-d^2}\right]}{\left(a c^2-d^2\right) \sqrt{a+b x^n}}+\frac{c x \text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{b c^2 x^n}{a c^2-d^2}\right]}{a c^2-d^2}$$

Result (type 6, 320 leaves):

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

Problem 563: Result more than twice size of optimal antiderivative.

$$\int\frac{x^m}{a\,c+b\,c\,x^n+d\,\sqrt{a+b\,x^n}}\,dx$$

Optimal (type 6, 167 leaves, 4 steps):

$$-\frac{d\,x^{1+m}\,\sqrt{1+\frac{b\,x^n}{a}}\,\text{AppellF1}\left[\frac{1+m}{n},\frac{1}{2},1,\frac{1+m+n}{n},-\frac{b\,x^n}{a},-\frac{b\,c^2\,x^n}{a\,c^2-d^2}\right]}{\left(a\,c^2-d^2\right)\,(1+m)\,\sqrt{a+b\,x^n}}+\frac{c\,x^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{b\,c^2\,x^n}{a\,c^2-d^2}\right]}{\left(a\,c^2-d^2\right)\,(1+m)}$$

Result (type 6, 373 leaves):

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

Problem 566: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{x}-x^{5/2}}\,dx$$

Optimal (type 3, 13 leaves, 5 steps):

$$\text{ArcTan}\left[\sqrt{x}\right]+\text{ArcTanh}\left[\sqrt{x}\right]$$

Result (type 3, 33 leaves):

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

Problem 587: Unable to integrate problem.

$$\int\left(a+\frac{b}{x}\right)^m(c+d\,x)^n\,dx$$

Optimal (type 6, 80 leaves, 4 steps):

$$\frac{\left(a+\frac{b}{x}\right)^m x\left(1+\frac{a\,x}{b}\right)^{-m}(c+d\,x)^n\left(1+\frac{d\,x}{c}\right)^{-n}\text{AppellF1}\left[1-m,-m,-n,2-m,-\frac{a\,x}{b},-\frac{d\,x}{c}\right]}{1-m}$$

Result (type 8, 19 leaves):

$$\int\left(a+\frac{b}{x}\right)^m(c+d\,x)^n\,dx$$

Problem 591: Unable to integrate problem.

$$\int\frac{\left(a+\frac{b}{x}\right)^m}{c+d\,x}\,dx$$

Optimal (type 5, 101 leaves, 5 steps):

$$-\frac{c\left(a+\frac{b}{x}\right)^{1+m}\text{Hypergeometric2F1}\left[1,1+m,2+m,\frac{c\left(a+\frac{b}{x}\right)}{a\,c-b\,d}\right]}{d\,(a\,c-b\,d)\,(1+m)}+\frac{\left(a+\frac{b}{x}\right)^{1+m}\text{Hypergeometric2F1}\left[1,1+m,2+m,1+\frac{b}{a\,x}\right]}{a\,d\,(1+m)}$$

Result (type 8, 19 leaves):

$$\int\frac{\left(a+\frac{b}{x}\right)^m}{c+d\,x}\,dx$$

Problem 592: Unable to integrate problem.

$$\int\frac{\left(a+\frac{b}{x}\right)^m}{(c+d\,x)^2}\,dx$$

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

$$-\frac{b\left(a+\frac{b}{x}\right)^{1+m}\text{Hypergeometric2F1}\left[2,1+m,2+m,\frac{c\left(a+\frac{b}{x}\right)}{a c-b d}\right]}{(a c-b d)^2(1+m)}$$

Result (type 8, 19 leaves):

$$\int \frac{\left(a+\frac{b}{x}\right)^m}{(c+d x)^2}\,dx$$

Problem 593: Unable to integrate problem.

$$\int \frac{\left(a+\frac{b}{x}\right)^m}{(c+d x)^3}\,dx$$

Optimal (type 5, 112 leaves, 4 steps):

$$-\frac{d\left(a+\frac{b}{x}\right)^{1+m}}{2 c (a c-b d)\left(d+\frac{c}{x}\right)^2}-\frac{b\,(2 a c-b d(1+m))\left(a+\frac{b}{x}\right)^{1+m}\text{Hypergeometric2F1}\left[2,1+m,2+m,\frac{c\left(a+\frac{b}{x}\right)}{a c-b d}\right]}{2 c (a c-b d)^3(1+m)}$$

Result (type 8, 19 leaves):

$$\int \frac{\left(a+\frac{b}{x}\right)^m}{(c+d x)^3}\,dx$$

Problem 594: Unable to integrate problem.

$$\int \frac{\left(a+\frac{b}{x}\right)^m}{(c+d x)^4}\,dx$$

Optimal (type 5, 185 leaves, 5 steps):

$$\frac{d^2\left(a+\frac{b}{x}\right)^{1+m}}{3 c^2 (a c-b d)\left(d+\frac{c}{x}\right)^3}-\frac{d\,(6 a c-b d(4+m))\left(a+\frac{b}{x}\right)^{1+m}}{6 c^2 (a c-b d)^2\left(d+\frac{c}{x}\right)^2}-$$

$$\frac{b\left(6 a^2 c^2-6 a b c d(1+m)+b^2 d^2\left(2+3 m+m^2\right)\right)\left(a+\frac{b}{x}\right)^{1+m}\text{Hypergeometric2F1}\left[2,1+m,2+m,\frac{c\left(a+\frac{b}{x}\right)}{a c-b d}\right]}{6 c^2 (a c-b d)^4(1+m)}$$

Result (type 8, 19 leaves):

$$\int \frac{\left(a+\frac{b}{x}\right)^m}{(c+d\,x)^4}\,dx$$

Problem 598: Unable to integrate problem.

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

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

$$\frac{\sqrt{b-\frac{a}{x^2}}\;x\,\text{Log}[x]}{\sqrt{a-b\,x^2}}$$

Result (type 8, 27 leaves):

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

Problem 601: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(c+d\,x)^{3/2}}{\sqrt{a+\frac{b}{x^2}}}\,dx$$

Optimal (type 4, 406 leaves, 8 steps):

$$\frac{2c\sqrt{c+dx}\,(b+ax^2)}{5a\sqrt{a+\frac{b}{x^2}}\,x}+\frac{2(c+dx)^{3/2}(b+ax^2)}{5a\sqrt{a+\frac{b}{x^2}}\,x}+\frac{2\sqrt{b}\,(ac^2-3bd^2)\sqrt{c+dx}\sqrt{1+\frac{ax^2}{b}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{-a}\,x}{\sqrt{b}}}}{\sqrt{2}}\right],-\frac{2\sqrt{-a}\sqrt{b}\,d}{ac-\sqrt{-a}\sqrt{b}\,d}\right]}{5(-a)^{3/2}d\sqrt{a+\frac{b}{x^2}}\,x\sqrt{\frac{a(c+dx)}{ac-\sqrt{-a}\sqrt{b}\,d}}}-$$

$$\frac{2\sqrt{b}\,c\,(ac^2+bd^2)\sqrt{\frac{a(c+dx)}{ac-\sqrt{-a}\sqrt{b}\,d}}\sqrt{1+\frac{ax^2}{b}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{1-\frac{\sqrt{-a}\,x}{\sqrt{b}}}}{\sqrt{2}}\right],-\frac{2\sqrt{-a}\sqrt{b}\,d}{ac-\sqrt{-a}\sqrt{b}\,d}\right]}{5(-a)^{3/2}d\sqrt{a+\frac{b}{x^2}}\,x\sqrt{c+dx}}$$

Result (type 4, 540 leaves) :

$$\frac{1}{5\sqrt{a+\frac{b}{x^2}}\,x}\sqrt{c+dx}$$

$$\left(\frac{2(2c+dx)(b+ax^2)}{a}+\left(2\left(d^2\sqrt{-c-\frac{i\sqrt{b}\,d}{\sqrt{a}}}\left(-3b^2d^2+a^2c^2x^2+ab\left(c^2-3d^2x^2\right)\right)+\sqrt{a}\left(-i\,a^{3/2}c^3+a\sqrt{b}\,c^2d+3i\sqrt{a}\,bcd^2-3b^{3/2}d^3\right)\right.\right.\right.$$

$$\sqrt{\frac{d\left(\frac{i\sqrt{b}}{\sqrt{a}}+x\right)}{c+dx}}\sqrt{-\frac{\frac{i\sqrt{b}\,d}{\sqrt{a}}-dx}{c+dx}}\,(c+dx)^{3/2}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-c-\frac{i\sqrt{b}\,d}{\sqrt{a}}}}{\sqrt{c+dx}}\right],\frac{\sqrt{a}\,c-i\sqrt{b}\,d}{\sqrt{a}\,c+i\sqrt{b}\,d}\right]-$$

$$\sqrt{a}\sqrt{b}\,d\left(ac^2+4i\sqrt{a}\sqrt{b}\,cd-3bd^2\right)\sqrt{\frac{d\left(\frac{i\sqrt{b}}{\sqrt{a}}+x\right)}{c+dx}}\sqrt{-\frac{\frac{i\sqrt{b}\,d}{\sqrt{a}}-dx}{c+dx}}\,(c+dx)^{3/2}$$

$$\left.\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{-c-\frac{i\sqrt{b}\,d}{\sqrt{a}}}}{\sqrt{c+dx}}\right],\frac{\sqrt{a}\,c-i\sqrt{b}\,d}{\sqrt{a}\,c+i\sqrt{b}\,d}\right]\right)\right)\Bigg/\left(a^2d^2\sqrt{-c-\frac{i\sqrt{b}\,d}{\sqrt{a}}}\,(c+dx)\right)\right)$$

Problem 681: Result more than twice size of optimal antiderivative.

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

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

$$\frac{1}{\sqrt{1+\frac{1}{x^2}}}$$

Result (type 2, 20 leaves):

$$\frac{\sqrt{1+\frac{1}{x^2}}\,x^2}{1+x^2}$$

Problem 682: Result more than twice size of optimal antiderivative.

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

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

$$\frac{1}{\sqrt{1+\frac{1}{x^2}}}$$

Result (type 2, 20 leaves):

$$\frac{\sqrt{1+\frac{1}{x^2}}\,x^2}{1+x^2}$$

Problem 737: Result more than twice size of optimal antiderivative.

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

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

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

Result (type 3, 32 leaves):

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

Problem 738: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 18 leaves, 2 steps):

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

Result (type 3, 47 leaves):

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

Problem 739: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{\frac{a+b\,x}{c-b\,x}}}{a+b\,x}\,dx$$

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

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

Result (type 3, 80 leaves):

$$\frac{i\,\sqrt{c-b\,x}\,\sqrt{\frac{a+b\,x}{c-b\,x}}\,\text{Log}\left[2\,\sqrt{c-b\,x}\,\sqrt{a+b\,x}-i\,(a-c+2\,b\,x)\right]}{b\,\sqrt{a+b\,x}}$$

Problem 740: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{\frac{a+b\,x}{c+d\,x}}}{a+b\,x}\,dx$$

Optimal (type 3, 41 leaves, 3 steps):

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

Result (type 3, 89 leaves):

$$\frac{\sqrt{\frac{a+b\,x}{c+d\,x}}\,\sqrt{c+d\,x}\,\text{Log}\left[b\,c+a\,d+2\,b\,d\,x+2\,\sqrt{b}\,\sqrt{d}\,\sqrt{a+b\,x}\,\sqrt{c+d\,x}\right]}{\sqrt{b}\,\sqrt{d}\,\sqrt{a+b\,x}}$$

Problem 759: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 108 leaves, 10 steps):

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

Result (type 3, 1012 leaves):

$$\frac{1}{8}\Bigg(4\,\text{ArcSin}[2+x]-4\sqrt{2}\,\text{ArcTan}\left[\sqrt{2}\,(1+x)\right]+2\sqrt{1-2\,i\sqrt{2}}$$

$$\text{ArcTan}\Big[\Big(60+51\,i\sqrt{2}+\left(-16+6\,i\sqrt{2}\right)x^4+54\,i\sqrt{1-2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}+x\left(68+176\,i\sqrt{2}+99\,i\sqrt{1-2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)+$$

$$2\,i\,x^3\left(34\left(i+\sqrt{2}\right)+9\sqrt{1-2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)+i\,x^2\left(44\,i+185\sqrt{2}+72\sqrt{1-2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\Big)\Big/$$

$$\left(93\,i+150\sqrt{2}+20\left(17\,i+22\sqrt{2}\right)x+\left(493\,i+466\sqrt{2}\right)x^2+16\left(19\,i+13\sqrt{2}\right)x^3+\left(66\,i+32\sqrt{2}\right)x^4\right)\Big]-\frac{1}{\sqrt{1+2\,i\sqrt{2}}}2\,i\left(-i+2\sqrt{2}\right)$$

$$\text{ArcTan}\Big[\Big(-60+51\,i\sqrt{2}+2\left(8+3\,i\sqrt{2}\right)x^4+54\,i\sqrt{1+2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}+2x^3\left(34+34\,i\sqrt{2}+9\,i\sqrt{1+2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)+$$

$$x^2\left(44+185\,i\sqrt{2}+72\,i\sqrt{1+2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)+i\,x\left(68\,i+176\sqrt{2}+99\sqrt{1+2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\Big)\Big/$$

$$\left(-93\,i+150\sqrt{2}+20\left(-17\,i+22\sqrt{2}\right)x+\left(-493\,i+466\sqrt{2}\right)x^2+16\left(-19\,i+13\sqrt{2}\right)x^3+\left(-66\,i+32\sqrt{2}\right)x^4\right)\Big]+$$

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

$$\left(i+2\sqrt{2}\right)\text{Log}\Big[\left(3+4x+2x^2\right)\Big(3+6\,i\sqrt{2}+\left(2+2\,i\sqrt{2}\right)x^2-2\sqrt{2-4\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}+x\left(4+8\,i\sqrt{2}-2\sqrt{2-4\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\Big)\Big]-$$

$$\frac{1}{\sqrt{1+2\,i\sqrt{2}}}\left(-i+2\sqrt{2}\right)$$

$$\text{Log}\Big[\left(3+4x+2x^2\right)\Big(3-6\,i\sqrt{2}+\left(2-2\,i\sqrt{2}\right)x^2-2\sqrt{2+4\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}-2x\left(-2+4\,i\sqrt{2}+\sqrt{2+4\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\Big)\Big]\Bigg)$$

Problem 760: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 87 leaves, 5 steps):

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

Result (type 3, 881 leaves):

$$\frac{1}{16}\left(\frac{8\,(3+x)}{3+4x+2x^2}+\frac{8\,(3+2x)\,\sqrt{-3-4x-x^2}}{3+4x+2x^2}+4\sqrt{2}\,\text{ArcTan}\left[\sqrt{2}\,(1+x)\right]-\frac{1}{\sqrt{1+2\,i\,\sqrt{2}}}\right.$$

$$2\,i\,\left(-2\,i+\sqrt{2}\right)\text{ArcTan}\left[\left((2+x)\,\left(3\left(5+4\,i\,\sqrt{2}\right)+16\left(2+i\,\sqrt{2}\right)x+2\left(9+2\,i\,\sqrt{2}\right)x^2\right)\right)\Big/\left(12\,i-6\sqrt{2}+\left(8\,i+6\sqrt{2}\right)x^3-\right.\right.$$

$$\left.\left.9\sqrt{1+2\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}+x\left(40\,i-5\sqrt{2}-12\sqrt{1+2\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)+x^2\left(36\,i+8\sqrt{2}-6\sqrt{1+2\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\right)\right]+$$

$$\frac{1}{\sqrt{1-2\,i\,\sqrt{2}}}2\left(2\,i+\sqrt{2}\right)\text{ArcTanh}\left[\left((2+x)\,\left(3\left(5\,i+4\sqrt{2}\right)+16\left(2\,i+\sqrt{2}\right)x+2\left(9\,i+2\sqrt{2}\right)x^2\right)\right)\Big/\left(-5\left(8\,i+\sqrt{2}\right)x+\left(-8\,i+6\sqrt{2}\right)x^3-\right.\right.$$

$$\left.\left.12\sqrt{1-2\,i\,\sqrt{2}}\;x\sqrt{-3-4x-x^2}+x^2\left(-36\,i+8\sqrt{2}-6\sqrt{1-2\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)-3\left(4\,i+2\sqrt{2}+3\sqrt{1-2\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\right)\right]-$$

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

$$\left(2\,i+\sqrt{2}\right)\text{Log}\left[\left(3+4x+2x^2\right)\left(3+6\,i\,\sqrt{2}+\left(2+2\,i\,\sqrt{2}\right)x^2-2\sqrt{2-4\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}+x\left(4+8\,i\,\sqrt{2}-2\sqrt{2-4\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\right)\right]+$$

$$\frac{1}{\sqrt{1+2\,i\,\sqrt{2}}}\left(-2\,i+\sqrt{2}\right)$$

$$\left.\text{Log}\left[\left(3+4x+2x^2\right)\left(3-6\,i\,\sqrt{2}+\left(2-2\,i\,\sqrt{2}\right)x^2-2\sqrt{2+4\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}-2x\left(-2+4\,i\,\sqrt{2}+\sqrt{2+4\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\right)\right]\right)$$

Problem 761: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 149 leaves, 6 steps):

$$-\frac{13-\frac{27\sqrt{-1-x}}{\sqrt{3+x}}}{18\left(1-\frac{3\,(1+x)}{3+x}-\frac{2\sqrt{-1-x}}{\sqrt{3+x}}\right)}-\frac{2\left(2-\frac{\sqrt{-1-x}}{\sqrt{3+x}}\right)}{9\left(1-\frac{3\,(1+x)}{3+x}-\frac{2\sqrt{-1-x}}{\sqrt{3+x}}\right)^2}-\frac{3\,\text{ArcTan}\left[\frac{1-\frac{3\sqrt{-1-x}}{\sqrt{3+x}}}{\sqrt{2}}\right]}{2\sqrt{2}}$$

Result (type 3, 914 leaves):

$$\frac{1}{32}\Bigg(\frac{8\,(-3+2\,x)}{(3+4\,x+2\,x^2)^2}-\frac{8\,(2+3\,x)}{3+4\,x+2\,x^2}-\frac{8\,\sqrt{-3-4\,x-x^2}\,(15+26\,x+22\,x^2+8\,x^3)}{(3+4\,x+2\,x^2)^2}-12\,\sqrt{2}\,\text{ArcTan}\big[\sqrt{2}\,(1+x)\big]+\frac{1}{\sqrt{1+2\,i\,\sqrt{2}}}$$

$$6\,\big(2+i\,\sqrt{2}\big)\,\text{ArcTan}\Big[\Big((2+x)\,\Big(3\,\big(5+4\,i\,\sqrt{2}\big)+16\,\big(2+i\,\sqrt{2}\big)\,x+2\,\big(9+2\,i\,\sqrt{2}\big)\,x^2\Big)\Big)\Big/\Big(12\,i-6\,\sqrt{2}+\big(8\,i+6\,\sqrt{2}\big)\,x^3-$$

$$9\,\sqrt{1+2\,i\,\sqrt{2}}\,\sqrt{-3-4\,x-x^2}+x\,\Big(40\,i-5\,\sqrt{2}-12\,\sqrt{1+2\,i\,\sqrt{2}}\,\sqrt{-3-4\,x-x^2}\Big)+x^2\,\Big(36\,i+8\,\sqrt{2}-6\,\sqrt{1+2\,i\,\sqrt{2}}\,\sqrt{-3-4\,x-x^2}\Big)\Big)\Big]-$$

$$\frac{1}{\sqrt{1-2\,i\,\sqrt{2}}}6\,\big(2\,i+\sqrt{2}\big)\,\text{ArcTanh}\Big[\Big((2+x)\,\Big(3\,\big(5\,i+4\,\sqrt{2}\big)+16\,\big(2\,i+\sqrt{2}\big)\,x+2\,\big(9\,i+2\,\sqrt{2}\big)\,x^2\Big)\Big)\Big/\Big(-5\,\big(8\,i+\sqrt{2}\big)\,x+\big(-8\,i+6\,\sqrt{2}\big)\,x^3-$$

$$12\,\sqrt{1-2\,i\,\sqrt{2}}\,x\,\sqrt{-3-4\,x-x^2}+x^2\,\Big(-36\,i+8\,\sqrt{2}-6\,\sqrt{1-2\,i\,\sqrt{2}}\,\sqrt{-3-4\,x-x^2}\Big)-3\,\Big(4\,i+2\,\sqrt{2}+3\,\sqrt{1-2\,i\,\sqrt{2}}\,\sqrt{-3-4\,x-x^2}\Big)\Big)\Big]+$$

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

$$\text{Log}\Big[(3+4\,x+2\,x^2)\,\Big(3+6\,i\,\sqrt{2}+\big(2+2\,i\,\sqrt{2}\big)\,x^2-2\,\sqrt{2-4\,i\,\sqrt{2}}\,\sqrt{-3-4\,x-x^2}+x\,\Big(4+8\,i\,\sqrt{2}-2\,\sqrt{2-4\,i\,\sqrt{2}}\,\sqrt{-3-4\,x-x^2}\Big)\Big)\Big]-$$

$$\frac{1}{\sqrt{1+2\,i\,\sqrt{2}}}3\,\big(-2\,i+\sqrt{2}\big)$$

$$\text{Log}\Big[(3+4\,x+2\,x^2)\,\Big(3-6\,i\,\sqrt{2}+\big(2-2\,i\,\sqrt{2}\big)\,x^2-2\,\sqrt{2+4\,i\,\sqrt{2}}\,\sqrt{-3-4\,x-x^2}-2\,x\,\Big(-2+4\,i\,\sqrt{2}+\sqrt{2+4\,i\,\sqrt{2}}\,\sqrt{-3-4\,x-x^2}\Big)\Big)\Big]\Bigg)$$

Problem 764: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int (8\,x-8\,x^2+4\,x^3-x^4)^{3/2}\,dx$$

Optimal (type 4, 102 leaves, 7 steps):

$$\frac{2}{35}\,\big(13-3\,(-1+x)^2\big)\,\sqrt{3-2\,(-1+x)^2-(-1+x)^4}\,(-1+x)+\frac{1}{7}\,\big(3-2\,(-1+x)^2-(-1+x)^4\big)^{3/2}\,(-1+x)+$$

$$\frac{16}{5}\,\sqrt{3}\,\text{EllipticE}\Big[\text{ArcSin}[1-x],\,-\frac{1}{3}\Big]-\frac{176}{35}\,\sqrt{3}\,\text{EllipticF}\Big[\text{ArcSin}[1-x],\,-\frac{1}{3}\Big]$$

Result (type 4, 278 leaves):

$$\left(896 - 1056 x + 352 x^2 + 848 x^3 - 1420 x^4 + 1152 x^5 - 602 x^6 + 206 x^7 - 45 x^8 + 5 x^9 + \frac{112 i \sqrt{2} (-2 + x) x \sqrt{\frac{4-2x+x^2}{x^2}} \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-\frac{4i}{x}}}{\sqrt{2}\, 3^{1/4}}\right], \frac{2\sqrt{3}}{-i+\sqrt{3}}\right]}{\sqrt{-\frac{i(-2+x)}{\left(-i+\sqrt{3}\right) x}}} - 304 i \sqrt{2} \sqrt{-\frac{i(-2+x)}{\left(-i+\sqrt{3}\right) x}}\, x^2 \sqrt{\frac{4-2x+x^2}{x^2}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-\frac{4i}{x}}}{\sqrt{2}\, 3^{1/4}}\right], \frac{2\sqrt{3}}{-i+\sqrt{3}}\right]\right) \Big/ \left(35 \sqrt{-x \left(-8 + 8 x - 4 x^2 + x^3\right)}\right)$$

Problem 765: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \sqrt{8 x - 8 x^2 + 4 x^3 - x^4}\, dx$$

Optimal (type 4, 62 leaves, 6 steps):

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

Result (type 4, 256 leaves):

$$-\left(\left(-16+24x-24x^2+14x^3-5x^4+x^5-\frac{2\,\mathrm{i}\,\sqrt{2}\,(-2+x)\,x\,\sqrt{\frac{4-2x+x^2}{x^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\mathrm{i}+\sqrt{3}-\frac{4\,\mathrm{i}}{x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{-\mathrm{i}+\sqrt{3}}\right]}{\sqrt{-\frac{\mathrm{i}\,(-2+x)}{\left(-\mathrm{i}+\sqrt{3}\right)x}}}+\right.\right.$$

$$\left.\left.8\,\mathrm{i}\,\sqrt{2}\,\sqrt{-\frac{\mathrm{i}\,(-2+x)}{\left(-\mathrm{i}+\sqrt{3}\right)x}}\,x^2\,\sqrt{\frac{4-2x+x^2}{x^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\mathrm{i}+\sqrt{3}-\frac{4\,\mathrm{i}}{x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{-\mathrm{i}+\sqrt{3}}\right]\right)\middle/\left(3\sqrt{-x\left(-8+8x-4x^2+x^3\right)}\right)\right)$$

Problem 766: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{8x-8x^2+4x^3-x^4}}\,dx$$

Optimal (type 4, 17 leaves, 3 steps):

$$-\frac{\text{EllipticF}\left[\text{ArcSin}[1-x],-\frac{1}{3}\right]}{\sqrt{3}}$$

Result (type 4, 156 leaves):

$$\frac{\sqrt{-\mathrm{i}+\sqrt{3}+\frac{4\,\mathrm{i}}{x}}\,\sqrt{-\frac{\mathrm{i}\,(-2+x)}{\left(-\mathrm{i}+\sqrt{3}\right)x}}\,x\left(-4+x-\mathrm{i}\sqrt{3}\,x\right)\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\mathrm{i}+\sqrt{3}-\frac{4\,\mathrm{i}}{x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{-\mathrm{i}+\sqrt{3}}\right]}{\sqrt{2}\,\sqrt{\mathrm{i}+\sqrt{3}-\frac{4\,\mathrm{i}}{x}}\,\sqrt{-x\left(-8+8x-4x^2+x^3\right)}}$$

Problem 767: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\left(8x-8x^2+4x^3-x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 73 leaves, 6 steps):

$$\frac{\left(5+(-1+x)^2\right)(-1+x)}{24\sqrt{3-2(-1+x)^2-(-1+x)^4}}+\frac{\text{EllipticE}\left[\text{ArcSin}[1-x],-\frac{1}{3}\right]}{8\sqrt{3}}-\frac{\text{EllipticF}\left[\text{ArcSin}[1-x],-\frac{1}{3}\right]}{4\sqrt{3}}$$

Result (type 4, 261 leaves) :

$$\frac{1}{24\,(-2+x)\,x}\sqrt{-x\,\left(-8+8\,x-4\,x^2+x^3\right)}\left(\frac{\sqrt{2}\,\left(-\mathrm{i}+\sqrt{3}\right)\sqrt{-\frac{\mathrm{i}\,(-2+x)}{\left(-\mathrm{i}+\sqrt{3}\right)x}}\;\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\mathrm{i}+\sqrt{3}-\frac{4\,\mathrm{i}}{x}}}{\sqrt{2}\;3^{1/4}}\right],\,\frac{2\,\sqrt{3}}{-\mathrm{i}+\sqrt{3}}\right]}{\sqrt{\frac{4-2\,x+x^2}{x^2}}}-\frac{2+x^2-4\,\mathrm{i}\,\sqrt{2}\,\sqrt{-\frac{\mathrm{i}\,(-2+x)}{\left(-\mathrm{i}+\sqrt{3}\right)x}}\;x^2\,\sqrt{\frac{4-2\,x+x^2}{x^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\mathrm{i}+\sqrt{3}-\frac{4\,\mathrm{i}}{x}}}{\sqrt{2}\;3^{1/4}}\right],\,\frac{2\,\sqrt{3}}{-\mathrm{i}+\sqrt{3}}\right]}{4-2\,x+x^2}\right)$$

Problem 768: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(8\,x-8\,x^2+4\,x^3-x^4\right)^{5/2}}\,dx$$

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

$$\frac{\left(5+(-1+x)^2\right)(-1+x)}{72\left(3-2\,(-1+x)^2-(-1+x)^4\right)^{3/2}}+\frac{\left(26+7\,(-1+x)^2\right)(-1+x)}{432\,\sqrt{3-2\,(-1+x)^2-(-1+x)^4}}+\frac{7\,\text{EllipticE}\left[\text{ArcSin}[1-x],\,-\frac{1}{3}\right]}{144\,\sqrt{3}}-\frac{11\,\text{EllipticF}\left[\text{ArcSin}[1-x],\,-\frac{1}{3}\right]}{144\,\sqrt{3}}$$

Result (type 4, 298 leaves) :

$$\left(\frac{7\,i\,\sqrt{2}\,(-2+x)\,x^2\,\sqrt{\frac{4-2x+x^2}{x^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-\frac{4i}{x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{-i+\sqrt{3}}\right]}{\sqrt{-\frac{i(-2+x)}{\left(-i+\sqrt{3}\right)x}}}+\right.$$

$$\frac{1}{-8+8x-4x^2+x^3}\left(36-232x+274x^2-226x^3+115x^4-37x^5+7x^6-19\,i\,\sqrt{2}\,\sqrt{-\frac{i(-2+x)}{\left(-i+\sqrt{3}\right)x}}\,x^3\,\sqrt{\frac{4-2x+x^2}{x^2}}\right.$$

$$\left.\left.\left(-8+8x-4x^2+x^3\right)\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-\frac{4i}{x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{-i+\sqrt{3}}\right]\right)\right)\Big/\left(432\,x\,\sqrt{-x\left(-8+8x-4x^2+x^3\right)}\right)$$

Problem 769: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 102 leaves, 7 steps):

$$\frac{2}{35}\left(13-3(-1+x)^2\right)\sqrt{3-2(-1+x)^2-(-1+x)^4}\,(-1+x)+\frac{1}{7}\left(3-2(-1+x)^2-(-1+x)^4\right)^{3/2}(-1+x)+$$
$$\frac{16}{5}\sqrt{3}\,\text{EllipticE}\left[\text{ArcSin}[1-x],-\frac{1}{3}\right]-\frac{176}{35}\sqrt{3}\,\text{EllipticF}\left[\text{ArcSin}[1-x],-\frac{1}{3}\right]$$

Result (type 4, 278 leaves):

$$\frac{1}{35\left(-2+x\right)x\sqrt{\frac{4-2x+x^2}{x^2}}}\sqrt{-x\left(-8+8x-4x^2+x^3\right)}\left(\sqrt{\frac{4-2x+x^2}{x^2}}\left(-224+152x+44x^2-228x^3+230x^4-116x^5+35x^6-5x^7\right)+112\sqrt{2}\left(-i+\sqrt{3}\right)\sqrt{-\frac{i\left(-2+x\right)}{\left(-i+\sqrt{3}\right)x}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-\frac{4i}{x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{-i+\sqrt{3}}\right]+304\,i\sqrt{2}\sqrt{-\frac{i\left(-2+x\right)}{\left(-i+\sqrt{3}\right)x}}\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-\frac{4i}{x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{-i+\sqrt{3}}\right]\right)$$

