Mathematica 11.3 Integration Test Results

Test results for the 886 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):

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

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

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

Result (type 4, 146 leaves):

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

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

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):

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

Result (type 4, 150 leaves):

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

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):

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

Result (type 4, 164 leaves):

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

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):

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

Result (type 4, 166 leaves):

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

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):

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

Result (type 4, 167 leaves):

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

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):

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

Result (type 4, 167 leaves):

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

Problem 9: Result unnecessarily involves imaginary or complex numbers.

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

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

$$\frac{2\,\text{ArcTan}\left[\frac{\sqrt{3}\sqrt{c}\,(c+2\,d\,x)}{\sqrt{c^3+4\,d^3x^3}}\right]}{3\sqrt{3}\,c^{3/2}\,d}+\left(2\times2^{1/3}\sqrt{2+\sqrt{3}}\,\left(c+2^{2/3}d\,x\right)\sqrt{\frac{c^2-2^{2/3}c\,d\,x+2\times2^{1/3}d^2x^2}{\left(\left(1+\sqrt{3}\right)c+2^{2/3}d\,x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)c+2^{2/3}d\,x}{\left(1+\sqrt{3}\right)c+2^{2/3}d\,x}\right],-7-4\sqrt{3}\right]\right)\Big/\left(3\times3^{1/4}c\,d\sqrt{\frac{c\left(c+2^{2/3}d\,x\right)}{\left(\left(1+\sqrt{3}\right)c+2^{2/3}d\,x\right)^2}}\sqrt{c^3+4\,d^3x^3}\right)$$

Result (type 4, 169 leaves):

$$-\left(\left(i\,2^{5/6}\sqrt{\frac{2^{1/3}c+2\,d\,x}{\left(1+(-1)^{1/3}\right)c}}\sqrt{2^{2/3}-\frac{2\times2^{1/3}d\,x}{c}+\frac{4\,d^2x^2}{c^2}}\,\text{EllipticPi}\left[\frac{i\,2^{1/3}\sqrt{3}}{2+(-2)^{1/3}},\text{ArcSin}\left[\frac{\sqrt{\frac{2^{1/3}c+2\,(-1)^{2/3}d\,x}{\left(1+(-1)^{1/3}\right)c}}}{2^{1/6}}\right],(-1)^{1/3}\right]\right)\Big/\left(\left(2+(-2)^{1/3}\right)d\sqrt{c^3+4\,d^3x^3}\right)\right)$$

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):

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

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

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

Result (type 4, 136 leaves):

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

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

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):

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

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

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

Result (type 4, 136 leaves):

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

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):

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

Result (type 4, 134 leaves):

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

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):

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

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

$$\left(3^{3/4}\sqrt{-\frac{1+x}{\left(1-\sqrt{3}+x\right)^2}}\ \sqrt{-1-x^3}\right)$$

Result (type 4, 138 leaves):

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

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

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):

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

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

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

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

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

Result (type 4, 128 leaves):

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

$$\left.\left(\left(7\,i+\sqrt{3}\right)\sqrt{1+x^3}\right)\right)$$

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):

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

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

$$\left(3^{1/4}\left(4+\sqrt{3}\right)\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{1-x^3}\right)+$$

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

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

Result (type 4, 128 leaves):

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

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

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):

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

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

$$\left(13\times 3^{1/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\sqrt{-1+x^3}\right)+$$

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

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

Result (type 4, 126 leaves):

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

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

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):

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

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

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

Result (type 4, 130 leaves) :

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

Problem 18: Unable to integrate problem.

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

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

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

Result (type 8, 27 leaves) :

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

Problem 19: Unable to integrate problem.

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

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

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

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):

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

Problem 21: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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):

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

Problem 22: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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):

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

Problem 23: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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):

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

Problem 24: 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, 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):

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

Problem 25: 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):

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

Problem 26: 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, 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):

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

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

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

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

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

Problem 27: 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):

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

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

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

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

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

Problem 28: 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):

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

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

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

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

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

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

Problem 29: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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

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

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

$$\left(3\times 3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\;\sqrt{1+x^3}\right)$$

Result (type 4, 336 leaves):

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

Problem 30: 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):

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

Result (type 4, 335 leaves):

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

$$\left(-3\,i\,\sqrt{-i+\sqrt{3}-2\,i\,x}\,\left(-6\,i-3\,i\,2^{1/3}+2\,\sqrt{3}-2^{1/3}\,\sqrt{3}+\left(-3\,i\,2^{1/3}+4\,\sqrt{3}+2^{1/3}\,\sqrt{3}\right)\,x\right)\right.$$

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

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

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

Problem 31: 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, 176 leaves, 4 steps):

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

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

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

Result (type 4, 333 leaves):

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

Problem 32: 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):

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

Result (type 4, 338 leaves):

$$\left(2\times 2^{1/6}\sqrt{\frac{i\,(1+x)}{3\,i+\sqrt{3}}}\right.$$

$$\left(3\sqrt{-i+\sqrt{3}+2\,i\,x}\,\left(-6-3\times 2^{1/3}-2\,i\,\sqrt{3}+i\,2^{1/3}\sqrt{3}+\left(3\times 2^{1/3}+4\,i\,\sqrt{3}+i\,2^{1/3}\sqrt{3}\right)x\right)\right.$$

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

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

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

Problem 33: 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):

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

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

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

Result (type 4, 340 leaves):

$$\left(2\times 2^{1/6}\sqrt{\frac{\mathrm{i}\,(1+x)}{3\,\mathrm{i}+\sqrt{3}}}\left(f\sqrt{-\mathrm{i}+\sqrt{3}+2\,\mathrm{i}\,x}\left(-6-3\times 2^{1/3}-2\,\mathrm{i}\,\sqrt{3}+\mathrm{i}\,2^{1/3}\sqrt{3}+\left(3\times 2^{1/3}+4\,\mathrm{i}\,\sqrt{3}+\mathrm{i}\,2^{1/3}\sqrt{3}\right)x\right)\right.\right.$$

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

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

$$\left(\sqrt{3}\left(\mathrm{i}+2\,\mathrm{i}\,2^{2/3}+\sqrt{3}\right)\sqrt{\mathrm{i}+\sqrt{3}-2\,\mathrm{i}\,x}\,\sqrt{1+x^3}\right)$$

Problem 34: 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):

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

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

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

Result (type 4, 340 leaves):

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

Problem 35: 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):

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

Result (type 4, 338 leaves):

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

Problem 36: 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):

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

Result (type 4, 342 leaves):

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

Problem 37: 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):

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

Result (type 4, 336 leaves):

$$\left(2\sqrt{\frac{a^{1/3}+b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(-\left(\left(3^{1/4}f\left((-1)^{1/3}a^{1/3}-b^{1/3}x\right)\sqrt{(-1)^{1/6}-\frac{i\,b^{1/3}x}{a^{1/3}}}\right.\right.\right.\right.$$

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

$$\frac{1}{(-1)^{1/3}+2^{2/3}}(-1)^{1/3}\left(1+(-1)^{1/3}\right)\left(-b^{1/3}e+2^{2/3}a^{1/3}f\right)\sqrt{1-\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}\ \text{EllipticPi}\Big[$$

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

Problem 38: 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):

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

$$\left(2\sqrt{2+\sqrt{3}}\left(2^{1/3}b^{1/3}e-a^{1/3}f\right)\left(a^{1/3}-b^{1/3}x\right)\sqrt{\frac{a^{2/3}+a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\right.$$

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

$$\left(3\times3^{1/4}a^{1/3}b^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}-b^{1/3}x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\sqrt{a-b x^3}\right)$$

Result (type 4, 399 leaves):

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

Problem 39: 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):

$$-\frac{2\left(b^{1/3}e+2^{2/3}a^{1/3}f\right)\text{ArcTanh}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}-2^{1/3}b^{1/3}x\right)}{\sqrt{-a+b x^3}}\right]}{3\sqrt{3}\sqrt{a}\,b^{2/3}}-$$
$$\left(2\sqrt{2-\sqrt{3}}\left(2^{1/3}b^{1/3}e-a^{1/3}f\right)\left(a^{1/3}-b^{1/3}x\right)\sqrt{\frac{a^{2/3}+a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x}{\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x}\right],-7+4\sqrt{3}\right]\right)\Big/$$
$$\left(3\times3^{1/4}a^{1/3}b^{2/3}\sqrt{-\frac{a^{1/3}\left(a^{1/3}-b^{1/3}x\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\sqrt{-a+b x^3}\right)$$

Result (type 4, 400 leaves):

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

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

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

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

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

Problem 40: 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):

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

$$\left(2\sqrt{2-\sqrt{3}}\left(2^{1/3}b^{1/3}e+a^{1/3}f\right)\left(a^{1/3}+b^{1/3}x\right)\sqrt{\frac{a^{2/3}-a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\right.$$

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

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

Result (type 4, 387 leaves):

$$\left(2\sqrt{\frac{a^{1/3}+b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(-\frac{1}{3^{1/4}}\left((-1)^{1/3}+2^{2/3}\right)f\left((-1)^{1/3}a^{1/3}-b^{1/3}x\right)\right.\right.$$

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

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

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

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

Problem 41: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 265 leaves, 4 steps):

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

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

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

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

Result (type 4, 380 leaves):

$$\left(2^{1/6}\sqrt{\frac{2^{1/3}c+2dx}{\left(1+(-1)^{1/3}\right)c}}\right.$$

$$\left(-f\sqrt{\frac{(-2)^{1/3}c-2(-1)^{2/3}dx}{\left(1+(-1)^{1/3}\right)c}}\left((-1)^{1/3}\left(2+(-2)^{1/3}\right)c-2\left((-1)^{1/3}+2^{2/3}\right)dx\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{2^{1/3}c+2(-1)^{2/3}dx}{\left(1+(-1)^{1/3}\right)c}}}{2^{1/6}}\right],(-1)^{1/3}\right]+\frac{1}{\sqrt{3}}$$

$$(-1)^{1/3}2^{2/3}\left(1+(-1)^{1/3}\right)(-de+cf)\sqrt{\frac{2^{1/3}c+2(-1)^{2/3}dx}{\left(1+(-1)^{1/3}\right)c}}\sqrt{2^{2/3}-\frac{2\times2^{1/3}dx}{c}+\frac{4d^2x^2}{c^2}}$$

$$\left.\left.\text{EllipticPi}\left[\frac{i\,2^{1/3}\sqrt{3}}{2+(-2)^{1/3}},\text{ArcSin}\left[\frac{\sqrt{\frac{2^{1/3}c+2(-1)^{2/3}dx}{\left(1+(-1)^{1/3}\right)c}}}{2^{1/6}}\right],(-1)^{1/3}\right]\right)\right)\Big/$$

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

Problem 42: 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):

$$-\frac{2\times2^{2/3}\,\text{ArcTan}\left[\frac{\sqrt{3}\left(1+2^{1/3}x\right)}{\sqrt{1+x^3}}\right]}{3\sqrt{3}}+$$

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

$$\left(3\times3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}\right)$$

Result (type 4, 207 leaves):

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

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

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

Problem 43: 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):

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

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

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

Result (type 4, 209 leaves):

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

Problem 44: 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):

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

Result (type 4, 207 leaves):

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

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

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

Problem 45: 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):

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

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

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

Result (type 4, 209 leaves):

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

Problem 46: 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):

$$-\frac{2\times2^{2/3}\,\text{ArcTan}\left[\frac{\sqrt{3}\,a^{1/6}\left(a^{1/3}+2^{1/3}b^{1/3}x\right)}{\sqrt{a+b\,x^3}}\right]}{3\sqrt{3}\,a^{1/6}\,b^{2/3}}+\left(2\sqrt{2+\sqrt{3}}\left(a^{1/3}+b^{1/3}x\right)\sqrt{\frac{a^{2/3}-a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}x}{\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x}\right],-7-4\sqrt{3}\right]\right)\Bigg/\left(3\times3^{1/4}\,b^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3}x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\sqrt{a+b\,x^3}\right)$$

Result (type 4, 324 leaves):

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

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

$$\left.\left.\left.(-1)^{1/3}\right]\right)\Bigg/\left(\sqrt{\frac{a^{1/3}+(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right)\right)+\frac{1}{(-1)^{1/3}+2^{2/3}}$$

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

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

Problem 47: 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):

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

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

$$\left.\left.-7-4\sqrt{3}\right]\right)\Bigg/\left(3\times 3^{1/4}b^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}-b^{1/3}x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\sqrt{a-b\,x^3}\right)$$

Result (type 4, 388 leaves):

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

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

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

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

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

Problem 48: 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):

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

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

$$\left.\left.-7+4\sqrt{3}\right]\right)\Big/\left(3\times 3^{1/4}b^{2/3}\sqrt{-\frac{a^{1/3}\left(a^{1/3}-b^{1/3}x\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\sqrt{-a+b x^3}\right)$$

Result (type 4, 389 leaves):

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

Problem 49: 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):

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

Result (type 4, 375 leaves):

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

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

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

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

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

Problem 50: 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):

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

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

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

Result (type 4, 372 leaves):

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

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

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

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

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

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

Problem 51: 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):

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

Problem 52: 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):

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

Problem 53: 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):

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

Result (type 4, 260 leaves):

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

Problem 54: 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):

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

Result (type 4, 267 leaves):

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

Problem 55: 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, 50 leaves, 2 steps):

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

Result (type 4, 407 leaves):

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

Problem 56: 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, 52 leaves, 2 steps):

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

Result (type 4, 370 leaves):

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

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

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

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

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

Problem 57: 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):

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

Result (type 4, 371 leaves):

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

Problem 58: 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):

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

Result (type 4, 410 leaves):

$$\left(2\sqrt{\frac{a^{1/3}+b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(-\frac{1}{2\sqrt{2}}3^{1/4}\left(\left(\mathbb{i}+\sqrt{3}\right)a^{1/3}-\left(-\mathbb{i}+\sqrt{3}\right)b^{1/3}x\right)\sqrt{\mathbb{i}+\sqrt{3}-\frac{2\,\mathbb{i}\,b^{1/3}x}{a^{1/3}}}\right.\right.$$

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

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

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

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

Problem 59: 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):

$$-\left(\left(2\sqrt{\frac{c-2dx}{\left(1+(-1)^{1/3}\right)c}}\left(\left(-2+(-1)^{1/3}\right)\left((-1)^{1/3}c+2dx\right)\sqrt{\frac{(-1)^{1/3}\left(c+2(-1)^{1/3}dx\right)}{\left(1+(-1)^{1/3}\right)c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{c-2(-1)^{2/3}dx}{\left(1+(-1)^{1/3}\right)c}}\right],(-1)^{1/3}\right]+(-1)^{1/3}\sqrt{3}\left(1+(-1)^{1/3}\right)c\sqrt{\frac{c-2(-1)^{2/3}dx}{\left(1+(-1)^{1/3}\right)c}}\sqrt{\frac{c^2+2cdx+4d^2x^2}{c^2}}\,\text{EllipticPi}\left[\frac{2\sqrt{3}}{3i+\sqrt{3}},\text{ArcSin}\left[\sqrt{\frac{c-2(-1)^{2/3}dx}{\left(1+(-1)^{1/3}\right)c}}\right],(-1)^{1/3}\right]\right)\right)\Big/\left(\left(-2+(-1)^{1/3}\right)d\sqrt{\frac{c-2(-1)^{2/3}dx}{\left(1+(-1)^{1/3}\right)c}}\sqrt{c^3-8d^3x^3}\right)\right)$$

Problem 60: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{e+fx}{(2-x)\sqrt{1+x^3}}\,dx$$

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

$$\frac{2}{9}(e+2f)\,\text{ArcTanh}\left[\frac{(1+x)^2}{3\sqrt{1+x^3}}\right]+\left(2\sqrt{2+\sqrt{3}}\,(e-f)(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]\right)\Big/\left(3\times 3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}\right)$$

Result (type 4, 273 leaves):

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

Problem 61: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{e+fx}{(2+x)\sqrt{1-x^3}}\,dx$$

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

$$-\frac{2}{9}(e-2f)\,\text{ArcTanh}\left[\frac{(1-x)^2}{3\sqrt{1-x^3}}\right]-\left(2\sqrt{2+\sqrt{3}}\,(e+f)(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],-7-4\sqrt{3}\right]\right)\Big/\left(3\times 3^{1/4}\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\sqrt{1-x^3}\right)$$

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 62: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{e+f x}{(2+x)\sqrt{-1+x^3}}\,dx$$

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

$$-\frac{2}{9}(e-2f)\,\text{ArcTan}\left[\frac{(1-x)^2}{3\sqrt{-1+x^3}}\right]-\left(2\sqrt{2-\sqrt{3}}\,(e+f)\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]\right)\Big/\left(3\times3^{1/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\,\sqrt{-1+x^3}\right)$$

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 63: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{e+f x}{(2-x)\sqrt{-1-x^3}}\,dx$$

Optimal (type 4, 150 leaves, 4 steps):

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

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

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

Result (type 4, 275 leaves):

$$\left(2\sqrt{\frac{2}{3}}\sqrt{-\frac{i(1+x)}{-3i+\sqrt{3}}}\left(-3if\sqrt{i+\sqrt{3}-2ix}\left(-i-\sqrt{3}+\left(-i+\sqrt{3}\right)x\right)\right.\right.$$

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

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

$$\left(\left(3i+\sqrt{3}\right)\sqrt{-i+\sqrt{3}+2ix}\,\sqrt{-1-x^3}\right)$$

Problem 64: Result unnecessarily involves imaginary or complex numbers.

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

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

$$\frac{2\left(b^{1/3}e+2a^{1/3}f\right)\text{ArcTanh}\left[\frac{\left(a^{1/3}+b^{1/3}x\right)^2}{3a^{1/6}\sqrt{a+bx^3}}\right]}{9\sqrt{a}\,b^{2/3}}+$$

$$\left(2\sqrt{2+\sqrt{3}}\left(b^{1/3}e-a^{1/3}f\right)\left(a^{1/3}+b^{1/3}x\right)\sqrt{\frac{a^{2/3}-a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\right.$$

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

$$\left(3\times 3^{1/4}a^{1/3}b^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3}x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\,\sqrt{a+bx^3}\right)$$

Result (type 4, 419 leaves):

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

Problem 65: 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):

$$-\frac{2\left(b^{1/3}e-2a^{1/3}f\right)\text{ArcTanh}\left[\frac{\left(a^{1/3}-b^{1/3}x\right)^2}{3a^{1/6}\sqrt{a-b\,x^3}}\right]}{9\sqrt{a}\,b^{2/3}}-$$
$$\left(2\sqrt{2+\sqrt{3}}\left(b^{1/3}e+a^{1/3}f\right)\left(a^{1/3}-b^{1/3}x\right)\sqrt{\frac{a^{2/3}+a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x}{\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x}\right],-7-4\sqrt{3}\right]\right)\Big/$$
$$\left(3\times3^{1/4}a^{1/3}b^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}-b^{1/3}x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\sqrt{a-b\,x^3}\right)$$

Result (type 4, 447 leaves):

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

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

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

$$i\left(b^{1/3} e-2 a^{1/3} f\right)\sqrt{-\frac{i\left(2 a^{1/3}+\left(1-i\sqrt{3}\right) b^{1/3} x\right)}{\left(-3 i+\sqrt{3}\right) a^{1/3}}}\sqrt{1+\frac{b^{1/3} x}{a^{1/3}}+\frac{b^{2/3} x^2}{a^{2/3}}}$$

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

Problem 66: 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):

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

$$\left(2\sqrt{2-\sqrt{3}}\left(b^{1/3} e+a^{1/3} f\right)\left(a^{1/3}-b^{1/3} x\right)\sqrt{\frac{a^{2/3}+a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1-\sqrt{3}\right) a^{1/3}-b^{1/3} x\right)^2}}\right.$$

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

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

Result (type 4, 448 leaves):

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

$$\left(-\frac{1}{2} \mathrm{i} f \sqrt{\frac{\left(-\mathrm{i}+\sqrt{3}\right) a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right) b^{1/3} x}{\left(-3 \mathrm{i}+\sqrt{3}\right) a^{1/3}}} \left(\left(-3 \mathrm{i}+\sqrt{3}\right) a^{1/3}-\left(3 \mathrm{i}+\sqrt{3}\right) b^{1/3} x\right)\right.$$

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

$$\mathrm{i} \left(b^{1/3} e-2 a^{1/3} f\right) \sqrt{-\frac{\mathrm{i} \left(2 a^{1/3}+\left(1-\mathrm{i} \sqrt{3}\right) b^{1/3} x\right)}{\left(-3 \mathrm{i}+\sqrt{3}\right) a^{1/3}}} \sqrt{1+\frac{b^{1/3} x}{a^{1/3}}+\frac{b^{2/3} x^2}{a^{2/3}}}$$

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

Problem 67: 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):

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

$$\left(2 \sqrt{2-\sqrt{3}} \left(b^{1/3} e-a^{1/3} f\right) \left(a^{1/3}+b^{1/3} x\right) \sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\right.$$

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

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

Result (type 4, 422 leaves):

$$\left(2\sqrt{\frac{a^{1/3}+b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(-\frac{1}{2\sqrt{2}}3^{1/4}f\left(\left(i+\sqrt{3}\right)a^{1/3}-\left(-i+\sqrt{3}\right)b^{1/3}x\right)\sqrt{i+\sqrt{3}-\frac{2\,i\,b^{1/3}x}{a^{1/3}}}\right.\right.$$

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

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

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

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

Problem 68: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{e+f\,x}{(c+d\,x)\sqrt{c^3-8\,d^3x^3}}\,dx$$

Optimal (type 4, 221 leaves, 4 steps):

$$-\frac{2\,(d\,e-c\,f)\,\text{ArcTanh}\left[\frac{(c-2\,d\,x)^2}{3\sqrt{c}\,\sqrt{c^3-8\,d^3x^3}}\right]}{9\,c^{3/2}d^2}-$$

$$\left(\sqrt{2+\sqrt{3}}\,(2\,d\,e+c\,f)\,(c-2\,d\,x)\sqrt{\frac{c^2+2\,c\,d\,x+4\,d^2x^2}{\left(\left(1+\sqrt{3}\right)c-2\,d\,x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)c-2\,d\,x}{\left(1+\sqrt{3}\right)c-2\,d\,x}\right],\right.\right.$$

$$\left.\left.-7-4\sqrt{3}\right]\right)\Big/\left(3\times3^{1/4}c\,d^2\sqrt{\frac{c\,(c-2\,d\,x)}{\left(\left(1+\sqrt{3}\right)c-2\,d\,x\right)^2}}\sqrt{c^3-8\,d^3x^3}\right)$$

Result (type 4, 384 leaves):

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

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{2}\sqrt{\frac{\mathrm{i}\,c+\mathrm{i}\,d\,x+\sqrt{3}\,d\,x}{3\,\mathrm{i}\,c-\sqrt{3}\,c}}\right],\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right]+$$

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

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

$$\left.\left(2\left(-2+(-1)^{1/3}\right)d^2\sqrt{\frac{c-2\,(-1)^{2/3}\,d\,x}{\left(1+(-1)^{1/3}\right)c}}\sqrt{c^3-8\,d^3\,x^3}\right)\right)$$

Problem 69: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 129 leaves, 4 steps):

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

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

$$\left(3\times3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}\right)$$

Result (type 4, 193 leaves):

$$\frac{1}{\sqrt{1+x^3}}2\sqrt{\frac{1+x}{1+(-1)^{1/3}}}$$

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

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

Problem 70: Result unnecessarily involves imaginary or complex numbers.

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

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

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

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

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

Result (type 4, 195 leaves):

$$\frac{1}{\sqrt{1-x^3}}2\sqrt{\frac{1-x}{1+(-1)^{1/3}}}$$

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

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

Problem 71: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 148 leaves, 4 steps):

$$\frac{4}{9}\,\text{ArcTan}\left[\frac{(1-x)^2}{3\sqrt{-1+x^3}}\right]-\left(2\sqrt{2-\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]\right)\Bigg/\left(3\times 3^{1/4}\sqrt{-\frac{1-x}{\left(1-\sqrt{3}-x\right)^2}}\,\sqrt{-1+x^3}\right)$$

Result (type 4, 193 leaves):

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

Problem 72: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 140 leaves, 4 steps):

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

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

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

Result (type 4, 195 leaves):

$$\frac{1}{\sqrt{-1-x^3}}2\sqrt{\frac{1+x}{1+(-1)^{1/3}}}$$

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

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

Problem 73: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 260 leaves, 4 steps):

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

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

$$\left.\left.-7-4\sqrt{3}\right]\right)\Bigg/\left(3\times 3^{1/4}b^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3}x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\,\sqrt{a+b\,x^3}\right)$$

Result (type 4, 407 leaves):

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

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

$$8\,i\,a^{1/3}\sqrt{\frac{-2\,i\,a^{1/3}+\left(i+\sqrt{3}\right)b^{1/3}x}{\left(-3\,i+\sqrt{3}\right)a^{1/3}}}\sqrt{1-\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}$$

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

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

Problem 74: 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):

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

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

$$\left.\left.-7-4\sqrt{3}\right]\right)\Big/\left(3\times 3^{1/4}\,b^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}-b^{1/3}x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\sqrt{a-b\,x^3}\right)$$

Result (type 4, 371 leaves):

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

Problem 75: 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):

$$\frac{4\,\text{ArcTan}\left[\frac{\left(a^{1/3}-b^{1/3}x\right)^2}{3\,a^{1/6}\sqrt{-a+b\,x^3}}\right]}{9\,a^{1/6}b^{2/3}}-\left(2\sqrt{2-\sqrt{3}}\left(a^{1/3}-b^{1/3}x\right)\right.$$
$$\left.\sqrt{\frac{a^{2/3}+a^{1/3}b^{1/3}x+b^{2/3}x^2}{\left(\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right)a^{1/3}-b^{1/3}x}{\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x}\right],-7+4\sqrt{3}\right]\right)\Big/$$
$$\left(3\times3^{1/4}b^{2/3}\sqrt{-\frac{a^{1/3}\left(a^{1/3}-b^{1/3}x\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}x\right)^2}}\sqrt{-a+b\,x^3}\right)$$

Result (type 4, 372 leaves):

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

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

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

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

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

Problem 76: 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):

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

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

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

Result (type 4, 410 leaves):

$$\left(\sqrt{\frac{a^{1/3}+b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\left(-\sqrt{2}\,3^{1/4}\left(\left(\mathrm{i}+\sqrt{3}\right)a^{1/3}-\left(-\mathrm{i}+\sqrt{3}\right)b^{1/3}x\right)\sqrt{\mathrm{i}+\sqrt{3}-\frac{2\,\mathrm{i}\,b^{1/3}x}{a^{1/3}}}\right.\right.$$

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

$$8\,\mathrm{i}\,a^{1/3}\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}\sqrt{1-\frac{b^{1/3}x}{a^{1/3}}+\frac{b^{2/3}x^2}{a^{2/3}}}$$

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

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

Problem 77: 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):

$$\frac{2\,\text{ArcTanh}\left[\frac{(c-2\,d\,x)^2}{3\sqrt{c}\sqrt{c^3-8\,d^3x^3}}\right]}{9\sqrt{c}\,d^2}-$$

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

$$\left.\left.-7-4\sqrt{3}\right]\right)\Big/\left(3\times3^{1/4}d^2\sqrt{\frac{c\,(c-2\,d\,x)}{\left(\left(1+\sqrt{3}\right)c-2\,d\,x\right)^2}}\sqrt{c^3-8\,d^3x^3}\right)$$