Problem 770: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 62 leaves, 6 steps):

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

Result (type 4, 256 leaves):

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

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

$$\left.8\,i\sqrt{2}\sqrt{-\frac{i\left(-2+x\right)}{\left(-i+\sqrt{3}\right)x}}\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-\frac{4i}{x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{-i+\sqrt{3}}\right]\right)$$

Problem 771: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 17 leaves, 3 steps):

$$-\frac{\text{EllipticF}\left[\text{ArcSin}[1-x],-\frac{1}{3}\right]}{\sqrt{3}}$$

Result (type 4, 100 leaves):

$$-\frac{(-1)^{1/3}\,(-2+x)^2\sqrt{\frac{x\left(-1+i\sqrt{3}+x\right)}{(-2+x)^2}}\,\sqrt{\frac{-2+x-(-1)^{1/3}x}{-2+x}}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{-\frac{(-1)^{2/3}x}{-2+x}}\right],(-1)^{2/3}\right]}{\sqrt{-x\left(-8+8x-4x^2+x^3\right)}}$$

Problem 772: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 73 leaves, 6 steps):

$$\frac{\left(5+(-1+x)^2\right)(-1+x)}{24\sqrt{3-2(-1+x)^2-(-1+x)^4}}+\frac{\text{EllipticE}\left[\text{ArcSin}[1-x],-\frac{1}{3}\right]}{8\sqrt{3}}-\frac{\text{EllipticF}\left[\text{ArcSin}[1-x],-\frac{1}{3}\right]}{4\sqrt{3}}$$

Result (type 4, 298 leaves):

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

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

$$\left.\left.\left.4i\sqrt{2}\sqrt{\frac{i x}{\left(i+\sqrt{3}\right)(-2+x)}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-i+\sqrt{3}-\frac{4i}{-2+x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{i+\sqrt{3}}\right]\right)\right)\right)\Big/\left(96\left(-x\left(-8+8x-4x^2+x^3\right)\right)^{3/2}\right)$$

Problem 773: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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

$$\frac{\left(5+(-1+x)^2\right)(-1+x)}{72\left(3-2(-1+x)^2-(-1+x)^4\right)^{3/2}}+\frac{\left(26+7(-1+x)^2\right)(-1+x)}{432\sqrt{3-2(-1+x)^2-(-1+x)^4}}+\frac{7\,\text{EllipticE}\left[\text{ArcSin}[1-x],-\frac{1}{3}\right]}{144\sqrt{3}}-\frac{11\,\text{EllipticF}\left[\text{ArcSin}[1-x],-\frac{1}{3}\right]}{144\sqrt{3}}$$

Result (type 4, 327 leaves):

$$\left((-2+x)^3 x^2 \left(4-2x+x^2\right)^2\right.$$

$$\left(-\frac{7x\left(4-2x+x^2\right)}{-2+x}+\frac{36+216x-622x^2+670x^3-445x^4+187x^5-49x^6+7x^7}{(-2+x)^2 x \left(4-2x+x^2\right)}+\frac{7\,i\sqrt{2}\,x\sqrt{\frac{4-2x+x^2}{(-2+x)^2}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-i+\sqrt{3}-\frac{4i}{-2+x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{i+\sqrt{3}}\right]}{\sqrt{\frac{i x}{\left(i+\sqrt{3}\right)(-2+x)}}}-19\right.$$

$$\left.\left. i\sqrt{2}\,(-2+x)\sqrt{\frac{i x}{\left(i+\sqrt{3}\right)(-2+x)}}\sqrt{\frac{4-2x+x^2}{(-2+x)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-i+\sqrt{3}-\frac{4i}{-2+x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{i+\sqrt{3}}\right]\right)\right) \Big/ \left(432\left(-x\left(-8+8x-4x^2+x^3\right)\right)^{5/2}\right)$$

Problem 774: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \left(4ac+4c^2x^2+4cdx^3+d^2x^4\right)^{3/2} dx$$

Optimal (type 4, 730 leaves, 6 steps):

$$\frac{1}{7}\left(\frac{c}{d}+x\right)\left(4 a c+4 c^2 x^2+4 c d x^3+d^2 x^4\right)^{3/2}+$$

$$\frac{2 c\left(\frac{c}{d}+x\right)\sqrt{4 a c+4 c^2 x^2+4 c d x^3+d^2 x^4}\left(7 c^3+20 a d^2-3 c d^2\left(\frac{c}{d}+x\right)^2\right)}{35 d^2}-\frac{16 c^3\left(c^3+8 a d^2\right)\left(\frac{c}{d}+x\right)\sqrt{4 a c+4 c^2 x^2+4 c d x^3+d^2 x^4}}{35 d^2\sqrt{c^3+4 a d^2}\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4 a d^2}}\right)}+$$

$$\left(16 c^{13/4}\left(c^3+4 a d^2\right)^{3/4}\left(c^3+8 a d^2\right)\sqrt{\frac{d^2\left(4 a c+4 c^2 x^2+4 c d x^3+d^2 x^4\right)}{\left(c^3+4 a d^2\right)\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4 a d^2}}\right)^2}}\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4 a d^2}}\right)\right.$$

$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c+d x}{c^{1/4}\left(c^3+4 a d^2\right)^{1/4}}\right],\frac{1}{2}\left(1+\frac{c^{3/2}}{\sqrt{c^3+4 a d^2}}\right)\right]\right)\Big/\left(35 d^5\sqrt{4 a c+4 c^2 x^2+4 c d x^3+d^2 x^4}\right)+$$

$$\left(8 c^{7/4}\left(c^3+4 a d^2\right)^{3/4}\left(\sqrt{c^3+4 a d^2}\left(c^3+5 a d^2\right)-c^{3/2}\left(c^3+8 a d^2\right)\right)\sqrt{\frac{d^2\left(4 a c+4 c^2 x^2+4 c d x^3+d^2 x^4\right)}{\left(c^3+4 a d^2\right)\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4 a d^2}}\right)^2}}\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4 a d^2}}\right)\right.$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c+d x}{c^{1/4}\left(c^3+4 a d^2\right)^{1/4}}\right],\frac{1}{2}\left(1+\frac{c^{3/2}}{\sqrt{c^3+4 a d^2}}\right)\right]\right)\Big/\left(35 d^5\sqrt{4 a c+4 c^2 x^2+4 c d x^3+d^2 x^4}\right)$$

Result (type 4, 10 468 leaves) :

$$\sqrt{4 a c+4 c^2 x^2+4 c d x^3+d^2 x^4}\left(\frac{4 c^2\left(2 c^3+15 a d^2\right)}{35 d^3}-\frac{4 c\left(c^3-15 a d^2\right) x}{35 d^2}+\frac{2 c^3 x^2}{35 d}+\frac{34 c^2 x^3}{35}+\frac{5}{7} c d x^4+\frac{d^2 x^5}{7}\right)+$$

$$\frac{1}{35 d^3} 16 c^2\left(\left(2 a c^3 d\left(\frac{-c-\sqrt{c^2-2 i\sqrt{a}\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2 i\sqrt{a}\sqrt{c}\,d}}{d}\right)\sqrt{\frac{\left(-\frac{-c+\sqrt{c^2-2 i\sqrt{a}\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2 i\sqrt{a}\sqrt{c}\,d}}{d}\right)\left(-\frac{-c-\sqrt{c^2-2 i\sqrt{a}\sqrt{c}\,d}}{d}+x\right)}{\left(-\frac{-c-\sqrt{c^2-2 i\sqrt{a}\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2 i\sqrt{a}\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2 i\sqrt{a}\sqrt{c}\,d}}{d}+x\right)}}\right.\right.$$

$$\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2\sqrt{\frac{\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\sqrt{\frac{\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)}{\left(\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)}\right]\right)\Big/$$

$$\left(\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

$$\left.\sqrt{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}\right)+$$

$$\left(40\,a^2\,d^3\left(\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\sqrt{\frac{\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}\right.$$

$$\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2 \sqrt{\frac{\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\sqrt{\frac{\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}\Big],$$

$$\frac{\left(\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)}{\left(\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)}\Big]\Big) \Big/$$

$$\Bigg(\Bigg(\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)$$

$$\sqrt{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}\Bigg) - \Bigg(8\,c^5\left(\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)$$

$$\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2 \sqrt{\frac{\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\,\left(-\frac{-c-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{d\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\sqrt{\frac{\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\,\left(-\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{d\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\sqrt{\frac{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}$$

$$\left(-\frac{1}{d}\left(-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\right],\right.$$

$$\left.\frac{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\right]+\frac{1}{d}2\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\;\text{EllipticPi}\left[\frac{-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}}{-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}},\right.$$

$$\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\right],$$

$$\left.\left.\frac{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\right]\right)\right)\Bigg/\left(\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

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

$$\left(64\, a\, c^2\, d^2 \left(\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2\right.$$

$$\sqrt{\frac{\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{d\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\sqrt{\frac{\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{d\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\sqrt{\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}$$

$$\left(-\frac{1}{d}\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\mathtt{EllipticF}\left[\mathtt{ArcSin}\left[\sqrt{\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\right]+\frac{1}{d}2\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\;\mathtt{EllipticPi}\left[\frac{-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}}{-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}},\right.$$

$$\mathtt{ArcSin}\left[\sqrt{\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\right],$$

$$\left.\left.\left.\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\right]\right)\right)\Bigg/$$

$$\left(\left(\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.\right.$$

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

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

$$2\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2$$

$$\sqrt{\frac{\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{d\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\sqrt{\frac{\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{d\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

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

$$\left.\frac{-c-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\,\text{EllipticE}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\Big],$$

$$\left.\frac{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\right]+\left(d\left(\frac{\left(-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)}{d}-\right.\right.$$

$$\left.\left.\frac{\left(-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)}{d}\right)\text{EllipticF}\Big[\right.$$

$$\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\Big],$$

$$\left.\left.\frac{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\right]\right)\Big/\left(2\,\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right.$$

$$\left.\left.\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right)\right)-\left(\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\right.\right.$$

$$\left.\frac{-c-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\text{EllipticPi}\Big[\frac{-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}}{-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}},$$

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

$$\left.\left.\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\right]\right)\Bigg/\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\Bigg)\Bigg)-$$

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

$$\left(-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)+2\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)$$

$$\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2\sqrt{\frac{\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{d\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\sqrt{\frac{\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{d\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\sqrt{\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}$$

$$\Bigg(\frac{1}{2\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}d\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)$$

$$\text{EllipticE}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\Big],$$

$$\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]+\Bigg(d\Bigg(\frac{\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)}{d}-$$

$$\frac{\left(-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)}{d}\Bigg)\text{EllipticF}\Big[$$

$$\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\Big],$$

$$\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]\Bigg)\Big/\Bigg(2\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}$$

$$\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\Bigg)-\Bigg(\Bigg(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-$$

$$\left.\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\,\texttt{EllipticPi}\left[\frac{-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}}{-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}},\right.$$

$$\texttt{ArcSin}\left[\sqrt{\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\right],$$

$$\left.\left.\left.\left.\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\right]\right)\middle/\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right)\right)\right)$$

Problem 775: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\sqrt{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}\,dx$$

Optimal (type 4, 622 leaves, 5 steps) :

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

$$\left(2\,c^{9/4}\left(c^3+4\,a\,d^2\right)^{3/4}\sqrt{\frac{d^2\left(4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4\right)}{\left(c^3+4\,a\,d^2\right)\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4\,a\,d^2}}\right)^2}}\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4\,a\,d^2}}\right)\right.$$

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

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

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

Result (type 4, 5218 leaves):

$$\left(\frac{c}{3\,d}+\frac{x}{3}\right)\sqrt{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}+$$

$$\frac{1}{3\,d}2\,c\left(\left(8\,a\,d\left(\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\sqrt{\frac{\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}\right.\right.$$

$$\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2 \sqrt{\frac{\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\sqrt{\frac{\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)}{\left(\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)}\right]\right)\Big/$$

$$\left(\left(\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.\right.$$

$$\left.\sqrt{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}\right)-\left(8\,c^2\left(\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

$$\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2 \sqrt{\frac{\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{d\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\sqrt{\frac{\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\,\left(-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{d\,\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\,\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\sqrt{\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\,\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\,\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}$$

$$\left(-\frac{1}{d}\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\,\mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\sqrt{\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\,\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\,\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\right],\right.$$

$$\left.\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\right]+\frac{1}{d}2\,\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\,\mathrm{EllipticPi}\left[\frac{-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}}{-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}},\right.$$

$$\mathrm{ArcSin}\left[\sqrt{\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\,\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\,\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\right],$$

$$\left.\left.\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\right]\right)\right)\Bigg/\left(\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

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

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

$$2\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2$$

$$\sqrt{\frac{\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{d\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\sqrt{\frac{\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{d\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

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

$$\frac{-c-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)\,\texttt{EllipticE}\Big[\texttt{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\Big],$$

$$\frac{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]+\Bigg(d\,\Bigg(\frac{\left(-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)}{d}-$$

$$\frac{\left(-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)}{d}\Bigg)\ \text{EllipticF}\Big[$$

$$\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\Big],$$

$$\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]\Bigg)\Big/\Bigg(2\,\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}$$

$$\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\Bigg)\Bigg)-\Bigg(\Bigg(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-$$

$$\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)\ \text{EllipticPi}\Big[\frac{-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}}{-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}},$$

$$\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\Big],$$

$$\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]\Bigg)\Big/\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\Bigg)\Bigg)\Bigg)$$

Problem 776: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 227 leaves, 2 steps):

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

Result (type 4, 822 leaves):

$$\left(2 \left(-c + \sqrt{c^2 - 2 i \sqrt{a} \sqrt{c} d} - d x\right) \left(c + \sqrt{c^2 - 2 i \sqrt{a} \sqrt{c} d} + d x\right) \sqrt{-\frac{\sqrt{c^2 - 2 i \sqrt{a} \sqrt{c} d} \left(c - \sqrt{c^2 + 2 i \sqrt{a} \sqrt{c} d} + d x\right)}{\left(\sqrt{c^2 - 2 i \sqrt{a} \sqrt{c} d} + \sqrt{c^2 + 2 i \sqrt{a} \sqrt{c} d}\right) \left(-c + \sqrt{c^2 - 2 i \sqrt{a} \sqrt{c} d} - d x\right)}} \right.$$

$$\sqrt{-\frac{\sqrt{c^2 - 2 i \sqrt{a} \sqrt{c} d} \left(c + \sqrt{c^2 + 2 i \sqrt{a} \sqrt{c} d} + d x\right)}{\left(\sqrt{c^2 - 2 i \sqrt{a} \sqrt{c} d} - \sqrt{c^2 + 2 i \sqrt{a} \sqrt{c} d}\right) \left(-c + \sqrt{c^2 - 2 i \sqrt{a} \sqrt{c} d} - d x\right)}} \text{EllipticF}\Big[$$

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

$$\left(d \sqrt{c^2 - 2 i \sqrt{a} \sqrt{c} d} \sqrt{\frac{\left(\sqrt{c^2 - 2 i \sqrt{a} \sqrt{c} d} - \sqrt{c^2 + 2 i \sqrt{a} \sqrt{c} d}\right) \left(c + \sqrt{c^2 - 2 i \sqrt{a} \sqrt{c} d} + d x\right)}{\left(\sqrt{c^2 - 2 i \sqrt{a} \sqrt{c} d} + \sqrt{c^2 + 2 i \sqrt{a} \sqrt{c} d}\right) \left(-c + \sqrt{c^2 - 2 i \sqrt{a} \sqrt{c} d} - d x\right)}} \sqrt{4 a c + x^2 \left(2 c + d x\right)^2} \right)$$

Problem 777: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 674 leaves, 5 steps):

$$-\frac{\left(\frac{c}{d}+x\right)\left(c^3-4 a d^2-c d^2\left(\frac{c}{d}+x\right)^2\right)}{8 a c\left(c^3+4 a d^2\right)\sqrt{4 a c+4 c^2 x^2+4 c d x^3+d^2 x^4}}-\frac{d^2\left(\frac{c}{d}+x\right)\sqrt{4 a c+4 c^2 x^2+4 c d x^3+d^2 x^4}}{8 a\left(c^3+4 a d^2\right)^{3/2}\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4 a d^2}}\right)}+$$

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

$$\left(8 a d\left(c^3+4 a d^2\right)^{1/4}\sqrt{4 a c+4 c^2 x^2+4 c d x^3+d^2 x^4}\right)+\left(\left(c^3+4 a d^2-c^{3/2}\sqrt{c^3+4 a d^2}\right)\sqrt{\frac{d^2\left(4 a c+4 c^2 x^2+4 c d x^3+d^2 x^4\right)}{\left(c^3+4 a d^2\right)\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4 a d^2}}\right)^2}}\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4 a d^2}}\right)\right.$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c+d x}{c^{1/4}\left(c^3+4 a d^2\right)^{1/4}}\right],\frac{1}{2}\left(1+\frac{c^{3/2}}{\sqrt{c^3+4 a d^2}}\right)\right]\right)\Bigg/\left(16 a c^{5/4} d\left(c^3+4 a d^2\right)^{3/4}\sqrt{4 a c+4 c^2 x^2+4 c d x^3+d^2 x^4}\right)$$

Result (type 4, 5276 leaves):

$$\frac{4 a c d+2 c^3 x+4 a d^2 x+3 c^2 d x^2+c d^2 x^3}{8 a c\left(c^3+4 a d^2\right)\sqrt{4 a c+4 c^2 x^2+4 c d x^3+d^2 x^4}}+\frac{1}{8 a c\left(c^3+4 a d^2\right)}$$

$$d\left(\left(8 a d\left(\frac{-c-\sqrt{c^2-2\,i\sqrt{a}\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\sqrt{a}\sqrt{c}\,d}}{d}\right)\sqrt{\frac{\left(-\frac{-c+\sqrt{c^2-2\,i\sqrt{a}\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\sqrt{a}\sqrt{c}\,d}}{d}\right)\left(-\frac{-c-\sqrt{c^2-2\,i\sqrt{a}\sqrt{c}\,d}}{d}+x\right)}{\left(-\frac{-c-\sqrt{c^2-2\,i\sqrt{a}\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\sqrt{a}\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\sqrt{a}\sqrt{c}\,d}}{d}+x\right)}}\right.\right.$$

$$\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2 \sqrt{\frac{\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\sqrt{\frac{\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)}{\left(\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)}\right]\right) \Big/$$

$$\left(\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

$$\left.\sqrt{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}\right)-\left(8\,c^2\left(\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

$$\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2 \sqrt{\frac{\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{d\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\sqrt{\frac{\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\,\left(-\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}{d\,\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\,\left(-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)}}$$

$$\sqrt{\frac{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\,\left(c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\,\left(-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}$$

$$\left(-\frac{1}{d}\left(-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\,\left(c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\,\left(-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\right],\right.$$

$$\left.\frac{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\right]+\frac{1}{d}2\,\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\,\text{EllipticPi}\left[\frac{-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}}{-\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}},\right.$$

$$\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\,\left(c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\,\left(-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\right],$$

$$\left.\left.\frac{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\right]\right)\right)\Big/\left(\left(-\frac{-c-\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,\mathbb{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

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

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

$$2\left(-\frac{-c-\sqrt{c^2-2 i \sqrt{a} \sqrt{c} d}}{d}+\frac{-c+\sqrt{c^2+2 i \sqrt{a} \sqrt{c} d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2 i \sqrt{a} \sqrt{c} d}}{d}+x\right)^2$$

$$\sqrt{\frac{\sqrt{c^2-2 i \sqrt{a} \sqrt{c} d}\left(-\frac{-c-\sqrt{c^2+2 i \sqrt{a} \sqrt{c} d}}{d}+x\right)}{d\left(-\frac{-c-\sqrt{c^2-2 i \sqrt{a} \sqrt{c} d}}{d}+\frac{-c-\sqrt{c^2+2 i \sqrt{a} \sqrt{c} d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2 i \sqrt{a} \sqrt{c} d}}{d}+x\right)}}$$

$$\sqrt{\frac{\sqrt{c^2-2 i \sqrt{a} \sqrt{c} d}\left(-\frac{-c+\sqrt{c^2+2 i \sqrt{a} \sqrt{c} d}}{d}+x\right)}{d\left(-\frac{-c-\sqrt{c^2-2 i \sqrt{a} \sqrt{c} d}}{d}+\frac{-c+\sqrt{c^2+2 i \sqrt{a} \sqrt{c} d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2 i \sqrt{a} \sqrt{c} d}}{d}+x\right)}}$$

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

$$\left.\frac{-c-\sqrt{c^2+2 i \sqrt{a} \sqrt{c} d}}{d}\right) \text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{c^2-2 i \sqrt{a} \sqrt{c} d}-\sqrt{c^2+2 i \sqrt{a} \sqrt{c} d}\right)\left(c+\sqrt{c^2-2 i \sqrt{a} \sqrt{c} d}+d x\right)}{\left(\sqrt{c^2-2 i \sqrt{a} \sqrt{c} d}+\sqrt{c^2+2 i \sqrt{a} \sqrt{c} d}\right)\left(-c+\sqrt{c^2-2 i \sqrt{a} \sqrt{c} d}-d x\right)}}\right],\right.$$

$$\left.\frac{\left(\sqrt{c^2-2 i \sqrt{a} \sqrt{c} d}+\sqrt{c^2+2 i \sqrt{a} \sqrt{c} d}\right)^2}{\left(\sqrt{c^2-2 i \sqrt{a} \sqrt{c} d}-\sqrt{c^2+2 i \sqrt{a} \sqrt{c} d}\right)^2}\right]+\left(d\left(\frac{\left(-c+\sqrt{c^2-2 i \sqrt{a} \sqrt{c} d}\right)\left(-\frac{-c+\sqrt{c^2-2 i \sqrt{a} \sqrt{c} d}}{d}-\frac{-c+\sqrt{c^2+2 i \sqrt{a} \sqrt{c} d}}{d}\right)}{d}-\right.\right.$$

$$\left(\frac{\left(-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)}{d}\right)\text{EllipticF}\Big[$$

$$\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\Big],$$

$$\left.\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]\right)\Bigg/\left(2\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right.$$

$$\left.\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right)-\left(\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\right.\right.$$

$$\left.\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\text{EllipticPi}\Big[\frac{-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}}{-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}},$$

$$\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)}}\Big],$$

$$\left.\left.\left.\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]\right)\Bigg/\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right)\right)\right)$$

Problem 778: Result more than twice size of optimal antiderivative.

$$\int \sqrt{8 a e^2 - d^3 x + 8 d e^2 x^3 + 8 e^3 x^4}\, dx$$

Optimal (type 4, 663 leaves, 5 steps):

$$\frac{1}{3}\left(\frac{d}{4 e}+x\right)\sqrt{8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4}-\frac{2 d^2\left(\frac{d}{4 e}+x\right)\sqrt{8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4}}{\sqrt{5 d^4+256 a e^3}\left(1+\frac{16 e^2\left(\frac{d}{4 e}+x\right)^2}{\sqrt{5 d^4+256 a e^3}}\right)}+$$

$$\left(d^2\left(5 d^4+256 a e^3\right)^{3/4}\sqrt{\frac{e\left(8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4\right)}{\left(5 d^4+256 a e^3\right)\left(1+\frac{16 e^2\left(\frac{d}{4 e}+x\right)^2}{\sqrt{5 d^4+256 a e^3}}\right)^2}}\left(1+\frac{16 e^2\left(\frac{d}{4 e}+x\right)^2}{\sqrt{5 d^4+256 a e^3}}\right)\right.$$

$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d+4 e x}{\left(5 d^4+256 a e^3\right)^{1/4}}\right],\frac{1}{2}\left(1+\frac{3 d^2}{\sqrt{5 d^4+256 a e^3}}\right)\right]\right)\Big/\left(8\sqrt{2}\, e^2\sqrt{8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4}\right)+$$

$$\left(\left(5 d^4+256 a e^3\right)^{1/4}\left(5 d^4+256 a e^3-3 d^2\sqrt{5 d^4+256 a e^3}\right)\sqrt{\frac{e\left(8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4\right)}{\left(5 d^4+256 a e^3\right)\left(1+\frac{16 e^2\left(\frac{d}{4 e}+x\right)^2}{\sqrt{5 d^4+256 a e^3}}\right)^2}}\left(1+\frac{16 e^2\left(\frac{d}{4 e}+x\right)^2}{\sqrt{5 d^4+256 a e^3}}\right)\right.$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d+4 e x}{\left(5 d^4+256 a e^3\right)^{1/4}}\right],\frac{1}{2}\left(1+\frac{3 d^2}{\sqrt{5 d^4+256 a e^3}}\right)\right]\right)\Big/\left(48\sqrt{2}\, e^2\sqrt{8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4}\right)$$

Result (type 4, 7543 leaves):

$$\left(\frac{d}{12 e}+\frac{x}{3}\right)\sqrt{8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4}+\frac{1}{24 e}$$

$$\Bigg(\Bigg(2\, d^4 \left(\frac{-d-\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}-\frac{-d+\sqrt{3\, d^2+2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}\right) \sqrt{\frac{\left(-\frac{-d+\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}+\frac{-d+\sqrt{3\, d^2+2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}\right) \left(-\frac{-d-\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}+x\right)}{\left(-\frac{-d-\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}+\frac{-d+\sqrt{3\, d^2+2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}\right) \left(-\frac{-d+\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}+x\right)}}$$

$$\left(-\frac{-d+\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}+x\right)^2 \sqrt{\frac{\left(-\frac{-d-\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}+\frac{-d+\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}\right) \left(-\frac{-d-\sqrt{3\, d^2+2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}+x\right)}{\left(-\frac{-d-\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}+\frac{-d-\sqrt{3\, d^2+2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}\right) \left(-\frac{-d+\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}+x\right)}}$$

$$\sqrt{\frac{\left(-\frac{-d-\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}+\frac{-d+\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}\right) \left(-\frac{-d+\sqrt{3\, d^2+2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}+x\right)}{\left(-\frac{-d-\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}+\frac{-d+\sqrt{3\, d^2+2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}\right) \left(-\frac{-d+\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\frac{-d+\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}+\frac{-d+\sqrt{3\, d^2+2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}\right) \left(-\frac{-d-\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}+x\right)}{\left(-\frac{-d-\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}+\frac{-d+\sqrt{3\, d^2+2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}\right) \left(-\frac{-d+\sqrt{3\, d^2-2\, \sqrt{d^4-64\, a\, e^3}}}{4\, e}+x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)}{\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)}\right]\right) \Big/$$

$$\left(\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.$$

$$\left.\sqrt{8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4}\right)+\left(256 a e^3\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.$$

$$\sqrt{\frac{\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}{\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}}$$

$$\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)^2 \sqrt{\frac{\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}{\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}}$$

$$\sqrt{\frac{\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}{\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}{\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}}\right],\right.$$

$$\left.\frac{\left(\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)}{\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)}\right]\right) \Big/$$

$$\left(\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.$$

$$\left.\sqrt{8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4}\right)-$$

$$\left(12 d^3 e\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)^2\right.$$

$$\sqrt{\frac{\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\,\left(-\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}{e\,\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\,\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}}$$

$$\sqrt{\frac{\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\,\left(-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}{e\,\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\,\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}}$$

$$\sqrt{\frac{\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)\,\left(d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\right)}{\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)\,\left(-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\right)}}$$

$$\left(-\frac{1}{4\,e}\left(-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\right)\,\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)\right.\right.}\right.$$

$$\left.\left(d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\right)\right)\Big/\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)\right.$$

$$\left.\left.\left.\left(-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\right)\right)\right)\Big],\ \frac{\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)^2}{\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)^2}\Big]+\frac{1}{2\,e}$$

$$\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\ \texttt{EllipticPi}\Bigg[\frac{-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}}{-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}},\ \texttt{ArcSin}\Bigg[\sqrt{\Bigg(\Bigg(\Bigg(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\ -}$$

$$\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\Bigg)\left(d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\right)\Bigg)\Bigg/\Bigg(\Bigg(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\Bigg)$$

$$\left(-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\right)\Bigg)\Bigg)\Bigg],\ \frac{\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)^2}{\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)^2}\Bigg]\Bigg)\Bigg/$$

$$\Bigg(\Bigg(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)\Bigg(\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)$$

$$\sqrt{8\,a\,e^2-d^3\,x+8\,d\,e^2\,x^3+8\,e^3\,x^4}\Bigg)-\frac{1}{\sqrt{8\,a\,e^2-d^3\,x+8\,d\,e^2\,x^3+8\,e^3\,x^4}}$$

$$24\,d^2\,e^2\Bigg(\Bigg(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\Bigg)\Bigg(-\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\Bigg)\Bigg(-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\Bigg)+$$

$$\frac{1}{2}\Bigg(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)\Bigg(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\Bigg)^2$$

$$\sqrt{\frac{\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}\left(-\frac{-d-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}{e\left(-\frac{-d-\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\left(-\frac{-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}}$$

$$\sqrt{\frac{\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}\left(-\frac{-d+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}{e\left(-\frac{-d-\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\left(-\frac{-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}}$$

$$\sqrt{\frac{\left(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\right)\left(d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\right)}{\left(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\right)\left(-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\right)}}$$

$$\Bigg(\Bigg(2\,e\left(-\frac{-d-\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\,\texttt{EllipticE}\Big[\texttt{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}\,-}$$

$$\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)\left(d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\right)\Big)\Big/\Big(\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)$$

$$\left(-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\right)\Big)\Big)}\Big],\ \frac{\left(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\right)^2}{\left(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\right)^2}\Big]\Bigg)\Big/$$

$$\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}\right)+\left(2 e\left(\frac{\left(-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}\right)\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)}{4 e}-\right.\right.$$

$$\left.\left.\frac{\left(-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}\right)\left(\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)}{4 e}\right)\right) \text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-\right.\right.\right.\right.}\right.\right.$$

$$\left.\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)\left(d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}+4 e x\right)\Big) \Big/ \left(\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)\right.$$

$$\left.\left.\left.\left(-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-4 e x\right)\right)\right)\right],\ \frac{\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)^2}{\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)^2}\Bigg]\Bigg) \Big/$$

$$\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right)-$$

$$\left(\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.$$

$$\text{EllipticPi}\left[\frac{-\frac{-d-\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2\sqrt{d^4-64 a e^3}}}{4 e}}{-\frac{-d+\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2\sqrt{d^4-64 a e^3}}}{4 e}},\ \text{ArcSin}\left[\right.\right.$$

$$\sqrt{\left(\left(\left(\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2\sqrt{d^4-64 a e^3}}\right)\left(d+\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}+4 e x\right)\right)\Big/\left(\left(\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}+\sqrt{3 d^2+2\sqrt{d^4-64 a e^3}}\right)\left(-d+\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}-4 e x\right)\right)\right)}\Big],$$

$$\left.\left.\frac{\left(\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}+\sqrt{3 d^2+2\sqrt{d^4-64 a e^3}}\right)^2}{\left(\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2\sqrt{d^4-64 a e^3}}\right)^2}\right]\right)\Big/\left(-\frac{-d+\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2\sqrt{d^4-64 a e^3}}}{4 e}\right)\Bigg)\Bigg)\Bigg)$$