Result (type 4, 295 leaves):

$$\left(\sqrt{\frac{c-2 d x}{\left(1+(-1)^{1/3}\right) c}} \left(\left(-2+(-1)^{1/3}\right) \left((-1)^{1/3} c+2 d x\right) \sqrt{\frac{(-1)^{1/3} \left(c+2 (-1)^{1/3} d x\right)}{\left(1+(-1)^{1/3}\right) c}} \text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{c-2 (-1)^{2/3} d x}{\left(1+(-1)^{1/3}\right) c}}\right],(-1)^{1/3}\right]+\frac{1}{\sqrt{3}} 2 (-1)^{1/3} \left(1+(-1)^{1/3}\right) c \sqrt{\frac{c-2 (-1)^{2/3} d x}{\left(1+(-1)^{1/3}\right) c}} \sqrt{\frac{c^2+2 c d x+4 d^2 x^2}{c^2}} \text{EllipticPi}\left[\frac{2 \sqrt{3}}{3 i+\sqrt{3}},\text{ArcSin}\left[\sqrt{\frac{c-2 (-1)^{2/3} d x}{\left(1+(-1)^{1/3}\right) c}}\right],(-1)^{1/3}\right]\right)\right) \Big/ \left(\left(-2+(-1)^{1/3}\right) d^2 \sqrt{\frac{c-2 (-1)^{2/3} d x}{\left(1+(-1)^{1/3}\right) c}} \sqrt{c^3-8 d^3 x^3}\right)$$

Problem 78: 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):

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

Problem 79: 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):

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

Problem 80: 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):

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

Problem 81: 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):

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

Problem 82: 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):

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

Result (type 4, 322 leaves):

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

Problem 83: 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):

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

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

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

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

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

Problem 84: 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):

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

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

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

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

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

Problem 85: 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):

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

$$\left.\left.\left.(-1)^{1/3}\right]\right) \Big/ \left(3^{1/4} b^{1/3} \sqrt{\frac{a^{1/3}+(-1)^{2/3} b^{1/3} x}{\left(1+(-1)^{1/3}\right) a^{1/3}}}\right)\right) +$$

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

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

Problem 86: 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, 1527 leaves):

$$\left(32 \left(26-15 \sqrt{3}\right) a^2 x\, \text{AppellF1}\left[\frac{1}{3}, \frac{1}{2}, 1, \frac{4}{3}, -\frac{b x^3}{a}, \frac{b x^3}{-10 a+6 \sqrt{3} a}\right]\right) \Big/$$

$$\left(\left(-5+3 \sqrt{3}\right) \left(2 \left(-5+3 \sqrt{3}\right) a-b x^3\right) \sqrt{a+b x^3}\right.$$

$$\left(8 \left(-5+3 \sqrt{3}\right) a\, \text{AppellF1}\left[\frac{1}{3}, \frac{1}{2}, 1, \frac{4}{3}, -\frac{b x^3}{a}, -\frac{b x^3}{10 a-6 \sqrt{3} a}\right] +\right.$$

$$3 b x^3 \left(\text{AppellF1}\left[\frac{4}{3}, \frac{1}{2}, 2, \frac{7}{3}, -\frac{b x^3}{a}, -\frac{b x^3}{10 a-6 \sqrt{3} a}\right] +\right.$$

$$\left.\left.\left.\left(5-3 \sqrt{3}\right) \text{AppellF1}\left[\frac{4}{3}, \frac{3}{2}, 1, \frac{7}{3}, -\frac{b x^3}{a}, -\frac{b x^3}{10 a-6 \sqrt{3} a}\right]\right)\right)\right) -$$

$$\left(32\sqrt{3}\left(26-15\sqrt{3}\right)a^2\,x\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},\frac{b x^3}{-10 a+6\sqrt{3}\,a}\right]\right)\Big/$$
$$\left(\left(-5+3\sqrt{3}\right)\left(2\left(-5+3\sqrt{3}\right)a-b x^3\right)\sqrt{a+b x^3}\right.$$
$$\left(8\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]+\right.$$
$$3 b x^3\left(\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},2,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]+\right.$$
$$\left.\left.\left.\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]\right)\right)\right)-$$
$$\left(60\left(26-15\sqrt{3}\right)a^2\left(\frac{b}{a}\right)^{1/3}x^2\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},\frac{b x^3}{-10 a+6\sqrt{3}\,a}\right]\right)\Big/$$
$$\left(\left(-5+3\sqrt{3}\right)\left(2\left(-5+3\sqrt{3}\right)a-b x^3\right)\sqrt{a+b x^3}\right.$$
$$\left(10\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]+\right.$$
$$3 b x^3\left(\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]+\right.$$
$$\left.\left.\left.\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]\right)\right)\right)+$$
$$\left(20\sqrt{3}\left(26-15\sqrt{3}\right)a^2\left(\frac{b}{a}\right)^{1/3}x^2\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},\frac{b x^3}{-10 a+6\sqrt{3}\,a}\right]\right)\Big/$$
$$\left(\left(-5+3\sqrt{3}\right)\left(2\left(-5+3\sqrt{3}\right)a-b x^3\right)\sqrt{a+b x^3}\right.$$
$$\left(10\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]+\right.$$
$$3 b x^3\left(\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]+\right.$$
$$\left.\left.\left.\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]\right)\right)\right)-$$
$$\left(16\left(26-15\sqrt{3}\right)a^2\left(\frac{b}{a}\right)^{2/3}x^3\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{b x^3}{a},\frac{b x^3}{-10 a+6\sqrt{3}\,a}\right]\right)\Big/$$
$$\left(\sqrt{3}\left(-5+3\sqrt{3}\right)\left(2\left(-5+3\sqrt{3}\right)a-b x^3\right)\sqrt{a+b x^3}\right.$$
$$\left(4\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]+\right.$$
$$b x^3\left(\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]+\right.$$
$$\left.\left.\left.\left(5-3\sqrt{3}\right)\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{b x^3}{a},-\frac{b x^3}{10 a-6\sqrt{3}\,a}\right]\right)\right)\right)-$$

$$\left(7\left(26-15\sqrt{3}\right)a\,b\,x^4\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b\,x^3}{a},\frac{b\,x^3}{-10\,a+6\sqrt{3}\,a}\right]\right)\Big/$$
$$\left(\left(-5+3\sqrt{3}\right)\left(2\left(-5+3\sqrt{3}\right)a-b\,x^3\right)\sqrt{a+b\,x^3}\right.$$
$$\left(14\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]+\right.$$
$$3\,b\,x^3\left(\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},2,\frac{10}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]+\right.$$
$$\left.\left.\left.\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},1,\frac{10}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]\right)\right)\right)$$

Problem 87: 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):

$$\frac{1}{3\left(-5+3\sqrt{3}\right)\sqrt{a-b x^3}\left(2\left(-5+3\sqrt{3}\right)a+b x^3\right)}$$

$$\left(26-15\sqrt{3}\right) a x \left(-\left(\left(96\left(-1+\sqrt{3}\right) a \,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]\right)\Big/\right.\right.$$
$$\left(8\left(-5+3\sqrt{3}\right) a \,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]-\right.$$
$$3 b x^3\left(\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},2,\frac{7}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]+\right.$$
$$\left.\left.\left.\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},1,\frac{7}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]\right)\right)\right)+$$
$$x\left(-\left(\left(60\left(-3+\sqrt{3}\right) a\left(\frac{b}{a}\right)^{1/3}\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]\right)\Big/\left(10\left(-5+3\sqrt{3}\right)\right.\right.\right.$$
$$a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]-3 b x^3\left(\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},\frac{b x^3}{a},\right.\right.$$
$$\left.\left.\left.\left.\left.\frac{b x^3}{10 a-6\sqrt{3} a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]\right)\right)\right)\right)+$$
$$x\left(-\left(\left(16\sqrt{3} a\left(\frac{b}{a}\right)^{2/3}\text{AppellF1}\left[1,\frac{1}{2},1,2,\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]\right)\Big/\left(4\left(-5+3\sqrt{3}\right)\right.\right.\right.$$
$$a\,\text{AppellF1}\left[1,\frac{1}{2},1,2,\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]-b x^3\left(\text{AppellF1}\left[2,\frac{1}{2},2,3,\frac{b x^3}{a},\right.\right.$$
$$\left.\left.\left.\left.\left.\frac{b x^3}{10 a-6\sqrt{3} a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[2,\frac{3}{2},1,3,\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]\right)\right)\right)\right)+$$
$$\left(21 b x\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]\right)\Big/$$
$$\left(14\left(-5+3\sqrt{3}\right) a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]-\right.$$
$$3 b x^3\left(\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},2,\frac{10}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]+\right.$$
$$\left.\left.\left.\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},1,\frac{10}{3},\frac{b x^3}{a},\frac{b x^3}{10 a-6\sqrt{3} a}\right]\right)\right)\right)$$

Problem 88: 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):

$$\frac{1}{3\left(-5+3\sqrt{3}\right)\sqrt{-a+b\,x^3}\,\left(2\left(-5+3\sqrt{3}\right)a+b\,x^3\right)}$$
$$\left(26-15\sqrt{3}\right)a\,x\left(-\left(\left(96\left(-1+\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]\right)\right/\right.$$
$$\left(8\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]-\right.$$
$$3\,b\,x^3\left(\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},2,\frac{7}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]+\right.$$
$$\left.\left.\left.\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},1,\frac{7}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]\right)\right)\right)+$$
$$x\left(-\left(\left(60\left(-3+\sqrt{3}\right)a\left(\frac{b}{a}\right)^{1/3}\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]\right)\right/\left(10\left(-5+3\sqrt{3}\right)\right.\right.$$
$$a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]-3\,b\,x^3\left(\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},\frac{b\,x^3}{a},\right.\right.$$
$$\left.\left.\left.\left.\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]\right)\right)\right)\right)+$$
$$x\left(-\left(\left(16\sqrt{3}\,a\left(\frac{b}{a}\right)^{2/3}\text{AppellF1}\left[1,\frac{1}{2},1,2,\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]\right)\right/\left(4\left(-5+3\sqrt{3}\right)\right.\right.$$
$$a\,\text{AppellF1}\left[1,\frac{1}{2},1,2,\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]-b\,x^3\left(\text{AppellF1}\left[2,\frac{1}{2},2,3,\frac{b\,x^3}{a},\right.\right.$$
$$\left.\left.\left.\left.\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[2,\frac{3}{2},1,3,\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]\right)\right)\right)\right)+$$
$$\left(21\,b\,x\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]\right)\Big/$$
$$\left(14\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]-\right.$$
$$3\,b\,x^3\left(\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},2,\frac{10}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]+\right.$$
$$\left.\left.\left.\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},1,\frac{10}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]\right)\right)\right)$$

Problem 89: 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, 1545 leaves):

$$\Big(32 \left(26-15 \sqrt{3}\right) a^2 x \, \text{AppellF1}\left[\frac{1}{3}, \frac{1}{2}, 1, \frac{4}{3}, -\frac{b x^3}{a}, \frac{b x^3}{-10 a+6 \sqrt{3} a}\right]\Big) \Big/$$

$$\Big(\left(-5+3 \sqrt{3}\right) \sqrt{-a-b x^3} \left(2 \left(-5+3 \sqrt{3}\right) a-b x^3\right)$$

$$\Big(8 \left(-5+3 \sqrt{3}\right) a \, \text{AppellF1}\left[\frac{1}{3}, \frac{1}{2}, 1, \frac{4}{3}, -\frac{b x^3}{a}, -\frac{b x^3}{10 a-6 \sqrt{3} a}\right]+$$

$$3 b x^3 \Big(\text{AppellF1}\left[\frac{4}{3}, \frac{1}{2}, 2, \frac{7}{3}, -\frac{b x^3}{a}, -\frac{b x^3}{10 a-6 \sqrt{3} a}\right]+$$

$$\left(5-3 \sqrt{3}\right) \text{AppellF1}\left[\frac{4}{3}, \frac{3}{2}, 1, \frac{7}{3}, -\frac{b x^3}{a}, -\frac{b x^3}{10 a-6 \sqrt{3} a}\right]\Big)\Big)\Big)-$$

$$\Big(32 \sqrt{3} \left(26-15 \sqrt{3}\right) a^2 x \, \text{AppellF1}\left[\frac{1}{3}, \frac{1}{2}, 1, \frac{4}{3}, -\frac{b x^3}{a}, \frac{b x^3}{-10 a+6 \sqrt{3} a}\right]\Big) \Big/$$

$$\Big(\left(-5+3 \sqrt{3}\right) \sqrt{-a-b x^3} \left(2 \left(-5+3 \sqrt{3}\right) a-b x^3\right)$$

$$\Big(8 \left(-5+3 \sqrt{3}\right) a \, \text{AppellF1}\left[\frac{1}{3}, \frac{1}{2}, 1, \frac{4}{3}, -\frac{b x^3}{a}, -\frac{b x^3}{10 a-6 \sqrt{3} a}\right]+$$

$$3 b x^3 \Big(\text{AppellF1}\left[\frac{4}{3}, \frac{1}{2}, 2, \frac{7}{3}, -\frac{b x^3}{a}, -\frac{b x^3}{10 a-6 \sqrt{3} a}\right]+$$

$$\left(5-3 \sqrt{3}\right) \text{AppellF1}\left[\frac{4}{3}, \frac{3}{2}, 1, \frac{7}{3}, -\frac{b x^3}{a}, -\frac{b x^3}{10 a-6 \sqrt{3} a}\right]\Big)\Big)\Big)-$$

$$\Big(60 \left(26-15 \sqrt{3}\right) a^2 \left(\frac{b}{a}\right)^{1/3} x^2 \, \text{AppellF1}\left[\frac{2}{3}, \frac{1}{2}, 1, \frac{5}{3}, -\frac{b x^3}{a}, \frac{b x^3}{-10 a+6 \sqrt{3} a}\right]\Big) \Big/$$

$$\Big(\left(-5+3 \sqrt{3}\right) \sqrt{-a-b x^3} \left(2 \left(-5+3 \sqrt{3}\right) a-b x^3\right)$$

$$\Big(10 \left(-5+3 \sqrt{3}\right) a \, \text{AppellF1}\left[\frac{2}{3}, \frac{1}{2}, 1, \frac{5}{3}, -\frac{b x^3}{a}, -\frac{b x^3}{10 a-6 \sqrt{3} a}\right]+$$

$$3\,b\,x^3\left(\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]\right)\Bigg)\Bigg)+$$

$$\left(20\sqrt{3}\left(26-15\sqrt{3}\right)a^2\left(\frac{b}{a}\right)^{1/3}x^2\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b\,x^3}{a},\frac{b\,x^3}{-10\,a+6\sqrt{3}\,a}\right]\right)\Bigg/$$

$$\Bigg(\left(-5+3\sqrt{3}\right)\sqrt{-a-b\,x^3}\left(2\left(-5+3\sqrt{3}\right)a-b\,x^3\right)\Bigg(10\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]+$$

$$3\,b\,x^3\left(\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]\right)\Bigg)\Bigg)-$$

$$\left(16\left(26-15\sqrt{3}\right)a^2\left(\frac{b}{a}\right)^{2/3}x^3\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{b\,x^3}{a},\frac{b\,x^3}{-10\,a+6\sqrt{3}\,a}\right]\right)\Bigg/$$

$$\Bigg(\sqrt{3}\left(-5+3\sqrt{3}\right)\sqrt{-a-b\,x^3}\left(2\left(-5+3\sqrt{3}\right)a-b\,x^3\right)\Bigg(4\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]+$$

$$b\,x^3\left(\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]\right)\Bigg)\Bigg)-$$

$$\left(7\left(26-15\sqrt{3}\right)a\,b\,x^4\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b\,x^3}{a},\frac{b\,x^3}{-10\,a+6\sqrt{3}\,a}\right]\right)\Bigg/$$

$$\Bigg(\left(-5+3\sqrt{3}\right)\sqrt{-a-b\,x^3}\left(2\left(-5+3\sqrt{3}\right)a-b\,x^3\right)\Bigg(14\left(-5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]+$$

$$3\,b\,x^3\left(\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},2,\frac{10}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]+\left(5-3\sqrt{3}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},1,\frac{10}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a-6\sqrt{3}\,a}\right]\right)\Bigg)\Bigg)$$

Problem 90: 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):

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

Problem 91: 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):

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

Problem 92: 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):

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

Problem 93: 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):

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

Problem 94: 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):

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

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

$$\left.\left.\left.(-1)^{1/3}\right]\right)\Big/\left(3^{1/4}\,b^{1/3}\,\sqrt{\frac{a^{1/3}+(-1)^{2/3}\,b^{1/3}\,x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right)\right)+$$

$$\left(4\,(-1)^{1/3}\left(1+(-1)^{1/3}\right)a^{1/3}\,\sqrt{1-\frac{b^{1/3}\,x}{a^{1/3}}+\frac{b^{2/3}\,x^2}{a^{2/3}}}\;\text{EllipticPi}\left[\frac{2\,\mathrm{i}\,\sqrt{3}}{3+(2+\mathrm{i})\sqrt{3}},\right.\right.$$

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

Problem 95: 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):

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

Result (type 4, 329 leaves):

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

Problem 96: 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):

$$\frac{1}{b^{1/3}\sqrt{-a+b\,x^3}}$$

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

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

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

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

Problem 97: 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):

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

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

$$\left.\left.\left.(-1)^{1/3}\right]\right)\Big/\left(3^{1/4}b^{1/3}\sqrt{\frac{a^{1/3}+(-1)^{2/3}b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right)\right)+$$

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

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

Problem 98: 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):

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

$$\left(26+15\sqrt{3}\right) a x \left(-\left(\left(96\left(1+\sqrt{3}\right) a \text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3} a}\right]\right)\middle/\right.\right.$$

$$\left(8\left(5+3\sqrt{3}\right) a \text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3} a}\right]-\right.$$

$$3 b x^3\left(\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},2,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3} a}\right]+\right.$$

$$\left.\left.\left.\left(5+3\sqrt{3}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3} a}\right]\right)\right)\right)+$$

$$x\left(\left(60\left(3+\sqrt{3}\right) a\left(\frac{b}{a}\right)^{1/3}\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3} a}\right]\right)\middle/\right.$$

$$\left(10\left(5+3\sqrt{3}\right) a \text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3} a}\right]-\right.$$

$$3 b x^3\left(\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3} a}\right]+\right.$$

$$\left.\left.\left.\left(5+3\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3} a}\right]\right)\right)\right)+$$

$$x\left(-\left(\left(16\sqrt{3} a\left(\frac{b}{a}\right)^{2/3}\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3} a}\right]\right)\middle/\right.\right.$$

$$\left(4\left(5+3\sqrt{3}\right) a \text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3} a}\right]-b\right.$$

$$x^3\left(\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3} a}\right]+\right.$$

$$\left.\left.\left.\left.\left(5+3\sqrt{3}\right)\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3} a}\right]\right)\right)\right)\right)+$$

$$\left(21 b x \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3} a}\right]\right)\middle/$$

$$\left(14\left(5+3\sqrt{3}\right) a \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3} a}\right]-\right.$$

$$3 b x^3\left(\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},2,\frac{10}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3} a}\right]+\right.$$

$$\left.\left.\left.\left(5+3\sqrt{3}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},1,\frac{10}{3},-\frac{b x^3}{a},-\frac{b x^3}{10 a+6\sqrt{3} a}\right]\right)\right)\right)\right)$$

Problem 99: 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):

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

Result (type 6, 835 leaves):

$$\frac{1}{3\left(5+3\sqrt{3}\right)\sqrt{a-b\,x^3}\,\left(2\left(5+3\sqrt{3}\right)a-b\,x^3\right)}$$

$$\Big(26+15\sqrt{3}\Big)\,a\,x\,\Bigg(-\Bigg(\Bigg(96\left(1+\sqrt{3}\right)a\,\text{AppellF1}\Big[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\Big]\Bigg)\Big/$$

$$\Bigg(8\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\Big[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\Big]+$$

$$3\,b\,x^3\Bigg(\text{AppellF1}\Big[\frac{4}{3},\frac{1}{2},2,\frac{7}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\Big]+$$

$$\left(5+3\sqrt{3}\right)\text{AppellF1}\Big[\frac{4}{3},\frac{3}{2},1,\frac{7}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\Big]\Bigg)\Bigg)\Bigg)+$$

$$x\,\Bigg(-\Bigg(\Bigg(60\left(3+\sqrt{3}\right)a\left(\frac{b}{a}\right)^{1/3}\text{AppellF1}\Big[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\Big]\Bigg)\Big/\Bigg(10\left(5+3\sqrt{3}\right)$$

$$a\,\text{AppellF1}\Big[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\Big]+3\,b\,x^3\Bigg(\text{AppellF1}\Big[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},\frac{b\,x^3}{a},$$

$$\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\Big]+\left(5+3\sqrt{3}\right)\text{AppellF1}\Big[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\Big]\Bigg)\Bigg)\Bigg)+$$

$$x\,\Bigg(-\Bigg(\Bigg(16\sqrt{3}\,a\left(\frac{b}{a}\right)^{2/3}\text{AppellF1}\Big[1,\frac{1}{2},1,2,\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\Big]\Bigg)\Big/\Bigg(4\left(5+3\sqrt{3}\right)$$

$$a\,\text{AppellF1}\Big[1,\frac{1}{2},1,2,\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\Big]+b\,x^3\Bigg(\text{AppellF1}\Big[2,\frac{1}{2},2,3,\frac{b\,x^3}{a},$$

$$\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\Big]+\left(5+3\sqrt{3}\right)\text{AppellF1}\Big[2,\frac{3}{2},1,3,\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\Big]\Bigg)\Bigg)\Bigg)-$$

$$\Bigg(21\,b\,x\,\text{AppellF1}\Big[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\Big]\Bigg)\Big/$$

$$\Bigg(14\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\Big[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\Big]+$$

$$3\,b\,x^3\Bigg(\text{AppellF1}\Big[\frac{7}{3},\frac{1}{2},2,\frac{10}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\Big]+$$

$$\left(5+3\sqrt{3}\right)\text{AppellF1}\Big[\frac{7}{3},\frac{3}{2},1,\frac{10}{3},\frac{b\,x^3}{a},\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\Big]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)$$

Problem 100: 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]+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]+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]+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]+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 101: 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):

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

Result (type 6, 869 leaves):

$$\frac{1}{3\left(5+3\sqrt{3}\right)\sqrt{-a-b\,x^3}\left(2\left(5+3\sqrt{3}\right)a+b\,x^3\right)}$$
$$\left(26+15\sqrt{3}\right)a\,x\left(-\left(\left(96\left(1+\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\Big/\right.\right.$$
$$\left(8\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]-\right.$$
$$3\,b\,x^3\left(\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},2,\frac{7}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\right.$$
$$\left.\left.\left.\left(5+3\sqrt{3}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},1,\frac{7}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\right)\right)+$$
$$x\left(\left(60\left(3+\sqrt{3}\right)a\left(\frac{b}{a}\right)^{1/3}\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\Big/\right.$$
$$\left(10\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]-\right.$$
$$3\,b\,x^3\left(\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\right.$$
$$\left.\left.\left.\left(5+3\sqrt{3}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\right)\right)+$$
$$x\left(-\left(\left(16\sqrt{3}\,a\left(\frac{b}{a}\right)^{2/3}\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\Big/\right.\right.$$
$$\left(4\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\left[1,\frac{1}{2},1,2,-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]-b\right.$$
$$x^3\left(\text{AppellF1}\left[2,\frac{1}{2},2,3,-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\right.$$
$$\left.\left.\left.\left.\left(5+3\sqrt{3}\right)\text{AppellF1}\left[2,\frac{3}{2},1,3,-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\right)\right)\right)+$$
$$\left(21\,b\,x\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\Big/$$
$$\left(14\left(5+3\sqrt{3}\right)a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]-\right.$$
$$3\,b\,x^3\left(\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},2,\frac{10}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]+\right.$$
$$\left.\left.\left.\left(5+3\sqrt{3}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},1,\frac{10}{3},-\frac{b\,x^3}{a},-\frac{b\,x^3}{10\,a+6\sqrt{3}\,a}\right]\right)\right)\right)$$

Problem 102: 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):

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

Result (type 4, 269 leaves):

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

Problem 103: Result unnecessarily involves 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):

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

Result (type 4, 267 leaves):

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

Problem 104: 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):

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

Result (type 4, 291 leaves):

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

Problem 105: 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):

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

Result (type 4, 291 leaves):

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

Problem 106: 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):

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

Result (type 4, 289 leaves):

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

Problem 107: 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):

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

Result (type 4, 293 leaves):

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

Problem 108: 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):

$$-\left(\left(4\sqrt{\frac{a^{1/3}+b^{1/3}x}{\left(1+(-1)^{1/3}\right)a^{1/3}}}\right.\right.$$

$$\left(-\frac{1}{2\sqrt{2}}\,\mathrm{i}\,3^{1/4}\,f\left(\left(\left(-2-\mathrm{i}\right)+\sqrt{3}\right)a^{1/3}+\left(\left(1+2\,\mathrm{i}\right)-\mathrm{i}\sqrt{3}\right)b^{1/3}x\right)\sqrt{\mathrm{i}+\sqrt{3}-\frac{2\,\mathrm{i}\,b^{1/3}x}{a^{1/3}}}\right.$$

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

$$\mathrm{i}\left(b^{1/3}e+\left(-1+\sqrt{3}\right)a^{1/3}f\right)\sqrt{\frac{-2\,\mathrm{i}\,a^{1/3}+\left(\mathrm{i}+\sqrt{3}\right)b^{1/3}x}{\left(-3\,\mathrm{i}+\sqrt{3}\right)a^{1/3}}}$$

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

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

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

Problem 109: 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):

$$\frac{\left(b^{1/3} e+\left(1-\sqrt{3}\right) a^{1/3} f\right) \text{ArcTanh}\left[\frac{\sqrt{-3+2 \sqrt{3}}\; a^{1/6} \left(a^{1/3}-b^{1/3} x\right)}{\sqrt{a-b x^3}}\right]}{\sqrt{3 \left(-3+2 \sqrt{3}\right)}\; \sqrt{a}\; b^{2/3}}+$$

$$\left(\sqrt{2+\sqrt{3}}\; \left(b^{1/3} e+\left(1+\sqrt{3}\right) a^{1/3} f\right) \left(a^{1/3}-b^{1/3} x\right) \sqrt{\frac{a^{2/3}+a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) a^{1/3}-b^{1/3} x\right)^2}}\right.$$

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

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

Result (type 4, 466 leaves) :

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

$$\left(\frac{1}{2} f \left(i \left(-3+(2+i) \sqrt{3}\right) a^{1/3}+\left(3-(2-i) \sqrt{3}\right) b^{1/3} x\right) \sqrt{\frac{\left(-i+\sqrt{3}\right) a^{1/3}+\left(i+\sqrt{3}\right) b^{1/3} x}{\left(-3 i+\sqrt{3}\right) a^{1/3}}}\right.$$

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

$$i \left(b^{1/3} e-\left(-1+\sqrt{3}\right) a^{1/3} f\right) \sqrt{-\frac{i \left(2 a^{1/3}+\left(1-i \sqrt{3}\right) b^{1/3} x\right)}{\left(-3 i+\sqrt{3}\right) a^{1/3}}}$$

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

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

Problem 110: 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):

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

$$\left(\sqrt{2-\sqrt{3}}\;\left(b^{1/3}\,e+\left(1+\sqrt{3}\right)a^{1/3}\,f\right)\left(a^{1/3}-b^{1/3}\,x\right)\sqrt{\frac{a^{2/3}+a^{1/3}\,b^{1/3}\,x+b^{2/3}\,x^2}{\left(\left(1-\sqrt{3}\right)a^{1/3}-b^{1/3}\,x\right)^2}}\right.$$

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

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

Result (type 4, 467 leaves):

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

$$\left(\frac{1}{2} f\left(i\left(-3+(2+i)\sqrt{3}\right) a^{1/3}+\left(3-(2-i)\sqrt{3}\right) b^{1/3} x\right)\sqrt{\frac{\left(-i+\sqrt{3}\right) a^{1/3}+\left(i+\sqrt{3}\right) b^{1/3} x}{\left(-3 i+\sqrt{3}\right) a^{1/3}}}\right.$$

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

$$i\left(b^{1/3} e-\left(-1+\sqrt{3}\right) a^{1/3} f\right)\sqrt{-\frac{i\left(2 a^{1/3}+\left(1-i\sqrt{3}\right) b^{1/3} x\right)}{\left(-3 i+\sqrt{3}\right) a^{1/3}}}$$

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

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

Problem 111: 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):