Problem 779: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4}}\, dx$$

Optimal (type 4, 235 leaves, 2 steps):

$$\left(\left(5 d^4+256 a e^3\right)^{1/4}\sqrt{\frac{e\left(8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4\right)}{\left(5 d^4+256 a e^3\right)\left(1+\frac{16 e^2\left(\frac{d}{4 e}+x\right)^2}{\sqrt{5 d^4+256 a e^3}}\right)^2}}\left(1+\frac{16 e^2\left(\frac{d}{4 e}+x\right)^2}{\sqrt{5 d^4+256 a e^3}}\right)\right.$$

$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d+4 e x}{\left(5 d^4+256 a e^3\right)^{1/4}}\right],\ \frac{1}{2}\left(1+\frac{3 d^2}{\sqrt{5 d^4+256 a e^3}}\right)\right]\right)\Big/\left(\sqrt{2}\, e\sqrt{8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4}\right)$$

Result (type 4, 1065 leaves):

$$-\Bigg(\Bigg(\bigg(-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-4 e x\bigg)\bigg(d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}+4 e x\bigg)$$

$$\sqrt{-\frac{\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}\left(d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}+4 e x\right)}{\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)\left(-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-4 e x\right)}}$$

$$\sqrt{\Bigg(\bigg(3 d^2-2 \sqrt{d^4-64 a e^3}-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}\,\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}+}$$

$$d\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)+4 e\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right) x\bigg)\Big/$$

$$\bigg(\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)\left(-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-4 e x\right)\bigg)\Bigg)$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)\left(d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}+4 e x\right)}{\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)\left(-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-4 e x\right)}}\right],\right.$$

$$\left.\frac{\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)^2}{\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)^2}\right]\Bigg)\Bigg/\Bigg(2 e\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)$$

$$\sqrt{\frac{\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}\left(-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}-4 e x\right)}{\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)\left(-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-4 e x\right)}}\ \sqrt{8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4}\Bigg)\Bigg)$$

Problem 780: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(8 a e^2 - d^3 x + 8 d e^2 x^3 + 8 e^3 x^4\right)^{3/2}} \, dx$$

Optimal (type 4, 748 leaves, 5 steps):

$$\frac{4 e \left(\frac{d}{4 e} + x\right) \left(13 d^4 - 256 a e^3 - 48 d^2 e^2 \left(\frac{d}{4 e} + x\right)^2\right)}{\left(5 d^8 - 64 a d^4 e^3 - 16384 a^2 e^6\right) \sqrt{8 a e^2 - d^3 x + 8 d e^2 x^3 + 8 e^3 x^4}} + \frac{384 d^2 e^2 \left(\frac{d}{4 e} + x\right) \sqrt{8 a e^2 - d^3 x + 8 d e^2 x^3 + 8 e^3 x^4}}{\left(d^4 - 64 a e^3\right) \left(5 d^4 + 256 a e^3\right)^{3/2} \left(1 + \frac{16 e^2 \left(\frac{d}{4 e} + x\right)^2}{\sqrt{5 d^4 + 256 a e^3}}\right)} -$$

$$\left(12 \sqrt{2} \, d^2 \sqrt{\frac{e \left(8 a e^2 - d^3 x + 8 d e^2 x^3 + 8 e^3 x^4\right)}{\left(5 d^4 + 256 a e^3\right) \left(1 + \frac{16 e^2 \left(\frac{d}{4 e} + x\right)^2}{\sqrt{5 d^4 + 256 a e^3}}\right)^2}} \left(1 + \frac{16 e^2 \left(\frac{d}{4 e} + x\right)^2}{\sqrt{5 d^4 + 256 a e^3}}\right) \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{d + 4 e x}{\left(5 d^4 + 256 a e^3\right)^{1/4}}\right], \frac{1}{2} \left(1 + \frac{3 d^2}{\sqrt{5 d^4 + 256 a e^3}}\right)\right]\right) \Big/$$

$$\left(\left(d^4 - 64 a e^3\right) \left(5 d^4 + 256 a e^3\right)^{1/4} \sqrt{8 a e^2 - d^3 x + 8 d e^2 x^3 + 8 e^3 x^4}\right) -$$

$$\left(2 \sqrt{2} \left(5 d^4 + 256 a e^3 - 3 d^2 \sqrt{5 d^4 + 256 a e^3}\right) \sqrt{\frac{e \left(8 a e^2 - d^3 x + 8 d e^2 x^3 + 8 e^3 x^4\right)}{\left(5 d^4 + 256 a e^3\right) \left(1 + \frac{16 e^2 \left(\frac{d}{4 e} + x\right)^2}{\sqrt{5 d^4 + 256 a e^3}}\right)^2}} \left(1 + \frac{16 e^2 \left(\frac{d}{4 e} + x\right)^2}{\sqrt{5 d^4 + 256 a e^3}}\right)\right.$$

$$\left.\text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d + 4 e x}{\left(5 d^4 + 256 a e^3\right)^{1/4}}\right], \frac{1}{2} \left(1 + \frac{3 d^2}{\sqrt{5 d^4 + 256 a e^3}}\right)\right]\right) \Big/ \left(\left(d^4 - 64 a e^3\right) \left(5 d^4 + 256 a e^3\right)^{3/4} \sqrt{8 a e^2 - d^3 x + 8 d e^2 x^3 + 8 e^3 x^4}\right)$$

Result (type 4, 7629 leaves):

$$\frac{2 \left(-5 d^5 + 128 a d e^3 - 8 d^4 e x + 512 a e^4 x + 72 d^3 e^2 x^2 + 96 d^2 e^3 x^3\right)}{\left(-d^4 + 64 a e^3\right) \left(5 d^4 + 256 a e^3\right) \sqrt{8 a e^2 - d^3 x + 8 d e^2 x^3 + 8 e^3 x^4}} - \frac{1}{\left(d^4 - 64 a e^3\right) \left(5 d^4 + 256 a e^3\right)} 8 e$$

$$\Bigg(\Bigg(2\,d^4\left(\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\sqrt{\frac{\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}{\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}}$$

$$\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)^2\sqrt{\frac{\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\left(-\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}{\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}}$$

$$\sqrt{\frac{\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\left(-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}{\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}}$$

$$\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{\frac{\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}{\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}}\Bigg],$$

$$\left.\left.\frac{\left(\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)}{\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)}\right]\right) \Big/$$

$$\left(\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.$$

$$\left.\sqrt{8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4}\right)+\left(256 a e^3\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.$$

$$\sqrt{\frac{\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}{\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}}$$

$$\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)^2 \sqrt{\frac{\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}{\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}}$$

$$\sqrt{\frac{\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}{\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}{\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}}\right],\right.$$

$$\left.\frac{\left(\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)}{\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)}\right]\right) \Big/$$

$$\left(\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.$$

$$\left.\sqrt{8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4}\right)-\left(12 d^3 e\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.$$

$$\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)^2 \sqrt{\frac{\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}} \left(-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}{e \left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right) \left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}}$$

$$\sqrt{\frac{\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}} \left(-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}{e \left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right) \left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)}}$$

$$\sqrt{\frac{\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right) \left(d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}+4 e x\right)}{\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right) \left(-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-4 e x\right)}}$$

$$\Bigg(-\frac{1}{4 e}\left(-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}\right) \text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{\Bigg(\Bigg(\Bigg(\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)}$$

$$\left(d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}+4 e x\right)\Bigg)\Bigg) \Big/ \Bigg(\Bigg(\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)$$

$$\left(-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-4 e x\right)\Bigg)\Bigg)\Bigg)\Bigg], \frac{\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)^2}{\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)^2}\Bigg]+\frac{1}{2 e}$$

$$\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}\;\text{EllipticPi}\Big[\frac{-\frac{-d-\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}}{-\frac{-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}},\;\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}\;-}$$

$$\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)\Big(d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\Big)\Big)\Big/\Big(\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)$$

$$\Big(-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\Big)\Big)\Big)}\Big],\;\frac{\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)^2}{\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)^2}\Big]\Big)\Big)\Big/$$

$$\Big(\Big(-\frac{-d-\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Big)\Big(\frac{-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Big)$$

$$\sqrt{8\,a\,e^2-d^3\,x+8\,d\,e^2\,x^3+8\,e^3\,x^4}\Big)-\frac{1}{\sqrt{8\,a\,e^2-d^3\,x+8\,d\,e^2\,x^3+8\,e^3\,x^4}}$$

$$24\,d^2\,e^2\Bigg(\Big(-\frac{-d-\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\Big)\Big(-\frac{-d-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\Big)\Big(-\frac{-d+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\Big)+$$

$$\frac{1}{2}\Big(-\frac{-d-\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Big)\Big(-\frac{-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\Big)^2$$

$$\sqrt{\frac{\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\,\left(-\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}{e\,\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\,\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}}$$

$$\sqrt{\frac{\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\,\left(-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}{e\,\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\,\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)}}$$

$$\sqrt{\left(\frac{\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)\,\left(d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\right)}{\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)\,\left(-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\right)}\right)}$$

$$\Bigg(\bigg(2\,e\,\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\,\texttt{EllipticE}\Big[$$

$$\texttt{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)\,\left(d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)\,\left(-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\right)\right)\right)\Big],$$

$$\frac{\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)^2}{\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)^2}\Big]\Big)\Big/\Big(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\Big)+$$

$$\Big(2\,e\,\Big(\frac{\left(-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\right)\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)}{4\,e}-$$

$$\frac{\left(-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\right)\left(\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)}{4\,e}\Big)\,\text{EllipticF}\Big[$$

$$\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\Big)\Big(d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\Big)\Big)\Big/\Big(\Big(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\Big)\Big(-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\Big)\Big)\Big)}\Big],$$

$$\frac{\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)^2}{\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)^2}\Big]\Big)\Big/\Big(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\,\Big(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+$$

$$\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Big)\Big)-\Big(\Big(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}-$$

$$\left.\frac{-d-\sqrt{3d^2+2\sqrt{d^4-64ae^3}}}{4e}-\frac{-d+\sqrt{3d^2+2\sqrt{d^4-64ae^3}}}{4e}\right)\text{EllipticPi}\left[\frac{-\frac{-d-\sqrt{3d^2-2\sqrt{d^4-64ae^3}}}{4e}+\frac{-d+\sqrt{3d^2+2\sqrt{d^4-64ae^3}}}{4e}}{-\frac{-d+\sqrt{3d^2-2\sqrt{d^4-64ae^3}}}{4e}+\frac{-d+\sqrt{3d^2+2\sqrt{d^4-64ae^3}}}{4e}},\right.$$

$$\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{3d^2-2\sqrt{d^4-64ae^3}}-\sqrt{3d^2+2\sqrt{d^4-64ae^3}}\right)\left(d+\sqrt{3d^2-2\sqrt{d^4-64ae^3}}+4ex\right)\right)\right/}\right.$$

$$\left.\left(\left(\sqrt{3d^2-2\sqrt{d^4-64ae^3}}+\sqrt{3d^2+2\sqrt{d^4-64ae^3}}\right)\left(-d+\sqrt{3d^2-2\sqrt{d^4-64ae^3}}-4ex\right)\right)\right)\right],$$

$$\left.\left.\left.\frac{\left(\sqrt{3d^2-2\sqrt{d^4-64ae^3}}+\sqrt{3d^2+2\sqrt{d^4-64ae^3}}\right)^2}{\left(\sqrt{3d^2-2\sqrt{d^4-64ae^3}}-\sqrt{3d^2+2\sqrt{d^4-64ae^3}}\right)^2}\right]\right)\Bigg/\left(-\frac{-d+\sqrt{3d^2-2\sqrt{d^4-64ae^3}}}{4e}+\frac{-d+\sqrt{3d^2+2\sqrt{d^4-64ae^3}}}{4e}\right)\right)\right)\right)$$

Problem 781: Result more than twice size of optimal antiderivative.

$$\int\left(a+8x-8x^2+4x^3-x^4\right)^{3/2}dx$$

Optimal (type 4, 452 leaves, 8 steps):

$$-\frac{16\,(7+2\,a)\left(1-\sqrt{4+a}\right)\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)(-1+x)}{35\,\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}+\frac{2}{35}\left(13+5\,a-3\,(-1+x)^2\right)\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}\,(-1+x)+$$

$$\frac{1}{7}\left(3+a-2\,(-1+x)^2-(-1+x)^4\right)^{3/2}(-1+x)+\frac{16\,(7+2\,a)\left(1-\sqrt{4+a}\right)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\,\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{35\,\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\,\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}+$$

$$\frac{4\,(3+a)\,(16+5\,a)\,\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\,\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{35\,\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\,\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}$$

Result (type 4, 6287 leaves) :

$$\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\left(\frac{1}{7}\,(-4-3\,a)+\frac{1}{35}\,(-32+15\,a)\,x+\frac{14\,x^2}{5}-\frac{66\,x^3}{35}+\frac{5\,x^4}{7}-\frac{x^5}{7}\right)+$$

$$\frac{4}{35}\left(\left(40\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right.\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\,\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\left(46\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\left(10\,a^2\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\;\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\,\right],\right.$$

$$\left.\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\,\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)+$$

$$\left(112\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\;\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\,\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.$$

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

$$\Bigg(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\Bigg)+$$

$$\Bigg(32\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\Bigg(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Bigg],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\Bigg[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},$$

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

$$\Bigg(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\Bigg)-\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$28\left(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+\right.$$

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

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

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

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\right.\right.$$

$$\left.\left.\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\middle/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)+$$

$$\Bigg(4\,\text{EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\Bigg)-$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}\,8\,a\,\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

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

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\ \sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\Bigg(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]+\Bigg(\Big(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)$$

$$\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\ \text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\,\right],\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\Bigg)\Bigg/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

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

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\Bigg)\Bigg/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\Bigg)\Bigg)$$

Problem 782: Result more than twice size of optimal antiderivative.

$$\int\sqrt{a+8x-8x^2+4x^3-x^4}\,dx$$

Optimal (type 4, 397 leaves, 7 steps):

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

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

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

Result (type 4, 3470 leaves) :

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

$$\frac{2}{3}\Bigg(\Bigg(4\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

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

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\left(4\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\ \sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\Bigg(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]+2\sqrt{-1-\sqrt{4+a}}\ \text{EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},$$

$$\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Big],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)-\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\ \sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\right.$$

$$\left.\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)\right)$$

Problem 783: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}\,dx$$

Optimal (type 4, 144 leaves, 3 steps):

$$\frac{\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}$$

Result (type 4, 540 leaves):

$$\left(2\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(1+\sqrt{-1+\sqrt{4+a}}-x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right.$$

$$\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\sqrt{a-x\left(-8+8x-4x^2+x^3\right)}\right)$$

Problem 784: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(a+8x-8x^2+4x^3-x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 437 leaves, 7 steps):

$$\frac{\left(5+a+(-1+x)^2\right)(-1+x)}{2\left(12+7a+a^2\right)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}-\frac{\left(1-\sqrt{4+a}\right)\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)(-1+x)}{2(3+a)(4+a)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+$$

$$\frac{\left(1-\sqrt{4+a}\right)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{2(3+a)(4+a)\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+$$

$$\frac{\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{2(4+a)\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}$$

Result (type 4, 3526 leaves) :

$$\frac{\left(6+a-8x-ax+3x^2-x^3\right)\sqrt{a+8x-8x^2+4x^3-x^4}}{2(3+a)(4+a)\left(-a-8x+8x^2-4x^3+x^4\right)}+$$

$$\frac{1}{2(3+a)(4+a)}\Bigg(\Bigg(4\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^{2}+4\,x^{3}-x^{4}}\right)+$$

$$\left(2\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^{2}\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\;\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^{2}+4\,x^{3}-x^{4}}\right)+$$

$$\left(4\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^{2}\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\ \sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\ \text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.$$

$$\left.\left.\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)-\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$\left(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+\right.$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\ \sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\right.\right.$$

$$\left.\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)\right)$$

Problem 785: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\left(a+8x-8x^2+4x^3-x^4\right)^{5/2}}\,dx$$

Optimal (type 4, 517 leaves, 8 steps) :

$$\frac{\left(5+a+(-1+x)^2\right)(-1+x)}{6\left(12+7a+a^2\right)\left(3+a-2(-1+x)^2-(-1+x)^4\right)^{3/2}}+\frac{\left(104+47a+5a^2+4(7+2a)(-1+x)^2\right)(-1+x)}{12(3+a)^2(4+a)^2\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}-$$

$$\frac{(7+2a)\left(1-\sqrt{4+a}\right)\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)(-1+x)}{3(3+a)^2(4+a)^2\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+\frac{(7+2a)\left(1-\sqrt{4+a}\right)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{3(3+a)^2(4+a)^2\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+$$

$$\frac{(16+5a)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{12(3+a)(4+a)^2\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}$$

Result (type 4, 6386 leaves):

$$\sqrt{a+8x-8x^2+4x^3-x^4}\left(\frac{-6-a+8x+ax-3x^2+x^3}{6(3+a)(4+a)\left(-a-8x+8x^2-4x^3+x^4\right)^2}+\frac{132+55a+5a^2-188x-71ax-5a^2x+84x^2+24ax^2-28x^3-8ax^3}{12(3+a)^2(4+a)^2\left(-a-8x+8x^2-4x^3+x^4\right)}\right)+$$

$$\frac{1}{12(3+a)^2(4+a)^2}$$

$$\left(\left(40\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right.\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\Bigg]\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)+$$

$$\Bigg(46\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\Bigg]\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)+$$

$$\Bigg(10\,a^2\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\,\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\,\right],\right.$$

$$\left.\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\,\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\left(112\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\,\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\,\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.$$

$$\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Bigg(32\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\Bigg(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.$$

$$\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)-\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$28\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\Bigg(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\Bigg[\text{ArcSin}\Bigg[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Bigg],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]+\Bigg(\Big(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)$$

$$\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\Big)\Bigg)\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Bigg],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\Bigg)-$$

$$\frac{1}{\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}}\,8\,a\left(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+\right.$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\ \sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\right.\right.$$

$$\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\ \text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\Bigg)\Bigg/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\Bigg(4\ \text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\Bigg)\Bigg/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\Bigg)\Bigg)$$

Problem 786: Result more than twice size of optimal antiderivative.

$$\int x\left(a+8x-8x^2+4x^3-x^4\right)^{3/2}\,dx$$

Optimal (type 4, 558 leaves, 14 steps):

$$\frac{3}{16}(4+a)\left(1+(-1+x)^2\right)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}+\frac{1}{8}\left(1+(-1+x)^2\right)\left(3+a-2(-1+x)^2-(-1+x)^4\right)^{3/2}-$$

$$\frac{16(7+2a)\left(1-\sqrt{4+a}\right)\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)(-1+x)}{35\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+\frac{2}{35}\left(13+5a-3(-1+x)^2\right)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}\,(-1+x)+$$

$$\frac{1}{7}\left(3+a-2(-1+x)^2-(-1+x)^4\right)^{3/2}(-1+x)+\frac{3}{16}(4+a)^2\,\text{ArcTan}\left[\frac{1+(-1+x)^2}{\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}\right]+$$

$$\frac{16(7+2a)\left(1-\sqrt{4+a}\right)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{35\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+$$

$$\frac{4(3+a)(16+5a)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{35\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}$$

Result (type 4, 7235 leaves):

$$\frac{1}{a+8x-8x^2+4x^3-x^4}\left(\frac{1}{56}(52+11a)-\frac{1}{280}(116+55a)x+\frac{1}{80}(-36+25a)x^2+\frac{74x^3}{35}-\frac{43x^4}{28}+\frac{17x^5}{28}-\frac{x^6}{8}\right)\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^{3/2}+$$

$$\frac{1}{280\left(a+8x-8x^2+4x^3-x^4\right)^{3/2}}\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^{3/2}$$

$$\left(-\left(\left(2080\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right.\right.\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\,\right],\right.$$

$$\left.\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\right)\Big/$$

$$\left.\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)\right)-$$

$$\left(208\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\;\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\,\right],\right.$$

$$\left.\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\,\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)+$$

$$\Bigg(110\,a^2\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\,\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\Bigg)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\,\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)+$$

$$\Bigg(6944\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\,\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.$$

$$\left.\left.\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\left(2704\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.$$

$$\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\,\right],\ \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Bigg(210\,a^2\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\ \sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\Bigg(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\Bigg[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\,\right],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]+2\sqrt{-1-\sqrt{4+a}}\ \text{EllipticPi}\Bigg[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},$$

$$\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\,\right],\ \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)-\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$896\left(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+\right.$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\left(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right.$$

$$\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Bigg/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\Bigg(4\,\text{EllipticPi}\Bigg[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\Bigg[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Bigg],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Bigg/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\Bigg)-$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}256\,a\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\Bigg(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)$$

$$\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)\right)$$

Problem 787: Result more than twice size of optimal antiderivative.

$$\int x\sqrt{a+8x-8x^2+4x^3-x^4}\,dx$$

Optimal (type 4, 466 leaves, 12 steps):

$$\frac{1}{4}\left(1+(-1+x)^2\right)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}-\frac{2\left(1-\sqrt{4+a}\right)\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)(-1+x)}{3\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+\frac{1}{3}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}\,(-1+x)+$$

$$\frac{1}{4}(4+a)\,\text{ArcTan}\left[\frac{1+(-1+x)^2}{\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}\right]+\frac{2\left(1-\sqrt{4+a}\right)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{3\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+$$

$$\frac{2(3+a)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{3\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}$$

Result (type 4, 4389 leaves) :

$$\left(\frac{1}{6}-\frac{x}{6}+\frac{x^2}{4}\right)\sqrt{a-x\left(-8+8x-4x^2+x^3\right)}+\frac{1}{6\sqrt{a+8x-8x^2+4x^3-x^4}}\sqrt{a-x\left(-8+8x-4x^2+x^3\right)}$$

$$\Bigg(-\Bigg(\Bigg(8\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\Big]\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)\Bigg)+$$

$$\Bigg(2\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\Big],$$

$$\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\Big]\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)+$$

$$\left(40\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.$$

$$\left.\left.\left.\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\left(6a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.$$

$$\left.\left.\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)-\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$4\left(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+\right.$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\;\left(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right.$$

$$\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Bigg)\Bigg)$$

Problem 788: Result more than twice size of optimal antiderivative.

$$\int \frac{x}{\sqrt{a+8x-8x^2+4x^3-x^4}}\,dx$$

Optimal (type 4, 179 leaves, 7 steps):

$$\frac{1}{2}\operatorname{ArcTan}\left[\frac{1+(-1+x)^2}{\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}\right]+\frac{\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\operatorname{EllipticF}\left[\operatorname{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}$$

Result (type 4, 865 leaves):

$$\left(2\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.$$

$$\left.\left.\left.\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a-x\left(-8+8x-4x^2+x^3\right)}\right)$$

Problem 789: Result more than twice size of optimal antiderivative.

$$\int\frac{x}{\left(a+8x-8x^2+4x^3-x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 474 leaves, 10 steps):

$$\frac{1+(-1+x)^2}{2\,(4+a)\,\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}+\frac{\left(5+a+(-1+x)^2\right)\,(-1+x)}{2\,\left(12+7\,a+a^2\right)\,\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}-$$

$$\frac{\left(1-\sqrt{4+a}\right)\,\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\,(-1+x)}{2\,(3+a)\,(4+a)\,\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}+\frac{\left(1-\sqrt{4+a}\right)\,\sqrt{1+\sqrt{4+a}}\,\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{2\,(3+a)\,(4+a)\,\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\,\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}+$$

$$\frac{\sqrt{1+\sqrt{4+a}}\,\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{2\,(4+a)\,\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\,\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}$$

Result (type 4, 3593 leaves):

$$\frac{\left(-a-2\,x+a\,x-a\,x^2-x^3\right)\,\left(a+8\,x-8\,x^2+4\,x^3-x^4\right)^2}{2\,(3+a)\,(4+a)\,\left(-a-8\,x+8\,x^2-4\,x^3+x^4\right)\,\left(a-x\,\left(-8+8\,x-4\,x^2+x^3\right)\right)^{3/2}}+\frac{1}{2\,(3+a)\,(4+a)\,\left(a-x\,\left(-8+8\,x-4\,x^2+x^3\right)\right)^{3/2}}\left(a+8\,x-8\,x^2+4\,x^3-x^4\right)^{3/2}$$

$$\Bigg(\Bigg(4\,\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\,\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\,\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\Bigg]\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)+$$

$$\Bigg(2\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\Bigg],$$

$$\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\Bigg]\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)+$$

$$\Bigg(4\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\;\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\Bigg(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Bigg],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\Bigg[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},$$

$$\text{ArcSin}\Bigg[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Bigg],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)-\frac{1}{\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}}$$

$$\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\;\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\right.$$

$$\left.\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)\right)$$

Problem 790: Result more than twice size of optimal antiderivative.

$$\int\frac{x}{\left(a+8x-8x^2+4x^3-x^4\right)^{5/2}}\,dx$$

Optimal (type 4, 591 leaves, 12 steps) :

$$\frac{1+(-1+x)^2}{6\,(4+a)\,\left(3+a-2\,(-1+x)^2-(-1+x)^4\right)^{3/2}}+\frac{1+(-1+x)^2}{3\,(4+a)^2\,\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}+$$

$$\frac{\left(5+a+(-1+x)^2\right)\,(-1+x)}{6\,\left(12+7\,a+a^2\right)\,\left(3+a-2\,(-1+x)^2-(-1+x)^4\right)^{3/2}}+\frac{\left(104+47\,a+5\,a^2+4\,(7+2\,a)\,(-1+x)^2\right)\,(-1+x)}{12\,(3+a)^2\,(4+a)^2\,\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}-$$

$$\frac{(7+2\,a)\,\left(1-\sqrt{4+a}\right)\,\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\,(-1+x)}{3\,(3+a)^2\,(4+a)^2\,\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}+\frac{(7+2\,a)\,\left(1-\sqrt{4+a}\right)\,\sqrt{1+\sqrt{4+a}}\,\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\,\text{EllipticE}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{3\,(3+a)^2\,(4+a)^2\,\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\,\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}+$$

$$\frac{(16+5\,a)\,\sqrt{1+\sqrt{4+a}}\,\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\,\text{EllipticF}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{12\,(3+a)\,(4+a)^2\,\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\,\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}$$

Result (type 4, 6452 leaves):

$$\frac{\left(a+8\,x-8\,x^2+4\,x^3-x^4\right)^3\,\left(\frac{a+2\,x-a\,x+a\,x^2+x^3}{6\,(3+a)\,(4+a)\,\left(-a-8\,x+8\,x^2-4\,x^3+x^4\right)^2}+\frac{60+7\,a-3\,a^2-116\,x-23\,a\,x+3\,a^2\,x+48\,x^2-4\,a^2\,x^2-28\,x^3-8\,a\,x^3}{12\,(3+a)^2\,(4+a)^2\,\left(-a-8\,x+8\,x^2-4\,x^3+x^4\right)}\right)}{\left(a-x\,\left(-8+8\,x-4\,x^2+x^3\right)\right)^{5/2}}+$$

$$\frac{1}{12\,(3+a)^2\,(4+a)^2\,\left(a-x\,\left(-8+8\,x-4\,x^2+x^3\right)\right)^{5/2}}\left(a+8\,x-8\,x^2+4\,x^3-x^4\right)^{5/2}$$

$$\Bigg(\Bigg(40\,\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\,\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\,\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\Bigg) \Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Bigg(46\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\ \sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\Bigg) \Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Bigg(10\,a^2\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\Big],$$

$$\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\Big]\Bigg)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)+$$

$$\Bigg(112\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.$$

$$\left.\left.\left.\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\left(32\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.$$

$$\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)-\frac{1}{\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}}$$

$$28\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\Bigg(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)$$

$$\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)-$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}\,8a\left(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+\right.$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\left(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right.$$

$$\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right) \middle/ \left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)\right)$$

Problem 791: Result more than twice size of optimal antiderivative.

$$\int x^2 \left(a+8x-8x^2+4x^3-x^4\right)^{3/2} \, dx$$

Optimal (type 4, 585 leaves, 15 steps):

$$\frac{3}{8}(4+a)\left(1+(-1+x)^2\right)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}+\frac{1}{4}\left(1+(-1+x)^2\right)\left(3+a-2(-1+x)^2-(-1+x)^4\right)^{3/2}+$$

$$\frac{4\left(140+111a+21a^2\right)\left(1-\sqrt{4+a}\right)\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)(-1+x)}{315\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+\frac{2}{315}\left(2(80+27a)+3(20+7a)(-1+x)^2\right)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}\,(-1+x)+$$

$$\frac{1}{63}\left(15+7(-1+x)^2\right)\left(3+a-2(-1+x)^2-(-1+x)^4\right)^{3/2}(-1+x)+\frac{3}{8}(4+a)^2\,\text{ArcTan}\left[\frac{1+(-1+x)^2}{\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}\right]-$$

$$\frac{4\left(140+111a+21a^2\right)\left(1-\sqrt{4+a}\right)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{315\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+$$

$$\frac{4(3+a)(100+33a)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{315\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}$$