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

$$\left(\sqrt{2-\sqrt{3}}\left(b^{1/3} e-\left(1+\sqrt{3}\right) a^{1/3} f\right)\left(a^{1/3}+b^{1/3} x\right)\sqrt{\frac{a^{2/3}-a^{1/3} b^{1/3} x+b^{2/3} x^2}{\left(\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1+\sqrt{3}\right) a^{1/3}+b^{1/3} x}{\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x}\right],-7+4\sqrt{3}\right]\right)\Big/$$
$$\left(3^{3/4} a^{1/3} b^{2/3}\sqrt{-\frac{a^{1/3}\left(a^{1/3}+b^{1/3} x\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}+b^{1/3} x\right)^2}}\;\sqrt{-a-b x^3}\right)$$

Result (type 4, 441 leaves):

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

Problem 112: 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):

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

Problem 113: 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):

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

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

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

$$\left(\left(3+(2+i)\sqrt{3}\right)\sqrt{1-x^3}\right)$$

Problem 114: 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):

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

$$\left(2\sqrt{\frac{7}{6}-\frac{2}{\sqrt{3}}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]\right)\Big/$$

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

Result (type 4, 230 leaves):

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

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

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

$$\left(\left(3+(2+i)\sqrt{3}\right)\sqrt{-1+x^3}\right)$$

Problem 115: 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):

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

$$\left(2\sqrt{\frac{7}{6}-\frac{2}{\sqrt{3}}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]\right)\Big/$$

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

Result (type 4, 211 leaves):

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

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

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

Problem 116: 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):

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

$$\left(2\sqrt{\frac{7}{6}+\frac{2}{\sqrt{3}}}\;(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]\right)\Big/$$

$$\left(3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\;\sqrt{1+x^3}\right)$$

Result (type 4, 225 leaves):

$$\left(2\sqrt{\frac{1+x}{1+(-1)^{1/3}}}\left(\frac{1}{\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}}\sqrt{\frac{(-1)^{1/3}-(-1)^{2/3}x}{1+(-1)^{1/3}}}\left(3-(2+i)\sqrt{3}+\left(-3i+(1+2i)\sqrt{3}\right)x\right)\right.\right.$$

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

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

$$\left(\left(-3i+(1+2i)\sqrt{3}\right)\sqrt{1+x^3}\right)$$

Problem 117: 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):

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

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

$$\left(3^{1/4}b^{2/3}\sqrt{\frac{a^{1/3}\left(a^{1/3}+b^{1/3}x\right)}{\left(\left(1+\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\sqrt{a+b x^3}\right)$$

Result (type 4, 427 leaves):

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

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

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

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

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

Problem 118: 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):

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

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

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

Result (type 4, 454 leaves):

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

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

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

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

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

Problem 119: 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):

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

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

$$\left.\left.-7+4\sqrt{3}\right]\right) \Bigg/ \left(3^{3/4} b^{2/3} \sqrt{-\frac{a^{1/3}\left(a^{1/3}-b^{1/3} x\right)}{\left(\left(1-\sqrt{3}\right) a^{1/3}-b^{1/3} x\right)^2}}\ \sqrt{-a+b x^3}\right)$$

Result (type 4, 455 leaves):

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

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

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

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

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

Problem 120: 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):

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

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

$$\left.\left.-7+4\sqrt{3}\right]\right)\Bigg/\left(3^{3/4}\,b^{2/3}\sqrt{-\frac{a^{1/3}\left(a^{1/3}+b^{1/3}x\right)}{\left(\left(1-\sqrt{3}\right)a^{1/3}+b^{1/3}x\right)^2}}\sqrt{-a-b\,x^3}\right)$$

Result (type 4, 430 leaves):

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

Problem 121: 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, 319 leaves, 6 steps):

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

Result (type 4, 214 leaves):

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

Problem 122: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 331 leaves, 6 steps):

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

Result (type 4, 235 leaves):

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

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

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

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

Problem 123: 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):

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

$$\left(4\times 3^{1/4}\sqrt{2+\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\;\text{EllipticPi}\left[\frac{\left(c+d+\sqrt{3}\,d\right)^2}{\left(c+d-\sqrt{3}\,d\right)^2},\right.\right.$$

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

Result (type 4, 233 leaves):

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

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

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

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

Problem 124: 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):

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

$$\left(4\times3^{1/4}\sqrt{2+\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\right.$$

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

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

Result (type 4, 216 leaves):

$$\frac{1}{d\sqrt{-1-x^3}}2\sqrt{\frac{1+x}{1+(-1)^{1/3}}}\left(-\frac{1}{\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}}\left(\left((-1)^{1/3}-x\right)\right.\right.$$

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

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

Problem 125: 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):

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

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

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

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

Result (type 4, 213 leaves):

$$\frac{1}{d\sqrt{1+x^3}}2\sqrt{\frac{1+x}{1+(-1)^{1/3}}}\left(-\frac{1}{\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}}\left((-1)^{1/3}-x\right)\right.$$

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

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

Problem 126: 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):

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

$$\left(4\times3^{1/4}\sqrt{2-\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticPi}\left[\frac{\left(c+d-\sqrt{3}\,d\right)^2}{\left(c+d+\sqrt{3}\,d\right)^2},\right.\right.$$

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

Result (type 4, 235 leaves):

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

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

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

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

Problem 127: 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):

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

$$\left(4\times3^{1/4}\sqrt{2-\sqrt{3}}\,(1-x)\sqrt{\frac{1+x+x^2}{\left(1-\sqrt{3}-x\right)^2}}\,\text{EllipticPi}\left[\frac{\left(c+d-\sqrt{3}\,d\right)^2}{\left(c+d+\sqrt{3}\,d\right)^2},\right.\right.$$

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

Result (type 4, 233 leaves):

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

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

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

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

Problem 128: 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):

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

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

$$\left(4\times 3^{1/4}\sqrt{2-\sqrt{3}}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\;\text{EllipticPi}\left[\frac{\left(c-\left(1-\sqrt{3}\right)d\right)^2}{\left(c-\left(1+\sqrt{3}\right)d\right)^2},\right.\right.$$

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

Result (type 4, 215 leaves):

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

Problem 129: 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):

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

Result (type 4, 149 leaves):

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

Problem 130: 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):

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

Result (type 4, 157 leaves):

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

Problem 131: 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):

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

Result (type 4, 150 leaves):

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

Problem 132: 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):

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

Result (type 4, 155 leaves):

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

Problem 133: 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):

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

Result (type 4, 149 leaves):

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

Problem 134: 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):

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

Result (type 4, 158 leaves):

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

Problem 135: 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):

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

Result (type 4, 151 leaves):

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

Problem 136: 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):

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

Result (type 4, 156 leaves):

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

Problem 137: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 334 leaves, 8 steps):

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

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

$$\left(3^{1/4}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\sqrt{1+x^3}\right)-$$

$$\left(12\times3^{1/4}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\,\text{EllipticPi}\left[97-56\sqrt{3},-\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],-7-4\sqrt{3}\right]\right)\Big/$$

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

Result (type 4, 194 leaves):

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

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

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

Problem 138: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 379 leaves, 8 steps):

$$\frac{3\,(1-x)\,\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\ \mathrm{ArcTanh}\left[\frac{\sqrt{7}\,\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}}{2\,\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}}\right]}{2\,\sqrt{7}\,\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\,\sqrt{1-x^3}}-$$

$$\left(2\,\sqrt{2\,\left(37+20\,\sqrt{3}\right)}\,(1-x)\,\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\ \mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],\ -7-4\,\sqrt{3}\right]\right)\Bigg/$$
$$\left(13\times 3^{1/4}\,\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\,\sqrt{1-x^3}\right)-$$
$$\left(12\times 3^{1/4}\,\sqrt{2+\sqrt{3}}\,(1-x)\,\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\ \mathrm{EllipticPi}\left[\frac{1}{169}\left(553+304\,\sqrt{3}\right),\right.\right.$$
$$\left.\left.-\mathrm{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],\ -7-4\,\sqrt{3}\right]\right)\Bigg/\left(13\,\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\,\sqrt{1-x^3}\right)$$

Result (type 4, 195 leaves) :

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

Problem 139: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 375 leaves, 8 steps) :

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

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

$$\left(12\times 3^{1/4}\,\sqrt{2+\sqrt{3}}\,(1-x)\,\sqrt{\frac{1+x+x^2}{\left(1+\sqrt{3}-x\right)^2}}\;\text{EllipticPi}\left[\frac{1}{169}\left(553+304\,\sqrt{3}\right),\right.\right.$$
$$\left.\left.-\text{ArcSin}\left[\frac{1-\sqrt{3}-x}{1+\sqrt{3}-x}\right],\,-7-4\,\sqrt{3}\right]\right)\Bigg/\left(13\,\sqrt{\frac{1-x}{\left(1+\sqrt{3}-x\right)^2}}\,\sqrt{-1+x^3}\right)$$

Result (type 4, 193 leaves):

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

Problem 140: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 343 leaves, 8 steps):

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

$$\left(2\sqrt{14+8\sqrt{3}}\,(1+x)\,\sqrt{\frac{1-x+x^2}{\left(1-\sqrt{3}+x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],\,-7+4\sqrt{3}\right]\right)\Big/$$

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

$$\left(12\times 3^{1/4}\,(1+x)\,\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\;\text{EllipticPi}\left[97-56\sqrt{3},\,-\text{ArcSin}\left[\frac{1-\sqrt{3}+x}{1+\sqrt{3}+x}\right],\,-7-4\sqrt{3}\right]\right)\Big/$$

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

Result (type 4, 196 leaves):

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

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

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

Problem 141: 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):

$$\frac{(d e-c f)(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}\ \text{ArcTan}\left[\frac{\sqrt{c^2+c d+d^2}\sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}}{\sqrt{c-d}\ \sqrt{d}\ \sqrt{\frac{1-x+x^2}{\left(1+\sqrt{3}+x\right)^2}}}\right]}{\sqrt{c-d}\ \sqrt{d}\ \sqrt{c^2+c d+d^2}\ \sqrt{\frac{1+x}{\left(1+\sqrt{3}+x\right)^2}}\ \sqrt{1+x^3}}+$$

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

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

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

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

Result (type 4, 211 leaves):

$$\frac{1}{d\sqrt{1+x^3}}2\sqrt{\frac{1+x}{1+(-1)^{1/3}}}\left(-\frac{1}{\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}}f\left((-1)^{1/3}-x\right)\right.$$

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

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

Problem 142: 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):

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

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

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

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

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

Result (type 4, 233 leaves):

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

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

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

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

Problem 143: 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):

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

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

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}-x}{1-\sqrt{3}-x}\right],-7+4\sqrt{3}\right]\right)\Big/$$

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

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

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

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

Result (type 4, 231 leaves) :

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

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

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

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

Problem 144: 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):

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

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

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{1+\sqrt{3}+x}{1-\sqrt{3}+x}\right],-7+4\sqrt{3}\right]\right)\Bigg/$$

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

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

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

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

Result (type 4, 213 leaves):

$$\frac{1}{d\sqrt{-1-x^3}}2\sqrt{\frac{1+x}{1+(-1)^{1/3}}}\left(-\frac{1}{\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}}f\left((-1)^{1/3}-x\right)\right.$$

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

$$\left.\mathbb{i}\,(-d e+c f)\,\sqrt{1-x+x^2}\,\text{EllipticPi}\left[\frac{\mathbb{i}\sqrt{3}\,d}{c+(-1)^{1/3}d},\text{ArcSin}\left[\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]\right)$$

Problem 145: 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):

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

Result (type 4, 134 leaves):

$$-\frac{2}{3} e \operatorname{ArcTanh}\left[\sqrt{1+x^3}\right]-\left(2 f \left((-1)^{1/3}-x\right) \sqrt{\frac{1+x}{1+(-1)^{1/3}}} \sqrt{-\frac{(-1)^{2/3} \left((-1)^{2/3}+x\right)}{1+(-1)^{1/3}}} \operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\sqrt{\frac{1+(-1)^{2/3} x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]\right)\Big/\left(\sqrt{\frac{1+(-1)^{2/3} x}{1+(-1)^{1/3}}} \sqrt{1+x^3}\right)$$

Problem 146: 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):

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

Result (type 4, 140 leaves):

$$-\frac{2}{3} e \operatorname{ArcTanh}\left[\sqrt{1-x^3}\right]+\left(2 f \sqrt{\frac{1-x}{1+(-1)^{1/3}}} \left((-1)^{1/3}+x\right) \sqrt{\frac{(-1)^{1/3}+(-1)^{2/3} x}{1+(-1)^{1/3}}} \operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\sqrt{\frac{1-(-1)^{2/3} x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]\right) \Big/ \left(\sqrt{\frac{1-(-1)^{2/3} x}{1+(-1)^{1/3}}} \sqrt{1-x^3}\right)$$

Problem 147: 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):

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

Result (type 4, 136 leaves):

$$\frac{2}{3} e \operatorname{ArcTan}\left[\sqrt{-1+x^3}\right]+\left(2 f \sqrt{\frac{1-x}{1+(-1)^{1/3}}} \left((-1)^{1/3}+x\right) \sqrt{\frac{(-1)^{1/3}+(-1)^{2/3} x}{1+(-1)^{1/3}}} \operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\sqrt{\frac{1-(-1)^{2/3} x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]\right) \Big/ \left(\sqrt{\frac{1-(-1)^{2/3} x}{1+(-1)^{1/3}}} \sqrt{-1+x^3}\right)$$

Problem 148: 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):

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

Result (type 4, 138 leaves):

$$\frac{2}{3} e \operatorname{ArcTan}\left[\sqrt{-1-x^3}\right]-\left(2 f\left((-1)^{1/3}-x\right)\sqrt{\frac{1+x}{1+(-1)^{1/3}}}\sqrt{-\frac{(-1)^{2/3}\left((-1)^{2/3}+x\right)}{1+(-1)^{1/3}}}\, \operatorname{EllipticF}\left[\operatorname{ArcSin}\left[\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}\right], (-1)^{1/3}\right]\right) \Big/ \left(\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}\sqrt{-1-x^3}\right)$$

Problem 149: 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):

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

Result (type 8, 33 leaves):

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

Problem 150: Unable to integrate problem.

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

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

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

Result (type 8, 32 leaves):

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

Problem 158: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 209 leaves, 3 steps):

$$\frac{a^2 d \left(2 b^3 c-a^3 d\right) (a+b x)^{1+n}}{b^6 (1+n)}-\frac{a d \left(4 b^3 c-5 a^3 d\right) (a+b x)^{2+n}}{b^6 (2+n)}+\frac{2 d \left(b^3 c-5 a^3 d\right) (a+b x)^{3+n}}{b^6 (3+n)}+\frac{10 a^2 d^2 (a+b x)^{4+n}}{b^6 (4+n)}-\frac{5 a d^2 (a+b x)^{5+n}}{b^6 (5+n)}+\frac{d^2 (a+b x)^{6+n}}{b^6 (6+n)}-\frac{c^2 (a+b x)^{1+n} \text{Hypergeometric2F1}\left[1,1+n,2+n,1+\frac{b x}{a}\right]}{a (1+n)}$$

Result (type 5, 420 leaves):

$$(a+b x)^n \left(\left(2 c d \left(1+\frac{b x}{a}\right)^{-n} \left(-2 a^2 b n x \left(1+\frac{b x}{a}\right)^n+a b^2 n (1+n) x^2 \left(1+\frac{b x}{a}\right)^n+b^3 \left(2+3 n+n^2\right) x^3 \left(1+\frac{b x}{a}\right)^n+2 a^3 \left(-1+\left(1+\frac{b x}{a}\right)^n\right)\right)\right) \Big/ \left(b^3 (1+n) (2+n) (3+n)\right)+\left(d^2 \left(1+\frac{b x}{a}\right)^{-n} \left(120 a^5 b n x \left(1+\frac{b x}{a}\right)^n-60 a^4 b^2 n (1+n) x^2 \left(1+\frac{b x}{a}\right)^n+20 a^3 b^3 n \left(2+3 n+n^2\right) x^3 \left(1+\frac{b x}{a}\right)^n-5 a^2 b^4 n \left(6+11 n+6 n^2+n^3\right) x^4 \left(1+\frac{b x}{a}\right)^n+a b^5 n \left(24+50 n+35 n^2+10 n^3+n^4\right) x^5 \left(1+\frac{b x}{a}\right)^n+b^6 \left(120+274 n+225 n^2+85 n^3+15 n^4+n^5\right) x^6 \left(1+\frac{b x}{a}\right)^n-120 a^6 \left(-1+\left(1+\frac{b x}{a}\right)^n\right)\right)\right) \Big/ \left(b^6 (1+n) (2+n) (3+n) (4+n) (5+n) (6+n)\right)+\frac{c^2 \left(1+\frac{a}{b x}\right)^{-n} \text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{a}{b x}\right]}{n}\right)$$

Problem 159: 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) :

$$\Big(\big(a+b\,x\big)^{1+n}\,\Big(-39\,916\,800\,a^{11}\,d^{3}+39\,916\,800\,a^{10}\,b\,d^{3}\,(1+n)\,x-19\,958\,400\,a^{9}\,b^{2}\,d^{3}\,\left(2+3\,n+n^{2}\right)\,x^{2}+$$
$$120\,960\,a^{8}\,b^{3}\,d^{2}\,\left(c\,\left(1320+362\,n+33\,n^{2}+n^{3}\right)+55\,d\,\left(6+11\,n+6\,n^{2}+n^{3}\right)\,x^{3}\right)-$$
$$30\,240\,a^{7}\,b^{4}\,d^{2}\,(1+n)\,x\,\left(4\,c\,\left(1320+362\,n+33\,n^{2}+n^{3}\right)+55\,d\,\left(24+26\,n+9\,n^{2}+n^{3}\right)\,x^{3}\right)+$$
$$30\,240\,a^{6}\,b^{5}\,d^{2}\,\left(2+3\,n+n^{2}\right)\,x^{2}\,\left(2\,c\,\left(1320+362\,n+33\,n^{2}+n^{3}\right)+11\,d\,\left(60+47\,n+12\,n^{2}+n^{3}\right)\,x^{3}\right)-$$
$$360\,a^{5}\,b^{6}\,d\,\Big(c^{2}\,\left(665\,280+434\,568\,n+117\,454\,n^{2}+16\,815\,n^{3}+1345\,n^{4}+57\,n^{5}+n^{6}\right)+$$
$$56\,c\,d\,\left(7920+16\,692\,n+12\,100\,n^{2}+3861\,n^{3}+571\,n^{4}+39\,n^{5}+n^{6}\right)\,x^{3}+$$
$$154\,d^{2}\,\left(720+1764\,n+1624\,n^{2}+735\,n^{3}+175\,n^{4}+21\,n^{5}+n^{6}\right)\,x^{6}\Big)+$$
$$360\,a^{4}\,b^{7}\,d\,(1+n)\,x\,\Big(c^{2}\,\left(665\,280+434\,568\,n+117\,454\,n^{2}+16\,815\,n^{3}+1345\,n^{4}+57\,n^{5}+n^{6}\right)+$$
$$14\,c\,d\,\left(31\,680+43\,008\,n+22\,084\,n^{2}+5460\,n^{3}+685\,n^{4}+42\,n^{5}+n^{6}\right)\,x^{3}+$$
$$22\,d^{2}\,\left(5040+8028\,n+5104\,n^{2}+1665\,n^{3}+295\,n^{4}+27\,n^{5}+n^{6}\right)\,x^{6}\Big)-18\,a^{3}\,b^{8}\,d\,\left(2+3\,n+n^{2}\right)$$
$$x^{2}\,\Big(10\,c^{2}\,\left(665\,280+434\,568\,n+117\,454\,n^{2}+16\,815\,n^{3}+1345\,n^{4}+57\,n^{5}+n^{6}\right)+$$
$$56\,c\,d\,\left(79\,200+83\,760\,n+34\,834\,n^{2}+7275\,n^{3}+805\,n^{4}+45\,n^{5}+n^{6}\right)\,x^{3}+$$
$$55\,d^{2}\,\left(20\,160+24\,552\,n+12\,154\,n^{2}+3135\,n^{3}+445\,n^{4}+33\,n^{5}+n^{6}\right)\,x^{6}\Big)+$$
$$b^{11}\,\left(246\,400+593\,520\,n+541\,508\,n^{2}+251\,352\,n^{3}+66\,489\,n^{4}+10\,440\,n^{5}+962\,n^{6}+48\,n^{7}+n^{8}\right)$$
$$x^{2}\,\Big(c^{3}\,\left(648+234\,n+27\,n^{2}+n^{3}\right)+3\,c^{2}\,d\,\left(324+171\,n+24\,n^{2}+n^{3}\right)\,x^{3}+$$
$$3\,c\,d^{2}\,\left(216+126\,n+21\,n^{2}+n^{3}\right)\,x^{6}+d^{3}\,\left(162+99\,n+18\,n^{2}+n^{3}\right)\,x^{9}\Big)-$$
$$a\,b^{10}\,\left(280+418\,n+159\,n^{2}+22\,n^{3}+n^{4}\right)\,x$$
$$\Big(2\,c^{3}\,\left(285\,120+221\,544\,n+70\,254\,n^{2}+11\,645\,n^{3}+1065\,n^{4}+51\,n^{5}+n^{6}\right)+$$
$$15\,c^{2}\,d\,\left(57\,024+70\,920\,n+32\,574\,n^{2}+7115\,n^{3}+801\,n^{4}+45\,n^{5}+n^{6}\right)\,x^{3}+$$
$$24\,c\,d^{2}\,\left(23\,760+32\,652\,n+17\,160\,n^{2}+4421\,n^{3}+591\,n^{4}+39\,n^{5}+n^{6}\right)\,x^{6}+$$
$$11\,d^{3}\,\left(12\,960+18\,612\,n+10\,404\,n^{2}+2915\,n^{3}+435\,n^{4}+33\,n^{5}+n^{6}\right)\,x^{9}\Big)+$$
$$2\,a^{2}\,b^{9}\,\Big(c^{3}\,\big(79\,833\,600+101\,378\,880\,n+56\,231\,712\,n^{2}+17\,893\,196\,n^{3}+3\,602\,088\,n^{4}+$$
$$476\,049\,n^{5}+41\,328\,n^{6}+2274\,n^{7}+72\,n^{8}+n^{9}\big)+30\,c^{2}\,d\,\big(3\,991\,680+9\,925\,488\,n+$$
$$9\,476\,652\,n^{2}+4\,665\,572\,n^{3}+1\,332\,327\,n^{4}+233\,481\,n^{5}+25\,518\,n^{6}+1698\,n^{7}+63\,n^{8}+n^{9}\big)\,x^{3}+$$
$$84\,c\,d^{2}\,\big(950\,400+2\,589\,120\,n+2\,806\,008\,n^{2}+1\,617\,020\,n^{3}+552\,426\,n^{4}+116\,949\,n^{5}+$$
$$15\,432\,n^{6}+1230\,n^{7}+54\,n^{8}+n^{9}\big)\,x^{6}+55\,d^{3}\,\big(362\,880+1\,026\,576\,n+1\,172\,700\,n^{2}+$$
$$723\,680\,n^{3}+269\,325\,n^{4}+63\,273\,n^{5}+9450\,n^{6}+870\,n^{7}+45\,n^{8}+n^{9}\big)\,x^{9}\Big)\Big)\Big)\Big/$$
$$\Big(b^{12}\,(1+n)\,(2+n)\,(3+n)\,(4+n)\,(5+n)\,(6+n)\,(7+n)$$
$$(8+n)$$
$$(9+n)$$
$$(10+n)$$
$$(11+n)$$
$$(12+n)\Big)$$

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

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

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):

$$\Big((a+b x)^{1+n}\,\big(3\,628\,800\,a^{10} d^3-3\,628\,800\,a^9 b d^3\,(1+n)\,x+1\,814\,400\,a^8 b^2 d^3\,(2+3 n+n^2)\,x^2-$$
$$15\,120\,a^7 b^3 d^2\,(c\,(990+299 n+30 n^2+n^3)+40 d\,(6+11 n+6 n^2+n^3)\,x^3)+$$
$$15\,120\,a^6 b^4 d^2\,(1+n)\,x\,(c\,(990+299 n+30 n^2+n^3)+10 d\,(24+26 n+9 n^2+n^3)\,x^3)-$$
$$7560\,a^5 b^5 d^2\,(2+3 n+n^2)\,x^2\,(c\,(990+299 n+30 n^2+n^3)+4 d\,(60+47 n+12 n^2+n^3)\,x^3)+$$
$$72\,a^4 b^6 d\,(c^2\,(332\,640+245\,004\,n+74\,524\,n^2+11\,985\,n^3+1075\,n^4+51\,n^5+n^6)+$$
$$35\,c\,d\,(5940+12\,684\,n+9409\,n^2+3120\,n^3+490\,n^4+36\,n^5+n^6)\,x^3+$$
$$70\,d^2\,(720+1764\,n+1624\,n^2+735\,n^3+175\,n^4+21\,n^5+n^6)\,x^6)-$$
$$18\,a^3 b^7 d\,(1+n)\,x\,(4\,c^2\,(332\,640+245\,004\,n+74\,524\,n^2+11\,985\,n^3+1075\,n^4+51\,n^5+n^6)+$$
$$35\,c\,d\,(23\,760+32\,916\,n+17\,404\,n^2+4485\,n^3+595\,n^4+39\,n^5+n^6)\,x^3+$$
$$40\,d^2\,(5040+8028\,n+5104\,n^2+1665\,n^3+295\,n^4+27\,n^5+n^6)\,x^6)+$$
$$18\,a^2 b^8 d\,(2+3 n+n^2)\,x^2\,(2\,c^2\,(332\,640+245\,004\,n+74\,524\,n^2+11\,985\,n^3+1075\,n^4+51\,n^5+n^6)+$$
$$7\,c\,d\,(59\,400+64\,470\,n+27\,733\,n^2+6048\,n^3+706\,n^4+42\,n^5+n^6)\,x^3+$$
$$5\,d^2\,(20\,160+24\,552\,n+12\,154\,n^2+3135\,n^3+445\,n^4+33\,n^5+n^6)\,x^6)+$$
$$b^{10}\,(45\,360+95\,436\,n+72\,180\,n^2+27\,109\,n^3+5620\,n^4+654\,n^5+40\,n^6+n^7)\,x$$
$$(c^3\,(440+183\,n+24\,n^2+n^3)+3\,c^2 d\,(176+126\,n+21\,n^2+n^3)\,x^3+$$
$$3\,c\,d^2\,(110+87\,n+18\,n^2+n^3)\,x^6+d^3\,(80+66\,n+15\,n^2+n^3)\,x^9)-$$
$$a\,b^9\,(162+99\,n+18\,n^2+n^3)\,(c^3\,(123\,200+111\,960\,n+41\,214\,n^2+7875\,n^3+825\,n^4+45\,n^5+n^6)+$$
$$12\,c^2 d\,(12\,320+24\,132\,n+15\,600\,n^2+4341\,n^3+591\,n^4+39\,n^5+n^6)\,x^3+$$
$$21\,c\,d^2\,(4400+9420\,n+7068\,n^2+2427\,n^3+411\,n^4+33\,n^5+n^6)\,x^6+$$
$$10\,d^3\,(2240+4968\,n+3954\,n^2+1485\,n^3+285\,n^4+27\,n^5+n^6)\,x^9)\big)\Big)\Big/$$
$$\big(b^{11}\,(1+n)\,(2+n)\,(3+n)\,(4+n)\,(5+n)\,(6+n)\,(7+n)\,(8+n)\,(9+n)\,(10+n)\,(11+n)\big)$$