Result (type 4, 8500 leaves):

$$\frac{1}{a+8x-8x^2+4x^3-x^4}$$

$$\left(\frac{1}{252}(404+107a)+\frac{(460+81a)\,x}{1260}-\frac{1}{360}(100+39a)\,x^2+\frac{1}{315}(-80+77a)\,x^3+\frac{71x^4}{42}-\frac{163x^5}{126}+\frac{19x^6}{36}-\frac{x^7}{9}\right)\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^{3/2}+$$

$$\frac{1}{1260\,\left(a+8\,x-8\,x^{2}+4\,x^{3}-x^{4}\right)^{3/2}}\,\left(a-x\,\left(-8+8\,x-4\,x^{2}+x^{3}\right)\right)^{3/2}$$

$$\Bigg(-\Bigg(\Bigg(16\,160\,\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^{2}\,\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\,\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\,\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\sqrt{a+8\,x-8\,x^{2}+4\,x^{3}-x^{4}}\right)\Bigg)-$$

$$\Bigg(5200\,a\,\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^{2}\,\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\ \sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\,\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)-$$

$$\Bigg(162\,a^2\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\ \sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\,\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)+$$

$$\left(21\,280\,\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\,\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.$$

$$\left.\left.\left.\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\,\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)+$$

$$\left(8016\,a\,\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\;\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\Bigg(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},$$

$$\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Big],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Bigg)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Bigg(546\,a^2\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\;\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\Bigg(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big] + 2\sqrt{-1-\sqrt{4+a}}\ \text{EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},$$

$$\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Big],\ \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Bigg) \Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right) + \frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$2240\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right) +$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\ \Bigg(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)$$

$$\text{EllipticE}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Big],\ \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big] +$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)+$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}1776\,a\left(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+\right.$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\;\left(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right.$$

$$\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right) +$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}\,336\,a^2\left(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+\right.$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\left(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right.$$

$$\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\Bigg/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\Bigg/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)\right)$$

Problem 792: Result more than twice size of optimal antiderivative.

$$\int x^2\sqrt{a+8x-8x^2+4x^3-x^4}\,dx$$

Optimal (type 4, 485 leaves, 13 steps):

$$\frac{1}{2}\left(1+(-1+x)^2\right)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}+\frac{2(8+3a)\left(1-\sqrt{4+a}\right)\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)(-1+x)}{15\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+$$

$$\frac{1}{15}\left(7+3(-1+x)^2\right)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}\,(-1+x)+\frac{1}{2}(4+a)\,\text{ArcTan}\left[\frac{1+(-1+x)^2}{\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}\right]-$$

$$\frac{2(8+3a)\left(1-\sqrt{4+a}\right)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{15\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+$$

$$\frac{8(3+a)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{15\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}$$

Result (type 4, 5647 leaves):

$$\left(\frac{1}{3}+\frac{x}{15}-\frac{x^2}{10}+\frac{x^3}{5}\right)\sqrt{a-x\left(-8+8x-4x^2+x^3\right)}+\frac{1}{15\sqrt{a+8x-8x^2+4x^3-x^4}}\sqrt{a-x\left(-8+8x-4x^2+x^3\right)}$$

$$\Bigg(-\Bigg(\Bigg(40\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\Big]\Bigg)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)\Bigg)-$$

$$\Bigg(2\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\Big],$$

$$\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\Big]\Bigg)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)+$$

$$\Bigg(56\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\Bigg(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]+2\sqrt{-1-\sqrt{4+a}}\,\text{EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},$$

$$\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Big],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Bigg)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Bigg(6a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right) \text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\ \text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.$$

$$\left.\left.\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)+\frac{1}{\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}}$$

$$16\left(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+\right.$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\left(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right.$$

$$\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)+$$

$$\frac{1}{\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}}\,6\,a\,\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\,\Bigg(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)$$

$$\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+$$

$$\Bigg(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right) \Big/ \left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\,\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right) \Big/ \left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)\right)$$

Problem 793: Result more than twice size of optimal antiderivative.

$$\int \frac{x^2}{\sqrt{a+8x-8x^2+4x^3-x^4}}\,dx$$

Optimal (type 4, 388 leaves, 11 steps):

$$\frac{\left(1-\sqrt{4+a}\right)\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)(-1+x)}{\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+\text{ArcTan}\left[\frac{1+(-1+x)^2}{\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}\right]-$$

$$\frac{\left(1-\sqrt{4+a}\right)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+$$

$$\frac{\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}$$

Result (type 4, 1247 leaves) :

$$\frac{1}{\sqrt{a - x\left(-8+8x-4x^2+x^3\right)}}\left(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.$$

$$\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\left(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right.$$

$$\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/$$

$$\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\Bigg)$$

Problem 794: Result more than twice size of optimal antiderivative.

$$\int\frac{x^2}{\left(a+8x-8x^2+4x^3-x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 311 leaves, 10 steps):

$$\frac{1+(-1+x)^2}{(4+a)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+\frac{(4+a)\left(2+(-1+x)^2\right)(-1+x)}{2\left(12+7a+a^2\right)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}-$$

$$\frac{\left(1-\sqrt{4+a}\right)\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)(-1+x)}{2(3+a)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+\frac{\left(1-\sqrt{4+a}\right)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{2(3+a)\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}$$

Result (type 4, 2941 leaves):

$$\frac{\left(-a-8x-ax+6x^2+ax^2-4x^3-ax^3\right)\left(a+8x-8x^2+4x^3-x^4\right)^2}{2(3+a)(4+a)\left(-a-8x+8x^2-4x^3+x^4\right)\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^{3/2}}-\frac{1}{2(3+a)\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^{3/2}}\left(a+8x-8x^2+4x^3-x^4\right)^{3/2}$$

$$\left(\left(2\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right.\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\ \sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\Big],$$

$$\left.\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\Big]\right)\right/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)-$$

$$\left(4\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\ \sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Big],\right.$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]+2\sqrt{-1-\sqrt{4+a}}\ \text{EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},$$

$$\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Bigg)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\right)+\frac{1}{\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}}$$

$$\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\Bigg(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+\Bigg(\Bigg(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)$$

$$\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\ \texttt{EllipticF}\Bigg[\texttt{ArcSin}\Bigg[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Bigg],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Bigg/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\Bigg(4\,\texttt{EllipticPi}\Bigg[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \texttt{ArcSin}\Bigg[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Bigg],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Bigg/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\Bigg)\Bigg)$$

Problem 795: Result more than twice size of optimal antiderivative.

$$\int\frac{x^2}{\left(a+8x-8x^2+4x^3-x^4\right)^{5/2}}\,dx$$

Optimal (type 4, 582 leaves, 13 steps):

$$\frac{1+(-1+x)^2}{3(4+a)\left(3+a-2(-1+x)^2-(-1+x)^4\right)^{3/2}}+\frac{2\left(1+(-1+x)^2\right)}{3(4+a)^2\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+\frac{(4+a)\left(2+(-1+x)^2\right)(-1+x)}{6\left(12+7a+a^2\right)\left(3+a-2(-1+x)^2-(-1+x)^4\right)^{3/2}}+$$

$$\frac{\left(29+7a+(13+3a)(-1+x)^2\right)(-1+x)}{12(3+a)^2(4+a)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}-\frac{(13+3a)\left(1-\sqrt{4+a}\right)\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)(-1+x)}{12(3+a)^2(4+a)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+$$

$$\frac{(13+3a)\left(1-\sqrt{4+a}\right)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{12(3+a)^2(4+a)\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+$$

$$\frac{\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{12\left(12+7a+a^2\right)\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}$$

Result (type 4, 5812 leaves):

$$\Bigg(\left(a+8x-8x^2+4x^3-x^4\right)^3$$

$$\left(\frac{a+8x+ax-6x^2-ax^2+4x^3+ax^3}{6(3+a)(4+a)\left(-a-8x+8x^2-4x^3+x^4\right)^2}+\frac{24-14a-6a^2-128x-36ax+84x^2+27ax^2+a^2x^2-52x^3-25ax^3-3a^2x^3}{12(3+a)^2(4+a)^2\left(-a-8x+8x^2-4x^3+x^4\right)}\right)\Bigg)\Bigg/$$

$$\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^{5/2}-\frac{1}{12(3+a)^2(4+a)\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^{5/2}}\left(a+8x-8x^2+4x^3-x^4\right)^{5/2}$$

$$\Bigg(\Bigg(20\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\left(4a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\right],\right.$$

$$\left.\frac{\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}\right]\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)-$$

$$\left(52 \left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right) \left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2 \sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right) \left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right) \left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}} \left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right) \left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}} \sqrt{\frac{\sqrt{-1-\sqrt{4+a}} \left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right) \left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right) \text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right) \left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right) \left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2 \sqrt{-1-\sqrt{4+a}}\ \text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.$$

$$\left.\left.\left.\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right) \left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right) \left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right], \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\right) \Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}} \left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right) \sqrt{a+8 x-8 x^2+4 x^3-x^4}\right) -$$

$$\left(12 a \left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right) \left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2 \sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right) \left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right) \left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right.$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}} \left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right) \left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}} \sqrt{\frac{\sqrt{-1-\sqrt{4+a}} \left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right) \left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.$$

$$\left.\left.\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$13\left(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+\right.$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\;\Bigg(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)$$

$$\text{EllipticE}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Big],\ \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]+$$

$$\Bigg(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\Bigg(4\,\text{EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\Bigg)+$$

$$\frac{1}{\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}}\,3\,a\,\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\,\Bigg(\frac{1}{2\sqrt{-1-\sqrt{4+a}}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)$$

$$\text{EllipticE}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Big],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]+$$

$$\Bigg(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\Bigg)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\Big],$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right) \Big/ \left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+$$

$$\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\,\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.\right.$$

$$\left.\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right) \Big/ \left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)\right)$$

Problem 796: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{8+8x-x^3+8x^4}}\,dx$$

Optimal (type 4, 129 leaves, 4 steps):

$$-\frac{x^2\sqrt{\frac{261-6\left(1+\frac{4}{x}\right)^2+\left(1+\frac{4}{x}\right)^4}{\left(87+\frac{\sqrt{29}\,(4+x)^2}{x^2}\right)^2}}\left(87+\frac{\sqrt{29}\,(4+x)^2}{x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{4+x}{\sqrt{3}\,29^{1/4}\,x}\right],\frac{1}{58}\left(29+\sqrt{29}\right)\right]}{8\sqrt{3}\,29^{1/4}\sqrt{8+8x-x^3+8x^4}}$$

Result (type 4, 927 leaves):

$$-\Bigg(\Bigg(2\,\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\big((x-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,1])\,(\text{Root}[8+8\#1-\#1^3+8\#1^4\&,2]-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,4])\big)\Big/\big((x-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,2])\,(\text{Root}[8+8\#1-\#1^3+8\#1^4\&,1]-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,4])\big)\Big)}\Big],$$
$$\big((\text{Root}[8+8\#1-\#1^3+8\#1^4\&,2]-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,3])\,(\text{Root}[8+8\#1-\#1^3+8\#1^4\&,1]-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,4])\big)\Big/$$
$$\big((\text{Root}[8+8\#1-\#1^3+8\#1^4\&,1]-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,3])\,(\text{Root}[8+8\#1-\#1^3+8\#1^4\&,2]-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,4])\big)\Big]$$
$$(x-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,2])^2$$
$$\sqrt{\Big(\big((\text{Root}[8+8\#1-\#1^3+8\#1^4\&,1]-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,2])\,(x-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,3])\big)\Big/\big((x-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,2])\,(\text{Root}[8+8\#1-\#1^3+8\#1^4\&,1]-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,3])\big)\Big)}$$
$$(\text{Root}[8+8\#1-\#1^3+8\#1^4\&,1]-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,4])$$
$$\sqrt{\Big(\big((x-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,1])\,(\text{Root}[8+8\#1-\#1^3+8\#1^4\&,1]-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,2])\,(x-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,4])\,(\text{Root}[8+8\#1-\#1^3+8\#1^4\&,2]-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,4])\big)\Big/\big((x-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,2])^2\,(\text{Root}[8+8\#1-\#1^3+8\#1^4\&,1]-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,4])^2\big)\Big)}\Bigg)\Bigg/$$
$$\Bigg(\sqrt{8+8x-x^3+8x^4}\,(-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,1]+\text{Root}[8+8\#1-\#1^3+8\#1^4\&,2])\,(\text{Root}[8+8\#1-\#1^3+8\#1^4\&,2]-\text{Root}[8+8\#1-\#1^3+8\#1^4\&,4])\Bigg)\Bigg)$$

Problem 797: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(8+8x-x^3+8x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 431 leaves, 10 steps):

$$-\frac{\left(66-\left(1+\frac{4}{x}\right)^2\right)x^2}{1008\sqrt{8+8x-x^3+8x^4}}+\frac{\left(216-7\left(1+\frac{4}{x}\right)^2\right)\left(1+\frac{4}{x}\right)x^2}{12528\sqrt{8+8x-x^3+8x^4}}+\frac{7\left(261-6\left(1+\frac{4}{x}\right)^2+\left(1+\frac{4}{x}\right)^4\right)\left(1+\frac{4}{x}\right)x^2}{432\sqrt{29}\sqrt{8+8x-x^3+8x^4}\left(87+\frac{\sqrt{29}(4+x)^2}{x^2}\right)}-$$
$$\frac{7x^2\sqrt{\frac{261-6\left(1+\frac{4}{x}\right)^2+\left(1+\frac{4}{x}\right)^4}{\left(87+\frac{\sqrt{29}(4+x)^2}{x^2}\right)^2}}\left(87+\frac{\sqrt{29}(4+x)^2}{x^2}\right)\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{4+x}{\sqrt{3}\,29^{1/4}x}\right],\frac{1}{58}\left(29+\sqrt{29}\right)\right]}{144\sqrt{3}\,29^{3/4}\sqrt{8+8x-x^3+8x^4}}+$$
$$\frac{\left(14-5\sqrt{29}\right)x^2\sqrt{\frac{261-6\left(1+\frac{4}{x}\right)^2+\left(1+\frac{4}{x}\right)^4}{\left(87+\frac{\sqrt{29}(4+x)^2}{x^2}\right)^2}}\left(87+\frac{\sqrt{29}(4+x)^2}{x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{4+x}{\sqrt{3}\,29^{1/4}x}\right],\frac{1}{58}\left(29+\sqrt{29}\right)\right]}{576\sqrt{3}\,29^{3/4}\sqrt{8+8x-x^3+8x^4}}$$

Result (type 4, 4865 leaves):

```
(544 + 1539 x - 1146 x^2 + 784 x^3)/(21 924 Sqrt[8 + 8 x - x^3 + 8 x^4]) +
1/6264 ((28 (x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2])^2 (-EllipticF[ArcSin[√(((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] -
      Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4]))/((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] -
      Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])))], -(((Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3])
     (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4]))/((-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] +
      Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])))]
   Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] + EllipticPi[(-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])/(-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4]),
    ArcSin[√(((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4]))/
      ((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])))],
    -(((Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &,
      4]))/((-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] -
      Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])))] (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]))
  √(((-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3]))/
    ((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3])))
  (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])
  √(((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4]))/
    ((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])))
  √(((-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4]))/
    ((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4]))))/
 (Sqrt[8 + 8 x - x^3 + 8 x^4] (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2])
  (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])) +
(842 EllipticF[ArcSin[√(((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1]) (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4]))/
      ((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])))],
   ((Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4]))/
    ((Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3])
     (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4]))] (x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2])^2
  √(((-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3]))/
    ((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3])))
  (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])
  √(((-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4]))/
```

```
((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])))
√(((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1]) (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])) /
    ((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])))) /
(√(8 + 8 x - x^3 + 8 x^4) (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2])
  (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])) -
1/√(8 + 8 x - x^3 + 8 x^4) 224 ((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1]) (x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3])
    (x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4]) + (x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2])^2
    √(((-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3])) /
      ((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3])))
    √(((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])) /
      ((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])))
    √(((-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])) /
      ((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])))
    (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])
    ((EllipticE[ArcSin[√(((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])) /
            ((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])))],
          -(((Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] -
                Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])) / ((-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3])
              (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])))] (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] +
          Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3])) / (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) +
      (EllipticF[ArcSin[√(((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])) /
            ((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])))],
          -(((Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] -
                Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])) / ((-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] +
                Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 3]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])))]
        (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4]) -
          Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4]))) /
      ((-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2]) (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] +
          Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])) - 1/(-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])
      EllipticPi[(-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4]) / (-Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] + Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4]), ArcSin[
        √(((x - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 1]) (Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 2] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])) /
```

$$\left(\left(x-\text{Root}\left[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,2\right]\right)\left(\text{Root}\left[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,4\right]\right)\right)\Big)\Big)\Big],$$

$$-\left(\left(\left(\text{Root}\left[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,2\right]-\text{Root}\left[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,3\right]\right)\left(\text{Root}\left[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(\left(-\text{Root}\left[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,1\right]+\text{Root}\left[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,3\right]\right)\left(\text{Root}\left[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,2\right]-\text{Root}\left[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,4\right]\right)\right)\right)\Big]\left(-\text{Root}\left[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,2\right]-\text{Root}\left[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,3\right]-\text{Root}\left[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,4\right]\right)\Big)\Big)\Big)$$

Problem 798: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{1+4x+4x^2+4x^4}}\,dx$$

Optimal (type 4, 108 leaves, 3 steps):

$$-\frac{\left(\sqrt{5}+\left(1+\frac{1}{x}\right)^2\right)\sqrt{\frac{5-2\left(1+\frac{1}{x}\right)^2+\left(1+\frac{1}{x}\right)^4}{\left(\sqrt{5}+\left(1+\frac{1}{x}\right)^2\right)^2}}\;x^2\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{1+\frac{1}{x}}{5^{1/4}}\right],\,\frac{1}{10}\left(5+\sqrt{5}\right)\right]}{2\times 5^{1/4}\sqrt{1+4x+4x^2+4x^4}}$$

Result (type 4, 249 leaves):

$$\left((2-i)\sqrt{-\frac{1}{10}+\frac{i}{5}}\sqrt{\frac{\left(2\,i+\sqrt{-1-2\,i}-\sqrt{-1+2\,i}\right)\left(-i+\sqrt{-1-2\,i}-2x\right)}{\left(-2\,i+\sqrt{-1-2\,i}+\sqrt{-1+2\,i}\right)\left(i+\sqrt{-1-2\,i}+2x\right)}}\right.$$

$$\left.\left(1+2x+2\,i\,x^2\right)\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(2\,i+\sqrt{-1-2\,i}+\sqrt{-1+2\,i}\right)\left(-i+\sqrt{-1+2\,i}+2x\right)}{\sqrt{-1+2\,i}\left(i+\sqrt{-1-2\,i}+2x\right)}}}{\sqrt{2}}\right],\,\frac{1}{2}\left(5-\sqrt{5}\right)\right]\right)\Big/$$

$$\left(\sqrt{\frac{(1+2\,i)\left((-1+i)+\sqrt{-1-2\,i}\right)\left(1+2x+2\,i\,x^2\right)}{\left(i+\sqrt{-1-2\,i}+2x\right)^2}}\sqrt{1+4x+4x^2+4x^4}\right)$$

Problem 799: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(1+4x+4x^2+4x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 367 leaves, 9 steps):

$$-\frac{\left(3-\left(1+\frac{1}{x}\right)^2\right)x^2}{\sqrt{1+4x+4x^2+4x^4}}+\frac{\left(13-9\left(1+\frac{1}{x}\right)^2\right)\left(1+\frac{1}{x}\right)x^2}{10\sqrt{1+4x+4x^2+4x^4}}+\frac{9\left(5-2\left(1+\frac{1}{x}\right)^2+\left(1+\frac{1}{x}\right)^4\right)\left(1+\frac{1}{x}\right)x^2}{10\left(\sqrt{5}+\left(1+\frac{1}{x}\right)^2\right)\sqrt{1+4x+4x^2+4x^4}}-$$

$$\frac{9\left(\sqrt{5}+\left(1+\frac{1}{x}\right)^2\right)\sqrt{\frac{5-2\left(1+\frac{1}{x}\right)^2+\left(1+\frac{1}{x}\right)^4}{\left(\sqrt{5}+\left(1+\frac{1}{x}\right)^2\right)^2}}\;x^2\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{1+\frac{1}{x}}{5^{1/4}}\right],\frac{1}{10}\left(5+\sqrt{5}\right)\right]}{2\times 5^{3/4}\sqrt{1+4x+4x^2+4x^4}}+$$

$$\frac{3\left(3-\sqrt{5}\right)\left(\sqrt{5}+\left(1+\frac{1}{x}\right)^2\right)\sqrt{\frac{5-2\left(1+\frac{1}{x}\right)^2+\left(1+\frac{1}{x}\right)^4}{\left(\sqrt{5}+\left(1+\frac{1}{x}\right)^2\right)^2}}\;x^2\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{1+\frac{1}{x}}{5^{1/4}}\right],\frac{1}{10}\left(5+\sqrt{5}\right)\right]}{4\times 5^{3/4}\sqrt{1+4x+4x^2+4x^4}}$$

Result (type 4, 3334 leaves):

$$\frac{19+42x-16x^2+36x^3}{10\sqrt{1+4x+4x^2+4x^4}}-$$

$$\frac{3}{5}\Bigg(-\Bigg(\Bigg(2\,\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{\Big(\big(\left(x-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,1]\right)\left(-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,2]+\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,4]\right)\big)\Big/}$$

$$\Big(\left(x-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,2]\right)\left(-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,1]+\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,4]\right)\Big)\Big)\Bigg],$$

$$\Big(\left(\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,2]-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,3]\right)\left(\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,1]-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,4]\right)\Big)\Big/\Big(\left(\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,1]-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,3]\right)$$

$$\left(\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,2]-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,4]\right)\Big)\Bigg]\left(x-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,2]\right)^2$$

$$\sqrt{\Big(\big(\left(-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,1]+\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,2]\right)\left(x-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,3]\right)\big)\Big/}$$

$$\Big(\left(x-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,2]\right)\left(-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,1]+\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,3]\right)\Big)\Big)$$

$$\left(\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,1]-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,4]\right)$$

$$\sqrt{\Big(\big(\left(-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,1]+\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,2]\right)\left(x-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,4]\right)\big)\Big/}$$

$$\Big(\left(x-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,2]\right)\left(-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,1]+\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,4]\right)\Big)\Big)$$

$$\sqrt{\Big(\big(\left(x-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,1]\right)\left(-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,2]+\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,4]\right)\big)\Big/}$$

$$\Big(\left(x-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,2]\right)\left(-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,1]+\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,4]\right)\Big)\Big)\Bigg)\Bigg/$$

$$\Big(\sqrt{1+4x+4x^2+4x^4}\;\left(-\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,1]+\text{Root}[1+4\#1+4\#1^2+4\#1^4\&,2]\right)$$

```
(-Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2] + Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4]))) +
1/Sqrt[1 + 4 x + 4 x^2 + 4 x^4] 6 ((x - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1]) (x - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 3])
   (x - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4]) + (x - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2])^2
   √(((-Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] + Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2]) (x - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 3])) /
      ((x - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2]) (-Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] + Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 3])))
   √(((x - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1]) (Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2] - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])) /
      ((x - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2]) (Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])))
   √(((-Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] + Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2]) (x - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])) /
      ((x - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2]) (-Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] + Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])))
   (-Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] + Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4]) ((EllipticE[ArcSin[
          √(((x - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1]) (Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2] - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])) /
             ((x - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2]) (Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])))],
        -(((Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2] - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 3]) (Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] -
                Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])) / ((-Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] + Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 3])
              (Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2] - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])))] (-Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] +
          Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 3])) / (-Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] + Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2]) +
     (EllipticF[ArcSin[√(((x - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1]) (Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2] - Root[
                   1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])) / ((x - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2]) (Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] -
                  Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])))], -(((Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2] - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 3])
              (Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])) / ((-Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] +
                Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 3]) (Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2] - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])))]
        (Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2] (-Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2] - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4]) -
          Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] (Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2] - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4]))) /
      ((-Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] + Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2]) (-Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2] +
          Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])) - (EllipticPi[(-Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] + Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4]) / (-Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2] + Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4]),
        ArcSin[√(((x - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1]) (Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2] - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])) /
             ((x - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2]) (Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])))],
        -(((Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2] - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 3]) (Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] -
                Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])) / ((-Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] + Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 3])
              (Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2] - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])))] (-Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1] -
          Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 2] - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 3] - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 4])) /
```

$$\left(-\text{Root}\left[1+4\,\#1+4\,\#1^2+4\,\#1^4\,\&,\,2\right]+\text{Root}\left[1+4\,\#1+4\,\#1^2+4\,\#1^4\,\&,\,4\right]\right)\Big)\Big)\Big)$$

Problem 800: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{8+24\,x+8\,x^2-15\,x^3+8\,x^4}}\,dx$$

Optimal (type 4, 126 leaves, 4 steps):

$$-\frac{\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)\sqrt{\frac{517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4}{\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)^2}}\;x^2\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{4+3\,x}{517^{1/4}\,x}\right],\,\frac{517+19\sqrt{517}}{1034}\right]}{8\times 517^{1/4}\sqrt{8+24\,x+8\,x^2-15\,x^3+8\,x^4}}$$

Result (type 4, 1148 leaves):

$$-\Bigg(\Bigg(2\,\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{\Big(\Big(\big(x-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]\big)\,\big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]-}$$
$$\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\big)\Big)\Big/\Big(\big(x-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]\big)$$
$$\big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\big)\Big)\Big)\Bigg],$$
$$\Big(\big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,3\right]\big)$$
$$\big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\big)\Big)\Big/$$
$$\Big(\big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,3\right]\big)$$
$$\big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\big)\Big)\Bigg]$$
$$\big(x-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]\big)^2\sqrt{\Big(\Big(\big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]\big)}$$
$$\big(x-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,3\right]\big)\Big)\Big/\Big(\big(x-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]\big)$$
$$\big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,3\right]\big)\Big)\Big)$$
$$\big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\big)$$
$$\sqrt{\Big(\Big(\big(x-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]\big)\,\big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]\big)}$$
$$\big(x-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\big)\,\big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]-$$
$$\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\big)\Big)\Big/\Big(\big(x-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]\big)^2$$
$$\big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\big)^2\Big)\Big)\Bigg)\Bigg/$$
$$\Bigg(\sqrt{8+24\,x+8\,x^2-15\,x^3+8\,x^4}\;\big(-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]+\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]\big)$$
$$\big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\big)\Bigg)\Bigg)$$

Problem 801: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(8+24\,x+8\,x^2-15\,x^3+8\,x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 434 leaves, 10 steps):

$$-\frac{\left(172-7\left(3+\frac{4}{x}\right)^2\right)x^2}{208\sqrt{8+24\,x+8\,x^2-15\,x^3+8\,x^4}}+\frac{\left(50\,896-2455\left(3+\frac{4}{x}\right)^2\right)\left(3+\frac{4}{x}\right)x^2}{322\,608\sqrt{8+24\,x+8\,x^2-15\,x^3+8\,x^4}}+\frac{2455\left(517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4\right)\left(3+\frac{4}{x}\right)x^2}{322\,608\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)\sqrt{8+24\,x+8\,x^2-15\,x^3+8\,x^4}}-$$

$$\frac{2455\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)\sqrt{\frac{517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4}{\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)^2}}\;x^2\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{4+3\,x}{517^{1/4}\,x}\right],\frac{517+19\sqrt{517}}{1034}\right]}{624\times 517^{3/4}\sqrt{8+24\,x+8\,x^2-15\,x^3+8\,x^4}}+$$

$$\left(\left(4910-203\sqrt{517}\right)\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)\sqrt{\frac{517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4}{\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)^2}}\;x^2\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{4+3\,x}{517^{1/4}\,x}\right],\frac{517+19\sqrt{517}}{1034}\right]\right)\Big/$$

$$\left(2496\times 517^{3/4}\sqrt{8+24\,x+8\,x^2-15\,x^3+8\,x^4}\right)$$

Result (type 4, 6019 leaves):

$$\frac{72\,888+89\,033\,x-94\,314\,x^2+39\,280\,x^3}{80\,652\sqrt{8+24\,x+8\,x^2-15\,x^3+8\,x^4}}+$$

$$\frac{1}{161\,304}\Bigg(\bigg(147\,300\left(x-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]\right)^2\bigg(-\text{EllipticF}\bigg[\text{ArcSin}\bigg[\sqrt{}\bigg(\Big(\Big(x-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]\Big)$$

$$\left(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\right)\Big)\Big/\Big(\Big(x-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]\Big)\left(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\right)\Big)\bigg)\bigg],$$

$$-\Big(\Big(\left(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,3\right]\right)$$

$$\left(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\right)\Big)\Big/$$

$$\Big(\left(-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]+\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,3\right]\right)\left(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\right)\Big)\Big)\bigg]\,\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]+$$

$$\text{EllipticPi}\left[\frac{-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]+\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]}{-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]+\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]},\right.$$

$$\text{ArcSin}\bigg[\sqrt{}\bigg(\Big(\Big(x-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]\Big)\Big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]-$$

$$\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\Big)\Big)\Big/\Big(\Big(x-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]\Big)$$

$$\left(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\right)\Big)\bigg)\bigg],$$

$$-\Big(\Big(\left(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,3\right]\right)$$

```
        (Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])) /
      ((-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 3])
        (Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2] - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])))]
    (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2]))
  √(((-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
      (x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 3])) / ((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
      (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 3])))
  (Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])
  √(((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1]) (Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2] -
        Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])) / ((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
      (Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])))
  √(((-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
      (x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])) / ((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
      (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])))) /
 (√(8 + 24 x + 8 x^2 - 15 x^3 + 8 x^4) (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
   (Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2] - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])) +
(121522 EllipticF[ArcSin[√(((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1]) (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2] +
            Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])) / ((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
          (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])))],
    ((Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2] - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 3])
       (Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])) /
     ((Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 3]) (Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2] -
        Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4]))] (x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])^2
  √(((-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
      (x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 3])) / ((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
      (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 3])))
  (Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])
  √(((-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
      (x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])) / ((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
      (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])))
  √(((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1]) (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2] +
        Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])) / ((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
      (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])))) /
```

$$\Big(\sqrt{8 + 24\,x + 8\,x^2 - 15\,x^3 + 8\,x^4}\;\big(-\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1] + \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2]\big)$$

$$\big(-\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2] + \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big)\Big) -$$

$$\frac{1}{\sqrt{8 + 24\,x + 8\,x^2 - 15\,x^3 + 8\,x^4}}\,78\,560\,\Big(\big(x - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1]\big)\,\big(x - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 3]\big)$$

$$\big(x - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big) + \big(x - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2]\big)^2$$

$$\surd\Big(\Big(\big(-\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1] + \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2]\big)$$

$$\big(x - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 3]\big)\Big)\Big) \Big/ \Big(\big(x - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2]\big)$$

$$\big(-\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1] + \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 3]\big)\Big)\Big)$$

$$\surd\Big(\Big(\big(x - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1]\big)\,\big(\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2] -$$

$$\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big)\Big)\Big) \Big/ \Big(\big(x - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2]\big)$$

$$\big(\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1] - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big)\Big)\Big)$$

$$\surd\Big(\Big(\big(-\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1] + \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2]\big)$$

$$\big(x - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big)\Big)\Big) \Big/ \Big(\big(x - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2]\big)$$

$$\big(-\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1] + \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big)\Big)\Big)$$

$$\big(-\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1] + \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big)$$

$$\Big(\Big(\mathrm{EllipticE}\Big[\mathrm{ArcSin}\Big[\surd\Big(\Big(\big(x - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1]\big)\,\big(\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2] -$$

$$\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big)\Big)\Big) \Big/ \Big(\big(x - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2]\big)$$

$$\big(\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1] - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big)\Big)\Big)\Big],$$

$$-\Big(\Big(\big(\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2] - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 3]\big)$$

$$\big(\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1] - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big)\Big)\Big) \Big/$$

$$\Big(\big(-\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1] + \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 3]\big)$$

$$\big(\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2] - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big)\Big)\Big)\Big]$$

$$\big(-\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1] + \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 3]\big)\Big)\Big) \Big/$$

$$\big(-\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1] + \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2]\big) +$$

$$\Big(\mathrm{EllipticF}\Big[\mathrm{ArcSin}\Big[\surd\Big(\Big(\big(x - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1]\big)\,\big(\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2] -$$

$$\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big)\Big)\Big) \Big/ \Big(\big(x - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2]\big)$$

$$\big(\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1] - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big)\Big)\Big)\Big],$$

$$-\Big(\Big(\big(\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2] - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 3]\big)$$

$$\big(\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1] - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big)\Big)\Big) \Big/$$

$$\Big(\big(-\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1] + \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 3]\big)\,\big(\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 -$$

$$15\,\#1^3 + 8\,\#1^4\,\&, 2] - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big)\Big)\Big)\Big]\,\big(\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2]$$

$$\big(-\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2] - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big) - \mathrm{Root}[8 + 24\,\#1 +$$

$$8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1]\,\big(\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2] - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big)\big)\Big) \Big/$$

$$\Big(\big(-\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1] + \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2]\big)$$

$$\big(-\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2] + \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big)\Big)\Big) -$$

$$\Big(\mathrm{EllipticPi}\Big[\big(-\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1] + \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big) \Big/$$

$$\big(-\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2] + \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 4]\big),\ \mathrm{ArcSin}\Big[$$

$$\surd\Big(\Big(\big(x - \mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 1]\big)\,\big(\mathrm{Root}[8 + 24\,\#1 + 8\,\#1^2 - 15\,\#1^3 + 8\,\#1^4\,\&, 2] -$$

$$\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\Big)\Big)\Big/\Big(\Big(x-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]\Big)$$
$$\Big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\Big)\Big)\Big)\Big],$$
$$-\Big(\Big(\Big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,3\right]\Big)$$
$$\Big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\Big)\Big)\Big/$$
$$\Big(\Big(-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]+\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,3\right]\Big)$$
$$\Big(\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\Big)\Big)\Big)\Big]$$
$$\Big(-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]-$$
$$\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,3\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\Big)\Big)\Big/$$
$$\Big(-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]+\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\Big)\Big)\Big)\Big)$$

Problem 802: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\left(8+24\,x+8\,x^2-15\,x^3+8\,x^4\right)^{5/2}}\,dx$$

Optimal (type 4, 577 leaves, 12 steps):

$$-\frac{\left(124415-6308\left(3+\frac{4}{x}\right)^2\right)x^2}{97344\sqrt{8+24\,x+8\,x^2-15\,x^3+8\,x^4}}-\frac{\left(64489-1399\left(3+\frac{4}{x}\right)^2\right)x^2}{624\left(517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4\right)\sqrt{8+24\,x+8\,x^2-15\,x^3+8\,x^4}}+$$
$$\frac{\left(18932921731-1086525994\left(3+\frac{4}{x}\right)^2\right)\left(3+\frac{4}{x}\right)x^2}{78056941248\sqrt{8+24\,x+8\,x^2-15\,x^3+8\,x^4}}+\frac{\left(11921698-359497\left(3+\frac{4}{x}\right)^2\right)\left(3+\frac{4}{x}\right)x^2}{483912\left(517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4\right)\sqrt{8+24\,x+8\,x^2-15\,x^3+8\,x^4}}+$$
$$\frac{543262997\left(517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4\right)\left(3+\frac{4}{x}\right)x^2}{39028470624\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)\sqrt{8+24\,x+8\,x^2-15\,x^3+8\,x^4}}-$$
$$\frac{543262997\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)\sqrt{\frac{517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4}{\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)^2}}\,x^2\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{4+3\,x}{517^{1/4}\,x}\right],\,\frac{517+19\sqrt{517}}{1034}\right]}{75490272\times517^{3/4}\sqrt{8+24\,x+8\,x^2-15\,x^3+8\,x^4}}+$$
$$\left(\left(4346103976-175318963\sqrt{517}\right)\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)\sqrt{\frac{517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4}{\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)^2}}\,x^2\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{4+3\,x}{517^{1/4}\,x}\right],\,\frac{517+19\sqrt{517}}{1034}\right]\right)\Big/$$
$$\left(1207844352\times517^{3/4}\sqrt{8+24\,x+8\,x^2-15\,x^3+8\,x^4}\right)$$

Result (type 4, 6084 leaves):

$$\sqrt{8+24x+8x^2-15x^3+8x^4}\left(\frac{72888+89033x-94314x^2+39280x^3}{241956\left(8+24x+8x^2-15x^3+8x^4\right)^2}+\frac{65072399400+77274145879x-83050578336x^2+34768831808x^3}{39028470624\left(8+24x+8x^2-15x^3+8x^4\right)}\right)+$$

$$\frac{1}{78056941248}$$

$$\Big(\Big(130383119280\left(x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]\right)^2\Big(-\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{}\Big(\Big(\Big(x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]\Big)$$

$$\Big(\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]\Big)\Big)\Big/\Big(\Big(x-\text{Root}[8+24\#1+8\#1^2-$$

$$15\#1^3+8\#1^4\&,2]\Big)\Big(\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]\Big)\Big)\Big)\Big],$$

$$-\Big(\Big(\Big(\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,3]\Big)$$

$$\Big(\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]\Big)\Big)\Big/$$

$$\Big(\Big(-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,3]\Big)\Big(\text{Root}[8+24\#1+8\#1^2-$$

$$15\#1^3+8\#1^4\&,2]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]\Big)\Big)\Big)\Big]\ \text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]+$$

$$\text{EllipticPi}\Big[\frac{-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]}{-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]},$$

$$\text{ArcSin}\Big[\sqrt{}\Big(\Big(\Big(x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]\Big)\Big(\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]-$$

$$\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]\Big)\Big)\Big/\Big(\Big(x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]\Big)$$

$$\Big(\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]\Big)\Big)\Big)\Big],$$

$$-\Big(\Big(\Big(\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,3]\Big)$$

$$\Big(\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]\Big)\Big)\Big/$$

$$\Big(\Big(-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,3]\Big)$$

$$\Big(\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]\Big)\Big)\Big)\Big]$$

$$\Big(-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]\Big)\Big)$$

$$\sqrt{}\Big(\Big(\Big(-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]\Big)$$

$$\Big(x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,3]\Big)\Big)\Big/\Big(\Big(x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]\Big)$$

$$\Big(-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,3]\Big)\Big)\Big)$$

$$\Big(\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]\Big)$$

$$\sqrt{}\Big(\Big(\Big(x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]\Big)\Big(\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]-$$

$$\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]\Big)\Big)\Big/\Big(\Big(x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]\Big)$$

$$\Big(\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]\Big)\Big)\Big)$$

$$\sqrt{}\Big(\Big(\Big(-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]\Big)$$

$$\Big(x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]\Big)\Big)\Big/\Big(\Big(x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]\Big)$$

$$\Big(-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]\Big)\Big)\Big)\Big)\Big/$$

$$\Big(\sqrt{8+24x+8x^2-15x^3+8x^4}\ \Big(-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]\Big)$$

```
    (Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2] - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])) +
  (103 049 936 174 EllipticF[ArcSin[√(((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1]) (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2] +
            Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])) / ((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
          (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])))],
     ((Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2] - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 3])
        (Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])) /
      ((Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 3]) (Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2] -
          Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4]))] (x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])^2
    √(((-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
        (x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 3])) / ((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
        (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 3])))
    (Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])
    √(((-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
        (x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])) / ((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
        (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])))
    √(((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1]) (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2] +
          Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])) / ((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
        (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])))) /
  (√(8 + 24 x + 8 x^2 - 15 x^3 + 8 x^4) (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
    (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])) -
 1/√(8 + 24 x + 8 x^2 - 15 x^3 + 8 x^4) 69 537 663 616 ((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1]) (x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 3])
    (x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4]) + (x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])^2
    √(((-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
        (x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 3])) / ((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
        (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 3])))
    √(((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1]) (Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2] -
          Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])) / ((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
        (Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])))
    √(((-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
        (x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])) / ((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
        (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])))
    (-Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] + Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])
    ((EllipticE[ArcSin[√(((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1]) (Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2] -
                Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])) / ((x - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2])
              (Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 1] - Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 4])))],
```

$$-(((\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2]-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,3])$$
$$(\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,1]-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,4]))/$$
$$((-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,1]+\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,3])$$
$$(\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2]-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,4]))))]$$
$$(-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,1]+\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,3]))/$$
$$(-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,1]+\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2])+$$
$$(\text{EllipticF}[\text{ArcSin}[\sqrt{}(((x-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,1])\ (\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2]-$$
$$\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,4]))/((x-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2])$$
$$(\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,1]-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,4]))))],$$
$$-(((\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2]-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,3])$$
$$(\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,1]-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,4]))/$$
$$((-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,1]+\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,3])\ (\text{Root}[8+24\#1+8\#1^{2}-$$
$$15\#1^{3}+8\#1^{4}\&,2]-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,4]))))]\ (\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2]$$
$$(-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2]-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,4])-\text{Root}[8+24\#1+$$
$$8\#1^{2}-15\#1^{3}+8\#1^{4}\&,1]\ (\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2]-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,4])))/$$
$$((-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,1]+\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2])$$
$$(-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2]+\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,4]))-$$
$$(\text{EllipticPi}[(-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,1]+\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,4])/$$
$$(-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2]+\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,4]),\ \text{ArcSin}[$$
$$\sqrt{}(((x-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,1])\ (\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2]-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+$$
$$8\#1^{4}\&,4]))/((x-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2])\ (\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,1]-\text{Root}[$$
$$8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,4]))))],\ -(((\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2]-\text{Root}[8+24\#1+8\#1^{2}-$$
$$15\#1^{3}+8\#1^{4}\&,3])\ (\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,1]-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,4]))/$$
$$((-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,1]+\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,3])$$
$$(\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2]-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,4]))))]$$
$$(-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,1]-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2]-$$
$$\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,3]-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,4]))/$$
$$(-\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,2]+\text{Root}[8+24\#1+8\#1^{2}-15\#1^{3}+8\#1^{4}\&,4])))\Bigg)$$

Problem 803: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{9-6x-44x^{2}+15x^{3}+3x^{4}}}\,dx$$

Optimal (type 4, 130 leaves, 4 steps):

$$-\frac{\sqrt{\frac{613-182\left(1-\frac{6}{x}\right)^2+\left(-1+\frac{6}{x}\right)^4}{\left(\sqrt{613}+\frac{(6-x)^2}{x^2}\right)^2}}\left(\sqrt{613}+\frac{(6-x)^2}{x^2}\right)x^2\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{6-x}{613^{1/4}\,x}\right],\frac{613+91\sqrt{613}}{1226}\right]}{12\times 613^{1/4}\sqrt{9-6x-44x^2+15x^3+3x^4}}$$

Result (type 4, 826 leaves) :

$$-\Bigg(\Bigg(2\,\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{\Big(\Big(\big(x-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,1]\big)\big(\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,2]-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,4]\big)\Big)\Big/\Big(\big(x-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,2]\big)\big(\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,1]-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,4]\big)\Big)\Big)}\Bigg],$$
$$\Big(\big(\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,2]-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,3]\big)\big(\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,1]-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,4]\big)\Big)\Big/\Big(\big(\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,1]-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,3]\big)\big(\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,2]-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,4]\big)\Big)\Bigg]$$
$$\sqrt{\frac{x-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,1]}{x-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,2]}}\big(x-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,2]\big)^2$$
$$\sqrt{\frac{x-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,3]}{x-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,2]}}$$
$$\sqrt{\frac{x-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,4]}{x-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,2]}}\Bigg)\Bigg/$$
$$\Bigg(\sqrt{\Big(\big(9-6x-44x^2+15x^3+3x^4\big)\big(\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,1]-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,3]\big)\big(\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,2]-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,4]\big)\Big)}\Bigg)\Bigg)$$

Problem 804: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(9-6x-44x^2+15x^3+3x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 444 leaves, 10 steps) :

$$-\frac{\left(176-23\left(1-\frac{6}{x}\right)^2\right)x^2}{51\,759\sqrt{9-6x-44x^2+15x^3+3x^4}}+\frac{\left(45\,401-3722\left(1-\frac{6}{x}\right)^2\right)\left(1-\frac{6}{x}\right)x^2}{31\,728\,267\sqrt{9-6x-44x^2+15x^3+3x^4}}+\frac{3722\left(613-182\left(1-\frac{6}{x}\right)^2+\left(-1+\frac{6}{x}\right)^4\right)\left(1-\frac{6}{x}\right)x^2}{31\,728\,267\left(\sqrt{613}+\frac{(6-x)^2}{x^2}\right)\sqrt{9-6x-44x^2+15x^3+3x^4}}+$$

$$\frac{3722\sqrt{\frac{613-182\left(1-\frac{6}{x}\right)^2+\left(-1+\frac{6}{x}\right)^4}{\left(\sqrt{613}+\frac{(6-x)^2}{x^2}\right)^2}}\left(\sqrt{613}+\frac{(6-x)^2}{x^2}\right)x^2\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{6-x}{613^{1/4}x}\right],\frac{613+91\sqrt{613}}{1226}\right]}{51\,759\times613^{3/4}\sqrt{9-6x-44x^2+15x^3+3x^4}}-$$

$$\frac{\left(7444-145\sqrt{613}\right)\sqrt{\frac{613-182\left(1-\frac{6}{x}\right)^2+\left(-1+\frac{6}{x}\right)^4}{\left(\sqrt{613}+\frac{(6-x)^2}{x^2}\right)^2}}\left(\sqrt{613}+\frac{(6-x)^2}{x^2}\right)x^2\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{6-x}{613^{1/4}x}\right],\frac{613+91\sqrt{613}}{1226}\right]}{207\,036\times613^{3/4}\sqrt{9-6x-44x^2+15x^3+3x^4}}$$

Result (type 4, 5428 leaves):

$$-\frac{2\left(-106\,926-592\,639x+232\,005x^2+44\,664x^3\right)}{10\,576\,089\sqrt{9-6x-44x^2+15x^3+3x^4}}+$$

$$\frac{1}{3\,525\,363}\Big(\Big(148\,880\left(x-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,2\right]\right)^2\Big(-\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{}\Big(\Big(\left(x-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,1\right]\right)$$

$$\left(\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,2\right]-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,4\right]\right)\Big)\Big/\Big(\left(x-\text{Root}\left[9-6\#1-44\#1^2+\right.\right.$$

$$\left.\left.15\#1^3+3\#1^4\&,2\right]\right)\left(\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,1\right]-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,4\right]\right)\Big)\Big)\Big],$$

$$-\Big(\Big(\left(\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,2\right]-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,3\right]\right)$$

$$\left(\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,1\right]-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,4\right]\right)\Big)\Big/$$

$$\Big(\left(-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,1\right]+\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,3\right]\right)\left(\text{Root}\left[9-6\#1-44\#1^2+\right.\right.$$

$$\left.\left.15\#1^3+3\#1^4\&,2\right]-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,4\right]\right)\Big)\Big)\Big]\,\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,2\right]+$$

$$\text{EllipticPi}\Big[\frac{-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,1\right]+\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,4\right]}{-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,2\right]+\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,4\right]},$$

$$\text{ArcSin}\Big[\sqrt{}\Big(\Big(\left(x-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,1\right]\right)\left(\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,2\right]-\right.$$

$$\left.\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,4\right]\right)\Big)\Big/\Big(\left(x-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,2\right]\right)$$

$$\left(\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,1\right]-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,4\right]\right)\Big)\Big)\Big],$$

$$-\Big(\Big(\left(\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,2\right]-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,3\right]\right)$$

$$\left(\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,1\right]-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,4\right]\right)\Big)\Big/$$

$$\Big(\left(-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,1\right]+\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,3\right]\right)$$

$$\left(\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,2\right]-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,4\right]\right)\Big)\Big)\Big]$$

$$\left(-\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,1\right]+\text{Root}\left[9-6\#1-44\#1^2+15\#1^3+3\#1^4\&,2\right]\right)\Big)$$

```
Sqrt[(x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 3])/(x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2])] Sqrt[(x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])/(x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2])]
  (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])
  √(((x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1]) (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2] -
          Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])) / ((x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2])
        (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])))) /
 (Sqrt[9 - 6 x - 44 x^2 + 15 x^3 + 3 x^4] (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])
  √((-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] + Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 3])
     (-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] + Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4]))) -
(54 294 EllipticF[ArcSin[√(((x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1]) (-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2] +
          Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])) / ((x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2])
        (-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] + Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])))],
   ((Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 3])
      (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])) /
    ((Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 3])
      (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4]))]
  Sqrt[(x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1])/(x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2])] (x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2])^2
  Sqrt[(x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 3])/(x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2])]
  Sqrt[(x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])/(x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2])]
  (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])) /
 (Sqrt[9 - 6 x - 44 x^2 + 15 x^3 + 3 x^4] (-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] + Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])
  √((-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] + Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 3])
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(-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2] + Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4]))) +

1/√(9 - 6 x - 44 x^2 + 15 x^3 + 3 x^4) 29776 ((x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1]) (x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 3])
  (x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4]) + (x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2])^2
  (-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] + Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2])
  √((x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 3])/(x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2])) √((x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])/(x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2]))
  √(((x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1]) (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2] -
        Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4]))/((x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2])
      (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])))
  √((-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] + Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])/(-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] + Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 3]))
  ((EllipticE[ArcSin[√(((x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1]) (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2] -
             Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4]))/((x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2])
            (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])))],
        -(((Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 3]) (Root[9 - 6 #1 - 44 #1^2 +
                15 #1^3 + 3 #1^4 &, 1] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4]))/((-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] +
              Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 3]) (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2] - Root[9 - 6 #1 - 44 #1^2 +
                15 #1^3 + 3 #1^4 &, 4])))] (-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] + Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 3])) /
     (-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] + Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2]) +
    (EllipticF[ArcSin[√(((x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1]) (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2] -
             Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4]))/((x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2])
            (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])))],
        -(((Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 3])
            (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4]))/
           ((-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] + Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 3]) (Root[9 - 6 #1 - 44 #1^2 +
                15 #1^3 + 3 #1^4 &, 2] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])))] (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2]
          (-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4]) - Root[9 - 6 #1 -
             44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4]))) /
     ((-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] + Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2])
       (-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2] + Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4])) -
    (EllipticPi[(-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] + Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4]) /
        (-Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2] + Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 4]), ArcSin[
        √(((x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1]) (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2] - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 +
                 3 #1^4 &, 4]))/((x - Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 2]) (Root[9 - 6 #1 - 44 #1^2 + 15 #1^3 + 3 #1^4 &, 1] - Root[
```

$9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4]))))],\;-(((\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2]-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,3])\,(\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1]-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4]))\,/\,((-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1]+\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,3])\,(\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2]-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4])))]\;(-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1]-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2]-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,3]-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4]))\,/\,(-\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2]+\text{Root}[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4])))$

Problem 817: Unable to integrate problem.

$$\int \frac{x-\sqrt{x^6}}{x\,(1-x^4)}\,dx$$

Optimal (type 3, 45 leaves, 9 steps):

$$\frac{\text{ArcTan}[x]}{2}+\frac{\sqrt{x^6}\,\text{ArcTan}[x]}{2\,x^3}+\frac{\text{ArcTanh}[x]}{2}-\frac{\sqrt{x^6}\,\text{ArcTanh}[x]}{2\,x^3}$$

Result (type 8, 26 leaves):

$$\int \frac{x-\sqrt{x^6}}{x\,(1-x^4)}\,dx$$

Problem 818: Unable to integrate problem.

$$\int \frac{1-\frac{\sqrt{x^6}}{x}}{1-x^4}\,dx$$

Optimal (type 3, 45 leaves, 9 steps):

$$\frac{\text{ArcTan}[x]}{2}+\frac{\sqrt{x^6}\,\text{ArcTan}[x]}{2\,x^3}+\frac{\text{ArcTanh}[x]}{2}-\frac{\sqrt{x^6}\,\text{ArcTanh}[x]}{2\,x^3}$$

Result (type 8, 26 leaves):

$$\int \frac{1-\frac{\sqrt{x^6}}{x}}{1-x^4}\,dx$$

Problem 819: Unable to integrate problem.

$$\int \frac{x - \sqrt{x^6}}{x - x^5} \, dx$$

Optimal (type 3, 45 leaves, 10 steps):

$$\frac{\text{ArcTan}[x]}{2} + \frac{\sqrt{x^6}\,\text{ArcTan}[x]}{2\,x^3} + \frac{\text{ArcTanh}[x]}{2} - \frac{\sqrt{x^6}\,\text{ArcTanh}[x]}{2\,x^3}$$

Result (type 8, 23 leaves):

$$\int \frac{x - \sqrt{x^6}}{x - x^5} \, dx$$

Problem 820: Unable to integrate problem.

$$\int \frac{x}{x + \sqrt{x^6}} \, dx$$

Optimal (type 3, 45 leaves, 11 steps):

$$\frac{\text{ArcTan}[x]}{2} + \frac{\sqrt{x^6}\,\text{ArcTan}[x]}{2\,x^3} + \frac{\text{ArcTanh}[x]}{2} - \frac{\sqrt{x^6}\,\text{ArcTanh}[x]}{2\,x^3}$$

Result (type 8, 15 leaves):

$$\int \frac{x}{x + \sqrt{x^6}} \, dx$$

Problem 821: Unable to integrate problem.

$$\int \frac{\sqrt{x} - \sqrt{x^3}}{x - x^3} \, dx$$

Optimal (type 3, 52 leaves, 12 steps):

$$\text{ArcTan}\left[\sqrt{x}\right] + \frac{\sqrt{x^3}\,\text{ArcTan}\left[\sqrt{x}\right]}{x^{3/2}} + \text{ArcTanh}\left[\sqrt{x}\right] - \frac{\sqrt{x^3}\,\text{ArcTanh}\left[\sqrt{x}\right]}{x^{3/2}}$$

Result (type 8, 27 leaves):

$$\int \frac{\sqrt{x} - \sqrt{x^3}}{x - x^3} \, dx$$

Problem 822: Unable to integrate problem.

$$\int \frac{1}{\sqrt{x}+\sqrt{x^3}}\,dx$$

Optimal (type 3, 52 leaves, 13 steps):

$$\text{ArcTan}\left[\sqrt{x}\right]+\frac{\sqrt{x^3}\,\text{ArcTan}\left[\sqrt{x}\right]}{x^{3/2}}+\text{ArcTanh}\left[\sqrt{x}\right]-\frac{\sqrt{x^3}\,\text{ArcTanh}\left[\sqrt{x}\right]}{x^{3/2}}$$

Result (type 8, 17 leaves):

$$\int \frac{1}{\sqrt{x}+\sqrt{x^3}}\,dx$$

Problem 843: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{3-x}\,\sqrt{5+x}}\,dx$$

Optimal (type 3, 12 leaves, 3 steps):

$$-\text{ArcSin}\left[\frac{1}{4}\,(-1-x)\right]$$

Result (type 3, 45 leaves):

$$\frac{2\,\sqrt{-3+x}\,\sqrt{5+x}\,\text{ArcSinh}\left[\frac{\sqrt{-3+x}}{2\,\sqrt{2}}\right]}{\sqrt{-(-3+x)\,(5+x)}}$$

Problem 844: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{(3-x)\,(5+x)}}\,dx$$

Optimal (type 3, 12 leaves, 3 steps):

$$-\text{ArcSin}\left[\frac{1}{4}\,(-1-x)\right]$$

Result (type 3, 45 leaves):

$$\frac{2\sqrt{-3+x}\ \sqrt{5+x}\ \text{ArcSinh}\left[\frac{\sqrt{-3+x}}{2\sqrt{2}}\right]}{\sqrt{-(-3+x)\ (5+x)}}$$

Problem 846: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{-3-x}\ \sqrt{5+x}}\, dx$$

Optimal (type 3, 4 leaves, 3 steps):

ArcSin[4 + x]

Result (type 3, 42 leaves):

$$\frac{2\sqrt{3+x}\ \sqrt{5+x}\ \text{ArcSinh}\left[\frac{\sqrt{3+x}}{\sqrt{2}}\right]}{\sqrt{-(3+x)\ (5+x)}}$$

Problem 847: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{(-3-x)\ (5+x)}}\, dx$$

Optimal (type 3, 4 leaves, 3 steps):

ArcSin[4 + x]

Result (type 3, 42 leaves):

$$\frac{2\sqrt{3+x}\ \sqrt{5+x}\ \text{ArcSinh}\left[\frac{\sqrt{3+x}}{\sqrt{2}}\right]}{\sqrt{-(3+x)\ (5+x)}}$$

Problem 852: Result more than twice size of optimal antiderivative.

$$\int \sqrt{\frac{1}{-1+x^2}}\, dx$$

Optimal (type 3, 25 leaves, 2 steps):

$$\sqrt{1-x^2}\,\sqrt{\frac{1}{-1+x^2}}\,\text{ArcSin}[x]$$

Result (type 3, 56 leaves):

$$\frac{1}{2}\sqrt{\frac{1}{-1+x^2}}\,\sqrt{-1+x^2}\,\left(-\text{Log}\left[1-\frac{x}{\sqrt{-1+x^2}}\right]+\text{Log}\left[1+\frac{x}{\sqrt{-1+x^2}}\right]\right)$$

Problem 853: Result more than twice size of optimal antiderivative.

$$\int\sqrt{\frac{1+x^2}{-1+x^4}}\,dx$$

Optimal (type 3, 25 leaves, 3 steps):

$$\sqrt{1-x^2}\,\sqrt{\frac{1}{-1+x^2}}\,\text{ArcSin}[x]$$

Result (type 3, 56 leaves):

$$\frac{1}{2}\sqrt{\frac{1}{-1+x^2}}\,\sqrt{-1+x^2}\,\left(-\text{Log}\left[1-\frac{x}{\sqrt{-1+x^2}}\right]+\text{Log}\left[1+\frac{x}{\sqrt{-1+x^2}}\right]\right)$$

Problem 855: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{1+x}}{\sqrt{1-x^2}}\,dx$$

Optimal (type 2, 11 leaves, 2 steps):

$$-2\sqrt{1-x}$$

Result (type 2, 23 leaves):

$$\frac{2\,(-1+x)\,\sqrt{1+x}}{\sqrt{1-x^2}}$$

Problem 857: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{1-x}}{\sqrt{1-x^2}}\,dx$$

Optimal (type 2, 9 leaves, 2 steps):

$$2\sqrt{1+x}$$

Result (type 2, 25 leaves):

$$\frac{2\sqrt{1-x}\,(1+x)}{\sqrt{1-x^2}}$$

Problem 861: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{1-x^2}}{\sqrt{1-x}}\,dx$$

Optimal (type 2, 11 leaves, 2 steps):

$$\frac{2}{3}(1+x)^{3/2}$$

Result (type 2, 27 leaves):

$$\frac{2\,(1+x)\,\sqrt{1-x^2}}{3\sqrt{1-x}}$$

Problem 863: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{1-x}\,\sqrt{2+3x}}{\sqrt{1-x^2}}\,dx$$

Optimal (type 3, 35 leaves, 4 steps):

$$\sqrt{1+x}\,\sqrt{2+3x}-\frac{\text{ArcSinh}\left[\sqrt{2+3x}\right]}{\sqrt{3}}$$

Result (type 3, 79 leaves):

$$\frac{\sqrt{1-x}\left(3\,(1+x)\,\sqrt{2+3x}+\sqrt{3}\,\sqrt{-1-x}\,\text{ArcTan}\left[\frac{\sqrt{3}\,\sqrt{-1-x}}{\sqrt{2+3x}}\right]\right)}{3\,\sqrt{1-x^2}}$$

Problem 864: Result more than twice size of optimal antiderivative.

$$\int \frac{(1+x)^{3/2}}{(1-x)^{3/2}\,x}\,dx$$

Optimal (type 3, 43 leaves, 7 steps):

$$\frac{4\,\sqrt{1+x}}{\sqrt{1-x}}-\text{ArcSin}[x]-\text{ArcTanh}\left[\sqrt{1-x}\,\sqrt{1+x}\right]$$

Result (type 3, 101 leaves):

$$-\frac{4\,\sqrt{1-x^2}}{-1+x}-2\,\text{ArcSin}\left[\frac{\sqrt{1+x}}{\sqrt{2}}\right]+\text{Log}\left[1-\sqrt{1+x}\right]-\text{Log}\left[2+\sqrt{1-x}-\sqrt{1+x}\right]-\text{Log}\left[1+\sqrt{1+x}\right]+\text{Log}\left[2+\sqrt{1-x}+\sqrt{1+x}\right]$$

Problem 866: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(1+a\,x)^{3/2}}{x\,(1-a\,x)^{3/2}}\,dx$$

Optimal (type 3, 51 leaves, 7 steps):

$$\frac{4\,\sqrt{1+a\,x}}{\sqrt{1-a\,x}}-\text{ArcSin}[a\,x]-\text{ArcTanh}\left[\sqrt{1-a\,x}\,\sqrt{1+a\,x}\right]$$

Result (type 3, 74 leaves):

$$\frac{4\,\sqrt{1-a^2\,x^2}}{1-a\,x}+\text{Log}[x]-\text{Log}\left[1+\sqrt{1-a^2\,x^2}\right]-i\,\text{Log}\left[2\left(-i\,a\,x+\sqrt{1-a^2\,x^2}\right)\right]$$

Problem 869: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{1+x^2}}{\sqrt{1-x^4}}\,dx$$

Optimal (type 3, 2 leaves, 2 steps):

$$\text{ArcSin}[x]$$

Result (type 3, 32 leaves) :

$$-\text{ArcTan}\left[\frac{x\sqrt{1+x^2}\,\sqrt{1-x^4}}{-1+x^4}\right]$$

Problem 871: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{1-x^2}}{\sqrt{1-x^4}}\,dx$$

Optimal (type 3, 2 leaves, 2 steps) :

$$\text{ArcSinh}[x]$$

Result (type 3, 42 leaves) :

$$\text{Log}\left[1-x^2\right]-\text{Log}\left[-x+x^3+\sqrt{1-x^2}\,\sqrt{1-x^4}\right]$$