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

$$\int (a+b x)^n\,(c+d x^3)^3\,dx$$

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) :

$$\Big((a+b x)^{1+n} \big(-362880 a^9 d^3+362880 a^8 b d^3 (1+n) x-181440 a^7 b^2 d^3 \left(2+3 n+n^2\right) x^2+2160 a^6 b^3 d^2 \left(c \left(720+242 n+27 n^2+n^3\right)+28 d \left(6+11 n+6 n^2+n^3\right) x^3\right)-2160 a^5 b^4 d^2 (1+n) x \left(c \left(720+242 n+27 n^2+n^3\right)+7 d \left(24+26 n+9 n^2+n^3\right) x^3\right)+216 a^4 b^5 d^2 \left(2+3 n+n^2\right) x^2 \left(5 c \left(720+242 n+27 n^2+n^3\right)+14 d \left(60+47 n+12 n^2+n^3\right) x^3\right)-9 a b^8 d \left(80+146 n+81 n^2+16 n^3+n^4\right) x^2 \left(c^2 \left(3780+1968 n+379 n^2+32 n^3+n^4\right)+2 c d \left(1080+858 n+235 n^2+26 n^3+n^4\right) x^3+d^2 \left(504+450 n+145 n^2+20 n^3+n^4\right) x^6\right)-18 a^3 b^6 d \left(c^2 \left(151200+127860 n+44524 n^2+8175 n^3+835 n^4+45 n^5+n^6\right)+20 c d \left(4320+9372 n+7144 n^2+2475 n^3+415 n^4+33 n^5+n^6\right) x^3+28 d^2 \left(720+1764 n+1624 n^2+735 n^3+175 n^4+21 n^5+n^6\right) x^6\right)+18 a^2 b^7 d (1+n) x \left(c^2 \left(151200+127860 n+44524 n^2+8175 n^3+835 n^4+45 n^5+n^6\right)+5 c d \left(17280+24528 n+13420 n^2+3624 n^3+511 n^4+36 n^5+n^6\right) x^3+4 d^2 \left(5040+8028 n+5104 n^2+1665 n^3+295 n^4+27 n^5+n^6\right) x^6\right)+b^9 \left(12960+18612 n+10404 n^2+2915 n^3+435 n^4+33 n^5+n^6\right) \left(c^3 \left(280+138 n+21 n^2+n^3\right)+3 c^2 d \left(70+87 n+18 n^2+n^3\right) x^3+3 c d^2 \left(40+54 n+15 n^2+n^3\right) x^6+d^3 \left(28+39 n+12 n^2+n^3\right) x^9\right)\big)\Big)\Big/\left(b^{10} (1+n) (2+n) (3+n) (4+n) (5+n) (6+n) (7+n) (8+n) (9+n) (10+n)\right)$$

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

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

Optimal (type 5, 358 leaves, 3 steps) :

$$\frac{a^2 d\left(3 b^6 c^2-3 a^3 b^3 c d+a^6 d^2\right)(a+b x)^{1+n}}{b^9(1+n)}-\frac{a d\left(6 b^6 c^2-15 a^3 b^3 c d+8 a^6 d^2\right)(a+b x)^{2+n}}{b^9(2+n)}+\frac{d\left(3 b^6 c^2-30 a^3 b^3 c d+28 a^6 d^2\right)(a+b x)^{3+n}}{b^9(3+n)}+\frac{2 a^2 d^2\left(15 b^3 c-28 a^3 d\right)(a+b x)^{4+n}}{b^9(4+n)}-\frac{5 a d^2\left(3 b^3 c-14 a^3 d\right)(a+b x)^{5+n}}{b^9(5+n)}+\frac{d^2\left(3 b^3 c-56 a^3 d\right)(a+b x)^{6+n}}{b^9(6+n)}+\frac{28 a^2 d^3(a+b x)^{7+n}}{b^9(7+n)}-\frac{8 a d^3(a+b x)^{8+n}}{b^9(8+n)}+\frac{d^3(a+b x)^{9+n}}{b^9(9+n)}-\frac{c^3(a+b x)^{1+n} \text{Hypergeometric2F1}\left[1,1+n,2+n,1+\frac{b x}{a}\right]}{a(1+n)}$$

Result (type 5, 856 leaves) :

$$(a+b x)^n\left(\left(3 c^2 d\left(1+\frac{b x}{a}\right)^{-n}\left(-2 a^2 b n x\left(1+\frac{b x}{a}\right)^n+a b^2 n(1+n) x^2\left(1+\frac{b x}{a}\right)^n+b^3\left(2+3 n+n^2\right) x^3\left(1+\frac{b x}{a}\right)^n+2 a^3\left(-1+\left(1+\frac{b x}{a}\right)^n\right)\right)\right) \Big/ \left(b^3(1+n)(2+n)(3+n)\right)+\frac{1}{b^6(1+n)(2+n)(3+n)(4+n)(5+n)(6+n)} 3 c d^2\left(1+\frac{b x}{a}\right)^{-n}\left(120 a^5 b n x\left(1+\frac{b x}{a}\right)^n-60 a^4 b^2 n(1+n) x^2\left(1+\frac{b x}{a}\right)^n+20 a^3 b^3 n\left(2+3 n+n^2\right) x^3\left(1+\frac{b x}{a}\right)^n-5 a^2 b^4 n\left(6+11 n+6 n^2+n^3\right) x^4\left(1+\frac{b x}{a}\right)^n+a b^5 n\left(24+50 n+35 n^2+10 n^3+n^4\right) x^5\left(1+\frac{b x}{a}\right)^n+b^6\left(120+274 n+225 n^2+85 n^3+15 n^4+n^5\right) x^6\left(1+\frac{b x}{a}\right)^n-120 a^6\left(-1+\left(1+\frac{b x}{a}\right)^n\right)\right)+\left(1 \Big/ \left(b^9(1+n)(2+n)(3+n)(4+n)(5+n)(6+n)(7+n)(8+n)(9+n)\right)\right) d^3\left(1+\frac{b x}{a}\right)^{-n}\left(-40320 a^8 b n x\left(1+\frac{b x}{a}\right)^n+20160 a^7 b^2 n(1+n) x^2\left(1+\frac{b x}{a}\right)^n-6720 a^6 b^3 n\left(2+3 n+n^2\right) x^3\left(1+\frac{b x}{a}\right)^n+1680 a^5 b^4 n\left(6+11 n+6 n^2+n^3\right) x^4\left(1+\frac{b x}{a}\right)^n-336 a^4 b^5 n\left(24+50 n+35 n^2+10 n^3+n^4\right) x^5\left(1+\frac{b x}{a}\right)^n+56 a^3 b^6 n\left(120+274 n+225 n^2+85 n^3+15 n^4+n^5\right) x^6\left(1+\frac{b x}{a}\right)^n-8 a^2 b^7 n\left(720+1764 n+1624 n^2+735 n^3+175 n^4+21 n^5+n^6\right) x^7\left(1+\frac{b x}{a}\right)^n+a b^8 n\left(5040+13068 n+13132 n^2+6769 n^3+1960 n^4+322 n^5+28 n^6+n^7\right) x^8\left(1+\frac{b x}{a}\right)^n+b^9\left(40320+109584 n+118124 n^2+67284 n^3+22449 n^4+4536 n^5+546 n^6+36 n^7+n^8\right) x^9\left(1+\frac{b x}{a}\right)^n+40320 a^9\left(-1+\left(1+\frac{b x}{a}\right)^n\right)\right)+\frac{c^3\left(1+\frac{a}{b x}\right)^{-n} \text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{a}{b x}\right]}{n}\right)$$

Problem 163: Result is not expressed in closed-form.

$$\int \frac{x^5 \left(e+f x\right)^n}{a+b x^3} \, dx$$

Optimal (type 5, 324 leaves, 7 steps):

$$\frac{e^2 \left(e+f x\right)^{1+n}}{b f^3 \left(1+n\right)}-\frac{2 e \left(e+f x\right)^{2+n}}{b f^3 \left(2+n\right)}+\frac{\left(e+f x\right)^{3+n}}{b f^3 \left(3+n\right)}+$$
$$\frac{a \left(e+f x\right)^{1+n} \text{Hypergeometric2F1}\left[1,1+n,2+n,\frac{b^{1/3} \left(e+f x\right)}{b^{1/3} e-a^{1/3} f}\right]}{3 b^{5/3} \left(b^{1/3} e-a^{1/3} f\right) \left(1+n\right)}+$$
$$\frac{a \left(e+f x\right)^{1+n} \text{Hypergeometric2F1}\left[1,1+n,2+n,\frac{b^{1/3} \left(e+f x\right)}{b^{1/3} e+\left(-1\right)^{1/3} a^{1/3} f}\right]}{3 b^{5/3} \left(b^{1/3} e+\left(-1\right)^{1/3} a^{1/3} f\right) \left(1+n\right)}+$$
$$\frac{a \left(e+f x\right)^{1+n} \text{Hypergeometric2F1}\left[1,1+n,2+n,\frac{b^{1/3} \left(e+f x\right)}{b^{1/3} e-\left(-1\right)^{2/3} a^{1/3} f}\right]}{3 b^{5/3} \left(b^{1/3} e-\left(-1\right)^{2/3} a^{1/3} f\right) \left(1+n\right)}$$

Result (type 7, 423 leaves):

$$\frac{1}{3 b f^3} \left(e+f x\right)^n \left(\left(3 \left(-2 e^2 f n x+e f^2 n \left(1+n\right) x^2+f^3 \left(2+3 n+n^2\right) x^3+e^3 \left(2-2 \left(1+\frac{f x}{e}\right)^{-n}\right)\right)\right)\Big/\right.$$
$$\left(6+11 n+6 n^2+n^3\right)-\frac{1}{b n} a f^3 \left(e^2 \text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3\&,\right.\right.$$
$$\left.\frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{e+f x-\#1}\right] \left(\frac{e+f x}{e+f x-\#1}\right)^{-n}}{e^2-2 e \#1+\#1^2}\&\right]-$$
$$2 e \text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3\&,\right.$$
$$\left.\frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{e+f x-\#1}\right] \left(\frac{e+f x}{e+f x-\#1}\right)^{-n} \#1}{e^2-2 e \#1+\#1^2}\&\right]+$$
$$\text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3\&,\right.$$
$$\left.\left.\left.\frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{e+f x-\#1}\right] \left(\frac{e+f x}{e+f x-\#1}\right)^{-n} \#1^2}{e^2-2 e \#1+\#1^2}\&\right]\right)\right)$$

Problem 164: Result is not expressed in closed-form.

$$\int \frac{x^4 \left(e+f x\right)^n}{a+b x^3} \, dx$$

Optimal (type 5, 332 leaves, 7 steps):

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

Result (type 7, 298 leaves):

$$\frac{1}{3\,b\,f^2}(e+f\,x)^n\left(-\frac{3\left(-e\,f\,n\,x-f^2\,(1+n)\,x^2+e^2\left(1-\left(1+\frac{f\,x}{e}\right)^{-n}\right)\right)}{2+3\,n+n^2}+\right.$$
$$\frac{1}{b\,n}a\,e\,f^3\,\text{RootSum}\Big[b\,e^3-a\,f^3-3\,b\,e^2\,\#1+3\,b\,e\,\#1^2-b\,\#1^3\,\&,$$
$$\frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{e+f\,x-\#1}\right]\left(\frac{e+f\,x}{e+f\,x-\#1}\right)^{-n}}{e^2-2\,e\,\#1+\#1^2}\,\&\Big]-$$
$$\frac{1}{b\,n}a\,f^3\,\text{RootSum}\Big[b\,e^3-a\,f^3-3\,b\,e^2\,\#1+3\,b\,e\,\#1^2-b\,\#1^3\,\&,$$
$$\left.\frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{e+f\,x-\#1}\right]\left(\frac{e+f\,x}{e+f\,x-\#1}\right)^{-n}\#1}{e^2-2\,e\,\#1+\#1^2}\,\&\Big]\right)$$

Problem 165: 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):

$$\frac{1}{3 b^2 f}(e+f x)^n \left(\frac{3 b (e+f x)}{1+n}-\frac{1}{n} a f^3 \text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3\&,\frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{e+f x-\#1}\right]\left(\frac{e+f x}{e+f x-\#1}\right)^{-n}}{e^2-2 e \#1+\#1^2}\&\right]\right)$$

Problem 166: 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):

$$\frac{1}{3 b n}(e+f x)^n \left(e^2 \text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3\&,\frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{e+f x-\#1}\right]\left(\frac{e+f x}{e+f x-\#1}\right)^{-n}}{e^2-2 e \#1+\#1^2}\&\right]-2 e \text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3\&,\frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{e+f x-\#1}\right]\left(\frac{e+f x}{e+f x-\#1}\right)^{-n} \#1}{e^2-2 e \#1+\#1^2}\&\right]+\text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3\&,\frac{\text{Hypergeometric2F1}\left[-n,-n,1-n,-\frac{\#1}{e+f x-\#1}\right]\left(\frac{e+f x}{e+f x-\#1}\right)^{-n} \#1^2}{e^2-2 e \#1+\#1^2}\&\right]\right)$$

Problem 167: 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):

$$\frac{(e+f x)^{1+n} \text{Hypergeometric2F1}\left[1, 1+n, 2+n, \frac{b^{1/3} (e+f x)}{b^{1/3} e-a^{1/3} f}\right]}{3 a^{1/3} b^{1/3} \left(b^{1/3} e-a^{1/3} f\right) (1+n)} -$$
$$\left((-1)^{1/3} (e+f x)^{1+n} \text{Hypergeometric2F1}\left[1, 1+n, 2+n, \frac{(-1)^{2/3} b^{1/3} (e+f x)}{(-1)^{2/3} b^{1/3} e-a^{1/3} f}\right]\right) \Big/$$
$$\left(3 a^{1/3} b^{1/3} \left((-1)^{2/3} b^{1/3} e-a^{1/3} f\right) (1+n)\right) -$$
$$\left((-1)^{2/3} (e+f x)^{1+n} \text{Hypergeometric2F1}\left[1, 1+n, 2+n, \frac{(-1)^{1/3} b^{1/3} (e+f x)}{(-1)^{1/3} b^{1/3} e+a^{1/3} f}\right]\right) \Big/$$
$$\left(3 a^{1/3} b^{1/3} \left((-1)^{1/3} b^{1/3} e+a^{1/3} f\right) (1+n)\right)$$

Result (type 7, 229 leaves) :

$$-\frac{1}{3 b n} f (e+f x)^n \left(e \text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3 \&,\right.\right.$$
$$\left.\frac{\text{Hypergeometric2F1}\left[-n, -n, 1-n, -\frac{\#1}{e+f x-\#1}\right] \left(\frac{e+f x}{e+f x-\#1}\right)^{-n}}{e^2-2 e \#1+\#1^2} \&\right] -$$
$$\text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3 \&,\right.$$
$$\left.\left.\frac{\text{Hypergeometric2F1}\left[-n, -n, 1-n, -\frac{\#1}{e+f x-\#1}\right] \left(\frac{e+f x}{e+f x-\#1}\right)^{-n} \#1}{e^2-2 e \#1+\#1^2} \&\right]\right)$$

Problem 168: 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) :

$$\frac{1}{3 b n} f^2 (e+f x)^n \text{RootSum}\left[b e^3-a f^3-3 b e^2 \#1+3 b e \#1^2-b \#1^3 \&,\right.$$
$$\left.\frac{\text{Hypergeometric2F1}\left[-n, -n, 1-n, -\frac{\#1}{e+f x-\#1}\right] \left(\frac{e+f x}{e+f x-\#1}\right)^{-n}}{e^2-2 e \#1+\#1^2} \&\right]$$

Problem 169: 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 170: 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):

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

Result (type 7, 280 leaves):

$$\frac{1}{3\,a}(e+f\,x)^n\left(\frac{3\left(1+\frac{e}{f\,x}\right)^{-n}\text{Hypergeometric2F1}\left[1-n,\,-n,\,2-n,\,-\frac{e}{f\,x}\right]}{(-1+n)\,x}+\right.$$
$$\frac{1}{n}e\,f\,\text{RootSum}\left[b\,e^3-a\,f^3-3\,b\,e^2\,\sharp1+3\,b\,e\,\sharp1^2-b\,\sharp1^3\,\&,\right.$$
$$\left.\frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\sharp1}{e+f\,x-\sharp1}\right]\left(\frac{e+f\,x}{e+f\,x-\sharp1}\right)^{-n}}{e^2-2\,e\,\sharp1+\sharp1^2}\,\&\right]-$$
$$\frac{1}{n}f\,\text{RootSum}\left[b\,e^3-a\,f^3-3\,b\,e^2\,\sharp1+3\,b\,e\,\sharp1^2-b\,\sharp1^3\,\&,\right.$$
$$\left.\left.\frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\sharp1}{e+f\,x-\sharp1}\right]\left(\frac{e+f\,x}{e+f\,x-\sharp1}\right)^{-n}\sharp1}{e^2-2\,e\,\sharp1+\sharp1^2}\,\&\right]\right)$$

Problem 171: 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):

$$\frac{1}{3 b^2 n (1+n)} (c+d x)^n \left((b c^3 - a d^3) (1+n) \text{RootSum}\left[b c^3 - a d^3 - 3 b c^2 \#1 + 3 b c \#1^2 - b \#1^3 \&, \frac{\text{Hypergeometric2F1}\left[-n, -n, 1-n, -\frac{\#1}{c+d x-\#1}\right] \left(\frac{c+d x}{c+d x-\#1}\right)^{-n}}{c^2 - 2 c \#1 + \#1^2} \&\right] + b \left(3 n (c+d x) - 2 c^2 (1+n) \text{RootSum}\left[b c^3 - a d^3 - 3 b c^2 \#1 + 3 b c \#1^2 - b \#1^3 \&, \frac{\text{Hypergeometric2F1}\left[-n, -n, 1-n, -\frac{\#1}{c+d x-\#1}\right] \left(\frac{c+d x}{c+d x-\#1}\right)^{-n} \#1}{c^2 - 2 c \#1 + \#1^2} \&\right] + c (1+n) \text{RootSum}\left[b c^3 - a d^3 - 3 b c^2 \#1 + 3 b c \#1^2 - b \#1^3 \&, \frac{\text{Hypergeometric2F1}\left[-n, -n, 1-n, -\frac{\#1}{c+d x-\#1}\right] \left(\frac{c+d x}{c+d x-\#1}\right)^{-n} \#1^2}{c^2 - 2 c \#1 + \#1^2} \&\right]\right)\right)$$

Problem 172: Unable to integrate problem.

$$\int \frac{x^m (e+f x)^n}{a+b x^3} \, dx$$

Optimal (type 6, 211 leaves, 8 steps):

$$\frac{x^{1+m} (e+f x)^n \left(1+\frac{f x}{e}\right)^{-n} \text{AppellF1}\left[1+m, -n, 1, 2+m, -\frac{f x}{e}, -\frac{b^{1/3} x}{a^{1/3}}\right]}{3 a (1+m)} + \frac{1}{3 a (1+m)} x^{1+m} (e+f x)^n \left(1+\frac{f x}{e}\right)^{-n} \text{AppellF1}\left[1+m, -n, 1, 2+m, -\frac{f x}{e}, \frac{(-1)^{1/3} b^{1/3} x}{a^{1/3}}\right] + \frac{1}{3 a (1+m)} x^{1+m} (e+f x)^n \left(1+\frac{f x}{e}\right)^{-n} \text{AppellF1}\left[1+m, -n, 1, 2+m, -\frac{f x}{e}, -\frac{(-1)^{2/3} b^{1/3} x}{a^{1/3}}\right]$$

Result (type 8, 22 leaves):

$$\int \frac{x^m (e+f x)^n}{a+b x^3} \, dx$$

Problem 173: 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):

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

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

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

$$\left.\left.\left(3^{1/4}\sqrt{b}\,c^{1/6}\sqrt{b\,c^{1/3}-a\,d^{1/3}}\,\sqrt{7-4\sqrt{3}+\frac{\left(\left(1-\sqrt{3}\right)c^{1/3}+d^{1/3}\,x\right)^2}{\left(\left(1+\sqrt{3}\right)c^{1/3}+d^{1/3}\,x\right)^2}}\right)\right]\right)\Bigg/$$

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

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

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

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

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

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

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

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

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

$$\left(4\times 3^{1/4}\sqrt{2+\sqrt{3}}\; c^{1/3}\left(b^3 c - a^3 d\right)\left(c^{1/3}+d^{1/3}\,x\right)\sqrt{\frac{c^{2/3}\left(1-\frac{d^{1/3}x}{c^{1/3}}+\frac{d^{2/3}x^2}{c^{2/3}}\right)}{\left(\left(1+\sqrt{3}\right)c^{1/3}+d^{1/3}\,x\right)^2}}\right.$$

$$\left.\mathrm{EllipticPi}\left[\frac{\left(\left(1+\sqrt{3}\right) b\, c^{1/3}-a\, d^{1/3}\right)^2}{\left(\left(1-\sqrt{3}\right) b\, c^{1/3}-a\, d^{1/3}\right)^2},\, -\mathrm{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)c^{1/3}+d^{1/3}\,x}{\left(1+\sqrt{3}\right)c^{1/3}+d^{1/3}\,x}\right],\, -7-4\sqrt{3}\right]\right) \Big/$$

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

Result (type 4, 820 leaves):

$$\frac{1}{3\, b\sqrt{c+d\,x^3}}$$

$$2\left(c+d\,x^3-\left(3^{3/4}\, a^2 d^{2/3}\left((-1)^{1/3} c^{1/3}-d^{1/3}\,x\right)\sqrt{\frac{c^{1/3}+d^{1/3}\,x}{\left(1+(-1)^{1/3}\right)c^{1/3}}}\;\sqrt{(-1)^{1/6}-\frac{i\, d^{1/3}\,x}{c^{1/3}}}\right.\right.$$

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

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

$$\left(\left(-1+(-1)^{2/3}\right)\mathrm{EllipticE}\left[\mathrm{ArcSin}\left[\frac{\sqrt{(-1)^{1/6}-\frac{i\, d^{1/3}x}{c^{1/3}}}}{3^{1/4}}\right],\,\frac{(-1)^{1/3}}{-1+(-1)^{1/3}}\right]+\right.$$

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

$$\left(3\,\mathrm{i}\,b\,c^{4/3}\sqrt{\frac{c^{1/3}+d^{1/3}\,x}{\left(1+(-1)^{1/3}\right)c^{1/3}}}\,\sqrt{1-\frac{d^{1/3}\,x}{c^{1/3}}+\frac{d^{2/3}\,x^2}{c^{2/3}}}\;\text{EllipticPi}\left[\frac{\mathrm{i}\,\sqrt{3}\,b\,c^{1/3}}{(-1)^{1/3}\,b\,c^{1/3}+a\,d^{1/3}},\right.\right.$$

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

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

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

$$\left.\left((-1)^{1/3}\,b\,c^{1/3}+a\,d^{1/3}\right)\right)$$

Problem 174: 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):

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

$$\text{AppellF1}\left[p,\,-p,\,-p,\,1+p,\,-\frac{2\,(d+e\,x)}{\left(-3+\mathrm{i}\,\sqrt{3}\right)d},\,\frac{2\,(d+e\,x)}{\left(3+\mathrm{i}\,\sqrt{3}\right)d}\right]$$

Result (type 8, 23 leaves) :

$$\int\frac{\left(d^3+e^3\,x^3\right)^p}{d+e\,x}\,dx$$

Problem 175: 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):

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

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

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

$$\left(3\left(5+i\sqrt{2}+i\sqrt{3}+\sqrt{6}\right)\text{EllipticPi}\left[\frac{2\sqrt{3}}{-i+2\sqrt{2}+\sqrt{3}},\right.\right.$$

$$\left.\left.\text{ArcSin}\left[\sqrt{\frac{1+(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]\right)\Big/\left(5\,i+2\sqrt{2}+\sqrt{3}+2\,i\sqrt{6}\right)\Bigg)$$

Problem 176: 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):

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

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

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

Problem 177: 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):

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

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

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

Problem 178: 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):

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

Problem 179: 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):

$$\frac{1}{3\sqrt{1+x^3}}\sqrt{\frac{1+x}{1+(-1)^{1/3}}}\sqrt{1-x+x^2}$$

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

$$\frac{1}{\left(2+(-1)^{2/3}+d+(-1)^{1/3}d\right)\sqrt{-8-4d+d^2}}$$

$$3\,i\left(\left(8+8(-1)^{1/3}-\left(1+(-1)^{1/3}\right)d^2+4\sqrt{-8-4d+d^2}-2(-1)^{1/3}\sqrt{-8-4d+d^2}+\right.\right.$$

$$\left.\left(1+(-1)^{1/3}\right)d\left(4+\sqrt{-8-4d+d^2}\right)\right)\text{EllipticPi}\left[\frac{2\,i\sqrt{3}}{2(-1)^{1/3}+d-\sqrt{-8-4d+d^2}},\right.$$

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

$$\left.\left(-4+\sqrt{-8-4d+d^2}\right)-2\left(4+4(-1)^{1/3}-2\sqrt{-8-4d+d^2}+(-1)^{1/3}\sqrt{-8-4d+d^2}\right)\right)$$

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

Problem 180: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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):

$$\frac{1}{3\sqrt{1-x^3}}\sqrt{\frac{1-x}{1+(-1)^{1/3}}}\sqrt{1+x+x^2}$$

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

$$\frac{1}{\left(-2-(-1)^{2/3}+d+(-1)^{1/3}d\right)\sqrt{-8+4d+d^2}}$$

$$3\,i\left(\left(8+8(-1)^{1/3}-\left(1+(-1)^{1/3}\right)d^2-4\sqrt{-8+4d+d^2}+2(-1)^{1/3}\sqrt{-8+4d+d^2}+\right.\right.$$

$$\left.\left(1+(-1)^{1/3}\right)d\left(-4+\sqrt{-8+4d+d^2}\right)\right)\text{EllipticPi}\left[\frac{2\,i\sqrt{3}}{2(-1)^{1/3}-d+\sqrt{-8+4d+d^2}},\right.$$

$$\left.\text{ArcSin}\left[\sqrt{\frac{1-(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]+\left(-8-8(-1)^{1/3}+\left(1+(-1)^{1/3}\right)d^2-\right.$$

$$\left.4\sqrt{-8+4d+d^2}+2(-1)^{1/3}\sqrt{-8+4d+d^2}+\left(1+(-1)^{1/3}\right)d\left(4+\sqrt{-8+4d+d^2}\right)\right)$$

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

Problem 181: 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):

$$\frac{1}{3\sqrt{-1+x^3}}\sqrt{\frac{1-x}{1+(-1)^{1/3}}}\sqrt{1+x+x^2}$$

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

$$\frac{1}{\left(-2-(-1)^{2/3}+d+(-1)^{1/3}d\right)\sqrt{-8+4d+d^2}}$$

$$3\,i\left(\left(8+8(-1)^{1/3}-\left(1+(-1)^{1/3}\right)d^2-4\sqrt{-8+4d+d^2}+2(-1)^{1/3}\sqrt{-8+4d+d^2}+\right.\right.$$

$$\left.\left(1+(-1)^{1/3}\right)d\left(-4+\sqrt{-8+4d+d^2}\right)\right)\text{EllipticPi}\left[\frac{2\,i\sqrt{3}}{2(-1)^{1/3}-d+\sqrt{-8+4d+d^2}},\right.$$

$$\left.\text{ArcSin}\left[\sqrt{\frac{1-(-1)^{2/3}x}{1+(-1)^{1/3}}}\right],(-1)^{1/3}\right]+\left(-8-8(-1)^{1/3}+\left(1+(-1)^{1/3}\right)d^2-\right.$$

$$\left.4\sqrt{-8+4d+d^2}+2(-1)^{1/3}\sqrt{-8+4d+d^2}+\left(1+(-1)^{1/3}\right)d\left(4+\sqrt{-8+4d+d^2}\right)\right)$$

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

Problem 182: 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):

$$\frac{1}{3\sqrt{-1-x^3}}\sqrt{\frac{1+x}{1+(-1)^{1/3}}}\sqrt{1-x+x^2}$$

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

$$\frac{1}{\left(2+(-1)^{2/3}+d+(-1)^{1/3}d\right)\sqrt{-8-4d+d^2}}$$

$$3\,i\left(\left(8+8(-1)^{1/3}-\left(1+(-1)^{1/3}\right)d^2+4\sqrt{-8-4d+d^2}-2(-1)^{1/3}\sqrt{-8-4d+d^2}+\right.\right.$$

$$\left.\left(1+(-1)^{1/3}\right)d\left(4+\sqrt{-8-4d+d^2}\right)\right)\text{EllipticPi}\left[\frac{2\,i\sqrt{3}}{2(-1)^{1/3}+d-\sqrt{-8-4d+d^2}},\right.$$

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

$$\left.\left(-4+\sqrt{-8-4d+d^2}\right)-2\left(4+4(-1)^{1/3}-2\sqrt{-8-4d+d^2}+(-1)^{1/3}\sqrt{-8-4d+d^2}\right)\right)$$