Problem 873: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{1-x^4}}{\sqrt{1+x^2}}\,dx$$

Optimal (type 3, 23 leaves, 3 steps) :

$$\frac{1}{2}x\sqrt{1-x^2}+\frac{\text{ArcSin}[x]}{2}$$

Result (type 3, 50 leaves) :

$$\frac{1}{2}\left(\frac{x\sqrt{1-x^4}}{\sqrt{1+x^2}}+\text{ArcTan}\left[\frac{x\sqrt{1+x^2}}{\sqrt{1-x^4}}\right]\right)$$

Problem 875: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{1-x^4}}{\sqrt{1-x^2}}\,dx$$

Optimal (type 3, 21 leaves, 3 steps) :

$$\frac{1}{2}x\sqrt{1+x^2}+\frac{\text{ArcSinh}[x]}{2}$$

Result (type 3, 70 leaves) :

$$\frac{1}{2}\left(\frac{x\sqrt{1-x^4}}{\sqrt{1-x^2}}+\text{Log}\left[1-x^2\right]-\text{Log}\left[-x+x^3+\sqrt{1-x^2}\,\sqrt{1-x^4}\,\right]\right)$$

Problem 911: Unable to integrate problem.

$$\int\frac{\sqrt{b\,x^2+\sqrt{a+b^2\,x^4}}}{\sqrt{a+b^2\,x^4}}\,dx$$

Optimal (type 3, 47 leaves, 2 steps):

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{2}\,\sqrt{b}\,x}{\sqrt{b\,x^2+\sqrt{a+b^2\,x^4}}}\right]}{\sqrt{2}\,\sqrt{b}}$$

Result (type 8, 39 leaves):

$$\int\frac{\sqrt{b\,x^2+\sqrt{a+b^2\,x^4}}}{\sqrt{a+b^2\,x^4}}\,dx$$

Problem 912: Unable to integrate problem.

$$\int\frac{\sqrt{-b\,x^2+\sqrt{a+b^2\,x^4}}}{\sqrt{a+b^2\,x^4}}\,dx$$

Optimal (type 3, 48 leaves, 2 steps):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{2}\,\sqrt{b}\,x}{\sqrt{-b\,x^2+\sqrt{a+b^2\,x^4}}}\right]}{\sqrt{2}\,\sqrt{b}}$$

Result (type 8, 40 leaves):

$$\int\frac{\sqrt{-b\,x^2+\sqrt{a+b^2\,x^4}}}{\sqrt{a+b^2\,x^4}}\,dx$$

Problem 913: Unable to integrate problem.

$$\int \frac{\sqrt{2 x^2+\sqrt{3+4 x^4}}}{(c+d x) \sqrt{3+4 x^4}} \, dx$$

Optimal (type 3, 169 leaves, 5 steps):

$$\frac{\left(\frac{1}{2}-\frac{i}{2}\right) \text{ArcTan}\left[\frac{\sqrt{3} d+2 i c x}{\sqrt{2 i c^2-\sqrt{3} d^2} \sqrt{\sqrt{3}-2 i x^2}}\right]}{\sqrt{2 i c^2-\sqrt{3} d^2}}-\frac{\left(\frac{1}{2}+\frac{i}{2}\right) \text{ArcTanh}\left[\frac{\sqrt{3} d-2 i c x}{\sqrt{2 i c^2+\sqrt{3} d^2} \sqrt{\sqrt{3}+2 i x^2}}\right]}{\sqrt{2 i c^2+\sqrt{3} d^2}}$$

Result (type 8, 42 leaves):

$$\int \frac{\sqrt{2 x^2+\sqrt{3+4 x^4}}}{(c+d x) \sqrt{3+4 x^4}} \, dx$$

Problem 914: Unable to integrate problem.

$$\int \frac{\sqrt{2 x^2+\sqrt{3+4 x^4}}}{(c+d x)^2 \sqrt{3+4 x^4}} \, dx$$

Optimal (type 3, 268 leaves, 7 steps):

$$\frac{\left(\frac{1}{2}-\frac{i}{2}\right) d \sqrt{\sqrt{3}-2 i x^2}}{\left(2 i c^2-\sqrt{3} d^2\right) (c+d x)}-\frac{\left(\frac{1}{2}+\frac{i}{2}\right) d \sqrt{\sqrt{3}+2 i x^2}}{\left(2 i c^2+\sqrt{3} d^2\right) (c+d x)}+\frac{(1+i) c \text{ArcTan}\left[\frac{\sqrt{3} d+2 i c x}{\sqrt{2 i c^2-\sqrt{3} d^2} \sqrt{\sqrt{3}-2 i x^2}}\right]}{\left(2 i c^2-\sqrt{3} d^2\right)^{3/2}}+\frac{(1-i) c \text{ArcTanh}\left[\frac{\sqrt{3} d-2 i c x}{\sqrt{2 i c^2+\sqrt{3} d^2} \sqrt{\sqrt{3}+2 i x^2}}\right]}{\left(2 i c^2+\sqrt{3} d^2\right)^{3/2}}$$

Result (type 8, 42 leaves):

$$\int \frac{\sqrt{2 x^2+\sqrt{3+4 x^4}}}{(c+d x)^2 \sqrt{3+4 x^4}} \, dx$$

Problem 918: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{2+\frac{b}{x^2}}}{b+2 x^2} \, dx$$

Optimal (type 3, 20 leaves, 3 steps):

$$-\frac{\text{ArcCsch}\left[\frac{\sqrt{2}\,x}{\sqrt{b}}\right]}{\sqrt{b}}$$

Result (type 3, 54 leaves):

$$\frac{\sqrt{2+\frac{b}{x^2}}\;x\left(\text{Log}[x]-\text{Log}\left[b+\sqrt{b}\;\sqrt{b+2\,x^2}\right]\right)}{\sqrt{b}\;\sqrt{b+2\,x^2}}$$

Problem 919: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{2-\frac{b}{x^2}}}{-b+2\,x^2}\,dx$$

Optimal (type 3, 20 leaves, 3 steps):

$$-\frac{\text{ArcCsc}\left[\frac{\sqrt{2}\,x}{\sqrt{b}}\right]}{\sqrt{b}}$$

Result (type 3, 64 leaves):

$$-\frac{i\,\sqrt{2-\frac{b}{x^2}}\;x\,\text{Log}\left[\frac{2\left(-i\,\sqrt{b}+\sqrt{-b+2\,x^2}\right)}{x}\right]}{\sqrt{b}\;\sqrt{-b+2\,x^2}}$$

Problem 926: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{(1+x)\,\sqrt{2\,x+x^2}}\,dx$$

Optimal (type 3, 12 leaves, 2 steps):

$$\text{ArcTan}\left[\sqrt{2\,x+x^2}\right]$$

Result (type 3, 37 leaves):

$$\frac{2\,\sqrt{x}\;\sqrt{2+x}\;\text{ArcTan}\left[\frac{\sqrt{x}}{\sqrt{2+x}}\right]}{\sqrt{x\,(2+x)}}$$

Problem 927: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{(1+2x)\sqrt{x+x^2}}\,dx$$

Optimal (type 3, 12 leaves, 2 steps):

$$\text{ArcTan}\left[2\sqrt{x+x^2}\right]$$

Result (type 3, 37 leaves):

$$\frac{2\sqrt{x}\,\sqrt{1+x}\,\text{ArcTan}\left[\frac{\sqrt{x}}{\sqrt{1+x}}\right]}{\sqrt{x\,(1+x)}}$$

Problem 929: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{x-x^2}}{1+x}\,dx$$

Optimal (type 3, 54 leaves, 6 steps):

$$\sqrt{x-x^2}-\frac{3}{2}\,\text{ArcSin}[1-2x]+\sqrt{2}\,\text{ArcTan}\left[\frac{1-3x}{2\sqrt{2}\,\sqrt{x-x^2}}\right]$$

Result (type 3, 120 leaves):

$$\frac{1}{2\sqrt{-1+x}\,\sqrt{x}}\sqrt{-(-1+x)\,x}\,\left(2\sqrt{-1+x}\,\sqrt{x}-6\,\text{Log}\left[\sqrt{-1+x}+\sqrt{x}\right]+\sqrt{2}\,\text{Log}\left[1-2\sqrt{2}\,\sqrt{-1+x}\,\sqrt{x}-3x\right]-\sqrt{2}\,\text{Log}\left[1+2\sqrt{2}\,\sqrt{-1+x}\,\sqrt{x}-3x\right]\right)$$

Problem 951: Result unnecessarily involves higher level functions.

$$\int \frac{\left(1+\sqrt{x}\right)^{1/3}}{x}\,dx$$

Optimal (type 3, 67 leaves, 6 steps):

$$6\left(1+\sqrt{x}\right)^{1/3}-2\sqrt{3}\,\text{ArcTan}\left[\frac{1+2\left(1+\sqrt{x}\right)^{1/3}}{\sqrt{3}}\right]+3\,\text{Log}\left[1-\left(1+\sqrt{x}\right)^{1/3}\right]-\frac{\text{Log}[x]}{2}$$

Result (type 5, 51 leaves):

$$\frac{6+6\sqrt{x}-3\left(1+\frac{1}{\sqrt{x}}\right)^{2/3}\text{Hypergeometric2F1}\left[\frac{2}{3},\frac{2}{3},\frac{5}{3},-\frac{1}{\sqrt{x}}\right]}{\left(1+\sqrt{x}\right)^{2/3}}$$

Problem 956: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{(a+b\,x)\,(c-d\,x)}}\,dx$$

Optimal (type 3, 65 leaves, 3 steps):

$$-\frac{\text{ArcTan}\left[\frac{b\,c-a\,d-2\,b\,d\,x}{2\,\sqrt{b}\,\sqrt{d}\,\sqrt{a\,c+(b\,c-a\,d)\,x-b\,d\,x^2}}\right]}{\sqrt{b}\,\sqrt{d}}$$

Result (type 3, 99 leaves):

$$\frac{i\,\sqrt{a+b\,x}\,\sqrt{c-d\,x}\,\text{Log}\left[2\,\sqrt{a+b\,x}\,\sqrt{c-d\,x}-\frac{i\,(-b\,c+a\,d+2\,b\,d\,x)}{\sqrt{b}\,\sqrt{d}}\right]}{\sqrt{b}\,\sqrt{d}\,\sqrt{(a+b\,x)\,(c-d\,x)}}$$

Problem 957: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{x}\,\left(1-x^2\right)}\,dx$$

Optimal (type 3, 13 leaves, 4 steps):

$$\text{ArcTan}\left[\sqrt{x}\right]+\text{ArcTanh}\left[\sqrt{x}\right]$$

Result (type 3, 33 leaves):

$$\text{ArcTan}\left[\sqrt{x}\right]-\frac{1}{2}\,\text{Log}\left[1-\sqrt{x}\right]+\frac{1}{2}\,\text{Log}\left[1+\sqrt{x}\right]$$

Problem 958: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{x}}{x-x^3}\,dx$$

Optimal (type 3, 13 leaves, 5 steps):

$$\text{ArcTan}\left[\sqrt{x}\right]+\text{ArcTanh}\left[\sqrt{x}\right]$$

Result (type 3, 33 leaves):

$$\text{ArcTan}\left[\sqrt{x}\right]-\frac{1}{2}\text{Log}\left[1-\sqrt{x}\right]+\frac{1}{2}\text{Log}\left[1+\sqrt{x}\right]$$

Problem 961: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{(1+x)\sqrt{2x+x^2}}\,dx$$

Optimal (type 3, 12 leaves, 2 steps):

$$\text{ArcTan}\left[\sqrt{2x+x^2}\right]$$

Result (type 3, 37 leaves):

$$\frac{2\sqrt{x}\sqrt{2+x}\,\text{ArcTan}\left[\frac{\sqrt{x}}{\sqrt{2+x}}\right]}{\sqrt{x(2+x)}}$$

Problem 969: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{x}{x-\sqrt{1+2x^2}}\,dx$$

Optimal (type 3, 31 leaves, 7 steps):

$$-x-\sqrt{1+2x^2}+\text{ArcTan}[x]+\text{ArcTan}\left[\sqrt{1+2x^2}\right]$$

Result (type 3, 101 leaves):

$$\frac{1}{4}\left(-4x-4\sqrt{1+2x^2}+4\,\text{ArcTan}[x]-4\,\text{ArcTan}\left[\frac{1}{\sqrt{1+2x^2}}\right]+2\,i\,\text{Log}\left[1+x^2\right]-i\,\text{Log}\left[1+3x^2-2x\sqrt{1+2x^2}\right]-i\,\text{Log}\left[1+3x^2+2x\sqrt{1+2x^2}\right]\right)$$

Problem 981: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{(1-x)\,x}}\,dx$$

Optimal (type 3, 8 leaves, 3 steps):

$$-\text{ArcSin}[1-2x]$$

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 984: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{1+\sqrt{5}-x^2+\sqrt{5}\,x^2}\,dx$$

Optimal (type 3, 24 leaves, 2 steps):

$$\frac{1}{2}\,\text{ArcTan}\left[\sqrt{\frac{1}{2}\left(3-\sqrt{5}\right)}\,x\right]$$

Result (type 3, 39 leaves):

$$\frac{1}{4}\,i\,\text{Log}\left[1+\sqrt{5}-2\,i\,x\right]-\frac{1}{4}\,i\,\text{Log}\left[1+\sqrt{5}+2\,i\,x\right]$$

Problem 995: Unable to integrate problem.

$$\int\sqrt{1-x^2+x\sqrt{-1+x^2}}\,dx$$

Optimal (type 3, 63 leaves, ? steps):

$$\frac{1}{4}\left(3\,x+\sqrt{-1+x^2}\right)\sqrt{1-x^2+x\sqrt{-1+x^2}}+\frac{3\,\text{ArcSin}\left[x-\sqrt{-1+x^2}\right]}{4\sqrt{2}}$$

Result (type 8, 24 leaves):

$$\int\sqrt{1-x^2+x\sqrt{-1+x^2}}\,dx$$

Problem 996: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{-x+\sqrt{x}\,\sqrt{1+x}}}{\sqrt{1+x}}\,dx$$

Optimal (type 3, 66 leaves, ? steps):

$$\frac{1}{2}\left(\sqrt{x}+3\sqrt{1+x}\right)\sqrt{-x+\sqrt{x}\sqrt{1+x}}-\frac{3\,\text{ArcSin}\left[\sqrt{x}-\sqrt{1+x}\right]}{2\sqrt{2}}$$

Result (type 3, 180 leaves):

$$-\left(\left(\left(1+x\right)\left(1+2x-2\sqrt{x}\sqrt{1+x}\right)^2\left(2\sqrt{-x+\sqrt{x}\sqrt{1+x}}\left(-3-2x+2\sqrt{x}\sqrt{1+x}\right)+3\sqrt{-2-4x+4\sqrt{x}\sqrt{1+x}}\,\text{Log}\left[2\sqrt{-x+\sqrt{x}\sqrt{1+x}}+\sqrt{-2-4x+4\sqrt{x}\sqrt{1+x}}\right]\right)\right)\Big/\left(4\left(-\sqrt{x}+\sqrt{1+x}\right)^3\left(1+x-\sqrt{x}\sqrt{1+x}\right)^2\right)\right)$$

Problem 997: Unable to integrate problem.

$$\int -\frac{x+2\sqrt{1+x^2}}{x+x^3+\sqrt{1+x^2}}\,dx$$

Optimal (type 3, 78 leaves, ? steps):

$$-\sqrt{2\left(1+\sqrt{5}\right)}\,\text{ArcTan}\left[\sqrt{-2+\sqrt{5}}\left(x+\sqrt{1+x^2}\right)\right]+\sqrt{2\left(-1+\sqrt{5}\right)}\,\text{ArcTanh}\left[\sqrt{2+\sqrt{5}}\left(x+\sqrt{1+x^2}\right)\right]$$

Result (type 8, 34 leaves):

$$-\int\frac{x+2\sqrt{1+x^2}}{x+x^3+\sqrt{1+x^2}}\,dx$$

Problem 998: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{1+2x}{\left(1+x^2\right)\sqrt{2+2x+x^2}}\,dx$$

Optimal (type 3, 126 leaves, 5 steps):

$$-\sqrt{\frac{1}{2}\left(1+\sqrt{5}\right)}\,\text{ArcTan}\left[\frac{2\sqrt{5}-\left(5+\sqrt{5}\right)x}{\sqrt{10\left(1+\sqrt{5}\right)}\sqrt{2+2x+x^2}}\right]-\sqrt{\frac{1}{2}\left(-1+\sqrt{5}\right)}\,\text{ArcTanh}\left[\frac{2\sqrt{5}+\left(5-\sqrt{5}\right)x}{\sqrt{10\left(-1+\sqrt{5}\right)}\sqrt{2+2x+x^2}}\right]$$

Result (type 3, 433 leaves):

$$\frac{1}{4}\left(2\sqrt{1+2i}\,\text{ArcTan}\left[\left((8+8i)-(1-4i)x^3+5i\sqrt{1+2i}\sqrt{2+2x+x^2}+x^2\left((-2+13i)+5\sqrt{1+2i}\sqrt{2+2x+x^2}\right)+\right.\right.\right.$$
$$\left.\left.(1+i)x\left((9+5i)+5\sqrt{1+2i}\sqrt{2+2x+x^2}\right)\right)\Big/\left((4+14i)+(2+2i)x+(4-11i)x^2-(3+8i)x^3\right)\right]+$$
$$2i\sqrt{1-2i}\,\text{ArcTanh}\left[\left((-8+8i)+(1+4i)x^3+5i\sqrt{1-2i}\sqrt{2+2x+x^2}+x^2\left((2+13i)-5\sqrt{1-2i}\sqrt{2+2x+x^2}\right)+\right.\right.$$
$$\left.\left.(1+i)x\left((5+9i)+5i\sqrt{1-2i}\sqrt{2+2x+x^2}\right)\right)\Big/\left((-14-4i)-(2+2i)x+(11-4i)x^2+(8+3i)x^3\right)\right]+$$
$$i\left(\left(\sqrt{1-2i}-\sqrt{1+2i}\right)\text{Log}\left[1+x^2\right]-\sqrt{1-2i}\,\text{Log}\left[(7-4i)+(8-4i)x+(3-2i)x^2+4\sqrt{1-2i}\sqrt{2+2x+x^2}+2\sqrt{1-2i}\,x\sqrt{2+2x+x^2}\right]+\right.$$
$$\left.\left.\sqrt{1+2i}\,\text{Log}\left[(7+4i)+(8+4i)x+(3+2i)x^2+4\sqrt{1+2i}\sqrt{2+2x+x^2}+2\sqrt{1+2i}\,x\sqrt{2+2x+x^2}\right]\right)\right)$$

Problem 1002: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x}{\sqrt{a+b c^4+4 b c^3 d x+6 b c^2 d^2 x^2+4 b c d^3 x^3+b d^4 x^4}}\,dx$$

Optimal (type 4, 184 leaves, 7 steps):

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{b}\,d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{a+b d^4\left(\frac{c}{d}+x\right)^4}}\right]}{2\sqrt{b}\,d^2}-\frac{c\left(\sqrt{a}+\sqrt{b}\,d^2\left(\frac{c}{d}+x\right)^2\right)\sqrt{\frac{a+b d^4\left(\frac{c}{d}+x\right)^4}{\left(\sqrt{a}+\sqrt{b}\,d^2\left(\frac{c}{d}+x\right)^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}(c+d x)}{a^{1/4}}\right],\frac{1}{2}\right]}{2 a^{1/4} b^{1/4} d^2\sqrt{a+b d^4\left(\frac{c}{d}+x\right)^4}}$$

Result (type 4, 330 leaves):

$$\left((-1)^{1/4}\sqrt{2}\sqrt{-\frac{i\left((-1)^{1/4}a^{1/4}+b^{1/4}(c+dx)\right)}{(-1)^{1/4}a^{1/4}-b^{1/4}(c+dx)}}\left(i\sqrt{a}+\sqrt{b}(c+dx)^2\right)\right.$$

$$\left(\left((-1)^{1/4}a^{1/4}-b^{1/4}c\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{-\frac{i\left((-1)^{1/4}a^{1/4}+b^{1/4}(c+dx)\right)}{(-1)^{1/4}a^{1/4}-b^{1/4}(c+dx)}}\right],-1\right]-\right.$$

$$\left.\left.2(-1)^{1/4}a^{1/4}\text{EllipticPi}\left[-i,\text{ArcSin}\left[\sqrt{-\frac{i\left((-1)^{1/4}a^{1/4}+b^{1/4}(c+dx)\right)}{(-1)^{1/4}a^{1/4}-b^{1/4}(c+dx)}}\right],-1\right]\right)\right)\Big/$$

$$\left(a^{1/4}\sqrt{b}\,d^2\sqrt{\frac{i\sqrt{a}+\sqrt{b}(c+dx)^2}{\left((-1)^{1/4}a^{1/4}-b^{1/4}(c+dx)\right)^2}}\sqrt{a+b(c+dx)^4}\right)$$

Problem 1003: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{a+bc^4+4bc^3dx+6bc^2d^2x^2+4bcd^3x^3+bd^4x^4}}\,dx$$

Optimal (type 4, 131 leaves, 2 steps):

$$\frac{\left(\sqrt{a}+\sqrt{b}\,d^2\left(\frac{c}{d}+x\right)^2\right)\sqrt{\frac{a+bd^4\left(\frac{c}{d}+x\right)^4}{\left(\sqrt{a}+\sqrt{b}\,d^2\left(\frac{c}{d}+x\right)^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}(c+dx)}{a^{1/4}}\right],\frac{1}{2}\right]}{2a^{1/4}b^{1/4}d\sqrt{a+bd^4\left(\frac{c}{d}+x\right)^4}}$$

Result (type 4, 90 leaves):

$$-\frac{i\sqrt{\frac{a+b(c+dx)^4}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}(c+dx)\right],-1\right]}{\sqrt{\frac{i\sqrt{b}}{\sqrt{a}}}\,d\sqrt{a+b(c+dx)^4}}$$

Problem 1004: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{a-c x^4}{\sqrt{a+b x^2+c x^4}\,\left(a d+a e x^2+c d x^4\right)}\,dx$$

Optimal (type 3, 54 leaves, 2 steps):

$$\frac{\text{ArcTanh}\left[\frac{\sqrt{b d-a e}\,x}{\sqrt{d}\,\sqrt{a+b x^2+c x^4}}\right]}{\sqrt{d}\,\sqrt{b d-a e}}$$

Result (type 4, 419 leaves):

$$\left(i\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}}\,\sqrt{1+\frac{2 c x^2}{b-\sqrt{b^2-4 a c}}}\,\left(\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{2}\,\sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\,x\right],\frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]-\text{EllipticPi}\left[\frac{\left(b+\sqrt{b^2-4 a c}\right) d}{a e-\sqrt{a}\,\sqrt{-4 c d^2+a e^2}},i\,\text{ArcSinh}\left[\sqrt{2}\,\sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\,x\right],\frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]-\text{EllipticPi}\left[\frac{\left(b+\sqrt{b^2-4 a c}\right) d}{a e+\sqrt{a}\,\sqrt{-4 c d^2+a e^2}},i\,\text{ArcSinh}\left[\sqrt{2}\,\sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\,x\right],\frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right)\right)\Big/\left(\sqrt{2}\,\sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\,d\,\sqrt{a+b x^2+c x^4}\right)$$

Problem 1005: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{a-c x^4}{\sqrt{a-b x^2+c x^4}\,\left(a d+a e x^2+c d x^4\right)}\,dx$$

Optimal (type 3, 53 leaves, 2 steps):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{b d+a e}\,x}{\sqrt{d}\,\sqrt{a-b x^2+c x^4}}\right]}{\sqrt{d}\,\sqrt{b d+a e}}$$

Result (type 4, 416 leaves):

$$\left(\mathrm{i}\sqrt{2+\frac{4cx^2}{-b+\sqrt{b^2-4ac}}}\sqrt{1-\frac{2cx^2}{b+\sqrt{b^2-4ac}}}\left(\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{2}\sqrt{\frac{c}{-b+\sqrt{b^2-4ac}}}\,x\right],\frac{b-\sqrt{b^2-4ac}}{b+\sqrt{b^2-4ac}}\right]-\right.\right.$$

$$\text{EllipticPi}\left[\frac{\left(b-\sqrt{b^2-4ac}\right)d}{-ae+\sqrt{a}\sqrt{-4cd^2+ae^2}},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{2}\sqrt{\frac{c}{-b+\sqrt{b^2-4ac}}}\,x\right],\frac{b-\sqrt{b^2-4ac}}{b+\sqrt{b^2-4ac}}\right]-$$

$$\left.\left.\text{EllipticPi}\left[\frac{\left(-b+\sqrt{b^2-4ac}\right)d}{ae+\sqrt{a}\sqrt{-4cd^2+ae^2}},\mathrm{i}\,\text{ArcSinh}\left[\sqrt{2}\sqrt{\frac{c}{-b+\sqrt{b^2-4ac}}}\,x\right],\frac{b-\sqrt{b^2-4ac}}{b+\sqrt{b^2-4ac}}\right]\right)\right)\Bigg/\left(2\sqrt{\frac{c}{-b+\sqrt{b^2-4ac}}}\,d\sqrt{a-bx^2+cx^4}\right)$$

Problem 1009: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{ef-efx^2}{\left(ad+bdx+adx^2\right)\sqrt{a+bx+cx^2+bx^3+ax^4}}\,dx$$

Optimal (type 3, 88 leaves, 1 step):

$$\frac{ef\,\text{ArcTan}\left[\frac{ab+\left(4a^2+b^2-2ac\right)x+abx^2}{2a\sqrt{2a-c}\sqrt{a+bx+cx^2+bx^3+ax^4}}\right]}{a\sqrt{2a-c}\,d}$$

Result (type 4, 13 884 leaves):

$$-\frac{1}{d}$$

$$ef\left(-\left(\left(8\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,2\right]\right)^2\left(\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,1\right]\right)\left(\text{Root}\left[a+b\,\#1+c\right.\right.\right.\right.}\right.\right.\right.\right.\right.\right.$$

$$\left.\#1^2+b\,\#1^3+a\,\#1^4\,\&,2\right]-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,4\right]\right)\Big/\left(\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,2\right]\right)\right.$$

$$\left.\left.\left.\left(\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,1\right]-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,4\right]\right)\right)\right)\right],$$

$$-\left(\left(\left(\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,2\right]-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,3\right]\right)\right.\right.$$

$$\left.\left(\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,1\right]-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,4\right]\right)\right)\Big/$$

$$\left(\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,3\right]\right)\left(\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\right.\right.\right.$$

$$\left.\left.\left.\left.2\right]-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,4\right]\right)\right)\right)\right]\left(-b+\sqrt{-4a^2+b^2}-2a\,\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,1\right]\right)-$$

$$2a\,\text{EllipticPi}\left[\left(\left(b-\sqrt{-4a^2+b^2}+2a\,\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,2\right]\right)\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,1\right]+\right.\right.\right.$$

$$\left.\left.\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,4\right]\right)\right)\Big/\left(\left(b-\sqrt{-4a^2+b^2}+2a\,\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,1\right]\right)\right.$$

$$(-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4])),$$

$$\text{ArcSin}[\sqrt{(}((x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1])\ (\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]-$$

$$\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))/((x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])$$

$$(\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))))],$$

$$-(((\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,3])$$

$$(\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))/$$

$$((-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,3])$$

$$(\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))))]$$

$$(-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]))$$

$$\sqrt{(}((-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])$$

$$(x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,3]))/((x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])$$

$$(-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,3])))$$

$$\sqrt{(}((x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1])\ (\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]-$$

$$\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))/((x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])$$

$$(\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4])))$$

$$\sqrt{(}((-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])$$

$$(x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))/((x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])$$

$$(-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4])))$$

$$(-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))/$$

$$((\left(-\frac{-b-\sqrt{-4a^2+b^2}}{2a}+\frac{-b+\sqrt{-4a^2+b^2}}{2a}\right)\sqrt{x\ (b+c\,x+b\,x^2)+a\ (1+x^4)}$$

$$(b-\sqrt{-4a^2+b^2}+2a\,\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1])$$

$$(-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])$$

$$(-b+\sqrt{-4a^2+b^2}-2a\,\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])$$

$$(\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))) +$$

$$(2b^2\ (x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])^2\ (\text{EllipticF}[\text{ArcSin}[\sqrt{(}((x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1])$$

$$(\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))/((x-\text{Root}[a+b\#1+c\#1^2+$$

$$b\#1^3+a\#1^4\&,2])\ (\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))))],$$

$$-(((\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,3])$$

$$(\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))/$$

$$((-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,3])\ (\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]-$$

$$\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))))]\ (-b+\sqrt{-4a^2+b^2}-2a\,\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1])-$$

```
2 a EllipticPi[((b - Sqrt[-4 a^2 + b^2] + 2 a Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2]) (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] +
      Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) / ((b - Sqrt[-4 a^2 + b^2] + 2 a Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1])
    (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])),
   ArcSin[Sqrt[(((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] -
           Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) / ((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])
         (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])))]],
   -(((Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 3]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &,
           1] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) / ((-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[
           a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 3]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])))]
  (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2]))
 Sqrt[(((-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2]) (x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 3])) /
    ((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])
      (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 3])))]
 Sqrt[(((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) /
    ((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])))]
 Sqrt[(((-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2]) (x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) /
    ((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])
      (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])))]
 (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) / (a^2
 (-(-b - Sqrt[-4 a^2 + b^2])/(2 a) + (-b + Sqrt[-4 a^2 + b^2])/(2 a))
 Sqrt[x (b + c x + b x^2) + a (1 + x^4)]
 (b - Sqrt[-4 a^2 + b^2] + 2 a Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1])
 (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])
 (-b + Sqrt[-4 a^2 + b^2] - 2 a Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])
 (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) -
(2 b Sqrt[-4 a^2 + b^2] (x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])^2
 (EllipticF[ArcSin[Sqrt[(((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] -
           Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) / ((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])
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            (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4]))))],
      - (((Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 3])
            (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4]))) /
          ((-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 3]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] -
            Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])))] (-b + Sqrt[-4 a^2 + b^2] - 2 a Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1]) -
    2 a EllipticPi[((b - Sqrt[-4 a^2 + b^2] + 2 a Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2]) (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] +
          Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) / ((b - Sqrt[-4 a^2 + b^2] + 2 a Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1])
        (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])),
      ArcSin[Sqrt[(((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] -
            Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4]))) / ((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])
          (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4]))))],
      - (((Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 3]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &,
            1] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4]))) / ((-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[
            a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 3]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])))]
    (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2]))
  Sqrt[(((-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2]) (x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 3])) /
      ((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])
        (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 3])))]
  Sqrt[(((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) /
      ((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])))]
  Sqrt[(((-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2]) (x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) /
      ((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])
        (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])))]
  (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) /
 (a^2 (-(-b - Sqrt[-4 a^2 + b^2])/(2 a) + (-b + Sqrt[-4 a^2 + b^2])/(2 a)) Sqrt[x (b + c x + b x^2) + a (1 + x^4)]
   (b - Sqrt[-4 a^2 + b^2] + 2 a Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1])
   (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])
   (-b + Sqrt[-4 a^2 + b^2] - 2 a Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])
   (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) -
```

$$(8\ (x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])^2\ (\text{EllipticF}[\text{ArcSin}[\surd(((x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1])$$

$$(\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))\,/\,((x-\text{Root}[a+b\#1+c\#1^2+$$

$$b\#1^3+a\#1^4\&,2])\ (\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))))],$$

$$-(((\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,3])$$

$$(\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))\,/$$

$$((-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,3])\ (\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]-$$

$$\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4])))]\ (-b-\sqrt{-4\,a^2+b^2}-2\,a\,\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1])-$$

$$2\,a\,\text{EllipticPi}[((b+\sqrt{-4\,a^2+b^2}+2\,a\,\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])\ (-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+$$

$$\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))\,/\,((b+\sqrt{-4\,a^2+b^2}+2\,a\,\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1])$$

$$(-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4])),$$

$$\text{ArcSin}[\surd(((x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1])\ (\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]-$$

$$\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))\,/\,((x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])$$

$$(\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4])))],$$

$$-(((\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,3])\ (\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,$$

$$1]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))\,/\,((-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[$$

$$a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,3])\ (\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4])))]$$

$$(-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]))$$

$$\surd(((-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])\ (x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,3]))\,/$$

$$((x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])$$

$$(-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,3])))$$

$$\surd(((x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1])\ (\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))\,/$$

$$((x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])\ (\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4])))$$

$$\surd(((-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])\ (x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))\,/$$

$$((x-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])$$

$$(-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4])))$$

$$(-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,4]))\,/$$

$$\left(\left(\frac{-b-\sqrt{-4\,a^2+b^2}}{2\,a}-\frac{-b+\sqrt{-4\,a^2+b^2}}{2\,a}\right)\sqrt{x\,(b+c\,x+b\,x^2)+a\,(1+x^4)}\right.$$

$$(b+\sqrt{-4\,a^2+b^2}+2\,a\,\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1])$$

$$(-\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,1]+\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])$$

$$(-b-\sqrt{-4\,a^2+b^2}-2\,a\,\text{Root}[a+b\#1+c\#1^2+b\#1^3+a\#1^4\&,2])$$

$$(\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2]-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4])\Big)+$$

$$\Big(2\,b^2\,(x-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2])^2$$

$$\Big(\mathrm{EllipticF}\big[\mathrm{ArcSin}\big[\sqrt{}(((x-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1])\,(\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2]-$$

$$\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4]))\,/\,((x-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2])$$

$$(\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1]-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4]))))\big],$$

$$-(((\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2]-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3])$$

$$(\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1]-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4]))\,/$$

$$((-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1]+\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3])\,(\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2]-$$

$$\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4]))))\big]\,\Big(-b-\sqrt{-4\,a^2+b^2}-2\,a\,\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1]\Big)-$$

$$2\,a\,\mathrm{EllipticPi}\Big[\Big(\Big(b+\sqrt{-4\,a^2+b^2}+2\,a\,\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2]\Big)\,(-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1]+$$

$$\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4])\Big)\Big/\Big(\Big(b+\sqrt{-4\,a^2+b^2}+2\,a\,\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1]\Big)$$

$$(-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2]+\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4])\Big),$$

$$\mathrm{ArcSin}\big[\sqrt{}(((x-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1])\,(\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2]-$$

$$\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4]))\,/\,((x-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2])$$

$$(\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1]-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4]))))\big],$$

$$-(((\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2]-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3])\,(\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,$$

$$1]-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4]))\,/\,((-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1]+\mathrm{Root}[$$

$$a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3])\,(\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2]-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4]))))\big]$$

$$(-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1]+\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2])\Big)$$

$$\sqrt{}(((-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1]+\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2])\,(x-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3]))\,/$$

$$((x-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2])$$

$$(-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1]+\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3])))$$

$$\sqrt{}(((x-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1])\,(\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2]-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4]))\,/$$

$$((x-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2])\,(\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1]-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4])))$$

$$\sqrt{}(((-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1]+\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2])\,(x-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4]))\,/$$

$$((x-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2])$$

$$(-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1]+\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4])))$$

$$(-\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1]+\mathrm{Root}[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4])\Big)\Big/$$

$$\left(a^2\left(\frac{-b-\sqrt{-4\,a^2+b^2}}{2\,a}-\frac{-b+\sqrt{-4\,a^2+b^2}}{2\,a}\right)\sqrt{x\,(b+c\,x+b\,x^2)+a\,(1+x^4)}\right.$$

```
(b + √(-4 a^2 + b^2) + 2 a Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1])
(-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])
(-b - √(-4 a^2 + b^2) - 2 a Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])

(Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) +

(2 b √(-4 a^2 + b^2) (x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])^2
  (EllipticF[ArcSin[√(((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] -
              Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) / ((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])
            (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])))],
       -(((Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 3])
           (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) /
         ((-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 3]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] -
             Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])))] (-b - √(-4 a^2 + b^2) - 2 a Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1]) -

     2 a EllipticPi[((b + √(-4 a^2 + b^2) + 2 a Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2]) (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] +

            Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) / ((b + √(-4 a^2 + b^2) + 2 a Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1])

          (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])),

       ArcSin[√(((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] -
              Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) / ((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])
            (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])))],
       -(((Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 3]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &,
              1] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) / ((-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[
              a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 3]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])))]
     (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2]))
  √(((-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2]) (x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 3])) /
     ((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])
       (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 3])))
  √(((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) /
     ((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2]) (Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])))
  √(((-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2]) (x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])) /
     ((x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])
       (-Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1] + Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 4])))
```

$$\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\Big)\Big/$$

$$\left(a^2\left(\frac{-b-\sqrt{-4\,a^2+b^2}}{2\,a}-\frac{-b+\sqrt{-4\,a^2+b^2}}{2\,a}\right)\sqrt{x\,\left(b+c\,x+b\,x^2\right)+a\,\left(1+x^4\right)}\right.$$

$$\left(b+\sqrt{-4\,a^2+b^2}+2\,a\,\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]\right)$$

$$\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)$$

$$\left(-b-\sqrt{-4\,a^2+b^2}-2\,a\,\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)$$

$$\left.\left(\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)+$$

$$\Big(2\,\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{}\Big(\Big(\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]\right)\,\Big(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]+$$

$$\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\Big)\Big)\Big/\Big(\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)$$

$$\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\Big)\Big)\Big],$$

$$\Big(\left(\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)$$

$$\left(\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\Big)\Big/$$

$$\Big(\left(\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)$$

$$\left(\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\Big)\Big]\,\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)^2$$

$$\sqrt{}\Big(\Big(\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\,\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)\Big)\Big/$$

$$\Big(\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)$$

$$\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)\Big)\Big)$$

$$\left(\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)$$

$$\sqrt{}\Big(\Big(\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\,\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\Big)\Big/$$

$$\Big(\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)$$

$$\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\Big)\Big)$$

$$\sqrt{}\Big(\Big(\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]\right)\,\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\Big)\Big/$$

$$\Big(\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)$$

$$\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\Big)\Big)\Big)\Big/$$

$$\Big(a\,\sqrt{x\,\left(b+c\,x+b\,x^2\right)+a\,\left(1+x^4\right)}\,\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)$$

$$\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\Big)\Big)$$

Problem 1010: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{e\, f - e\, f\, x^2}{\left(-a\, d + b\, d\, x - a\, d\, x^2\right) \sqrt{-a + b\, x + c\, x^2 + b\, x^3 - a\, x^4}}\, dx$$

Optimal (type 3, 88 leaves, 1 step):

$$\frac{e\, f\, \text{ArcTanh}\left[\frac{a\, b - \left(4\, a^2 + b^2 + 2\, a\, c\right) x + a\, b\, x^2}{2\, a\, \sqrt{2\, a + c}\, \sqrt{-a + b\, x + c\, x^2 + b\, x^3 - a\, x^4}}\right]}{a\, \sqrt{2\, a + c}\, d}$$

Result (type 4, 15 147 leaves):

$$\frac{1}{d} e\, f \Bigg(-\Bigg(\Bigg(8\, \left(x - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 2\right]\right)^2$$

$$\Bigg(\text{EllipticF}\Big[\text{ArcSin}\Big[\surd\Big(\Big(\Big(x - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 1\right]\Big) \Big(\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 2\right] -$$

$$\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 4\right]\Big)\Big) \Big/ \Big(\Big(x - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 2\right]\Big)$$

$$\Big(\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 1\right] - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 4\right]\Big)\Big)\Big)\Big],$$

$$-\Big(\Big(\Big(\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 2\right] - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 3\right]\Big)$$

$$\Big(\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 1\right] - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 4\right]\Big)\Big) \Big/$$

$$\Big(\Big(-\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 1\right] + \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 3\right]\Big) \Big(\text{Root}\Big[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,$$

$$2\Big] - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 4\right]\Big)\Big)\Big)\Big] \left(b + \sqrt{-4\, a^2 + b^2} - 2\, a\, \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 1\right]\right) -$$

$$2\, a\, \text{EllipticPi}\Bigg[\Bigg(\Bigg(-b - \sqrt{-4\, a^2 + b^2} + 2\, a\, \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 2\right]\Bigg) \Big(-\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 1\right] +$$

$$\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 4\right]\Big)\Bigg) \Bigg/ \Bigg(\Bigg(-b - \sqrt{-4\, a^2 + b^2} + 2\, a\, \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 1\right]\Bigg)$$

$$\Big(-\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 2\right] + \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 4\right]\Big)\Bigg),$$

$$\text{ArcSin}\Big[\surd\Big(\Big(\Big(x - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 1\right]\Big) \Big(\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 2\right] -$$

$$\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 4\right]\Big)\Big) \Big/ \Big(\Big(x - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 2\right]\Big)$$

$$\Big(\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 1\right] - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 4\right]\Big)\Big)\Big)\Big],$$

$$-\Big(\Big(\Big(\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 2\right] - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 3\right]\Big)$$

$$\Big(\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 1\right] - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 4\right]\Big)\Big) \Big/$$

$$\Big(\Big(-\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 1\right] + \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 3\right]\Big)$$

$$\Big(\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 2\right] - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 4\right]\Big)\Big)\Big)\Bigg]$$

$$\Big(-\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 1\right] + \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 2\right]\Big)\Bigg)$$

$$\surd\Big(\Big(\Big(-\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 1\right] + \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 2\right]\Big)$$

$$\Big(x - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 3\right]\Big)\Big) \Big/ \Big(\Big(x - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 2\right]\Big)$$

$$\Big(-\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 1\right] + \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 3\right]\Big)\Big)\Big)$$

$$\surd\Big(\Big(\Big(x - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 1\right]\Big) \Big(\text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 2\right] - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 4\right]\Big)\Big) \Big/$$

$$\Big(\Big(x - \text{Root}\left[a - b\, \#1 - c\, \#1^2 - b\, \#1^3 + a\, \#1^4\, \&,\, 2\right]\Big)$$

$$\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\big)\big)$$

$$\sqrt{}\Big(\Big(\Big(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\Big)$$

$$\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\big)\big)\Big/\Big(\Big(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\Big)$$

$$\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\big)\big)$$

$$\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\Big)\Big/$$

$$\left(\left(-\frac{b-\sqrt{-4\,a^2+b^2}}{2\,a}+\frac{b+\sqrt{-4\,a^2+b^2}}{2\,a}\right)\sqrt{x\,\left(b+c\,x+b\,x^2\right)-a\,\left(1+x^4\right)}\right.$$

$$\left(-b-\sqrt{-4\,a^2+b^2}+2\,a\,\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]\right)$$

$$\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)$$

$$\left(b+\sqrt{-4\,a^2+b^2}-2\,a\,\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)$$

$$\left.\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\Bigg)+$$

$$\Bigg(2\,b^2\,\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)^2\,\Bigg(\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{}\Big(\Big(\Big(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]\Big)$$

$$\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\big)\big)\Big/\Big(\Big(x-\text{Root}\Big[a-b\,\#1-c\,\#1^2-$$

$$b\,\#1^3+a\,\#1^4\,\&,\,2\Big]\Big)\,\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\big)\big)\Big]\Big],$$

$$-\Big(\Big(\Big(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\right]\Big)$$

$$\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\big)\big)\Big/$$

$$\Big(\Big(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\right]\Big)\,\Big(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]-$$

$$\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\Big)\big)\big)\Big]\,\left(b+\sqrt{-4\,a^2+b^2}-2\,a\,\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]\right)-$$

$$2\,a\,\text{EllipticPi}\Big[\Big(\Big(-b-\sqrt{-4\,a^2+b^2}+2\,a\,\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\Big)\,\Big(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+$$

$$\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\Big)\Big)\Big/\Big(\Big(-b-\sqrt{-4\,a^2+b^2}+2\,a\,\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]\Big)$$

$$\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\Big),$$

$$\text{ArcSin}\Big[\sqrt{}\Big(\Big(\Big(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]\Big)\,\Big(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]-$$

$$\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\Big)\big)\big)\Big/\Big(\Big(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\Big)$$

$$\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\big)\big)\Big],$$

$$-\Big(\Big(\Big(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\right]\Big)\,\Big(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]-$$

$$\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\Big)\big)\big)\Big/\Big(\Big(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\Big[$$

$$a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\Big]\Big)\,\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\big)\big)\Big]$$

$$\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\Bigg)$$

$$\sqrt{}\Big(\Big(\Big(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\Big)\,\Big(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\right]\Big)\big)\big)\Big/$$

$$\Big(\Big(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\Big)\,\Big(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\right]\Big)\big)\big)$$

```
√(((x - Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 1]) (Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 2] - Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 4])) /
    ((x - Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 2]) (Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 1] - Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 4])))
√(((-Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 1] + Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 2]) (x - Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 4])) /
    ((x - Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 2]) (-Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 1] + Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 4])))
(-Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 1] + Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 4])) / (a^2
(-(b - √(-4 a^2 + b^2))/(2 a) + (b + √(-4 a^2 + b^2))/(2 a))
√(x (b + c x + b x^2) - a (1 + x^4))
(-b - √(-4 a^2 + b^2) + 2 a Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 1])
(-Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 1] + Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 2])
(b + √(-4 a^2 + b^2) - 2 a Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 2])
(Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 2] - Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 4])) + (2
b
√(-4 a^2 + b^2)
(x - Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 2])^2
(EllipticF[ArcSin[√(((x - Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 1]) (Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 2] -
            Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 4])) / ((x - Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 2])
          (Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 1] - Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 4])))],
    -(((Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 2] - Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 3])
          (Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 1] - Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 4])) /
        ((-Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 1] + Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 3]) (Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 2] -
            Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 4])))] (b + √(-4 a^2 + b^2) - 2 a Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 1]) -
  2 a EllipticPi[(((-b - √(-4 a^2 + b^2) + 2 a Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 2]) (-Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 1] +
            Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 4])) / ((-b - √(-4 a^2 + b^2) + 2 a Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 1])
          (-Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 2] + Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 4]))),
    ArcSin[√(((x - Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 1]) (Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 2] -
            Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 4])) / ((x - Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 2])
          (Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 1] - Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 4])))],
    -(((Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 2] - Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 3]) (Root[a - b ♯1 - c ♯1^2 - b ♯1^3 + a ♯1^4 &, 1] -
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$$\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,4]))\Big/\Big((-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1]+\text{Root}[$$
$$a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,3])\ (\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2]-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,4]))\Big)\Big]$$
$$(-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1]+\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2])\Big)$$

$$\sqrt{\Big(\big((-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1]+\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2])\ (x-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,3])\big)\Big/}$$
$$\big((x-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2])\ (-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1]+\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,3])\big)\Big)$$
$$\sqrt{\Big(\big((x-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1])\ (\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2]-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,4])\big)\Big/}$$
$$\big((x-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2])\ (\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1]-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,4])\big)\Big)$$
$$\sqrt{\Big(\big((-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1]+\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2])\ (x-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,4])\big)\Big/}$$
$$\big((x-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2])\ (-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1]+\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,4])\big)\Big)$$

$$(-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1]+\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,4])\Big)\Big/\Big(a^2$$

$$\left(-\frac{b-\sqrt{-4a^2+b^2}}{2a}+\frac{b+\sqrt{-4a^2+b^2}}{2a}\right)$$
$$\sqrt{x\,(b+c\,x+b\,x^2)-a\,(1+x^4)}$$
$$\left(-b-\sqrt{-4a^2+b^2}+2a\,\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1]\right)$$
$$(-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1]+\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2])$$
$$\left(b+\sqrt{-4a^2+b^2}-2a\,\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2]\right)$$
$$(\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2]-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,4])\Big)-$$

$$\Big(8\,(x-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2])^2$$
$$\Big(\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\big((x-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1])\ (\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2]-}$$
$$\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,4])\big)\Big/\big((x-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2])$$
$$(\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1]-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,4])\big)\Big)\Big],$$
$$-\Big(\big((\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2]-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,3])$$
$$(\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1]-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,4])\big)\Big/$$
$$\big((-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1]+\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,3])\ (\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2]-$$
$$\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,4])\big)\Big)\Big]\ \left(b-\sqrt{-4a^2+b^2}-2a\,\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1]\right)-$$
$$2a\,\text{EllipticPi}\Big[\Big(\left(-b+\sqrt{-4a^2+b^2}+2a\,\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2]\right)\ (-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1]+$$
$$\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,4])\Big)\Big/\Big(\left(-b+\sqrt{-4a^2+b^2}+2a\,\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,1]\right)$$
$$(-\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,2]+\text{Root}[a-b\#1-c\#1^2-b\#1^3+a\#1^4\&,4])\Big),$$

```
ArcSin[√(((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] -
        Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) / ((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2])
      (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])))],
  -(((Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] -
        Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) / ((-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[
          a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])))]
 (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]))

√(((-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]) (x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3])) /
   ((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]) (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3])))
√(((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) /
   ((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])))
√(((-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]) (x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) /
   ((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]) (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])))
 (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) /

(((b - √(-4 a^2 + b^2))/(2 a) - (b + √(-4 a^2 + b^2))/(2 a)) √(x (b + c x + b x^2) - a (1 + x^4))
 (-b + √(-4 a^2 + b^2) + 2 a Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1])
 (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2])
 (b - √(-4 a^2 + b^2) - 2 a Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2])

 (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) + (2

 b^2
 (x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2])^2
 (EllipticF[ArcSin[√(((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] -

        Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) / ((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2])
      (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])))],
  -(((Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3])
      (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) /
     ((-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] -
        Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])))] (b - √(-4 a^2 + b^2) - 2 a Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1]) -

  2 a EllipticPi[((-b + √(-4 a^2 + b^2) + 2 a Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]) (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] +

       Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) / ((-b + √(-4 a^2 + b^2) + 2 a Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1])
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(-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])),
   ArcSin[√(((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] -
         Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) / ((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2])
        (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])))],
   - (((Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] -
        Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) / ((-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[
         a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])))]
  (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]))
 √(((-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]) (x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3])) /
    ((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]) (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3])))
 √(((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) /
    ((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])))
 √(((-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]) (x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) /
    ((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]) (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])))
 (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) / (a^2
 ((b - √(-4 a^2 + b^2))/(2 a) - (b + √(-4 a^2 + b^2))/(2 a))
 √(x (b + c x + b x^2) - a (1 + x^4))
 (-b + √(-4 a^2 + b^2) + 2 a Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1])
 (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2])
 (b - √(-4 a^2 + b^2) - 2 a Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2])
 (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) -
(2 b √(-4 a^2 + b^2) (x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2])^2
 (EllipticF[ArcSin[√(((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] -
         Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) / ((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2])
        (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])))],
   - (((Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3])
       (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) /
     ((-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] -
        Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])))] (b - √(-4 a^2 + b^2) - 2 a Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1]) -
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2 a EllipticPi[((-b + Sqrt[-4 a^2 + b^2] + 2 a Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]) (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] +
      Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) / ((-b + Sqrt[-4 a^2 + b^2] + 2 a Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1])
     (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])),
   ArcSin[√(((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] -
         Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) / ((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2])
       (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])))],
   -(((Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] -
         Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) / ((-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[
          a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])))]
  (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]))
 √(((-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]) (x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3])) /
    ((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]) (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3])))
 √(((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) /
    ((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]) (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])))
 √(((-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]) (x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) /
    ((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2]) (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])))
 (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) / (a^2
 ((b - Sqrt[-4 a^2 + b^2])/(2 a) - (b + Sqrt[-4 a^2 + b^2])/(2 a))
 Sqrt[x (b + c x + b x^2) - a (1 + x^4)]
 (-b + Sqrt[-4 a^2 + b^2] + 2 a Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1])
 (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2])
 (b - Sqrt[-4 a^2 + b^2] - 2 a Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2])
 (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) +
(2 EllipticF[ArcSin[√(((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1]) (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] +
         Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) / ((x - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2])
       (-Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] + Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])))],
   ((Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 2] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3])
      (Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 4])) /
    ((Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 1] - Root[a - b #1 - c #1^2 - b #1^3 + a #1^4 &, 3])
```

$$\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\Big)\Big)\Big]\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)^2$$

$$\sqrt{\left(\left(\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)\right)\right)}$$

$$\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)$$

$$\sqrt{\left(\left(\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\right)}$$

$$\sqrt{\left(\left(\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]\right)\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\right)}\Big)\Big)\Big/$$

$$\left(a\sqrt{x\left(b+c\,x+b\,x^2\right)-a\left(1+x^4\right)}\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)$$

Problem 1011: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{a\,x^2+b\,x\sqrt{-\frac{a}{b^2}+\frac{a^2x^2}{b^2}}}}{x\sqrt{-\frac{a}{b^2}+\frac{a^2x^2}{b^2}}}\,dx$$

Optimal (type 3, 46 leaves, 2 steps):

$$\frac{\sqrt{2}\,b\,\text{ArcSinh}\left[\frac{a\,x+b\sqrt{-\frac{a}{b^2}+\frac{a^2x^2}{b^2}}}{\sqrt{a}}\right]}{\sqrt{a}}$$

Result (type 3, 199 leaves):

$$-\left(\left(x\sqrt{a\,x\left(a\,x+b\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\right)}\left(-1+a\,x^2+b\,x\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\right)\right.\right.$$

$$\left.\left.\left(\text{Log}\left[1-\frac{\sqrt{a\,x\left(a\,x+b\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\right)}}{\sqrt{2}\,a\,x}\right]-\text{Log}\left[1+\frac{\sqrt{a\,x\left(a\,x+b\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\right)}}{\sqrt{2}\,a\,x}\right]\right)\right)\Bigg/\left(\sqrt{2}\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\left(x\left(a\,x+b\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\right)\right)^{3/2}\right)\right)$$

Problem 1012: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{-a\,x^2+b\,x\sqrt{\frac{a}{b^2}+\frac{a^2\,x^2}{b^2}}}}{x\sqrt{\frac{a}{b^2}+\frac{a^2\,x^2}{b^2}}}\,dx$$

Optimal (type 3, 46 leaves, 2 steps):

$$\frac{\sqrt{2}\,b\,\text{ArcSin}\left[\frac{a\,x-b\sqrt{\frac{a}{b^2}+\frac{a^2\,x^2}{b^2}}}{\sqrt{a}}\right]}{\sqrt{a}}$$

Result (type 3, 213 leaves):

$$\left(b^2 \sqrt{\frac{a\left(1+a x^2\right)}{b^2}} \sqrt{a x \left(a x-b \sqrt{\frac{a\left(1+a x^2\right)}{b^2}}\right)} \sqrt{x \left(-a x+b \sqrt{\frac{a\left(1+a x^2\right)}{b^2}}\right)}\right.$$

$$\left.\left(\text{Log}\left[1-\frac{\sqrt{a x \left(a x-b \sqrt{\frac{a\left(1+a x^2\right)}{b^2}}\right)}}{\sqrt{2}\, a x}\right]-\text{Log}\left[1+\frac{\sqrt{a x \left(a x-b \sqrt{\frac{a\left(1+a x^2\right)}{b^2}}\right)}}{\sqrt{2}\, a x}\right]\right)\right) \Big/ \left(\sqrt{2}\, a^2 x \left(-1-a x^2+b x \sqrt{\frac{a\left(1+a x^2\right)}{b^2}}\right)\right)$$

Problem 1013: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{x \left(a x+b \sqrt{-\frac{a}{b^2}+\frac{a^2 x^2}{b^2}}\right)}}{x \sqrt{-\frac{a}{b^2}+\frac{a^2 x^2}{b^2}}}\, dx$$

Optimal (type 3, 46 leaves, 3 steps):

$$\frac{\sqrt{2}\, b\, \text{ArcSinh}\left[\frac{\sqrt{a x+b \sqrt{-\frac{a}{b^2}+\frac{a^2 x^2}{b^2}}}}{\sqrt{a}}\right]}{\sqrt{a}}$$

Result (type 3, 199 leaves):

$$-\left(\left(x\sqrt{a x\left(a x+b\sqrt{\frac{a\left(-1+a x^2\right)}{b^2}}\right)}\left(-1+a x^2+b x\sqrt{\frac{a\left(-1+a x^2\right)}{b^2}}\right)\right.\right.$$

$$\left.\left.\left(\text{Log}\left[1-\frac{\sqrt{a x\left(a x+b\sqrt{\frac{a\left(-1+a x^2\right)}{b^2}}\right)}}{\sqrt{2}\, a x}\right]-\text{Log}\left[1+\frac{\sqrt{a x\left(a x+b\sqrt{\frac{a\left(-1+a x^2\right)}{b^2}}\right)}}{\sqrt{2}\, a x}\right]\right)\right)\Big/\left(\sqrt{2}\sqrt{\frac{a\left(-1+a x^2\right)}{b^2}}\left(x\left(a x+b\sqrt{\frac{a\left(-1+a x^2\right)}{b^2}}\right)\right)^{3/2}\right)\right)$$

Problem 1014: Result more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{x\left(-a x+b\sqrt{\frac{a}{b^2}+\frac{a^2 x^2}{b^2}}\right)}}{x\sqrt{\frac{a}{b^2}+\frac{a^2 x^2}{b^2}}}\, dx$$

Optimal (type 3, 46 leaves, 3 steps):

$$\frac{\sqrt{2}\, b\, \text{ArcSin}\left[\frac{a x-b\sqrt{\frac{a}{b^2}+\frac{a^2 x^2}{b^2}}}{\sqrt{a}}\right]}{\sqrt{a}}$$

Result (type 3, 213 leaves):

$$\left(b^2 \sqrt{\frac{a\,(1+a\,x^2)}{b^2}}\ \sqrt{a\,x\left(a\,x-b\sqrt{\frac{a\,(1+a\,x^2)}{b^2}}\right)}\ \sqrt{x\left(-a\,x+b\sqrt{\frac{a\,(1+a\,x^2)}{b^2}}\right)}\right.$$

$$\left.\left(\text{Log}\left[1-\frac{\sqrt{a\,x\left(a\,x-b\sqrt{\frac{a\,(1+a\,x^2)}{b^2}}\right)}}{\sqrt{2}\,a\,x}\right]-\text{Log}\left[1+\frac{\sqrt{a\,x\left(a\,x-b\sqrt{\frac{a\,(1+a\,x^2)}{b^2}}\right)}}{\sqrt{2}\,a\,x}\right]\right)\right)\Bigg/\left(\sqrt{2}\,a^2\,x\left(-1-a\,x^2+b\,x\sqrt{\frac{a\,(1+a\,x^2)}{b^2}}\right)\right)$$

Problem 1015: Result more than twice size of optimal antiderivative.

$$\int \frac{-\sqrt{-4+x}-4\sqrt{-1+x}+\sqrt{-4+x}\,x+\sqrt{-1+x}\,x}{\left(1+\sqrt{-4+x}+\sqrt{-1+x}\right)\left(4-5\,x+x^2\right)}\,dx$$

Optimal (type 3, 19 leaves, 3 steps):

$$2\,\text{Log}\left[1+\sqrt{-4+x}+\sqrt{-1+x}\right]$$

Result (type 3, 75 leaves):

$$-\text{ArcTanh}\left[\sqrt{-4+x}\right]+\text{ArcTanh}\left[\frac{\sqrt{-1+x}}{2}\right]+\frac{1}{2}\,\text{Log}\left[17-4\sqrt{-4+x}\,\sqrt{-1+x}-5\,x\right]+\frac{1}{2}\,\text{Log}\left[5-2\sqrt{-4+x}\,\sqrt{-1+x}-2\,x\right]$$

Problem 1016: Unable to integrate problem.

$$\int \frac{1}{x\,(3+3\,x+x^2)\,(3+3\,x+3\,x^2+x^3)^{1/3}}\,dx$$

Optimal (type 3, 90 leaves, 3 steps):

$$-\frac{\text{ArcTan}\left[\frac{1+\frac{2\cdot 3^{1/3}\,(1+x)}{(2+(1+x)^3)^{1/3}}}{\sqrt{3}}\right]}{3^{5/6}}-\frac{\text{Log}\left[1-(1+x)^3\right]}{6\times 3^{1/3}}+\frac{\text{Log}\left[3^{1/3}\,(1+x)-\left(2+(1+x)^3\right)^{1/3}\right]}{2\times 3^{1/3}}$$

Result (type 8, 33 leaves):

$$\int \frac{1}{x\left(3+3x+x^2\right)\left(3+3x+3x^2+x^3\right)^{1/3}}\,dx$$

Problem 1017: Unable to integrate problem.

$$\int \frac{1-x^2}{\left(1-x+x^2\right)\left(1-x^3\right)^{2/3}}\,dx$$

Optimal (type 3, 103 leaves, ? steps):

$$\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{1-\frac{2\,2^{1/3}(1-x)}{\left(1-x^3\right)^{1/3}}}{\sqrt{3}}\right]}{2^{2/3}}-\frac{\text{Log}\left[1+2\,(1-x)^3-x^3\right]}{2\times 2^{2/3}}+\frac{3\,\text{Log}\left[2^{1/3}\,(1-x)+\left(1-x^3\right)^{1/3}\right]}{2\times 2^{2/3}}$$

Result (type 8, 31 leaves) :

$$\int \frac{1-x^2}{\left(1-x+x^2\right)\left(1-x^3\right)^{2/3}}\,dx$$

Problem 1018: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{x^2}{\sqrt{-1+x^4}\,\left(1+x^4\right)}\,dx$$

Optimal (type 3, 49 leaves, ? steps):

$$-\frac{1}{4}\,\text{ArcTan}\left[\frac{1+x^2}{x\,\sqrt{-1+x^4}}\right]-\frac{1}{4}\,\text{ArcTanh}\left[\frac{1-x^2}{x\,\sqrt{-1+x^4}}\right]$$

Result (type 6, 114 leaves) :

$$-\left(\left(7\,x^3\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},x^4,-x^4\right]\right)\Big/\left(3\,\sqrt{-1+x^4}\,\left(1+x^4\right)\left(-7\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},x^4,-x^4\right]+2\,x^4\left(2\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},x^4,-x^4\right]-\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},x^4,-x^4\right]\right)\right)\right)\right)$$

Problem 1019: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \frac{a - c x^4}{\left(a e + c d x^2\right) \left(d + e x^2\right) \sqrt{a + b x^2 + c x^4}} \, dx$$

Optimal (type 3, 80 leaves, 2 steps):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{c d^2 - b d e + a e^2}\, x}{\sqrt{d} \sqrt{e} \sqrt{a + b x^2 + c x^4}}\right]}{\sqrt{d} \sqrt{e} \sqrt{c d^2 - b d e + a e^2}}$$

Result (type 4, 383 leaves):

$$\left(i \sqrt{\frac{b + \sqrt{b^2 - 4 a c} + 2 c x^2}{b + \sqrt{b^2 - 4 a c}}} \sqrt{1 + \frac{2 c x^2}{b - \sqrt{b^2 - 4 a c}}} \left(\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b + \sqrt{b^2 - 4 a c}}}\, x\right], \frac{b + \sqrt{b^2 - 4 a c}}{b - \sqrt{b^2 - 4 a c}}\right] - \text{EllipticPi}\left[\frac{\left(b + \sqrt{b^2 - 4 a c}\right) d}{2 a e}, i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b + \sqrt{b^2 - 4 a c}}}\, x\right], \frac{b + \sqrt{b^2 - 4 a c}}{b - \sqrt{b^2 - 4 a c}}\right] - \text{EllipticPi}\left[\frac{\left(b + \sqrt{b^2 - 4 a c}\right) e}{2 c d}, i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b + \sqrt{b^2 - 4 a c}}}\, x\right], \frac{b + \sqrt{b^2 - 4 a c}}{b - \sqrt{b^2 - 4 a c}}\right]\right)\right) \Big/ \left(\sqrt{2} \sqrt{\frac{c}{b + \sqrt{b^2 - 4 a c}}}\, d e \sqrt{a + b x^2 + c x^4}\right)$$

Problem 1021: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\frac{1}{x} + \sqrt{1 - x^2}} \, dx$$

Optimal (type 3, 122 leaves, 12 steps):

$$\text{ArcSin}[x] - \frac{\text{ArcTan}\left[\frac{1 - 2 x^2}{\sqrt{3}}\right]}{\sqrt{3}} - \frac{\text{ArcTan}\left[\frac{x}{\sqrt{-\frac{i - \sqrt{3}}{i + \sqrt{3}}} \sqrt{1 - x^2}}\right]}{\sqrt{3}} - \frac{\text{ArcTan}\left[\frac{\sqrt{-\frac{i - \sqrt{3}}{i + \sqrt{3}}}\, x}{\sqrt{1 - x^2}}\right]}{\sqrt{3}}$$

Result (type 3, 2681 leaves):

$$\frac{\left(1+x\sqrt{1-x^2}\right)\mathrm{ArcSin}[x]}{x\left(\frac{1}{x}+\sqrt{1-x^2}\right)}+\Big(\Big(\left(-i+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)$$

$$\mathrm{ArcTan}\Big[\Big(x\left(7i-\sqrt{3}+8i\sqrt{3}\,x+7i\,x^2+\sqrt{3}\,x^2\right)\Big)\Big/\Big(-6i+2\sqrt{3}+3x-11i\sqrt{3}\,x-18i\,x^2-2\sqrt{3}\,x^2-3x^3-3i\sqrt{3}\,x^3-$$

$$2i\sqrt{2\left(1-i\sqrt{3}\right)}\sqrt{1-x^2}-2i\sqrt{6\left(1-i\sqrt{3}\right)}\,x\sqrt{1-x^2}-2i\sqrt{2\left(1-i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}\Big)\Big]\Big)\Big/\Big(2\sqrt{6\left(1-i\sqrt{3}\right)}\,x\left(\frac{1}{x}+\sqrt{1-x^2}\right)\Big)-$$

$$\Big(\left(-i+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\mathrm{ArcTan}\Big[\Big(x\left(7i-\sqrt{3}-8i\sqrt{3}\,x+7i\,x^2+\sqrt{3}\,x^2\right)\Big)\Big/\Big(6i-2\sqrt{3}+3x-11i\sqrt{3}\,x+18i\,x^2+2\sqrt{3}\,x^2-$$

$$3x^3-3i\sqrt{3}\,x^3+2i\sqrt{2\left(1-i\sqrt{3}\right)}\sqrt{1-x^2}-2i\sqrt{6\left(1-i\sqrt{3}\right)}\,x\sqrt{1-x^2}+2i\sqrt{2\left(1-i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}\Big)\Big]\Big)\Big/$$

$$\Big(2\sqrt{6\left(1-i\sqrt{3}\right)}\,x\left(\frac{1}{x}+\sqrt{1-x^2}\right)\Big)-\Big(\left(i+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\mathrm{ArcTan}\Big[\Big(x\left(-7i-\sqrt{3}-8i\sqrt{3}\,x-7i\,x^2+\sqrt{3}\,x^2\right)\Big)\Big/$$

$$\Big(-6i-2\sqrt{3}-3x-11i\sqrt{3}\,x-18i\,x^2+2\sqrt{3}\,x^2+3x^3-3i\sqrt{3}\,x^3-2i\sqrt{2\left(1+i\sqrt{3}\right)}\sqrt{1-x^2}-$$

$$2i\sqrt{6\left(1+i\sqrt{3}\right)}\,x\sqrt{1-x^2}-2i\sqrt{2\left(1+i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}\Big)\Big]\Big)\Big/\Big(2\sqrt{6\left(1+i\sqrt{3}\right)}\,x\left(\frac{1}{x}+\sqrt{1-x^2}\right)\Big)+$$

$$\Big(\left(i+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\mathrm{ArcTan}\Big[\Big(x\left(-7i-\sqrt{3}+8i\sqrt{3}\,x-7i\,x^2+\sqrt{3}\,x^2\right)\Big)\Big/\Big(6i+2\sqrt{3}-3x-11i\sqrt{3}\,x+18i\,x^2-2\sqrt{3}\,x^2+$$

$$3x^3-3i\sqrt{3}\,x^3+2i\sqrt{2\left(1+i\sqrt{3}\right)}\sqrt{1-x^2}-2i\sqrt{6\left(1+i\sqrt{3}\right)}\,x\sqrt{1-x^2}+2i\sqrt{2\left(1+i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}\Big)\Big]\Big)\Big/$$

$$\Big(2\sqrt{6\left(1+i\sqrt{3}\right)}\,x\left(\frac{1}{x}+\sqrt{1-x^2}\right)\Big)+\frac{i\left(-i+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\mathrm{Log}\left[\left(-i+\sqrt{3}-2x\right)^2\left(i+\sqrt{3}-2x\right)^2\right]}{4\sqrt{6\left(1-i\sqrt{3}\right)}\,x\left(\frac{1}{x}+\sqrt{1-x^2}\right)}-$$

$$\frac{i\left(i+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\mathrm{Log}\left[\left(-i+\sqrt{3}-2x\right)^2\left(i+\sqrt{3}-2x\right)^2\right]}{4\sqrt{6\left(1+i\sqrt{3}\right)}\,x\left(\frac{1}{x}+\sqrt{1-x^2}\right)}-$$

$$\frac{i\left(-i+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\text{Log}\left[\left(-i+\sqrt{3}+2x\right)^2\left(i+\sqrt{3}+2x\right)^2\right]}{4\sqrt{6\left(1-i\sqrt{3}\right)}\,x\left(\frac{1}{x}+\sqrt{1-x^2}\right)}+$$

$$\frac{i\left(i+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\text{Log}\left[\left(-i+\sqrt{3}+2x\right)^2\left(i+\sqrt{3}+2x\right)^2\right]}{4\sqrt{6\left(1+i\sqrt{3}\right)}\,x\left(\frac{1}{x}+\sqrt{1-x^2}\right)}-$$

$$\frac{i\left(1+x\sqrt{1-x^2}\right)\text{Log}\left[-\frac{1}{2}-\frac{i\sqrt{3}}{2}+x^2\right]}{2\sqrt{3}\,x\left(\frac{1}{x}+\sqrt{1-x^2}\right)}+$$

$$\frac{i\left(1+x\sqrt{1-x^2}\right)\text{Log}\left[-\frac{1}{2}+\frac{i\sqrt{3}}{2}+x^2\right]}{2\sqrt{3}\,x\left(\frac{1}{x}+\sqrt{1-x^2}\right)}-$$

$$\left(i\left(-i+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\text{Log}\left[3i+\sqrt{3}-3x-5i\sqrt{3}\,x+10i\,x^2+3x^3-3i\sqrt{3}\,x^3+i\,x^4-\sqrt{3}\,x^4+2i\sqrt{2\left(1-i\sqrt{3}\right)}\sqrt{1-x^2}-\right.\right.$$
$$\left.\left.3i\sqrt{6\left(1-i\sqrt{3}\right)}\,x\sqrt{1-x^2}+5i\sqrt{2\left(1-i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}-i\sqrt{6\left(1-i\sqrt{3}\right)}\,x^3\sqrt{1-x^2}\right]\right)\Big/\left(4\sqrt{6\left(1-i\sqrt{3}\right)}\,x\left(\frac{1}{x}+\sqrt{1-x^2}\right)\right)+$$

$$\left(i\left(-i+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\text{Log}\left[3i+\sqrt{3}+3x+5i\sqrt{3}\,x+10i\,x^2-3x^3+3i\sqrt{3}\,x^3+i\,x^4-\sqrt{3}\,x^4+2i\sqrt{2\left(1-i\sqrt{3}\right)}\sqrt{1-x^2}+\right.\right.$$
$$\left.\left.3i\sqrt{6\left(1-i\sqrt{3}\right)}\,x\sqrt{1-x^2}+5i\sqrt{2\left(1-i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}+i\sqrt{6\left(1-i\sqrt{3}\right)}\,x^3\sqrt{1-x^2}\right]\right)\Big/\left(4\sqrt{6\left(1-i\sqrt{3}\right)}\,x\left(\frac{1}{x}+\sqrt{1-x^2}\right)\right)-$$

$$\left(i\left(i+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\text{Log}\left[-3i+\sqrt{3}+3x-5i\sqrt{3}\,x-10i\,x^2-3x^3-3i\sqrt{3}\,x^3-i\,x^4-\sqrt{3}\,x^4-2i\sqrt{2\left(1+i\sqrt{3}\right)}\sqrt{1-x^2}-\right.\right.$$
$$\left.\left.3i\sqrt{6\left(1+i\sqrt{3}\right)}\,x\sqrt{1-x^2}-5i\sqrt{2\left(1+i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}-i\sqrt{6\left(1+i\sqrt{3}\right)}\,x^3\sqrt{1-x^2}\right]\right)\Big/\left(4\sqrt{6\left(1+i\sqrt{3}\right)}\,x\left(\frac{1}{x}+\sqrt{1-x^2}\right)\right)+$$

$$\left(i\left(i+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\text{Log}\left[-3i+\sqrt{3}-3x+5i\sqrt{3}\,x-10i\,x^2+3x^3+3i\sqrt{3}\,x^3-i\,x^4-\sqrt{3}\,x^4-2i\sqrt{2\left(1+i\sqrt{3}\right)}\sqrt{1-x^2}+\right.\right.$$
$$\left.\left.3i\sqrt{6\left(1+i\sqrt{3}\right)}\,x\sqrt{1-x^2}-5i\sqrt{2\left(1+i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}+i\sqrt{6\left(1+i\sqrt{3}\right)}\,x^3\sqrt{1-x^2}\right]\right)\Big/\left(4\sqrt{6\left(1+i\sqrt{3}\right)}\,x\left(\frac{1}{x}+\sqrt{1-x^2}\right)\right)$$

Problem 1022: Result more than twice size of optimal antiderivative.

$$\int \frac{x\sqrt{1-x^2}}{x-x^3+\sqrt{1-x^2}}\,dx$$

Optimal (type 3, 122 leaves, 13 steps):

$$\text{ArcSin}[x]-\frac{\text{ArcTan}\left[\frac{1-2x^2}{\sqrt{3}}\right]}{\sqrt{3}}-\frac{\text{ArcTan}\left[\frac{x}{\sqrt{-\frac{i-\sqrt{3}}{i+\sqrt{3}}}\,\sqrt{1-x^2}}\right]}{\sqrt{3}}-\frac{\text{ArcTan}\left[\frac{\sqrt{-\frac{i-\sqrt{3}}{i+\sqrt{3}}}\,x}{\sqrt{1-x^2}}\right]}{\sqrt{3}}$$

Result (type 3, 2155 leaves):

$$\text{ArcSin}[x]+\frac{1}{2\sqrt{6\left(1-i\sqrt{3}\right)}}$$

$$\left(-i+\sqrt{3}\right)\text{ArcTan}\Big[\left(x\left(7i-\sqrt{3}+8i\sqrt{3}\,x+7ix^2+\sqrt{3}\,x^2\right)\right)\Big/\Big(-6i+2\sqrt{3}+3x-11i\sqrt{3}\,x-18ix^2-2\sqrt{3}\,x^2-3x^3-$$

$$3i\sqrt{3}\,x^3-2i\sqrt{2\left(1-i\sqrt{3}\right)}\,\sqrt{1-x^2}-2i\sqrt{6\left(1-i\sqrt{3}\right)}\,x\sqrt{1-x^2}-2i\sqrt{2\left(1-i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}\Big)\Big]-$$

$$\frac{1}{2\sqrt{6\left(1-i\sqrt{3}\right)}}\left(-i+\sqrt{3}\right)\text{ArcTan}\Big[\left(x\left(7i-\sqrt{3}-8i\sqrt{3}\,x+7ix^2+\sqrt{3}\,x^2\right)\right)\Big/\Big(6i-2\sqrt{3}+3x-11i\sqrt{3}\,x+18ix^2+$$

$$2\sqrt{3}\,x^2-3x^3-3i\sqrt{3}\,x^3+2i\sqrt{2\left(1-i\sqrt{3}\right)}\,\sqrt{1-x^2}-2i\sqrt{6\left(1-i\sqrt{3}\right)}\,x\sqrt{1-x^2}+2i\sqrt{2\left(1-i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}\Big)\Big]-$$

$$\frac{1}{2\sqrt{6\left(1+i\sqrt{3}\right)}}\left(i+\sqrt{3}\right)\text{ArcTan}\Big[\left(x\left(-7i-\sqrt{3}-8i\sqrt{3}\,x-7ix^2+\sqrt{3}\,x^2\right)\right)\Big/\Big(-6i-2\sqrt{3}-3x-11i\sqrt{3}\,x-18ix^2+$$

$$2\sqrt{3}\,x^2+3x^3-3i\sqrt{3}\,x^3-2i\sqrt{2\left(1+i\sqrt{3}\right)}\,\sqrt{1-x^2}-2i\sqrt{6\left(1+i\sqrt{3}\right)}\,x\sqrt{1-x^2}-2i\sqrt{2\left(1+i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}\Big)\Big]+$$

$$\frac{1}{2\sqrt{6\left(1+i\sqrt{3}\right)}}\left(i+\sqrt{3}\right)\text{ArcTan}\Big[\left(x\left(-7i-\sqrt{3}+8i\sqrt{3}\,x-7ix^2+\sqrt{3}\,x^2\right)\right)\Big/\Big(6i+2\sqrt{3}-3x-11i\sqrt{3}\,x+18ix^2-$$

$$2\sqrt{3}\,x^2+3x^3-3\,i\sqrt{3}\,x^3+2\,i\sqrt{2\left(1+i\sqrt{3}\right)}\,\sqrt{1-x^2}-2\,i\sqrt{6\left(1+i\sqrt{3}\right)}\,x\sqrt{1-x^2}+2\,i\sqrt{2\left(1+i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}\Bigg)\Big]+$$

$$\frac{i\left(-i+\sqrt{3}\right)\text{Log}\left[\left(-i+\sqrt{3}-2x\right)^2\left(i+\sqrt{3}-2x\right)^2\right]}{4\sqrt{6\left(1-i\sqrt{3}\right)}}-\frac{i\left(i+\sqrt{3}\right)\text{Log}\left[\left(-i+\sqrt{3}-2x\right)^2\left(i+\sqrt{3}-2x\right)^2\right]}{4\sqrt{6\left(1+i\sqrt{3}\right)}}-$$

$$\frac{i\left(-i+\sqrt{3}\right)\text{Log}\left[\left(-i+\sqrt{3}+2x\right)^2\left(i+\sqrt{3}+2x\right)^2\right]}{4\sqrt{6\left(1-i\sqrt{3}\right)}}+$$

$$\frac{i\left(i+\sqrt{3}\right)\text{Log}\left[\left(-i+\sqrt{3}+2x\right)^2\left(i+\sqrt{3}+2x\right)^2\right]}{4\sqrt{6\left(1+i\sqrt{3}\right)}}-$$

$$\frac{i\,\text{Log}\left[-\frac{1}{2}-\frac{i\sqrt{3}}{2}+x^2\right]}{2\sqrt{3}}+$$

$$\frac{i\,\text{Log}\left[-\frac{1}{2}+\frac{i\sqrt{3}}{2}+x^2\right]}{2\sqrt{3}}-\frac{1}{4\sqrt{6\left(1-i\sqrt{3}\right)}}$$

$$i\left(-i+\sqrt{3}\right)\text{Log}\Big[3\,i+\sqrt{3}-3x-5\,i\sqrt{3}\,x+10\,i\,x^2+3x^3-3\,i\sqrt{3}\,x^3+i\,x^4-\sqrt{3}\,x^4+2\,i\sqrt{2\left(1-i\sqrt{3}\right)}\,\sqrt{1-x^2}-$$
$$3\,i\sqrt{6\left(1-i\sqrt{3}\right)}\,x\sqrt{1-x^2}+5\,i\sqrt{2\left(1-i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}-i\sqrt{6\left(1-i\sqrt{3}\right)}\,x^3\sqrt{1-x^2}\Big]+\frac{1}{4\sqrt{6\left(1-i\sqrt{3}\right)}}$$

$$i\left(-i+\sqrt{3}\right)\text{Log}\Big[3\,i+\sqrt{3}+3x+5\,i\sqrt{3}\,x+10\,i\,x^2-3x^3+3\,i\sqrt{3}\,x^3+i\,x^4-\sqrt{3}\,x^4+2\,i\sqrt{2\left(1-i\sqrt{3}\right)}\,\sqrt{1-x^2}+$$
$$3\,i\sqrt{6\left(1-i\sqrt{3}\right)}\,x\sqrt{1-x^2}+5\,i\sqrt{2\left(1-i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}+i\sqrt{6\left(1-i\sqrt{3}\right)}\,x^3\sqrt{1-x^2}\Big]-\frac{1}{4\sqrt{6\left(1+i\sqrt{3}\right)}}$$

$$i\left(i+\sqrt{3}\right)\text{Log}\Big[-3\,i+\sqrt{3}+3x-5\,i\sqrt{3}\,x-10\,i\,x^2-3x^3-3\,i\sqrt{3}\,x^3-i\,x^4-\sqrt{3}\,x^4-2\,i\sqrt{2\left(1+i\sqrt{3}\right)}\,\sqrt{1-x^2}-$$

$$3\,i\,\sqrt{6\left(1+i\sqrt{3}\right)}\;x\sqrt{1-x^2}-5\,i\,\sqrt{2\left(1+i\sqrt{3}\right)}\;x^2\sqrt{1-x^2}-i\,\sqrt{6\left(1+i\sqrt{3}\right)}\;x^3\sqrt{1-x^2}\,\Big]+\frac{1}{4\sqrt{6\left(1+i\sqrt{3}\right)}}$$

$$i\left(i+\sqrt{3}\right)\text{Log}\Big[-3\,i+\sqrt{3}-3\,x+5\,i\sqrt{3}\,x-10\,i\,x^2+3\,x^3+3\,i\sqrt{3}\,x^3-i\,x^4-\sqrt{3}\,x^4-2\,i\sqrt{2\left(1+i\sqrt{3}\right)}\sqrt{1-x^2}+$$
$$3\,i\,\sqrt{6\left(1+i\sqrt{3}\right)}\;x\sqrt{1-x^2}-5\,i\,\sqrt{2\left(1+i\sqrt{3}\right)}\;x^2\sqrt{1-x^2}+i\,\sqrt{6\left(1+i\sqrt{3}\right)}\;x^3\sqrt{1-x^2}\,\Big]$$

Problem 1024: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{x}{\sqrt{-44\,375\,b^4+576\,000\,b^3\,c\,x+576\,000\,b^2\,c^2\,x^2+5\,308\,416\,c^4\,x^4}}\,dx$$

Optimal (type 3, 177 leaves, 1 step):

$$\frac{1}{18\,432\,c^2}\text{Log}\Big[20\,738\,073\,600\,000\,000\,b^8\,c^4+597\,005\,697\,024\,000\,000\,b^6\,c^6\,x^2+2\,583\,100\,705\,996\,800\,000\,b^5\,c^7\,x^3+$$
$$951\,050\,714\,480\,640\,000\,b^4\,c^8\,x^4+21\,641\,687\,369\,515\,008\,000\,b^3\,c^9\,x^5+32\,462\,531\,054\,272\,512\,000\,b^2\,c^{10}\,x^6+$$
$$149\,587\,343\,098\,087\,735\,296\,c^{12}\,x^8+5\,308\,416\,\sqrt{-44\,375\,b^4+576\,000\,b^3\,c\,x+576\,000\,b^2\,c^2\,x^2+5\,308\,416\,c^4\,x^4}$$
$$\left(12\,203\,125\,b^6\,c^4+79\,200\,000\,b^5\,c^5\,x+38\,880\,000\,b^4\,c^6\,x^2+1\,105\,920\,000\,b^3\,c^7\,x^3+1\,990\,656\,000\,b^2\,c^8\,x^4+12\,230\,590\,464\,c^{10}\,x^6\right)\Big]$$

Result (type 4, 1671 leaves):

$$\left(2\left(x-\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]}{c}\right)^2\right.$$

$$\left(-\frac{1}{c}b\,\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\big(c\,x-b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]\big)}\right.$$
$$\big(\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]-\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]\big)\Big)\Big/$$
$$\Big(\big(c\,x-b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]\big)\big(\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]-$$
$$\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]\big)\Big)\Big)\Big],$$
$$-\Big(\Big(\big(\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]-\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,3\right]\big)$$
$$\big(\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]-\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]\big)\Big)\Big/$$
$$\Big(\big(-\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]+\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,3\right]\big)$$
$$\big(\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]-\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]\big)\Big)\Big)\Big]$$
$$\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]+\frac{1}{c}\text{EllipticPi}\Big[$$

$$\frac{-\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\&,1\right]}{c}+\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\&,4\right]}{c}}{-\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\&,2\right]}{c}+\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\&,4\right]}{c}},$$

$$\text{ArcSin}\Big[\sqrt{}\Big(\Big(\big(c\,x-b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]\big)$$
$$\big(\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]-\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]\big)\Big)\Big/$$
$$\Big(\big(c\,x-b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]\big)\ \big(\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]-$$
$$\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]\big)\Big)\Big)\Big],$$
$$-\Big(\Big(\big(\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]-\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,3\right]\big)$$
$$\big(\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]-\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]\big)\Big)\Big/$$
$$\Big(\big(-\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]+\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,3\right]\big)$$
$$\big(\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]-\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]\big)\Big)\Big)\Big]$$

$$\big(-b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]+b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]\big)\Bigg)$$

$$\sqrt{}\Bigg(\Bigg(\big(-b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]+b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]\big)$$
$$\left(x-\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,3\right]}{c}\right)\Bigg)\Bigg/$$
$$\Bigg(c\left(x-\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]}{c}\right)$$
$$\left(-\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]}{c}+\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,3\right]}{c}\right)\Bigg)\Bigg)$$
$$\sqrt{}\Big(\Big(\big(c\,x-b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]\big)$$
$$\big(\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]-\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]\big)\Big)\Big/$$
$$\Big(\big(c\,x-b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]\big)$$
$$\big(\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]-\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]\big)\Big)\Big)$$
$$\left(\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]}{c}-\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]}{c}\right)$$

$$\sqrt{}\Bigg(\Bigg(\big(-b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]+b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]\big)$$
$$\left(x-\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]}{c}\right)\Bigg)\Bigg/$$
$$\Bigg(c\left(x-\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]}{c}\right)$$

$$\left(-\frac{b\,\text{Root}\left[-44375+576000\,\#1+576000\,\#1^2+5308416\,\#1^4\,\&,\,1\right]}{c}+\frac{b\,\text{Root}\left[-44375+576000\,\#1+576000\,\#1^2+5308416\,\#1^4\,\&,\,4\right]}{c}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(\sqrt{-44375\,b^4+576000\,b^3\,c\,x+576000\,b^2\,c^2\,x^2+5308416\,c^4\,x^4}\right.$$
$$\left(-\frac{b\,\text{Root}\left[-44375+576000\,\#1+576000\,\#1^2+5308416\,\#1^4\,\&,\,1\right]}{c}+\frac{b\,\text{Root}\left[-44375+576000\,\#1+576000\,\#1^2+5308416\,\#1^4\,\&,\,2\right]}{c}\right)$$
$$\left.\left(\frac{b\,\text{Root}\left[-44375+576000\,\#1+576000\,\#1^2+5308416\,\#1^4\,\&,\,2\right]}{c}-\frac{b\,\text{Root}\left[-44375+576000\,\#1+576000\,\#1^2+5308416\,\#1^4\,\&,\,4\right]}{c}\right)\right)$$

Problem 1025: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{1+4\,x}{\sqrt{9+120\,x+64\,x^2+64\,x^3+64\,x^4}}\,dx$$

Optimal (type 3, 100 leaves, 2 steps):

$$\frac{1}{16}\,\text{Log}\left[921+2864\,x+9280\,x^2+13440\,x^3+17024\,x^4+19456\,x^5+12288\,x^6+8192\,x^7+4096\,x^8+\sqrt{9+120\,x+64\,x^2+64\,x^3+64\,x^4}\,\left(179+444\,x+744\,x^2+1280\,x^3+960\,x^4+768\,x^5+512\,x^6\right)\right]$$

Result (type 4, 2787 leaves):

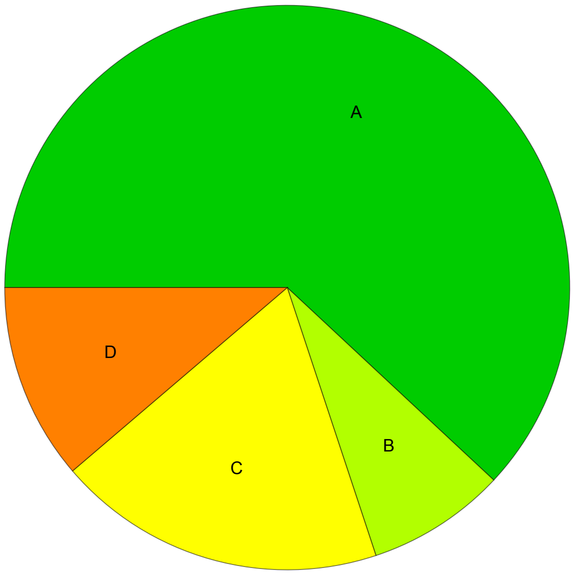
$$\Big(8\,\left(x-\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,2\right]\right)^2$$
$$\Big(-\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{}\Big(\Big(\left(x-\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,1\right]\right)\,\Big(\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,2\right]-$$
$$\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,4\right]\Big)\Big)\Big/\Big(\left(x-\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,2\right]\right)$$
$$\left(\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,1\right]-\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,4\right]\right)\Big)\Big)\Big]\Big],$$
$$-\Big(\Big(\left(\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,2\right]-\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,3\right]\right)$$
$$\left(\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,1\right]-\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,4\right]\right)\Big)\Big/$$
$$\Big(\left(-\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,1\right]+\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,3\right]\right)\,\Big(\text{Root}\left[9+120\,\#1+64\,\#1^2+\right.$$
$$\left.64\,\#1^3+64\,\#1^4\,\&,\,2\right]-\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,4\right]\Big)\Big)\Big)\Big]\,\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,2\right]+$$
$$\text{EllipticPi}\Big[\left(-\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,1\right]+\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,4\right]\right)\Big/$$
$$\left(-\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,2\right]+\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,4\right]\right),$$

```
ArcSin[√(((x - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1]) (Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2] -
        Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4])) / ((x - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2])
      (Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1] - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4]))))],
  -(((Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2] - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 3])
       (Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1] - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4])) /
     ((-Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1] + Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 3])
       (Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2] - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4]))))]
 (-Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1] + Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2]))
√((x - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 3]) / ((x - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2])
    (-Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1] + Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 3]))))
(Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1] - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4])
√(((x - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1])
    (Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2] - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4])) /
  ((x - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2])
    (Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1] - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4])))
√((x - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4]) / ((x - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2])
    (-Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1] + Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4]))))) /
(√(9 + 120 x + 64 x^2 + 64 x^3 + 64 x^4) (Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2] - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4])) +
(2
  EllipticF[
   ArcSin[√(((x - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1]) (-Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2] +
          Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4])) / ((x - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2])
        (-Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1] + Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4]))))],
   ((Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2] - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 3])
      (Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1] - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4])) /
    ((Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1] - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 3])
      (Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2] - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4]))]
  (x - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2])^2 √((x - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 3]) /
     ((x - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2])
       (-Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1] + Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 3]))))
  (Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1] - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4])
  √((x - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4]) / ((x - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2])
       (-Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1] + Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4]))))
  √(((x - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1]) (-Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2] +
         Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4])) / ((x - Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 2])
       (-Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 1] + Root[9 + 120 #1 + 64 #1^2 + 64 #1^3 + 64 #1^4 &, 4]))))) /
```

$$\left(\sqrt{9+120\,x+64\,x^2+64\,x^3+64\,x^4}\;\left(-\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,2\right]+\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,4\right]\right)\right)$$

Summary of Integration Test Results

1519 integration problems



A - 941 optimal antiderivatives

B - 121 more than twice size of optimal antiderivatives

C - 286 unnecessarily complex antiderivatives

D - 171 unable to integrate problems

E - 0 integration timeouts