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

Problem 183: 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):

$$\frac{3}{4}d^2 e\,x^2\sqrt{a+c\,x^4}+\frac{6\,a\,d\,e^2\,x\sqrt{a+c\,x^4}}{5\sqrt{c}\left(\sqrt{a}+\sqrt{c}\,x^2\right)}+\frac{1}{15}d\,x\left(5\,d^2+9\,e^2x^2\right)\sqrt{a+c\,x^4}+$$

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

$$6\,a^{5/4}d\,e^2\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}x}{a^{1/4}}\right],\frac{1}{2}\right]+\frac{1}{15\,c^{3/4}\sqrt{a+c\,x^4}}$$

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

Result (type 4, 310 leaves):

$$\frac{1}{60\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,c\sqrt{a+c x^4}}\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\left(10 a^2 e^3+c^2 x^5\left(20 d^3+45 d^2 e x+36 d e^2 x^2+10 e^3 x^3\right)+\right.\right.$$
$$\left.a c x\left(20 d^3+45 d^2 e x+36 d e^2 x^2+20 e^3 x^3\right)+45 a\sqrt{c}\,d^2 e\sqrt{a+c x^4}\,\text{ArcTanh}\left[\frac{\sqrt{c}\,x^2}{\sqrt{a+c x^4}}\right]\right)+$$
$$72 a^{3/2}\sqrt{c}\,d e^2\sqrt{1+\frac{c x^4}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]-$$
$$\left.8 a\sqrt{c}\,d\left(5 i\sqrt{c}\,d^2+9\sqrt{a}\,e^2\right)\sqrt{1+\frac{c x^4}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]\right)$$

Problem 184: 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):

$$\frac{1}{2}d e x^2\sqrt{a+c x^4}+\frac{2 a e^2 x\sqrt{a+c x^4}}{5\sqrt{c}\left(\sqrt{a}+\sqrt{c}\,x^2\right)}+$$
$$\frac{1}{15}x\left(5 d^2+3 e^2 x^2\right)\sqrt{a+c x^4}+\frac{a d e\,\text{ArcTanh}\left[\frac{\sqrt{c}\,x^2}{\sqrt{a+c x^4}}\right]}{2\sqrt{c}}-\frac{1}{5 c^{3/4}\sqrt{a+c x^4}}$$
$$2 a^{5/4} e^2\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}x}{a^{1/4}}\right],\frac{1}{2}\right]+\frac{1}{15 c^{3/4}\sqrt{a+c x^4}}$$
$$a^{3/4}\left(5\sqrt{c}\,d^2+3\sqrt{a}\,e^2\right)\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}x}{a^{1/4}}\right],\frac{1}{2}\right]$$

Result (type 4, 247 leaves):

$$\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\left(\sqrt{c}\,x\left(10 d^2+15 d e x+6 e^2 x^2\right)\left(a+c x^4\right)+15 a d e\sqrt{a+c x^4}\,\text{ArcTanh}\left[\frac{\sqrt{c}\,x^2}{\sqrt{a+c x^4}}\right]\right)+\right.$$
$$12 a^{3/2} e^2\sqrt{1+\frac{c x^4}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]-4 a\left(5 i\sqrt{c}\,d^2+3\sqrt{a}\,e^2\right)$$
$$\left.\sqrt{1+\frac{c x^4}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]\right)\Big/\left(30\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,\sqrt{c}\,\sqrt{a+c x^4}\right)$$

Problem 185: 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 186: 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 187: 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):

$$\frac{\sqrt{a+c\,x^4}}{2\,e}-\frac{\sqrt{c}\;d\,x\,\sqrt{a+c\,x^4}}{e^2\left(\sqrt{a}+\sqrt{c}\;x^2\right)}-\frac{\sqrt{-c\,d^4-a\,e^4}\;\text{ArcTan}\left[\frac{\sqrt{-c\,d^4-a\,e^4}\;x}{d\,e\,\sqrt{a+c\,x^4}}\right]}{2\,e^3}+$$
$$\frac{\sqrt{c}\;d^2\,\text{ArcTanh}\left[\frac{\sqrt{c}\;x^2}{\sqrt{a+c\,x^4}}\right]}{2\,e^3}-\frac{\sqrt{c\,d^4+a\,e^4}\;\text{ArcTanh}\left[\frac{a\,e^2+c\,d^2\,x^2}{\sqrt{c\,d^4+a\,e^4}\;\sqrt{a+c\,x^4}}\right]}{2\,e^3}+\frac{1}{e^2\,\sqrt{a+c\,x^4}}$$
$$a^{1/4}\,c^{1/4}\,d\left(\sqrt{a}+\sqrt{c}\;x^2\right)\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\;x^2\right)^2}}\;\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]-\frac{1}{2\,e^4\,\sqrt{a+c\,x^4}}$$
$$a^{1/4}\,c^{1/4}\,d\left(\frac{\sqrt{c}\;d^2}{\sqrt{a}}+e^2\right)\left(\sqrt{a}+\sqrt{c}\;x^2\right)\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\;x^2\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]+$$
$$\left(c^{1/4}\,d\left(c\,d^4+a\,e^4\right)\left(\sqrt{a}+\sqrt{c}\;x^2\right)\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\;x^2\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]\right)\Big/$$
$$\left(2\,a^{1/4}\,e^4\left(\sqrt{c}\;d^2+\sqrt{a}\;e^2\right)\sqrt{a+c\,x^4}\right)-$$
$$\left(\left(\sqrt{c}\;d^2-\sqrt{a}\;e^2\right)\left(c\,d^4+a\,e^4\right)\left(\sqrt{a}+\sqrt{c}\;x^2\right)\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\;x^2\right)^2}}\;\text{EllipticPi}\left[\right.\right.$$
$$\left.\left.\frac{\left(\sqrt{c}\;d^2+\sqrt{a}\;e^2\right)^2}{4\,\sqrt{a}\;\sqrt{c}\;d^2\,e^2},2\,\text{ArcTan}\left[\frac{c^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(4\,a^{1/4}\,c^{1/4}\,d\,e^4\left(\sqrt{c}\;d^2+\sqrt{a}\;e^2\right)\sqrt{a+c\,x^4}\right)$$

Result (type 4, 451 leaves):

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

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

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

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

$$\left.\left.\left.\left.\sqrt{c}\,\sqrt{a+c\,x^4}\right]-\sqrt{c\,d^4+a\,e^4}\,\sqrt{a+c\,x^4}\,\text{Log}\left[a\,e^2+c\,d^2\,x^2+\sqrt{c\,d^4+a\,e^4}\,\sqrt{a+c\,x^4}\right]\right)\right)\right)$$

Problem 188: 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):

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

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

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

$$2\,a^{1/4}\,c^{1/4}\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]+\frac{1}{4\,e^4\sqrt{a+c\,x^4}}$$

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

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

$$\left(2\,a^{1/4}\,e^4\sqrt{a+c\,x^4}\right)+$$

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

$$\left(4\,a^{1/4}\,e^4\,\sqrt{a+c\,x^4}\right)-$$

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

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

$$\left.\text{EllipticPi}\left[\frac{\left(\sqrt{c}\,d^2+\sqrt{a}\,e^2\right)^2}{4\,\sqrt{a}\,\sqrt{c}\,d^2\,e^2},2\,\text{ArcTan}\left[\frac{c^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(4\,a^{1/4}\,c^{1/4}\,d^2\,e^4\,\sqrt{a+c\,x^4}\right)+$$

$$\left(\left(\sqrt{c}\,d^2-\sqrt{a}\,e^2\right)\left(c\,d^4+a\,e^4\right)\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticPi}\left[\right.\right.$$

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

Result (type 4, 531 leaves) :

$$\frac{1}{e^4\sqrt{a+c x^4}}\left(-2\,i\,a\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,e^2\sqrt{1+\frac{c x^4}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]-\right.$$

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

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

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

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

$$c d^4\sqrt{a+c x^4}\,\text{Log}\left[a e^2+c d^2x^2+\sqrt{c d^4+a e^4}\sqrt{a+c x^4}\right]-$$

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

Problem 189: 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):

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

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

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

$$\left(2a^{1/4}c^{3/4}\sqrt{a+c x^4}\right)$$

Result (type 4, 240 leaves):

$$\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\, e \left(e^2 \left(a + c x^4\right) + 3 \sqrt{c}\, d^2 \sqrt{a + c x^4}\, \text{ArcTanh}\left[\frac{\sqrt{c}\, x^2}{\sqrt{a + c x^4}}\right]\right) + 6 \sqrt{a} \sqrt{c}\, d\, e^2 \sqrt{1 + \frac{c x^4}{a}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\, x\right], -1\right] - 2 \sqrt{c}\, d \left(i \sqrt{c}\, d^2 + 3 \sqrt{a}\, e^2\right) \sqrt{1 + \frac{c x^4}{a}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\, x\right], -1\right]\right) \Big/ \left(2 \sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\, c \sqrt{a + c x^4}\right)$$

Problem 190: 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):

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

Result (type 4, 204 leaves):

$$\left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\, d\, e \sqrt{a + c x^4}\, \text{ArcTanh}\left[\frac{\sqrt{c}\, x^2}{\sqrt{a + c x^4}}\right] + \sqrt{a}\, e^2 \sqrt{1 + \frac{c x^4}{a}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\, x\right], -1\right] - \left(i \sqrt{c}\, d^2 + \sqrt{a}\, e^2\right) \sqrt{1 + \frac{c x^4}{a}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\, x\right], -1\right]\right) \Big/ \left(\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\, \sqrt{c} \sqrt{a + c x^4}\right)$$

Problem 191: 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 192: 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 193: 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):

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

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

$$\left(\left(\sqrt{c}\,d^2-\sqrt{a}\,e^2\right)\,\left(\sqrt{a}+\sqrt{c}\,x^2\right)\,\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticPi}\left[\frac{\left(\sqrt{c}\,d^2+\sqrt{a}\,e^2\right)^2}{4\,\sqrt{a}\,\sqrt{c}\,d^2\,e^2},\right.\right.$$

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

Result (type 4, 200 leaves):

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

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

Problem 194: 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):

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

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

$$\left(a^{1/4} c^{1/4} e^2\left(\sqrt{a}+\sqrt{c}\;x^2\right)\sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c}\;x^2\right)^2}}\;\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]\right)\Big/$$

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

$$\left(c^{3/4} d^2\left(\sqrt{c}\;d^2-\sqrt{a}\;e^2\right)\left(\sqrt{a}+\sqrt{c}\;x^2\right)\sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c}\;x^2\right)^2}}\;\text{EllipticPi}\left[\frac{\left(\sqrt{c}\;d^2+\sqrt{a}\;e^2\right)^2}{4\sqrt{a}\;\sqrt{c}\;d^2 e^2},\right.\right.$$

$$\left.\left.2\,\text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(2 a^{1/4}\left(\sqrt{c}\;d^2+\sqrt{a}\;e^2\right)\left(c d^4+a e^4\right)\sqrt{a+c x^4}\right)$$

Result (type 4, 462 leaves):

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

$$\left(\sqrt{a}\;\sqrt{c}\;e^2\sqrt{c d^4+a e^4}\;(d+e x)\sqrt{1+\frac{c x^4}{a}}\;\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\;x\right],-1\right]+i\sqrt{c}\right.$$

$$\left(\sqrt{c}\;d^2+i\sqrt{a}\;e^2\right)\sqrt{c d^4+a e^4}\;(d+e x)\sqrt{1+\frac{c x^4}{a}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\;x\right],-1\right]-$$

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

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

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

Problem 195: 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):

$$-\frac{e^3 \sqrt{a+c x^4}}{2 \left(c d^4+a e^4\right) (d+e x)^2}-\frac{3 c d^3 e^3 \sqrt{a+c x^4}}{\left(c d^4+a e^4\right)^2 (d+e x)}+\frac{3 c^{3/2} d^3 e^2 x \sqrt{a+c x^4}}{\left(c d^4+a e^4\right)^2 \left(\sqrt{a}+\sqrt{c} x^2\right)}+$$
$$\frac{3 c d^2 e \left(c d^4-a e^4\right) \text{ArcTan}\left[\frac{\sqrt{-c d^4-a e^4} x}{d e \sqrt{a+c x^4}}\right]}{2 \left(-c d^4-a e^4\right)^{5/2}}-\frac{3 c d^2 e \left(c d^4-a e^4\right) \text{ArcTanh}\left[\frac{a e^2+c d^2 x^2}{\sqrt{c d^4+a e^4} \sqrt{a+c x^4}}\right]}{2 \left(c d^4+a e^4\right)^{5/2}}-$$
$$\left(3 a^{1/4} c^{5/4} d^3 e^2 \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{2}\right]\right) \Big/$$
$$\left(\left(c d^4+a e^4\right)^2 \sqrt{a+c x^4}\right)+\frac{c^{3/4} d \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{2}\right]}{2 a^{1/4} \left(c d^4+a e^4\right) \sqrt{a+c x^4}}-$$
$$\left(3 c^{3/4} d \left(\sqrt{c} d^2-\sqrt{a} e^2\right)^2 \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}}\right.$$
$$\left.\text{EllipticPi}\left[\frac{\left(\sqrt{c} d^2+\sqrt{a} e^2\right)^2}{4 \sqrt{a} \sqrt{c} d^2 e^2}, 2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(4 a^{1/4} \left(c d^4+a e^4\right)^2 \sqrt{a+c x^4}\right)$$

Result (type 4, 884 leaves):

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

$$6\,i\,a\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,c d^3 e^2\sqrt{c d^4+a e^4}\,(d+e x)^2\sqrt{1+\frac{c x^4}{a}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]+$$

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

$$6\,i\,a\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,c d^3 e^2\sqrt{c d^4+a e^4}\,(d+e x)^2\sqrt{1+\frac{c x^4}{a}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}}{\sqrt{a}}}\,x\right],-1\right]-$$

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

$$6(-1)^{1/4}a^{1/4}c^{7/4}d^5\sqrt{c d^4+a e^4}\,(d+e x)^2\sqrt{1+\frac{c x^4}{a}}$$

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

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

$$3c^2d^6e(d+e x)^2\sqrt{a+c x^4}\,\text{Log}\left[-d^2+e^2x^2\right]-3 a c d^2 e^5(d+e x)^2\sqrt{a+c x^4}\,\text{Log}\left[-d^2+e^2x^2\right]-$$

$$3c^2d^6e(d+e x)^2\sqrt{a+c x^4}\,\text{Log}\left[a e^2+c d^2x^2+\sqrt{c d^4+a e^4}\sqrt{a+c x^4}\right]+$$

$$3 a c d^2 e^5(d+e x)^2\sqrt{a+c x^4}\,\text{Log}\left[a e^2+c d^2x^2+\sqrt{c d^4+a e^4}\sqrt{a+c x^4}\right]\Bigg)$$

Problem 196: 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):

$$-\frac{3\,d\,e^2\,x\,\sqrt{a+c\,x^4}}{2\,a\,\sqrt{c}\,\left(\sqrt{a}+\sqrt{c}\,x^2\right)}-\frac{a\,e^3-c\,x\,\left(d^3+3\,d^2\,e\,x+3\,d\,e^2\,x^2\right)}{2\,a\,c\,\sqrt{a+c\,x^4}}+\frac{3\,d\,e^2\,\left(\sqrt{a}+\sqrt{c}\,x^2\right)\,\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]}{2\,a^{3/4}\,c^{3/4}\,\sqrt{a+c\,x^4}}+\left(d\,\left(\sqrt{c}\,d^2-3\,\sqrt{a}\,e^2\right)\,\left(\sqrt{a}+\sqrt{c}\,x^2\right)\,\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(4\,a^{5/4}\,c^{3/4}\,\sqrt{a+c\,x^4}\right)$$

Result (type 4, 215 leaves):

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

Problem 197: 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):

$$\frac{x\,(d+e\,x)^2}{2\,a\,\sqrt{a+c\,x^4}}-\frac{e^2\,x\,\sqrt{a+c\,x^4}}{2\,a\,\sqrt{c}\,\left(\sqrt{a}+\sqrt{c}\,x^2\right)}+\frac{e^2\,\left(\sqrt{a}+\sqrt{c}\,x^2\right)\,\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]}{2\,a^{3/4}\,c^{3/4}\,\sqrt{a+c\,x^4}}+\left(\left(\sqrt{c}\,d^2-\sqrt{a}\,e^2\right)\,\left(\sqrt{a}+\sqrt{c}\,x^2\right)\,\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,x}{a^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(4\,a^{5/4}\,c^{3/4}\,\sqrt{a+c\,x^4}\right)$$

Result (type 4, 188 leaves):

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

Problem 198: Result unnecessarily involves imaginary or complex numbers.

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

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 199: Result unnecessarily involves imaginary or complex numbers.

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

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 200: 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):

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

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

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

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

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

$$\left(4\,a^{5/4}\,\left(c\,d^4+a\,e^4\right)\,\sqrt{a+c\,x^4}\right)+$$

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

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

$$\left(e^4\,\left(\sqrt{c}\,d^2-\sqrt{a}\,e^2\right)\,\left(\sqrt{a}+\sqrt{c}\,x^2\right)\,\sqrt{\frac{a+c\,x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticPi}\left[\frac{\left(\sqrt{c}\,d^2+\sqrt{a}\,e^2\right)^2}{4\,\sqrt{a}\,\sqrt{c}\,d^2\,e^2},\right.\right.$$

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

Result (type 4, 464 leaves):

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

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

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

$$\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}} \left(-2\, (-1)^{1/4}\, a^{5/4}\, e^4 \sqrt{c\, d^4 + a\, e^4} \sqrt{1 + \frac{c\, x^4}{a}}\, \text{EllipticPi}\left[\frac{i \sqrt{a}\, e^2}{\sqrt{c}\, d^2},\right.\right.$$

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

$$\left.\left.\left.\sqrt{a + c\, x^4}\, \text{Log}\left[-d^2 + e^2\, x^2\right] - a\, e^5 \sqrt{a + c\, x^4}\, \text{Log}\left[a\, e^2 + c\, d^2\, x^2 + \sqrt{c\, d^4 + a\, e^4} \sqrt{a + c\, x^4}\right]\right)\right)\right)$$

Problem 201: 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):

$$\frac{1}{4\,b\,n}(c+d\,x)^n\left(c^3\,\text{RootSum}\left[b\,c^4+a\,d^4-4\,b\,c^3\,\#1+6\,b\,c^2\,\#1^2-4\,b\,c\,\#1^3+b\,\#1^4\,\&,\ \frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{c+d\,x-\#1}\right]\left(\frac{c+d\,x}{c+d\,x-\#1}\right)^{-n}}{c^3-3\,c^2\,\#1+3\,c\,\#1^2-\#1^3}\,\&\right]-\right.$$
$$3\,c^2\,\text{RootSum}\left[b\,c^4+a\,d^4-4\,b\,c^3\,\#1+6\,b\,c^2\,\#1^2-4\,b\,c\,\#1^3+b\,\#1^4\,\&,\ \frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{c+d\,x-\#1}\right]\left(\frac{c+d\,x}{c+d\,x-\#1}\right)^{-n}\#1}{c^3-3\,c^2\,\#1+3\,c\,\#1^2-\#1^3}\,\&\right]+$$
$$3\,c\,\text{RootSum}\left[b\,c^4+a\,d^4-4\,b\,c^3\,\#1+6\,b\,c^2\,\#1^2-4\,b\,c\,\#1^3+b\,\#1^4\,\&,\ \frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{c+d\,x-\#1}\right]\left(\frac{c+d\,x}{c+d\,x-\#1}\right)^{-n}\#1^2}{c^3-3\,c^2\,\#1+3\,c\,\#1^2-\#1^3}\,\&\right]-$$
$$\left.\text{RootSum}\left[b\,c^4+a\,d^4-4\,b\,c^3\,\#1+6\,b\,c^2\,\#1^2-4\,b\,c\,\#1^3+b\,\#1^4\,\&,\ \frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{c+d\,x-\#1}\right]\left(\frac{c+d\,x}{c+d\,x-\#1}\right)^{-n}\#1^3}{c^3-3\,c^2\,\#1+3\,c\,\#1^2-\#1^3}\,\&\right]\right)$$

Problem 202: Result is not expressed in closed-form.

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

Optimal (type 5, 349 leaves, 10 steps):

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

Result (type 7, 691 leaves):

$$\frac{1}{4\,b^2\,n\,(1+n)}\,(c+d\,x)^n\left((b\,c^4+a\,d^4)\,(1+n)\,\text{RootSum}\left[b\,c^4+a\,d^4-4\,b\,c^3\,\#1+6\,b\,c^2\,\#1^2-4\,b\,c\,\#1^3+b\,\#1^4\,\&,\ \frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{c+d\,x-\#1}\right]\left(\frac{c+d\,x}{c+d\,x-\#1}\right)^{-n}}{c^3-3\,c^2\,\#1+3\,c\,\#1^2-\#1^3}\,\&\right]-\right.$$

$$b\left(-4\,c\,n-4\,d\,n\,x+3\,c^3\,(1+n)\,\text{RootSum}\left[b\,c^4+a\,d^4-4\,b\,c^3\,\#1+6\,b\,c^2\,\#1^2-4\,b\,c\,\#1^3+b\,\#1^4\,\&,\ \frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{c+d\,x-\#1}\right]\left(\frac{c+d\,x}{c+d\,x-\#1}\right)^{-n}\#1}{c^3-3\,c^2\,\#1+3\,c\,\#1^2-\#1^3}\,\&\right]-\right.$$

$$3\,c^2\,(1+n)\,\text{RootSum}\left[b\,c^4+a\,d^4-4\,b\,c^3\,\#1+6\,b\,c^2\,\#1^2-4\,b\,c\,\#1^3+b\,\#1^4\,\&,\ \frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{c+d\,x-\#1}\right]\left(\frac{c+d\,x}{c+d\,x-\#1}\right)^{-n}\#1^2}{c^3-3\,c^2\,\#1+3\,c\,\#1^2-\#1^3}\,\&\right]+$$

$$c\,\text{RootSum}\left[b\,c^4+a\,d^4-4\,b\,c^3\,\#1+6\,b\,c^2\,\#1^2-4\,b\,c\,\#1^3+b\,\#1^4\,\&,\ \frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{c+d\,x-\#1}\right]\left(\frac{c+d\,x}{c+d\,x-\#1}\right)^{-n}\#1^3}{c^3-3\,c^2\,\#1+3\,c\,\#1^2-\#1^3}\,\&\right]+$$

$$\left.\left.c\,n\,\text{RootSum}\left[b\,c^4+a\,d^4-4\,b\,c^3\,\#1+6\,b\,c^2\,\#1^2-4\,b\,c\,\#1^3+b\,\#1^4\,\&,\ \frac{\text{Hypergeometric2F1}\left[-n,\,-n,\,1-n,\,-\frac{\#1}{c+d\,x-\#1}\right]\left(\frac{c+d\,x}{c+d\,x-\#1}\right)^{-n}\#1^3}{c^3-3\,c^2\,\#1+3\,c\,\#1^2-\#1^3}\,\&\right]\right)\right)$$

Problem 203: 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):

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

$$\left(e^2 \text{ArcTanh}\left[\left(4 a e^2+b \left(d-\sqrt{d^2-4 c e}\right)^2 x^2\right)\Big/\right.\right.$$

$$\left.\left.\left(2 \sqrt{2} \sqrt{\left(b d^4-4 b c d^2 e+2 b c^2 e^2+2 a e^4-b d \sqrt{d^2-4 c e} \left(d^2-2 c e\right)\right)} \sqrt{a+b x^4}\right)\right]\right)\Big/$$

$$\left(\sqrt{2} \sqrt{d^2-4 c e} \sqrt{b d^4-4 b c d^2 e+2 b c^2 e^2+2 a e^4-b d \sqrt{d^2-4 c e} \left(d^2-2 c e\right)}\right)+$$

$$\left(e^2 \text{ArcTanh}\left[\left(4 a e^2+b \left(d+\sqrt{d^2-4 c e}\right)^2 x^2\right)\Big/\right.\right.$$

$$\left.\left.\left(2 \sqrt{2} \sqrt{\left(b d^4-4 b c d^2 e+2 b c^2 e^2+2 a e^4+b d \sqrt{d^2-4 c e} \left(d^2-2 c e\right)\right)} \sqrt{a+b x^4}\right)\right]\right)\Big/$$

$$\left(\sqrt{2} \sqrt{d^2-4 c e} \sqrt{b d^4-4 b c d^2 e+2 b c^2 e^2+2 a e^4+b d \sqrt{d^2-4 c e} \left(d^2-2 c e\right)}\right)+$$

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

$$\left(2 a^{1/4} \sqrt{d^2-4 c e} \left(2 \sqrt{a} e^2+\sqrt{b} \left(d^2-2 c e-d \sqrt{d^2-4 c e}\right)\right) \sqrt{a+b x^4}\right)-$$

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

$$\left(2 a^{1/4} \sqrt{d^2-4 c e} \left(2 \sqrt{a} e^2+\sqrt{b} \left(d^2-2 c e+d \sqrt{d^2-4 c e}\right)\right) \sqrt{a+b x^4}\right)+$$

$$\left(e \left(2 \sqrt{a} e^2-\sqrt{b} \left(d^2-2 c e-d \sqrt{d^2-4 c e}\right)\right) \left(\sqrt{a}+\sqrt{b} x^2\right) \sqrt{\frac{a+b x^4}{\left(\sqrt{a}+\sqrt{b} x^2\right)^2}}\right.$$

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

$$\left(2 a^{1/4} b^{1/4} \sqrt{d^2-4 c e} \left(d-\sqrt{d^2-4 c e}\right) \left(2 \sqrt{a} e^2+\sqrt{b} \left(d^2-2 c e-d \sqrt{d^2-4 c e}\right)\right) \sqrt{a+b x^4}\right)-$$

$$\left(e \left(2 \sqrt{a} e^2-\sqrt{b} \left(d^2-2 c e+d \sqrt{d^2-4 c e}\right)\right) \left(\sqrt{a}+\sqrt{b} x^2\right) \sqrt{\frac{a+b x^4}{\left(\sqrt{a}+\sqrt{b} x^2\right)^2}}\right.$$

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

$$\left(2 a^{1/4} b^{1/4} \sqrt{d^2-4 c e} \left(d+\sqrt{d^2-4 c e}\right) \left(2 \sqrt{a} e^2+\sqrt{b} \left(d^2-2 c e+d \sqrt{d^2-4 c e}\right)\right) \sqrt{a+b x^4}\right)$$

Result (type 4, 653 leaves) :

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

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

$$-1\Bigg]-\left(2i\sqrt{a}\,e^2+\sqrt{b}\left(-d^2+2ce+d\sqrt{d^2-4ce}\right)\right)\text{EllipticPi}\Bigg[-\frac{i\left(2(-1)^{1/4}a^{1/4}e+b^{1/4}\left(d+\sqrt{d^2-4ce}\right)\right)}{-2(-1)^{1/4}a^{1/4}e+b^{1/4}\left(d+\sqrt{d^2-4ce}\right)},$$

$$\text{ArcSin}\left[\sqrt{-\frac{i\left((-1)^{1/4}a^{1/4}+b^{1/4}x\right)}{(-1)^{1/4}a^{1/4}-b^{1/4}x}}\right],-1\Bigg]\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\Bigg(a^{1/4}\sqrt{d^2-4ce}\left(bc^2-ae^2-i\sqrt{a}\sqrt{b}\left(d^2-2ce\right)\right)\sqrt{\frac{i\sqrt{a}+\sqrt{b}\,x^2}{\left((-1)^{1/4}a^{1/4}-b^{1/4}x\right)^2}}\sqrt{a+bx^4}\Bigg)\Bigg)$$

Problem 204: Unable to integrate problem.

$$\int\frac{\sqrt{a x^{23}}}{\sqrt{1+x^5}}\,dx$$

Optimal (type 3, 75 leaves, 6 steps) :

$$-\frac{3\sqrt{a x^{23}}\sqrt{1+x^5}}{20 x^9}+\frac{\sqrt{a x^{23}}\sqrt{1+x^5}}{10 x^4}+\frac{3\sqrt{a x^{23}}\,\text{ArcSinh}\left[x^{5/2}\right]}{20 x^{23/2}}$$

Result (type 8, 21 leaves):

$$\int \frac{\sqrt{a\,x^{23}}}{\sqrt{1+x^5}}\,dx$$

Problem 205: Unable to integrate problem.

$$\int \frac{\sqrt{a\,x^{13}}}{\sqrt{1+x^5}}\,dx$$

Optimal (type 3, 50 leaves, 5 steps):

$$\frac{\sqrt{a\,x^{13}}\,\sqrt{1+x^5}}{5\,x^4}-\frac{\sqrt{a\,x^{13}}\,\text{ArcSinh}\left[x^{5/2}\right]}{5\,x^{13/2}}$$

Result (type 8, 21 leaves):

$$\int \frac{\sqrt{a\,x^{13}}}{\sqrt{1+x^5}}\,dx$$

Problem 206: Unable to integrate problem.

$$\int \frac{\sqrt{a\,x^{3}}}{\sqrt{1+x^5}}\,dx$$

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

$$\frac{2\,\sqrt{a\,x^{3}}\,\text{ArcSinh}\left[x^{5/2}\right]}{5\,x^{3/2}}$$

Result (type 8, 21 leaves):

$$\int \frac{\sqrt{a\,x^{3}}}{\sqrt{1+x^5}}\,dx$$

Problem 212: 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 213: 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 216: 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):

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

Problem 218: 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):

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

Problem 219: 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):

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

Problem 221: 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):

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

Problem 224: 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):

$$\frac{\left(1+\sqrt{3}\right)\sqrt{a\,x^3}\,\sqrt{1+x^3}}{x\left(1+\left(1+\sqrt{3}\right)x\right)}-\left(3^{1/4}\sqrt{a\,x^3}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\left(1+\sqrt{3}\right)x\right)^2}}\,\text{EllipticE}\left[\text{ArcCos}\left[\frac{1+\left(1-\sqrt{3}\right)x}{1+\left(1+\sqrt{3}\right)x}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/\left(x\sqrt{\frac{x\,(1+x)}{\left(1+\left(1+\sqrt{3}\right)x\right)^2}}\,\sqrt{1+x^3}\right)-\left(\left(1-\sqrt{3}\right)\sqrt{a\,x^3}\,(1+x)\sqrt{\frac{1-x+x^2}{\left(1+\left(1+\sqrt{3}\right)x\right)^2}}\,\text{EllipticF}\left[\text{ArcCos}\left[\frac{1+\left(1-\sqrt{3}\right)x}{1+\left(1+\sqrt{3}\right)x}\right],\frac{1}{4}\left(2+\sqrt{3}\right)\right]\right)\Bigg/\left(2\times3^{1/4}\,x\sqrt{\frac{x\,(1+x)}{\left(1+\left(1+\sqrt{3}\right)x\right)^2}}\,\sqrt{1+x^3}\right)$$

Result (type 4, 174 leaves):

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

Problem 225: 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):

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

Result (type 4, 134 leaves):

$$-\left(\left(2 a x\sqrt{-(-1)^{1/6}\left((-1)^{2/3}+x\right)}\,\sqrt{1+(-1)^{1/3}x+(-1)^{2/3}x^2}\left(\sqrt{3}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}(1+x)}}{3^{1/4}}\right],(-1)^{1/3}\right]+(-1)^{5/6}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}(1+x)}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)\right)\Big/\left(3^{1/4}\sqrt{a x^2}\,\sqrt{1+x^3}\right)\right)$$

Problem 227: 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):

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

Result (type 4, 106 leaves):

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

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

Problem 229: 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):

$$-2\sqrt{\frac{a}{x^3}}\,x\sqrt{1+x^3}+\frac{2\left(1+\sqrt{3}\right)\sqrt{\frac{a}{x^3}}\,x^2\sqrt{1+x^3}}{1+\left(1+\sqrt{3}\right)x}-\left(2\times3^{1/4}\sqrt{\frac{a}{x^3}}\,x^2\left(1+x\right)\right.$$

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

$$\left(\sqrt{\frac{x\left(1+x\right)}{\left(1+\left(1+\sqrt{3}\right)x\right)^2}}\sqrt{1+x^3}\right)-\left(\left(1-\sqrt{3}\right)\sqrt{\frac{a}{x^3}}\,x^2\left(1+x\right)\sqrt{\frac{1-x+x^2}{\left(1+\left(1+\sqrt{3}\right)x\right)^2}}\right.$$

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

Result (type 4, 165 leaves):

$$-\frac{1}{\sqrt{\frac{a}{x^3}}\sqrt{1+x^3}}\sqrt{\frac{2}{3}}\left(-1+\left(-1\right)^{2/3}\right)a\sqrt{\frac{-\left(-1\right)^{1/3}+x}{\left(1+\left(-1\right)^{1/3}\right)x}}\sqrt{\frac{\left(1+x\right)\left(-1+i\sqrt{3}+2x\right)}{x^2}}$$

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

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

Problem 230: 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):

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

Result (type 4, 146 leaves):

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

Problem 235: 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):

$$-\left(\left(2\,\text{i}\,e\sqrt{a x}\,\sqrt{1+\frac{f x}{e}}\left(\text{EllipticE}\left[\text{i}\,\text{ArcSinh}\left[\sqrt{\frac{e x}{d}}\right],\frac{d f}{e^2}\right]-\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\sqrt{\frac{e x}{d}}\right],\frac{d f}{e^2}\right]\right)\right)\Big/\left(f\sqrt{\frac{e x}{d+e x}}\,\sqrt{d+e x}\,\sqrt{e+f x}\right)\right)$$

Problem 261: 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 263: 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 286: 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):

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

Problem 288: 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 289: 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 291: 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):

$$\frac{\left(d+e\,x+f\sqrt{a+\frac{e^2\,x^2}{f^2}}\right)^{1+n}}{2\,e\,(1+n)}+\frac{1}{2\,d^2\,e\,(1+n)}$$

$$a\,f^2\left(d+e\,x+f\sqrt{a+\frac{e^2\,x^2}{f^2}}\right)^{1+n}\,\text{Hypergeometric2F1}\left[2,\,1+n,\,2+n,\,\frac{d+e\,x+f\sqrt{a+\frac{e^2\,x^2}{f^2}}}{d}\right]$$

Result (type 8, 27 leaves):

$$\int \left(d+e\,x+f\sqrt{a+\frac{e^2\,x^2}{f^2}}\right)^n \,dx$$

Problem 298: 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 299: Unable to integrate problem.

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

Optimal (type 3, 183 leaves, 6 steps):

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

Result (type 8, 29 leaves):

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

Problem 302: Unable to integrate problem.

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

Optimal (type 3, 158 leaves, 5 steps):

$$-\frac{1+\frac{a\,f^2}{d^2}}{e\sqrt{d+e\,x+f\sqrt{a+\frac{e^2x^2}{f^2}}}}-\frac{a\,f^2\sqrt{d+e\,x+f\sqrt{a+\frac{e^2x^2}{f^2}}}}{2\,d^2\,e\left(e\,x+f\sqrt{a+\frac{e^2x^2}{f^2}}\right)}+\frac{3\,a\,f^2\,\text{ArcTanh}\left[\frac{\sqrt{d+e\,x+f\sqrt{a+\frac{e^2x^2}{f^2}}}}{\sqrt{d}}\right]}{2\,d^{5/2}\,e}$$

Result (type 8, 29 leaves):

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

Problem 303: Unable to integrate problem.

$$\int \frac{1}{\left(d+e\,x+f\sqrt{a+\frac{e^2x^2}{f^2}}\right)^{5/2}}\,dx$$

Optimal (type 3, 199 leaves, 6 steps):

$$-\frac{1+\frac{a f^2}{d^2}}{3\,e\left(d+e\,x+f\sqrt{a+\frac{e^2x^2}{f^2}}\right)^{3/2}}-\frac{2\,a\,f^2}{d^3\,e\sqrt{d+e\,x+f\sqrt{a+\frac{e^2x^2}{f^2}}}}-$$

$$\frac{a\,f^2\sqrt{d+e\,x+f\sqrt{a+\frac{e^2x^2}{f^2}}}}{2\,d^3\,e\left(e\,x+f\sqrt{a+\frac{e^2x^2}{f^2}}\right)}+\frac{5\,a\,f^2\,\text{ArcTanh}\left[\frac{\sqrt{d+e\,x+f\sqrt{a+\frac{e^2x^2}{f^2}}}}{\sqrt{d}}\right]}{2\,d^{7/2}\,e}$$

Result (type 8, 29 leaves):

$$\int \frac{1}{\left(d+e\,x+f\sqrt{a+\frac{e^2x^2}{f^2}}\right)^{5/2}}\,dx$$

Problem 310: Unable to integrate problem.

$$\int \left(d+e\,x+f\sqrt{a+b\,x+\frac{e^2x^2}{f^2}}\right)^n\,dx$$

Optimal (type 5, 166 leaves, 4 steps):

$$\frac{\left(d+e x+f\sqrt{a+b x+\frac{e^2 x^2}{f^2}}\right)^{1+n}}{2 e (1+n)}+$$

$$\left(f^2 \left(4 a e^2-b^2 f^2\right) \left(d+e x+f\sqrt{a+b x+\frac{e^2 x^2}{f^2}}\right)^{1+n} \text{Hypergeometric2F1}\left[2,\right.\right.$$

$$\left.\left.1+n,\ 2+n,\ \frac{2 e \left(d+e x+f\sqrt{a+b x+\frac{e^2 x^2}{f^2}}\right)}{2 d e-b f^2}\right]\right) \Big/ \left(2 e \left(2 d e-b f^2\right)^2 (1+n)\right)$$

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 316: 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):

$$-\frac{d^2 e-b d f^2+a e f^2}{\left(2 d e-b f^2\right)^2 \left(d+e x+f\sqrt{a+b x+\frac{e^2 x^2}{f^2}}\right)^2}-$$

$$\frac{2 f^2 \left(4 a e^2-b^2 f^2\right)}{\left(2 d e-b f^2\right)^3 \left(d+e x+f\sqrt{a+b x+\frac{e^2 x^2}{f^2}}\right)}-\frac{2 e f^2 \left(4 a e^2-b^2 f^2\right)}{\left(2 d e-b f^2\right)^3 \left(b f^2+2 e \left(e x+f\sqrt{a+\frac{x \left(b f^2+e^2 x\right)}{f^2}}\right)\right)}+$$

$$\frac{6 e f^2 \left(4 a e^2-b^2 f^2\right) \text{Log}\left[d+e x+f\sqrt{a+b x+\frac{e^2 x^2}{f^2}}\right]}{\left(2 d e-b f^2\right)^4}-$$

$$\frac{6 e f^2 \left(4 a e^2-b^2 f^2\right) \text{Log}\left[b f^2+2 e \left(e x+f\sqrt{a+\frac{x \left(b f^2+e^2 x\right)}{f^2}}\right)\right]}{\left(2 d e-b f^2\right)^4}$$

Result (type 3, 665 leaves):

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

$$\left(2 f \sqrt{a+x \left(b+\frac{e^2 x}{f^2}\right)} \left(b^3 f^6 x+b e f^2 \left(-3 d^3-a d f^2+d^2 e x-9 a e f^2 x+8 d e^2 x^2\right)+b^2 \left(a f^6-e f^4 x (d+2 e x)\right)-2 e^2 \left(3 a^2 f^4+d^2 e x (3 d+4 e x)-a d f^2 (5 d+9 e x)\right)\right)\right)\Big/$$

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

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

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

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

Problem 317: 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):

$$\frac{f^2 \left(2 d e - b f^2\right) \left(4 a e^2 - b^2 f^2\right) \sqrt{d + e x + f \sqrt{a + b x + \frac{e^2 x^2}{f^2}}}}{4 e^4} +$$

$$\frac{f^2 \left(4 a e^2 - b^2 f^2\right) \left(d + e x + f \sqrt{a + b x + \frac{e^2 x^2}{f^2}}\right)^{3/2}}{12 e^3} + \frac{\left(d + e x + f \sqrt{a + b x + \frac{e^2 x^2}{f^2}}\right)^{7/2}}{7 e} -$$

$$\frac{f^2 \left(2 d e - b f^2\right)^2 \left(4 a e^2 - b^2 f^2\right) \sqrt{d + e x + f \sqrt{a + b x + \frac{e^2 x^2}{f^2}}}}{16 e^4 \left(b f^2 + 2 e \left(e x + f \sqrt{a + \frac{x \left(b f^2 + e^2 x\right)}{f^2}}\right)\right)} - \frac{1}{16 \sqrt{2}\, e^{9/2}}$$

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

Result (type 8, 32 leaves):

$$\int \left(d + e x + f \sqrt{a + b x + \frac{e^2 x^2}{f^2}}\right)^{5/2} dx$$

Problem 318: Unable to integrate problem.

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

Optimal (type 3, 302 leaves, 6 steps):

$$\frac{f^2\left(4 a e^2-b^2 f^2\right)\sqrt{d+e x+f\sqrt{a+b x+\frac{e^2 x^2}{f^2}}}}{4 e^3}+\frac{\left(d+e x+f\sqrt{a+b x+\frac{e^2 x^2}{f^2}}\right)^{5/2}}{5 e}-$$

$$\frac{f^2\left(2 d e-b f^2\right)\left(4 a e^2-b^2 f^2\right)\sqrt{d+e x+f\sqrt{a+b x+\frac{e^2 x^2}{f^2}}}}{8 e^3\left(b f^2+2 e\left(e x+f\sqrt{a+\frac{x\left(b f^2+e^2 x\right)}{f^2}}\right)\right)}-$$

$$\frac{3 f^2\sqrt{2 d e-b f^2}\left(4 a e^2-b^2 f^2\right)\text{ArcTanh}\left[\frac{\sqrt{2}\sqrt{e}\sqrt{d+e x+f\sqrt{a+b x+\frac{e^2 x^2}{f^2}}}}{\sqrt{2 d e-b f^2}}\right]}{8\sqrt{2}\, e^{7/2}}$$

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 321: 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):

$$-\frac{4\left(d^2 e-b d f^2+a e f^2\right)}{\left(2 d e-b f^2\right)^2\sqrt{d+e x+f\sqrt{a+b x+\frac{e^2 x^2}{f^2}}}}-\frac{f^2\left(4 a e^2-b^2 f^2\right)\sqrt{d+e x+f\sqrt{a+b x+\frac{e^2 x^2}{f^2}}}}{\left(2 d e-b f^2\right)^2\left(b f^2+2 e\left(e x+f\sqrt{a+\frac{x\left(b f^2+e^2 x\right)}{f^2}}\right)\right)}+$$

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

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 322: 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):

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

$$\frac{4\,f^2\left(4\,a\,e^2-b^2\,f^2\right)}{\left(2\,d\,e-b\,f^2\right)^3\sqrt{d+e\,x+f\sqrt{a+b\,x+\frac{e^2\,x^2}{f^2}}}}-\frac{2\,e\,f^2\left(4\,a\,e^2-b^2\,f^2\right)\sqrt{d+e\,x+f\sqrt{a+b\,x+\frac{e^2\,x^2}{f^2}}}}{\left(2\,d\,e-b\,f^2\right)^3\left(b\,f^2+2\,e\left(e\,x+f\sqrt{a+\frac{x\,(b\,f^2+e^2\,x)}{f^2}}\right)\right)}+$$

$$\frac{5\sqrt{2}\,\sqrt{e}\,f^2\left(4\,a\,e^2-b^2\,f^2\right)\text{ArcTanh}\left[\frac{\sqrt{2}\,\sqrt{e}\,\sqrt{d+e\,x+f\sqrt{a+b\,x+\frac{e^2\,x^2}{f^2}}}}{\sqrt{2\,d\,e-b\,f^2}}\right]}{\left(2\,d\,e-b\,f^2\right)^{7/2}}$$

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 323: 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):

$$\frac{1}{2}\left(x+\sqrt{a+x^2}\right)^n\left(-\frac{2\,a^2\left(x-n\sqrt{a+x^2}\right)}{-1+n^2}+\frac{1}{16}\left(\frac{a^5}{(-5+n)\left(x+\sqrt{a+x^2}\right)^5}-\frac{3\,a^4}{(-3+n)\left(x+\sqrt{a+x^2}\right)^3}+\frac{2\,a^3}{(-1+n)\left(x+\sqrt{a+x^2}\right)}+\frac{2\,a^2\left(x+\sqrt{a+x^2}\right)}{1+n}-\frac{3\,a\left(x+\sqrt{a+x^2}\right)^3}{3+n}+\frac{\left(x+\sqrt{a+x^2}\right)^5}{5+n}\right)+\left(4\,a\sqrt{a+x^2}\left(2\,a^3\,n+a^2\,(-3+n)\,n\,x\left((-3+n)\,x-2\sqrt{a+x^2}\right)+4\left(3-n-3\,n^2+n^3\right)x^5\left(x+\sqrt{a+x^2}\right)+a\left(3-4\,n+n^2\right)x^3\left((3+5\,n)\,x+(1+3\,n)\sqrt{a+x^2}\right)\right)\right)\Big/\left((-3+n)\,(-1+n)\,(1+n)\,(3+n)\left(x+\sqrt{a+x^2}\right)^2\left(a+x\left(x+\sqrt{a+x^2}\right)\right)\right)\right)$$

Problem 326: 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 327: 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 328: 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 331: 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 332: 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 333: 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 334: 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):

$$\frac{1}{n}\sqrt{a+x^2}\,\left(x+\sqrt{a+x^2}\right)^n$$
$$\left(\left(\left(x+\sqrt{a+x^2}\right)^4\left(2\,a^4+a^3\,(-4+n)\,x\left((-4+n)\,x-2\sqrt{a+x^2}\right)+8\,(-4+n)\,n\,x^7\left(x+\sqrt{a+x^2}\right)+\right.\right.\right.$$
$$\left.\left.4\,a\,(-4+n)\,n\,x^5\left(4\,x+3\sqrt{a+x^2}\right)+a^2\,(-4+n)\,x^3\left((-4+9\,n)\,x+4\,(-1+n)\sqrt{a+x^2}\right)\right)\right)\Big/$$
$$\left((-4+n)\,(4+n)\left(128\,x^8\left(x+\sqrt{a+x^2}\right)+a^4\left(8\,x+\sqrt{a+x^2}\right)+64\,a\,x^6\left(5\,x+4\sqrt{a+x^2}\right)+\right.\right.$$
$$\left.\left.8\,a^3\,x^2\left(11\,x+4\sqrt{a+x^2}\right)+16\,a^2\,x^4\left(17\,x+10\sqrt{a+x^2}\right)\right)\right)+$$
$$\left(a\sqrt{a+x^2}\left(a^2\left(-2+n^2\right)+2\,(-2+n)\,n\,x^3\left(x+\sqrt{a+x^2}\right)+\right.\right.$$
$$\left.\left.\left.a\,(-2+n)\,x\left((2+3\,n)\,x+2\,(1+n)\sqrt{a+x^2}\right)\right)\right)\Big/\left(\left(-4+n^2\right)\left(a+x\left(x+\sqrt{a+x^2}\right)\right)^2\right)\right)$$

Problem 337: 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 338: 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 339: 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):

$$\left(\left(x-\sqrt{a+x^2}\right)^{9+n} \left(a+x \left(x-\sqrt{a+x^2}\right)\right) \left(\frac{4 a^3}{n}+\frac{a^6}{(-6+n) \left(x-\sqrt{a+x^2}\right)^6}-\frac{2 a^5}{(-4+n) \left(x-\sqrt{a+x^2}\right)^4}-\frac{a^4}{(-2+n) \left(x-\sqrt{a+x^2}\right)^2}-\frac{a^2 \left(x-\sqrt{a+x^2}\right)^2}{2+n}-\frac{2 a \left(x-\sqrt{a+x^2}\right)^4}{4+n}+\frac{\left(x-\sqrt{a+x^2}\right)^6}{6+n}\right)\right) \Big/ \left(64 \left(a^5 \left(-10 x+\sqrt{a+x^2}\right)+512 x^{10} \left(-x+\sqrt{a+x^2}\right)+10 a^4 x^2 \left(-17 x+5 \sqrt{a+x^2}\right)+256 a x^8 \left(-6 x+5 \sqrt{a+x^2}\right)+16 a^3 x^4 \left(-52 x+25 \sqrt{a+x^2}\right)+32 a^2 x^6 \left(-53 x+35 \sqrt{a+x^2}\right)\right)\right)+\left(2 a \sqrt{a+x^2} \left(x-\sqrt{a+x^2}\right)^{4+n} \left(-2 a^4+8 (-4+n) n x^7 \left(-x+\sqrt{a+x^2}\right)-a^3 (-4+n) x \left((-4+n) x+2 \sqrt{a+x^2}\right)+4 a (-4+n) n x^5 \left(-4 x+3 \sqrt{a+x^2}\right)+a^2 (-4+n) x^3 \left((4-9 n) x+4 (-1+n) \sqrt{a+x^2}\right)\right)\right) \Big/ \left((-4+n) n (4+n) \left(a^4 \left(-8 x+\sqrt{a+x^2}\right)+128 x^8 \left(-x+\sqrt{a+x^2}\right)+8 a^3 x^2 \left(-11 x+4 \sqrt{a+x^2}\right)+64 a x^6 \left(-5 x+4 \sqrt{a+x^2}\right)+16 a^2 x^4 \left(-17 x+10 \sqrt{a+x^2}\right)\right)\right)+\left(a^2 \left(a+x^2\right) \left(x-\sqrt{a+x^2}\right)^n \left(-a^2 \left(-2+n^2\right)+2 (-2+n) n x^3 \left(-x+\sqrt{a+x^2}\right)+a (-2+n) x \left(-(2+3 n) x+2 (1+n) \sqrt{a+x^2}\right)\right)\right) \Big/ \left(n \left(-4+n^2\right) \left(a+x \left(x-\sqrt{a+x^2}\right)\right)^2\right)$$

Problem 340: 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):

$$\frac{1}{n}\left(x-\sqrt{a+x^2}\right)^n\left(\left(\sqrt{a+x^2}\left(x-\sqrt{a+x^2}\right)^4\left(-2\,a^4+8\,(-4+n)\,n\,x^7\left(-x+\sqrt{a+x^2}\right)-a^3\,(-4+n)\,x\left((-4+n)\,x+2\sqrt{a+x^2}\right)+4\,a\,(-4+n)\,n\,x^5\left(-4\,x+3\sqrt{a+x^2}\right)+a^2\,(-4+n)\,x^3\left((4-9\,n)\,x+4\,(-1+n)\sqrt{a+x^2}\right)\right)\right)\Big/\left((-4+n)\,(4+n)\left(a^4\left(-8\,x+\sqrt{a+x^2}\right)+128\,x^8\left(-x+\sqrt{a+x^2}\right)+8\,a^3\,x^2\left(-11\,x+4\sqrt{a+x^2}\right)+64\,a\,x^6\left(-5\,x+4\sqrt{a+x^2}\right)+16\,a^2\,x^4\left(-17\,x+10\sqrt{a+x^2}\right)\right)\right)+\left(a\,(a+x^2)\left(-a^2\,(-2+n^2)+2\,(-2+n)\,n\,x^3\left(-x+\sqrt{a+x^2}\right)+a\,(-2+n)\,x\left(-(2+3\,n)\,x+2\,(1+n)\sqrt{a+x^2}\right)\right)\right)\Big/\left((-4+n^2)\left(a+x\left(x-\sqrt{a+x^2}\right)\right)^2\right)\right)$$

Problem 343: 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 344: 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 345: 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 346: 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 347: 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 348: 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):

$$-\left(\left(2 f^2 \left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^{1+n} \text{Hypergeometric2F1}\left[1,\frac{1+n}{2},\frac{3+n}{2},\frac{\left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^2}{d^2-a f^2}\right]\right)\Big/\left(e \left(d^2-a f^2\right) (1+n)\right)\right)$$

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 349: 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):

$$-\left(\left(8 f^4 \left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^{3+n} \text{Hypergeometric2F1}\left[3,\frac{3+n}{2},\frac{5+n}{2},\frac{\left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^2}{d^2-a f^2}\right]\right)\Big/\left(e \left(d^2-a f^2\right)^3 (3+n)\right)\right)$$

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 350: 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 351: 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):

$$-\left(\left(2\,f^2\left(d+e\,x+f\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{1+n}\text{Hypergeometric2F1}\left[1,\frac{1+n}{2},\frac{3+n}{2},\frac{\left(d+e\,x+f\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^2}{d^2-a\,f^2}\right]\right)\Bigg/\left(e\,\left(d^2-a\,f^2\right)\,(1+n)\right)\right)$$

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 352: 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 353: 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 354: 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 355: 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):

$$\left(4 f^3 \left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^{2+n} \text{Hypergeometric2F1}\left[2, \frac{2+n}{2}, \frac{4+n}{2}, \frac{\left(d+e x+f \sqrt{a+\frac{2 d e x}{f^2}+\frac{e^2 x^2}{f^2}}\right)^2}{d^2-a f^2}\right]\right) \Big/ \left(e \left(d^2-a f^2\right)^2 (2+n)\right)$$

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 356: 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 357: 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 358: 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 359: 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):

$$\left(4\,f^3\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\,\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^{2+n}\right.$$

$$\left.\text{Hypergeometric2F1}\left[2,\,\frac{2+n}{2},\,\frac{4+n}{2},\,\frac{\left(d+e\,x+f\,\sqrt{a+\frac{2\,d\,e\,x}{f^2}+\frac{e^2\,x^2}{f^2}}\right)^2}{d^2-a\,f^2}\right]\right)\Bigg/$$

$$\left(e\,\left(d^2-a\,f^2\right)^2\,g\,\left(2+n\right)\,\sqrt{a\,g+\frac{2\,d\,e\,g\,x}{f^2}+\frac{e^2\,g\,x^2}{f^2}}\right)$$

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 360: 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 361: 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 362: 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):

$$\left(-\frac{\left(-d - 2\,e + \sqrt{d}\,\sqrt{d + 2\,e}\right)\,\text{ArcTan}\left[\frac{\sqrt{2}\,\sqrt{f}\,x}{\sqrt{d + e - \sqrt{d}\,\sqrt{d + 2\,e}}}\right]}{\sqrt{d + e - \sqrt{d}\,\sqrt{d + 2\,e}}} - \frac{\left(d + 2\,e + \sqrt{d}\,\sqrt{d + 2\,e}\right)\,\text{ArcTan}\left[\frac{\sqrt{2}\,\sqrt{f}\,x}{\sqrt{d + e + \sqrt{d}\,\sqrt{d + 2\,e}}}\right]}{\sqrt{d + e + \sqrt{d}\,\sqrt{d + 2\,e}}}\right) \Big/ \left(2\,\sqrt{2}\,\sqrt{d}\,\sqrt{d + 2\,e}\,\sqrt{f}\right)$$

Problem 363: 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):

$$\left(-\frac{\left(-i d+2 i e+\sqrt{d}\sqrt{-d+2 e}\right)\text{ArcTan}\left[\frac{\sqrt{2}\sqrt{f}\,x}{\sqrt{-d+e-i\sqrt{d}\sqrt{-d+2 e}}}\right]}{\sqrt{-d+e-i\sqrt{d}\sqrt{-d+2 e}}}-\frac{\left(i d-2 i e+\sqrt{d}\sqrt{-d+2 e}\right)\text{ArcTan}\left[\frac{\sqrt{2}\sqrt{f}\,x}{\sqrt{-d+e+i\sqrt{d}\sqrt{-d+2 e}}}\right]}{\sqrt{-d+e+i\sqrt{d}\sqrt{-d+2 e}}}\right)\Big/\left(2\sqrt{2}\sqrt{d}\sqrt{-d+2 e}\sqrt{f}\right)$$

Problem 364: 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):

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

Problem 365: 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):

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

Problem 366: 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 367: 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 370: 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):

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

Problem 371: 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):

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

Result (type 7, 85 leaves):

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

Problem 374: 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):

$$-\frac{1}{2\,f}\text{RootSum}\left[e^2+4\,e\,f\,\sharp 1^3+4\,d\,f\,\sharp 1^4+4\,f^2\,\sharp 1^6\,\&,\ \frac{-e\,\text{Log}[x-\sharp 1]+f\,\text{Log}[x-\sharp 1]\,\sharp 1^3}{3\,e\,\sharp 1+4\,d\,\sharp 1^2+6\,f\,\sharp 1^4}\,\&\right]$$

Problem 375: 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):

$$-\frac{1}{2\,f}\text{RootSum}\left[e^2+4\,e\,f\,\sharp 1^3-4\,d\,f\,\sharp 1^4+4\,f^2\,\sharp 1^6\,\&,\ \frac{-e\,\text{Log}[x-\sharp 1]+f\,\text{Log}[x-\sharp 1]\,\sharp 1^3}{3\,e\,\sharp 1-4\,d\,\sharp 1^2+6\,f\,\sharp 1^4}\,\&\right]$$

Problem 380: Unable to integrate problem.

$$\int \frac{x^m\,\left(e\,\left(1+m\right)+2\,f\,\left(1+m-n\right)\,x^n\right)}{e^2+4\,d\,f\,x^{2+2\,m}+4\,e\,f\,x^n+4\,f^2\,x^{2\,n}}\,dx$$

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):

$$\int \frac{x^m\,\left(e\,\left(1+m\right)+2\,f\,\left(1+m-n\right)\,x^n\right)}{e^2+4\,d\,f\,x^{2+2\,m}+4\,e\,f\,x^n+4\,f^2\,x^{2\,n}}\,dx$$

Problem 381: 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 385: 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):

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

Problem 386: 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) :

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

Problem 393: 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) :

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

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 394: 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) :

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

Result (type 6, 596 leaves) :

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

Problem 396: 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 397: 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 398: 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):

$$-\frac{c}{a c^2 x-d^2 x}+\frac{d \sqrt{a+b x^3}}{a^2 c^2 x-a d^2 x}+$$
$$\left(5 a b c^2 d x^2 \text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\Big/\left(2 \sqrt{a+b x^3}\left(a c^2-d^2+b c^2 x^3\right)\right.$$
$$\left(10 a \left(a c^2-d^2\right) \text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]-3 b x^3 \left(2 a c^2 \text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\right.\right.\right.$$
$$\left.\left.\left.\left.\frac{8}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]+\left(a c^2-d^2\right) \text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\right)\right)+$$
$$\left(5 b d^3 x^2 \text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\Big/\left(2 \sqrt{a+b x^3}\left(a c^2-d^2+b c^2 x^3\right)\right.$$
$$\left(10 a \left(a c^2-d^2\right) \text{AppellF1}\left[\frac{2}{3},\frac{1}{2},1,\frac{5}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]-\right.$$
$$3 b x^3 \left(2 a c^2 \text{AppellF1}\left[\frac{5}{3},\frac{1}{2},2,\frac{8}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]+\right.$$
$$\left.\left.\left.\left(a c^2-d^2\right) \text{AppellF1}\left[\frac{5}{3},\frac{3}{2},1,\frac{8}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\right)\right)+$$
$$\left(8 b^2 c^2 d x^5 \text{AppellF1}\left[\frac{5}{3},\frac{1}{2},1,\frac{8}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\Big/$$
$$\left(5 \sqrt{a+b x^3}\left(a c^2-d^2+b c^2 x^3\right)\left(-16 a \left(a c^2-d^2\right) \text{AppellF1}\left[\frac{5}{3},\frac{1}{2},1,\frac{8}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]+\right.\right.$$
$$3 b x^3 \left(2 a c^2 \text{AppellF1}\left[\frac{8}{3},\frac{1}{2},2,\frac{11}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]+\right.$$
$$\left.\left.\left.\left(a c^2-d^2\right) \text{AppellF1}\left[\frac{8}{3},\frac{3}{2},1,\frac{11}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]\right)\right)\right)-$$
$$\frac{b^{1/3} c^{5/3} \text{ArcTan}\left[\frac{-1+\frac{2 b^{1/3} c^{2/3} x}{\left(a c^2-d^2\right)^{1/3}}}{\sqrt{3}}\right]}{\sqrt{3}\left(a c^2-d^2\right)^{4/3}}+\frac{b^{1/3} c^{5/3} \text{Log}\left[\left(a c^2-d^2\right)^{1/3}+b^{1/3} c^{2/3} x\right]}{3\left(a c^2-d^2\right)^{4/3}}-$$
$$\frac{b^{1/3} c^{5/3} \text{Log}\left[\left(a c^2-d^2\right)^{2/3}-b^{1/3} c^{2/3}\left(a c^2-d^2\right)^{1/3} x+b^{2/3} c^{4/3} x^2\right]}{6\left(a c^2-d^2\right)^{4/3}}$$

Problem 399: 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):

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

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

$$\left(8 a\left(a c^2-d^2\right) \text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]-3 b x^3\left(2 a c^2 \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},2,\frac{7}{3},\right.\right.\right.$$

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

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

$$\left(8 a\left(a c^2-d^2\right) \text{AppellF1}\left[\frac{1}{3},\frac{1}{2},1,\frac{4}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]-\right.$$

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

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

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

$$\left(8 \sqrt{a+b x^3}\left(a c^2-d^2+b c^2 x^3\right)\left(14 a\left(a c^2-d^2\right) \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},1,\frac{7}{3},-\frac{b x^3}{a},-\frac{b c^2 x^3}{a c^2-d^2}\right]-\right.\right.$$

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

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

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

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

Problem 400: 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 401: 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):

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

Problem 404: 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 425: Unable to integrate problem.

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

Optimal (type 6, 80 leaves, 4 steps):

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

Result (type 8, 19 leaves):

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

Problem 429: Unable to integrate problem.

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

Optimal (type 5, 101 leaves, 5 steps):

$$-\frac{c\left(a+\frac{b}{x}\right)^{1+m}\text{Hypergeometric2F1}\left[1,1+m,2+m,\frac{c\left(a+\frac{b}{x}\right)}{a c-b d}\right]}{d\left(a c-b d\right)\left(1+m\right)}+\frac{\left(a+\frac{b}{x}\right)^{1+m}\text{Hypergeometric2F1}\left[1,1+m,2+m,1+\frac{b}{a x}\right]}{a d\left(1+m\right)}$$

Result (type 8, 19 leaves):

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

Problem 430: Unable to integrate problem.

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

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

$$-\frac{b\left(a+\frac{b}{x}\right)^{1+m}\text{Hypergeometric2F1}\left[2,1+m,2+m,\frac{c\left(a+\frac{b}{x}\right)}{a c-b d}\right]}{\left(a c-b d\right)^{2}\left(1+m\right)}$$

Result (type 8, 19 leaves):

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

Problem 431: Unable to integrate problem.

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

Optimal (type 5, 112 leaves, 4 steps):

$$-\frac{d\left(a+\frac{b}{x}\right)^{1+m}}{2 c\left(a c-b d\right)\left(d+\frac{c}{x}\right)^{2}}-\left(b\left(2 a c-b d\left(1+m\right)\right)\left(a+\frac{b}{x}\right)^{1+m}\text{Hypergeometric2F1}\left[2,1+m,2+m,\frac{c\left(a+\frac{b}{x}\right)}{a c-b d}\right]\right)\Big/\left(2 c\left(a c-b d\right)^{3}\left(1+m\right)\right)$$

Result (type 8, 19 leaves):

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

Problem 432: 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):

$$\frac{d^2\left(a+\frac{b}{x}\right)^{1+m}}{3\,c^2\,(a\,c-b\,d)\left(d+\frac{c}{x}\right)^3}-\frac{d\,(6\,a\,c-b\,d\,(4+m))\left(a+\frac{b}{x}\right)^{1+m}}{6\,c^2\,(a\,c-b\,d)^2\left(d+\frac{c}{x}\right)^2}-\left(b\left(6\,a^2\,c^2-6\,a\,b\,c\,d\,(1+m)+b^2\,d^2\,(2+3\,m+m^2)\right)\left(a+\frac{b}{x}\right)^{1+m}\text{Hypergeometric2F1}\left[2,1+m,2+m,\frac{c\left(a+\frac{b}{x}\right)}{a\,c-b\,d}\right]\right)\Big/\left(6\,c^2\,(a\,c-b\,d)^4\,(1+m)\right)$$

Result (type 8, 19 leaves):

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

Problem 436: 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 439: 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):

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

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

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

$$\left(2 \sqrt{b}\, c \left(a c^2+b d^2\right) \sqrt{\frac{a (c+d x)}{a c-\sqrt{-a}\, \sqrt{b}\, d}}\, \sqrt{1+\frac{a x^2}{b}}\right.$$

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

Result (type 4, 540 leaves):

$$\frac{1}{5\sqrt{a+\frac{b}{x^2}}\;x}$$

$$\sqrt{c+d\,x}\;\Bigg(\frac{2\,(2\,c+d\,x)\,\left(b+a\,x^2\right)}{a}+\Bigg(2\,\Bigg(d^2\,\sqrt{-c-\frac{i\,\sqrt{b}\,d}{\sqrt{a}}}\;\left(-3\,b^2\,d^2+a^2\,c^2\,x^2+a\,b\,\left(c^2-3\,d^2\,x^2\right)\right)+$$

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

$$(c+d\,x)^{3/2}\,\text{EllipticE}\Big[i\,\text{ArcSinh}\Big[\frac{\sqrt{-c-\frac{i\,\sqrt{b}\,d}{\sqrt{a}}}}{\sqrt{c+d\,x}}\Big],\,\frac{\sqrt{a}\;c-i\,\sqrt{b}\;d}{\sqrt{a}\;c+i\,\sqrt{b}\;d}\Big]-\sqrt{a}\;\sqrt{b}\;d$$

$$\left(a\,c^2+4\,i\,\sqrt{a}\;\sqrt{b}\;c\,d-3\,b\,d^2\right)\,\sqrt{\frac{d\,\left(\frac{i\,\sqrt{b}}{\sqrt{a}}+x\right)}{c+d\,x}}\;\sqrt{-\frac{\frac{i\,\sqrt{b}\,d}{\sqrt{a}}-d\,x}{c+d\,x}}\;\;(c+d\,x)^{3/2}\,\text{EllipticF}\Big[$$

$$i\,\text{ArcSinh}\Big[\frac{\sqrt{-c-\frac{i\,\sqrt{b}\,d}{\sqrt{a}}}}{\sqrt{c+d\,x}}\Big],\,\frac{\sqrt{a}\;c-i\,\sqrt{b}\;d}{\sqrt{a}\;c+i\,\sqrt{b}\;d}\Big]\Bigg)\Bigg)\Bigg/\left(a^2\,d^2\,\sqrt{-c-\frac{i\,\sqrt{b}\,d}{\sqrt{a}}}\;(c+d\,x)\right)\Bigg)$$

Problem 519: 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 520: 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 580: 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 581: 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 582: 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 583: 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 602: 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):

$$\frac{1}{8}\left(4\,\text{ArcSin}[2+x]-4\sqrt{2}\,\text{ArcTan}\left[\sqrt{2}\,(1+x)\right]+\right.$$

$$2\sqrt{1-2\,i\sqrt{2}}\,\text{ArcTan}\Big[\Big(60+51\,i\sqrt{2}+\left(-16+6\,i\sqrt{2}\right)x^4+$$

$$54\,i\sqrt{1-2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}+x\left(68+176\,i\sqrt{2}+99\,i\sqrt{1-2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)+$$

$$2\,i\,x^3\left(34\left(i+\sqrt{2}\right)+9\sqrt{1-2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)+$$

$$i\,x^2\left(44\,i+185\sqrt{2}+72\sqrt{1-2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\Big)\Big/\Big(93\,i+150\sqrt{2}+$$

$$20\left(17\,i+22\sqrt{2}\right)x+\left(493\,i+466\sqrt{2}\right)x^2+16\left(19\,i+13\sqrt{2}\right)x^3+\left(66\,i+32\sqrt{2}\right)x^4\Big)\Big]-$$

$$\frac{1}{\sqrt{1+2\,i\sqrt{2}}}2\,i\left(-i+2\sqrt{2}\right)\text{ArcTan}\Big[\Big(-60+51\,i\sqrt{2}+2\left(8+3\,i\sqrt{2}\right)x^4+$$

$$54\,i\sqrt{1+2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}+2x^3\left(34+34\,i\sqrt{2}+9\,i\sqrt{1+2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)+$$

$$x^2\left(44+185\,i\sqrt{2}+72\,i\sqrt{1+2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)+$$

$$i\,x\left(68\,i+176\sqrt{2}+99\sqrt{1+2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\Big)\Big/$$

$$\Big(-93\,i+150\sqrt{2}+20\left(-17\,i+22\sqrt{2}\right)x+\left(-493\,i+466\sqrt{2}\right)x^2+$$

$$16\left(-19\,i+13\sqrt{2}\right)x^3+\left(-66\,i+32\sqrt{2}\right)x^4\Big)\Big]+$$

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

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

$$\frac{1}{\sqrt{1-2\,i\sqrt{2}}}\left(i+2\sqrt{2}\right)$$

$$\text{Log}\Big[\left(3+4x+2x^2\right)\Big(3+6\,i\sqrt{2}+\left(2+2\,i\sqrt{2}\right)x^2-2\sqrt{2-4\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}+$$

$$x\left(4+8\,i\sqrt{2}-2\sqrt{2-4\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\Big)\Big]-$$

$$\frac{1}{\sqrt{1+2\,i\sqrt{2}}}\left(-i+2\sqrt{2}\right)\text{Log}\Big[\left(3+4x+2x^2\right)\Big(3-6\,i\sqrt{2}+\left(2-2\,i\sqrt{2}\right)x^2-$$

$$\left.2\sqrt{2+4\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}-2x\left(-2+4\,i\sqrt{2}+\sqrt{2+4\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\Big)\Big]\right)$$

Problem 603: 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):

$$\frac{1}{16}\left(\frac{8\,(3+x)}{3+4x+2x^2}+\frac{8\,(3+2x)\sqrt{-3-4x-x^2}}{3+4x+2x^2}+\right.$$

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

$$\left((2+x)\left(3\left(5+4\,i\,\sqrt{2}\right)+16\left(2+i\,\sqrt{2}\right)x+2\left(9+2\,i\,\sqrt{2}\right)x^2\right)\right)\Big/\left(12\,i-6\sqrt{2}+\left(8\,i+6\sqrt{2}\right)\right.$$

$$x^3-9\sqrt{1+2\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}+x\left(40\,i-5\sqrt{2}-12\sqrt{1+2\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)+$$

$$\left.x^2\left(36\,i+8\sqrt{2}-6\sqrt{1+2\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\right)\Big]+\frac{1}{\sqrt{1-2\,i\,\sqrt{2}}}$$

$$2\left(2\,i+\sqrt{2}\right)\text{ArcTanh}\Big[\left((2+x)\left(3\left(5\,i+4\sqrt{2}\right)+16\left(2\,i+\sqrt{2}\right)x+2\left(9\,i+2\sqrt{2}\right)x^2\right)\right)\Big/$$

$$\left(-5\left(8\,i+\sqrt{2}\right)x+\left(-8\,i+6\sqrt{2}\right)x^3-12\sqrt{1-2\,i\,\sqrt{2}}\,x\sqrt{-3-4x-x^2}+\right.$$

$$x^2\left(-36\,i+8\sqrt{2}-6\sqrt{1-2\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)-$$

$$\left.3\left(4\,i+2\sqrt{2}+3\sqrt{1-2\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\right)\Big]-$$

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

$$\frac{1}{\sqrt{1-2\,i\,\sqrt{2}}}$$

$$\left(2\,i+\sqrt{2}\right)\text{Log}\Big[\left(3+4x+2x^2\right)\left(3+6\,i\,\sqrt{2}+\left(2+2\,i\,\sqrt{2}\right)x^2-\right.$$

$$\left.2\sqrt{2-4\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}+x\left(4+8\,i\,\sqrt{2}-2\sqrt{2-4\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\right)\Big]+$$

$$\frac{1}{\sqrt{1+2\,i\,\sqrt{2}}}\left(-2\,i+\sqrt{2}\right)\text{Log}\Big[\left(3+4x+2x^2\right)\left(3-6\,i\,\sqrt{2}+\left(2-2\,i\,\sqrt{2}\right)x^2-\right.$$

$$\left.\left.2\sqrt{2+4\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}-2x\left(-2+4\,i\,\sqrt{2}+\sqrt{2+4\,i\,\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\right)\Big]\right)$$

Problem 604: 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):

$$\frac{1}{32}\left(\frac{8(-3+2x)}{(3+4x+2x^2)^2}-\frac{8(2+3x)}{3+4x+2x^2}-\right.$$

$$\frac{8\sqrt{-3-4x-x^2}\,(15+26x+22x^2+8x^3)}{(3+4x+2x^2)^2}-12\sqrt{2}\,\text{ArcTan}\left[\sqrt{2}\,(1+x)\right]+\frac{1}{\sqrt{1+2\,i\sqrt{2}}}$$

$$6\left(2+i\sqrt{2}\right)\text{ArcTan}\left[\left((2+x)\left(3\left(5+4\,i\sqrt{2}\right)+16\left(2+i\sqrt{2}\right)x+2\left(9+2\,i\sqrt{2}\right)x^2\right)\right)\Big/\right.$$

$$\left(12\,i-6\sqrt{2}+\left(8\,i+6\sqrt{2}\right)x^3-9\sqrt{1+2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}+\right.$$

$$x\left(40\,i-5\sqrt{2}-12\sqrt{1+2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)+$$

$$\left.\left.x^2\left(36\,i+8\sqrt{2}-6\sqrt{1+2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\right)\right]-\frac{1}{\sqrt{1-2\,i\sqrt{2}}}$$

$$6\left(2\,i+\sqrt{2}\right)\text{ArcTanh}\left[\left((2+x)\left(3\left(5\,i+4\sqrt{2}\right)+16\left(2\,i+\sqrt{2}\right)x+2\left(9\,i+2\sqrt{2}\right)x^2\right)\right)\Big/\right.$$

$$\left(-5\left(8\,i+\sqrt{2}\right)x+\left(-8\,i+6\sqrt{2}\right)x^3-12\sqrt{1-2\,i\sqrt{2}}\,x\sqrt{-3-4x-x^2}+x^2\left(-36\,i+8\sqrt{2}-\right.\right.$$

$$\left.\left.\left.6\sqrt{1-2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)-3\left(4\,i+2\sqrt{2}+3\sqrt{1-2\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\right)\right]+$$

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

$$\frac{1}{\sqrt{1-2\,i\sqrt{2}}}$$

$$3\left(2\,i+\sqrt{2}\right)\text{Log}\left[\left(3+4x+2x^2\right)\left(3+6\,i\sqrt{2}+\left(2+2\,i\sqrt{2}\right)x^2-\right.\right.$$

$$\left.\left.2\sqrt{2-4\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}+x\left(4+8\,i\sqrt{2}-2\sqrt{2-4\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\right)\right]-$$

$$\frac{1}{\sqrt{1+2\,i\sqrt{2}}}3\left(-2\,i+\sqrt{2}\right)\text{Log}\left[\left(3+4x+2x^2\right)\left(3-6\,i\sqrt{2}+\left(2-2\,i\sqrt{2}\right)x^2-\right.\right.$$

$$\left.\left.\left.2\sqrt{2+4\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}-2x\left(-2+4\,i\sqrt{2}+\sqrt{2+4\,i\sqrt{2}}\,\sqrt{-3-4x-x^2}\right)\right)\right]\right)$$

Problem 607: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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):

$$\left(896-1056\,x+352\,x^2+848\,x^3-1420\,x^4+1152\,x^5-602\,x^6+206\,x^7-45\,x^8+5\,x^9+\frac{1}{\sqrt{-\frac{i\,(-2+x)}{\left(-i+\sqrt{3}\right)x}}}\right.$$
$$112\,i\,\sqrt{2}\,(-2+x)\,x\,\sqrt{\frac{4-2\,x+x^2}{x^2}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-\frac{4\,i}{x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\,\sqrt{3}}{-i+\sqrt{3}}\right]-$$
$$\left.304\,i\,\sqrt{2}\,\sqrt{-\frac{i\,(-2+x)}{\left(-i+\sqrt{3}\right)x}}\,x^2\,\sqrt{\frac{4-2\,x+x^2}{x^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-\frac{4\,i}{x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\,\sqrt{3}}{-i+\sqrt{3}}\right]\right)\Big/$$
$$\left(35\,\sqrt{-x\,\left(-8+8\,x-4\,x^2+x^3\right)}\right)$$

Problem 608: 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):

$$-\left(\left(-16+24x-24x^2+14x^3-5x^4+x^5-\frac{1}{\sqrt{-\frac{i(-2+x)}{(-i+\sqrt{3})x}}}\right.\right.$$

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

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

$$\left.\left(3\sqrt{-x(-8+8x-4x^2+x^3)}\right)\right)$$

Problem 609: 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):

$$\left(\sqrt{-i+\sqrt{3}+\frac{4i}{x}}\sqrt{-\frac{i(-2+x)}{(-i+\sqrt{3})x}}\,x\right.$$

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

$$\left(\sqrt{2}\sqrt{i+\sqrt{3}-\frac{4i}{x}}\sqrt{-x(-8+8x-4x^2+x^3)}\right)$$

Problem 610: 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):

$$\frac{1}{24(-2+x)x}\sqrt{-x\left(-8+8x-4x^2+x^3\right)} \left(\frac{1}{\sqrt{\frac{4-2x+x^2}{x^2}}}\sqrt{2}\left(-i+\sqrt{3}\right)\sqrt{-\frac{i(-2+x)}{\left(-i+\sqrt{3}\right)x}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-\frac{4i}{x}}}{\sqrt{2}\ 3^{1/4}}\right], \frac{2\sqrt{3}}{-i+\sqrt{3}}\right] - \frac{1}{4-2x+x^2}\left(2+x^2 - 4i\sqrt{2}\sqrt{-\frac{i(-2+x)}{\left(-i+\sqrt{3}\right)x}}\ x^2\sqrt{\frac{4-2x+x^2}{x^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-\frac{4i}{x}}}{\sqrt{2}\ 3^{1/4}}\right], \frac{2\sqrt{3}}{-i+\sqrt{3}}\right]\right)\right)$$

Problem 611: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(8x - 8x^2 + 4x^3 - x^4\right)^{5/2}}\, dx$$

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) :

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

$$\left(36-232x+274x^2-226x^3+115x^4-37x^5+7x^6-19 i\sqrt{2}\sqrt{-\frac{i(-2+x)}{\left(-i+\sqrt{3}\right)x}}\,x^3\right.$$

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

$$\left.\left(-8+8x-4x^2+x^3\right)\right)\Big/\left(432x\sqrt{-x\left(-8+8x-4x^2+x^3\right)}\right)$$

Problem 612: 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) :

$$\left(\sqrt{-x\left(-8+8x-4x^2+x^3\right)}\right.$$

$$\left(\sqrt{\frac{4-2x+x^2}{x^2}}\left(-224+152x+44x^2-228x^3+230x^4-116x^5+35x^6-5x^7\right)+\right.$$

$$112\sqrt{2}\left(-i+\sqrt{3}\right)\sqrt{-\frac{i(-2+x)}{\left(-i+\sqrt{3}\right)x}}\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-\frac{4i}{x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{-i+\sqrt{3}}\right]+$$

$$\left.\left.304\,i\sqrt{2}\sqrt{-\frac{i(-2+x)}{\left(-i+\sqrt{3}\right)x}}\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{i+\sqrt{3}-\frac{4i}{x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{-i+\sqrt{3}}\right]\right)\right)\Big/$$

$$\left(35(-2+x)x\sqrt{\frac{4-2x+x^2}{x^2}}\right)$$

Problem 613: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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):

$$\left(\sqrt{-x\left(-8+8x-4x^2+x^3\right)}\left(\sqrt{\frac{4-2x+x^2}{x^2}}\left(-4+4x-3x^2+x^3\right)+\right.\right.$$

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

$$\left.\left.8\mathrm{i}\sqrt{2}\sqrt{-\frac{\mathrm{i}\left(-2+x\right)}{\left(-\mathrm{i}+\sqrt{3}\right)x}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\mathrm{i}+\sqrt{3}-\frac{4\mathrm{i}}{x}}}{\sqrt{2}\ 3^{1/4}}\right],\frac{2\sqrt{3}}{-\mathrm{i}+\sqrt{3}}\right]\right)\right)\Big/$$

$$\left(3\left(-2+x\right)x\sqrt{\frac{4-2x+x^2}{x^2}}\right)$$

Problem 614: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 17 leaves, 3 steps):

$$-\frac{\text{EllipticF}\left[\text{ArcSin}\left[1-x\right],-\frac{1}{3}\right]}{\sqrt{3}}$$

Result (type 4, 100 leaves):

$$-\left(\left(\left(-1\right)^{1/3}\left(-2+x\right)^2\sqrt{\frac{x\left(-1+\mathrm{i}\sqrt{3}+x\right)}{\left(-2+x\right)^2}}\sqrt{\frac{-2+x-\left(-1\right)^{1/3}x}{-2+x}}\right.\right.$$

$$\left.\left.\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{-\frac{\left(-1\right)^{2/3}x}{-2+x}}\right],\left(-1\right)^{2/3}\right]\right)\Big/\left(\sqrt{-x\left(-8+8x-4x^2+x^3\right)}\right)\right)$$

Problem 615: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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):

$$\left((-2+x)^2 x\left(4-2x+x^2\right)\left(2(-1+x)x-3\left(4-2x+x^2\right)-\frac{3x\left(4-2x+x^2\right)}{-2+x}-4(2-x)\sqrt{\frac{4-2x+x^2}{(-2+x)^2}}\left(x\sqrt{\frac{4-2x+x^2}{(-2+x)^2}}-\sqrt{2}\left(i+\sqrt{3}\right)\sqrt{\frac{i x}{\left(i+\sqrt{3}\right)(-2+x)}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{-i+\sqrt{3}-\frac{4i}{-2+x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{i+\sqrt{3}}\right]+4i\sqrt{2}\sqrt{\frac{i x}{\left(i+\sqrt{3}\right)(-2+x)}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-i+\sqrt{3}-\frac{4i}{-2+x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{i+\sqrt{3}}\right]\right)\right)\right)\Big/\left(96\left(-x\left(-8+8x-4x^2+x^3\right)\right)^{3/2}\right)$$

Problem 616: 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):

$$\left((-2+x)^3 x^2 \left(4-2x+x^2\right)^2\right.$$

$$\left(-\frac{7x\left(4-2x+x^2\right)}{-2+x}+\frac{36+216x-622x^2+670x^3-445x^4+187x^5-49x^6+7x^7}{(-2+x)^2 x\left(4-2x+x^2\right)}+\right.$$

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

$$19\,i\sqrt{2}\,(-2+x)\sqrt{\frac{i x}{\left(i+\sqrt{3}\right)(-2+x)}}\sqrt{\frac{4-2x+x^2}{(-2+x)^2}}$$

$$\left.\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-i+\sqrt{3}-\frac{4i}{-2+x}}}{\sqrt{2}\,3^{1/4}}\right],\frac{2\sqrt{3}}{i+\sqrt{3}}\right]\right)\right)\Big/\left(432\left(-x\left(-8+8x-4x^2+x^3\right)\right)^{5/2}\right)$$

Problem 617: 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) :

$$\frac{1}{7}\left(\frac{c}{d}+x\right)\left(4ac+4c^2x^2+4cdx^3+d^2x^4\right)^{3/2}+\frac{1}{35d^2}2c\left(\frac{c}{d}+x\right)\sqrt{4ac+4c^2x^2+4cdx^3+d^2x^4}\left(7c^3+20ad^2-3cd^2\left(\frac{c}{d}+x\right)^2\right)-\frac{16c^3\left(c^3+8ad^2\right)\left(\frac{c}{d}+x\right)\sqrt{4ac+4c^2x^2+4cdx^3+d^2x^4}}{35d^2\sqrt{c^3+4ad^2}\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4ad^2}}\right)}+$$

$$\left(16c^{13/4}\left(c^3+4ad^2\right)^{3/4}\left(c^3+8ad^2\right)\sqrt{\frac{d^2\left(4ac+4c^2x^2+4cdx^3+d^2x^4\right)}{\left(c^3+4ad^2\right)\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4ad^2}}\right)^2}}\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4ad^2}}\right)\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c+dx}{c^{1/4}\left(c^3+4ad^2\right)^{1/4}}\right],\frac{1}{2}\left(1+\frac{c^{3/2}}{\sqrt{c^3+4ad^2}}\right)\right]\right)\Big/$$

$$\left(35d^5\sqrt{4ac+4c^2x^2+4cdx^3+d^2x^4}\right)+\left(8c^{7/4}\left(c^3+4ad^2\right)^{3/4}\left(\sqrt{c^3+4ad^2}\left(c^3+5ad^2\right)-c^{3/2}\left(c^3+8ad^2\right)\right)\sqrt{\frac{d^2\left(4ac+4c^2x^2+4cdx^3+d^2x^4\right)}{\left(c^3+4ad^2\right)\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4ad^2}}\right)^2}}\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4ad^2}}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c+dx}{c^{1/4}\left(c^3+4ad^2\right)^{1/4}}\right],\frac{1}{2}\left(1+\frac{c^{3/2}}{\sqrt{c^3+4ad^2}}\right)\right]\right)\Big/$$

$$\left(35d^5\sqrt{4ac+4c^2x^2+4cdx^3+d^2x^4}\right)$$

Result (type 4, 10468 leaves):

$$\sqrt{4ac+4c^2x^2+4cdx^3+d^2x^4}\left(\frac{4c^2\left(2c^3+15ad^2\right)}{35d^3}-\frac{4c\left(c^3-15ad^2\right)x}{35d^2}+\frac{2c^3x^2}{35d}+\frac{34c^2x^3}{35}+\frac{5}{7}cdx^4+\frac{d^2x^5}{7}\right)+$$

$$\frac{1}{35\,d^3}\,16\,c^2\left(\left(2\,a\,c^3\,d\left(\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.\right.$$

$$\sqrt{\left(\left(\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Big/\left(\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\right)}\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2$$

$$\sqrt{\left(\left(\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Big/\left(\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\right)}$$

$$\sqrt{\left(\left(\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Big/\left(\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\right)}$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Big/\left(\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\right.\right.\right.}$$

$$\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\Bigg)\Bigg)\Bigg)\Bigg],$$

$$\Bigg(\Bigg(\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)$$

$$\left(\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\Bigg)\Big/$$

$$\Bigg(\Bigg(\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)$$

$$\left(\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\Bigg)\Bigg]\Bigg)\Big/$$

$$\Bigg(\Bigg(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)$$

$$\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)$$

$$\sqrt{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}\Bigg)+$$

$$\Bigg(40\,a^2\,d^3\left(\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)$$

$$\sqrt{\Bigg(\Bigg(\Bigg(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)}$$

$$\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\Bigg)\Big/$$

$$\Bigg(\Bigg(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)$$

$$\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\Bigg)\Bigg)\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2$$

$$\sqrt{\Bigg(\Bigg(\Bigg(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)}$$

$$\left(-\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\Bigg)\Bigg/\Bigg(\Bigg(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+$$

$$\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\Bigg)\Bigg)$$

$$\sqrt{\Bigg(\Bigg(\Bigg(\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)}$$

$$\left(-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\Bigg)\Bigg/\Bigg(\Bigg(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+$$

$$\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\Bigg)\Bigg)$$

$$\mathtt{EllipticF}\Bigg[\mathtt{ArcSin}\Bigg[\sqrt{\Bigg(\Bigg(\Bigg(\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)}$$

$$\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\Bigg)\Bigg/\Bigg(\Bigg(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+$$

$$\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\Bigg)\Bigg)\Bigg]\Bigg],$$

$$\Bigg(\left(\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)$$

$$\left(\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\Bigg)\Bigg/$$

$$\Bigg(\left(\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)$$

$$\left(\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\Bigg)\Bigg]\Bigg)\Bigg/$$

$$\Bigg(\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)$$

$$\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)$$

$$\left.\sqrt{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}\right)-$$

$$\left(8\,c^5\left(\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

$$\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2$$

$$\sqrt{\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Big/\left(d\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Big/\left(d\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\right)}$$

$$\sqrt{\left(\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)}$$

$$\left(-\frac{1}{d}\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\text{EllipticF}\Big[\text{ArcSin}\Big[\right.$$

$$\sqrt{\left(\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\right.\right.}$$

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

$$2\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\ \text{EllipticPi}\Big[\frac{-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}}{-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}},\ \text{ArcSin}\Big[$$

$$\sqrt{\Bigg(\bigg(\Big(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\Big)\Big(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\Big)\bigg)\Bigg/}$$

$$\bigg(\Big(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\Big)\Big(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-$$

$$\left.\left.\left.\left.d\,x\right)\right)\right)\right],\ \frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]\Bigg)\Bigg)\Bigg/$$

$$\Bigg(\bigg(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\bigg)$$

$$\bigg(\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\bigg)$$

$$\sqrt{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}\Bigg)-$$

$$\Bigg(64\,a\,c^2\,d^2\left(\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)$$

$$\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2$$

$$\sqrt{\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\right)\Bigg/}$$

$$\left(d\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

$$\left.\left.\left.\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\,\left(-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Big/\left(d\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\right)}$$

$$\sqrt{\left(\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)}$$

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

$$2\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\;\text{EllipticPi}\Big[\frac{-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}}{-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}},\text{ArcSin}\Big[$$

$$\left.\sqrt{\left(\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)}\Big],\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]\right)\Big/$$

$$\left(\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

$$\left(\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)$$

$$\left.\sqrt{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}\right)-$$

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

$$\left(-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\left(-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)+$$

$$2\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)$$

$$\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2$$

$$\sqrt{\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\right/}$$

$$\left(d\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

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

$$\sqrt{\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\right/}$$

$$\left(d\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

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

$$\sqrt{\left(\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\right/}$$

$$\left.\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)$$

$$\left(\left(d\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\text{EllipticE}\Big[\right.\right.$$

$$\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\right.\right.}$$

$$\left.\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\right.\right.$$

$$\left.\left.\left.\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)\Big],$$

$$\left.\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]\right)\Big/\left(2\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)+$$

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

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

$$\left.\left.\left(\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right)\right)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\right.\right.}$$

$$\left.\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\right.\right.$$

$$\left.\left.\left.\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)\Big],$$

$$\left.\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]\right)\Big/$$

$$\left(2\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right)-$$

$$\left(\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\right.\right.$$

$$\left.\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\ \text{EllipticPi}\Bigg[\frac{-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}}{-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}},$$

$$\text{ArcSin}\Bigg[\sqrt{\left(\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)}\Bigg],$$

$$\left.\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Bigg]\right)\Bigg/$$

$$\left.\left.\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right)\right)-$$

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

$$\left(-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\left(-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)+$$

$$2\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)$$

$$\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2$$

$$\sqrt{\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Big/\left(d\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\,\left(-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Big/\left(d\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\right)}$$

$$\sqrt{\left(\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)}$$

$$\left(\left(d\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\text{EllipticE}\Big[\right.\right.$$

$$\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)}\Big],$$

$$\left.\left.\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]\right)\Big/\left(2\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)+\right.$$

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

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

$$\left.\left.\left(\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right)\right)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\right.\right.}$$

$$\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\Big)\Big/\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\right.\right.$$

$$\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\,\Big)\,\Big(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\,-d\,x\Big)\Big)\Big)\Big],$$

$$\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]\Bigg)\Big/$$

$$\left(2\,\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\,\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right)-$$

$$\Bigg(\Bigg(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-$$

$$\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)\,\text{EllipticPi}\Big[\frac{-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}}{-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}},$$

$$\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Big)}$$

$$\Big(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\Big)\Big)\Big/\Big(\Big(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+$$

$$\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\,\Big)\,\Big(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\,-d\,x\Big)\Big)\Big)\Big],$$

$$\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]\Bigg)\Big/$$

$$\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\Bigg)\Bigg)\Bigg)$$

Problem 618: 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):

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

$$\left(2\,c^{9/4}\left(c^3+4\,a\,d^2\right)^{3/4}\sqrt{\frac{d^2\left(4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4\right)}{\left(c^3+4\,a\,d^2\right)\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4\,a\,d^2}}\right)^2}}\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4\,a\,d^2}}\right)\right.$$

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

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

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

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

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

Result (type 4, 5218 leaves) :

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

$$\frac{1}{3\,d}2\,c\left(\left(8\,a\,d\left(\frac{-c-\sqrt{c^2-2\,i\sqrt{a}\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\sqrt{a}\sqrt{c}\,d}}{d}\right)\right.\right.$$

$$\sqrt{\left(\left(\left(-\frac{-c+\sqrt{c^2-2\,i\sqrt{a}\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\sqrt{a}\sqrt{c}\,d}}{d}\right)\right.\right.}$$

$$\left.\left.\left(-\frac{-c-\sqrt{c^2-2\,i\sqrt{a}\sqrt{c}\,d}}{d}+x\right)\right)\Big/\right.$$

$$\left(\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

$$\left.\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Bigg)\Bigg)\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2$$

$$\sqrt{\left(\left(\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.\right.}$$

$$\left.\left(-\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Big/\left(\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\right.\right.$$

$$\left.\left.\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Bigg)$$

$$\sqrt{\left(\left(\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.\right.}$$

$$\left.\left(-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Big/\left(\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\right.\right.$$

$$\left.\left.\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Bigg)$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.\right.}\right.\right.$$

$$\left.\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Big/\left(\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\right.\right.$$

$$\left.\left.\left.\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Bigg)\right],$$

$$\left(\left(\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

$$\left.\left(\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right)\Big/$$

$$\left(\left(\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

$$\left(\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\Bigg)\Bigg]\Bigg)\Bigg/$$

$$\left(\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

$$\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)$$

$$\left.\sqrt{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}\right)-$$

$$\left(8\,c^2\left(\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

$$\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2$$

$$\sqrt{\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Bigg/\left(d\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Bigg/\left(d\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\right)}$$

$$\sqrt{\left(\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)}$$

$$\left(-\frac{1}{d}\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)}\Big],\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]+\frac{1}{d}\,2\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\;\text{EllipticPi}\Big[\frac{-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}}{-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}},\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)}\Big],\frac{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]\right)\Big/$$

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

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

$$2\,\Bigg(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)$$

$$\Bigg(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\Bigg)^2$$

$$\sqrt{\Bigg(\Bigg(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\,\Bigg(-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\Bigg)\Bigg)\Bigg/}$$

$$\Bigg(d\,\Bigg(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)$$

$$\Bigg(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\Bigg)\Bigg)\Bigg)\,\sqrt{\Bigg(\Bigg(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}$$

$$\Bigg(-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\Bigg)\Bigg)\Bigg/\Bigg(d\,\Bigg(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+$$

$$\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)\,\Bigg(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\Bigg)\Bigg)\Bigg)$$

$$\sqrt{\Bigg(\Bigg(\Bigg(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Bigg)\Bigg(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\Bigg)\Bigg)\Bigg/}$$

$$\Bigg(\Bigg(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Bigg)\Bigg(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\Bigg)\Bigg)\Bigg)$$

$$\Bigg(\Bigg(d\,\Bigg(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)\,\text{EllipticE}\Big[$$

$$\text{ArcSin}\Big[\sqrt{\Bigg(\Bigg(\Bigg(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Bigg)}$$

$$\Bigg(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\Bigg)\Bigg)\Bigg/\Bigg(\Bigg(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+$$

$$\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Bigg)\Bigg(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\Bigg)\Bigg)\Bigg)\Big],$$

$$\frac{\Big(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Big)^2}{\Big(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Big)^2}\Big]\Bigg)\Bigg/\Bigg(2\,\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Bigg)+$$

$$\left(d\left(\frac{1}{d}\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\right.\right.\right.$$

$$\left.\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)-\frac{1}{d}\left(-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)$$

$$\left.\left(\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\right.\right.}$$

$$\left.\left.\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\right.\right.\right.$$

$$\left.\left.\left.\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)\Big],$$

$$\left.\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]\right)\Big/$$

$$\left(2\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right)-$$

$$\left(\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\right.\right.$$

$$\left.\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\text{EllipticPi}\Big[\frac{-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}}{-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}},$$

$$\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\right.\right.}$$

$$\left.\left.\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\right.\right.\right.$$

$$\left.\left.\left.\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)\Big],$$

$$\left.\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]\right)\Big/$$

$$\left.\left.\left.\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right)\right)\right)$$

Problem 619: 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):

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

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

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

Result (type 4, 822 leaves):

$$\left(2\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right.$$

$$\sqrt{\left(-\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\left(c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)\right)}$$

$$\sqrt{\left(-\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\left(c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)\right)}\ \mathtt{EllipticF}\Big[$$

$$\mathtt{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)}\Big],$$

$$\left.\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]\right)\Big/\left(d\,\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right.$$

$$\sqrt{\left(\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)}$$

$$\left.\sqrt{4\,a\,c+x^2\,\left(2\,c+d\,x\right)^2}\right)$$

Problem 620: 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):

$$-\frac{\left(\frac{c}{d}+x\right)\left(c^3-4\,a\,d^2-c\,d^2\left(\frac{c}{d}+x\right)^2\right)}{8\,a\,c\left(c^3+4\,a\,d^2\right)\sqrt{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}}-$$

$$\frac{d^2\left(\frac{c}{d}+x\right)\sqrt{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}}{8\,a\left(c^3+4\,a\,d^2\right)^{3/2}\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4\,a\,d^2}}\right)}+\left(c^{1/4}\sqrt{\frac{d^2\left(4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4\right)}{\left(c^3+4\,a\,d^2\right)\left(\sqrt{c}+\frac{d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{c^3+4\,a\,d^2}}\right)^2}}\right.$$

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

$$\left(8\,a\,d\left(c^3+4\,a\,d^2\right)^{1/4}\sqrt{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}\right)+$$

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

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

$$\left(16\,a\,c^{5/4}\,d\left(c^3+4\,a\,d^2\right)^{3/4}\sqrt{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}\right)$$

Result (type 4, 5276 leaves) :

$$\frac{4\,a\,c\,d+2\,c^3\,x+4\,a\,d^2\,x+3\,c^2\,d\,x^2+c\,d^2\,x^3}{8\,a\,c\left(c^3+4\,a\,d^2\right)\sqrt{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}}+$$

$$\frac{1}{8\,a\,c\left(c^3+4\,a\,d^2\right)}d\left(\left(8\,a\,d\left(\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.\right.$$

$$\sqrt{\left(\left(\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.\right.}$$

$$\left.\left.\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Big/\right.$$

$$\Bigg(\Bigg(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)$$

$$\Bigg(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\Bigg)\Bigg)\Bigg)\Bigg)\;\Bigg(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\Bigg)^2$$

$$\sqrt{}\Bigg(\Bigg(\Bigg(\Bigg(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)$$

$$\Bigg(-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\Bigg)\Bigg)\Bigg/\Bigg(\Bigg(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+$$

$$\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)\Bigg(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\Bigg)\Bigg)\Bigg)$$

$$\sqrt{}\Bigg(\Bigg(\Bigg(\Bigg(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)$$

$$\Bigg(-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\Bigg)\Bigg)\Bigg/\Bigg(\Bigg(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+$$

$$\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)\Bigg(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\Bigg)\Bigg)\Bigg)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{}\Bigg(\Bigg(\Bigg(\Bigg(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)$$

$$\Bigg(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\Bigg)\Bigg)\Bigg/\Bigg(\Bigg(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+$$

$$\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)\Bigg(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\Bigg)\Bigg)\Bigg)\Big],$$

$$\Bigg(\Bigg(\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)$$

$$\Bigg(\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)\Bigg)\Bigg/$$

$$\Bigg(\Bigg(\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)$$

$$\left(\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\bigg)\bigg]\bigg)\Bigg/$$

$$\left(\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

$$\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)$$

$$\left.\sqrt{4\,a\,c+4\,c^2\,x^2+4\,c\,d\,x^3+d^2\,x^4}\right)-$$

$$\left(8\,c^2\left(\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

$$\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2$$

$$\sqrt{\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Bigg/\right.}$$

$$\left(d\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

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

$$\sqrt{\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\left(-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Bigg/\right.}$$

$$\left(d\left(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

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

$$\sqrt{\left(\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Bigg/\right.}$$

$$\left(\left(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\bigg)$$

$$\left(-\frac{1}{d}\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)}\right],\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\right]+\frac{1}{d}2\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\;\text{EllipticPi}\left[\frac{-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}}{-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}},\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)}\right],\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\right]\right)\Big/$$

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

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

$$2\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)$$

$$\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)^2$$

$$\sqrt{\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\,\left(-\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\right/}$$

$$\left(d\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right.$$

$$\left.\left.\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\right)\;\sqrt{\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right.\right.}$$

$$\left.\left(-\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Big/\left(d\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\right.\right.$$

$$\left.\left.\frac{-c+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\left(-\frac{-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+x\right)\right)\Big)$$

$$\sqrt{\left(\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\right/}$$

$$\left.\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\right)$$

$$\left(\left(d\left(-\frac{-c-\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\mathrm{EllipticE}\Big[\right.\right.$$

$$\mathrm{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\right.\right.}$$

$$\left.\left(c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\right)\right)\Big/\left(\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\right.\right.$$

$$\left.\left.\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)\left(-c+\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\right)\right)\Big)\Big],$$

$$\left.\frac{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}{\left(\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)^2}\Big]\right)\Big/\left(2\sqrt{c^2-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{c}\,d}\right)+$$

$$\Bigg(d\,\Bigg(\frac{1}{d}\Big(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Big)\Bigg(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-$$

$$\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)-\frac{1}{d}\Big(-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Big)$$

$$\Bigg(\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)\Bigg)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Big)}$$

$$\Big(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\Big)\Big)\Big/\Big(\Big(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+$$

$$\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Big)\Big(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\Big)\Big)\Big)\Big],$$

$$\frac{\Big(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Big)^2}{\Big(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Big)^2}\Big]\Bigg)\Big/$$

$$\Bigg(2\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Bigg(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)\Bigg)-$$

$$\Bigg(\Bigg(-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-\frac{-c-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}-$$

$$\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\Bigg)\,\text{EllipticPi}\Bigg[\frac{-\frac{-c-\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}}{-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}},$$

$$\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Big)}$$

$$\Big(c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+d\,x\Big)\Big)\Big/\Big(\Big(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+$$

$$\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Big)\Big(-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-d\,x\Big)\Big)\Big)\Big],$$

$$\frac{\Big(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Big)^2}{\Big(\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}-\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}\Big)^2}\Big]\Bigg)\Big/$$

$$\left.\left.\left.\left(-\frac{-c+\sqrt{c^2-2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}+\frac{-c+\sqrt{c^2+2\,i\,\sqrt{a}\,\sqrt{c}\,d}}{d}\right)\right)\right)\right)$$

Problem 621: 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):

$$\frac{1}{3}\left(\frac{d}{4\,e}+x\right)\sqrt{8\,a\,e^2-d^3\,x+8\,d\,e^2\,x^3+8\,e^3\,x^4}-\frac{2\,d^2\left(\frac{d}{4\,e}+x\right)\sqrt{8\,a\,e^2-d^3\,x+8\,d\,e^2\,x^3+8\,e^3\,x^4}}{\sqrt{5\,d^4+256\,a\,e^3}\left(1+\frac{16\,e^2\left(\frac{d}{4\,e}+x\right)^2}{\sqrt{5\,d^4+256\,a\,e^3}}\right)}+$$

$$\left(d^2\left(5\,d^4+256\,a\,e^3\right)^{3/4}\sqrt{\frac{e\left(8\,a\,e^2-d^3\,x+8\,d\,e^2\,x^3+8\,e^3\,x^4\right)}{\left(5\,d^4+256\,a\,e^3\right)\left(1+\frac{16\,e^2\left(\frac{d}{4\,e}+x\right)^2}{\sqrt{5\,d^4+256\,a\,e^3}}\right)^2}}\left(1+\frac{16\,e^2\left(\frac{d}{4\,e}+x\right)^2}{\sqrt{5\,d^4+256\,a\,e^3}}\right)\right.$$

$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d+4\,e\,x}{\left(5\,d^4+256\,a\,e^3\right)^{1/4}}\right],\frac{1}{2}\left(1+\frac{3\,d^2}{\sqrt{5\,d^4+256\,a\,e^3}}\right)\right]\right)\Big/$$

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

$$\left(\left(5\,d^4+256\,a\,e^3\right)^{1/4}\left(5\,d^4+256\,a\,e^3-3\,d^2\sqrt{5\,d^4+256\,a\,e^3}\right)\sqrt{\frac{e\left(8\,a\,e^2-d^3\,x+8\,d\,e^2\,x^3+8\,e^3\,x^4\right)}{\left(5\,d^4+256\,a\,e^3\right)\left(1+\frac{16\,e^2\left(\frac{d}{4\,e}+x\right)^2}{\sqrt{5\,d^4+256\,a\,e^3}}\right)^2}}\right.$$

$$\left.\left(1+\frac{16\,e^2\left(\frac{d}{4\,e}+x\right)^2}{\sqrt{5\,d^4+256\,a\,e^3}}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d+4\,e\,x}{\left(5\,d^4+256\,a\,e^3\right)^{1/4}}\right],\frac{1}{2}\left(1+\frac{3\,d^2}{\sqrt{5\,d^4+256\,a\,e^3}}\right)\right]\right)\Big/$$

$$\left(48\,\sqrt{2}\,e^2\sqrt{8\,a\,e^2-d^3\,x+8\,d\,e^2\,x^3+8\,e^3\,x^4}\right)$$

Result (type 4, 7543 leaves):

$$\left(\frac{d}{12\,e}+\frac{x}{3}\right)\sqrt{8\,a\,e^2-d^3\,x+8\,d\,e^2\,x^3+8\,e^3\,x^4}+$$

$$\frac{1}{24\,e}\Bigg(\Bigg(2\,d^4\left(\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)$$

$$\sqrt{\Bigg(\Bigg(\Bigg(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)}$$

$$\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\Bigg)\Bigg/$$

$$\Bigg(\Bigg(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)$$

$$\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\Bigg)\Bigg)\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)^2$$

$$\sqrt{\Bigg(\Bigg(\Bigg(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)}$$

$$\left(-\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\Bigg)\Bigg/\Bigg(\Bigg(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+$$

$$\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\Bigg)\Bigg)$$

$$\sqrt{\Bigg(\Bigg(\Bigg(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)}$$

$$\left(-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\Bigg)\Bigg/\Bigg(\Bigg(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+$$

$$\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\Bigg)\Bigg)$$

$$\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{\Bigg(\Bigg(\Bigg(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)}$$

$$\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\Bigg)\Bigg/\Bigg(\Bigg(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+$$

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

$$\left(\left(\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.$$

$$\left.\left.\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right)\right/$$

$$\left(\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.$$

$$\left.\left.\left.\left(\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right)\right]\right)\Big/$$

$$\left(\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.$$

$$\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)$$

$$\left.\sqrt{8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4}\right)+$$

$$\left(256 a e^3\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.$$

$$\sqrt{\left(\left(\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.\right.}$$

$$\left.\left.\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)\right)\right/$$

$$\left(\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.$$

$$\left.\left.\left.\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)\right)\right)\right)\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)^2$$

$$\sqrt{\left(\left(\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.\right.}$$

$$\left(-\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\Bigg)\Bigg)\Bigg/\Bigg(\Bigg(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+$$

$$\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\Bigg)\Bigg)$$

$$\sqrt{\Bigg(\Bigg(\Bigg(\Bigg(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)}$$

$$\left(-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\Bigg)\Bigg)\Bigg/\Bigg(\Bigg(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+$$

$$\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\Bigg)\Bigg)$$

$$\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{\Bigg(\Bigg(\Bigg(\Bigg(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)}$$

$$\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\Bigg)\Bigg)\Bigg/\Bigg(\Bigg(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+$$

$$\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\Bigg)\Bigg)\Bigg],$$

$$\Bigg(\Bigg(\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)$$

$$\Bigg(\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)\Bigg)\Bigg/$$

$$\Bigg(\Bigg(\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)$$

$$\Bigg(\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)\Bigg)\Bigg]\Bigg)\Bigg/$$

$$\Bigg(\Bigg(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)$$

$$\Bigg(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Bigg)$$

$$\left.\sqrt{8 a e^2 - d^3 x + 8 d e^2 x^3 + 8 e^3 x^4}\right) -$$

$$\left(12 d^3 e \left(\frac{-d - \sqrt{3 d^2 - 2 \sqrt{d^4 - 64 a e^3}}}{4 e} - \frac{-d + \sqrt{3 d^2 + 2 \sqrt{d^4 - 64 a e^3}}}{4 e}\right)\right.$$

$$\left(-\frac{-d + \sqrt{3 d^2 - 2 \sqrt{d^4 - 64 a e^3}}}{4 e} + x\right)^2$$

$$\sqrt{\left(\left(\sqrt{3 d^2 - 2 \sqrt{d^4 - 64 a e^3}} \left(-\frac{-d - \sqrt{3 d^2 + 2 \sqrt{d^4 - 64 a e^3}}}{4 e} + x\right)\right) \Big/ \left(e \left(-\frac{-d - \sqrt{3 d^2 - 2 \sqrt{d^4 - 64 a e^3}}}{4 e} + \frac{-d - \sqrt{3 d^2 + 2 \sqrt{d^4 - 64 a e^3}}}{4 e}\right) \left(-\frac{-d + \sqrt{3 d^2 - 2 \sqrt{d^4 - 64 a e^3}}}{4 e} + x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{3 d^2 - 2 \sqrt{d^4 - 64 a e^3}} \left(-\frac{-d + \sqrt{3 d^2 + 2 \sqrt{d^4 - 64 a e^3}}}{4 e} + x\right)\right) \Big/ \left(e \left(-\frac{-d - \sqrt{3 d^2 - 2 \sqrt{d^4 - 64 a e^3}}}{4 e} + \frac{-d + \sqrt{3 d^2 + 2 \sqrt{d^4 - 64 a e^3}}}{4 e}\right) \left(-\frac{-d + \sqrt{3 d^2 - 2 \sqrt{d^4 - 64 a e^3}}}{4 e} + x\right)\right)\right)}$$

$$\sqrt{\left(\left(\left(\sqrt{3 d^2 - 2 \sqrt{d^4 - 64 a e^3}} - \sqrt{3 d^2 + 2 \sqrt{d^4 - 64 a e^3}}\right) \left(d + \sqrt{3 d^2 - 2 \sqrt{d^4 - 64 a e^3}} + 4 e x\right)\right) \Big/ \left(\left(\sqrt{3 d^2 - 2 \sqrt{d^4 - 64 a e^3}} + \sqrt{3 d^2 + 2 \sqrt{d^4 - 64 a e^3}}\right) \left(-d + \sqrt{3 d^2 - 2 \sqrt{d^4 - 64 a e^3}} - 4 e x\right)\right)\right)} \left(-\frac{1}{4 e}\left(-d + \sqrt{3 d^2 - 2 \sqrt{d^4 - 64 a e^3}}\right)\right.$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)}$$

$$\Big(d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\Big)\Big)\Big)\Big/\Big(\Big(\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+$$

$$\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)\Big(-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\Big)\Big)\Big)\Big]\Big],$$

$$\frac{\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)^2}{\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)^2}\Big]+\frac{1}{2\,e}$$

$$\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}\;\text{EllipticPi}\Big[\frac{-\frac{-d-\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}}{-\frac{-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}},$$

$$\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)}$$

$$\Big(d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\Big)\Big)\Big)\Big/\Big(\Big(\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+$$

$$\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)\Big(-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\Big)\Big)\Big)\Big]\Big],$$

$$\frac{\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)^2}{\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)^2}\Big]\Big)\Big/$$

$$\Big(\Big(-\frac{-d-\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Big)$$

$$\Big(\frac{-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Big)$$

$$\sqrt{8\,a\,e^2-d^3\,x+8\,d\,e^2\,x^3+8\,e^3\,x^4}\Big)-$$

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

$$24\;d^2\;e^2$$

$$\Bigg(\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)$$

$$\left(-\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\left(-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)+$$

$$\frac{1}{2}\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)$$

$$\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)^2$$

$$\sqrt{\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\left(-\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\Big/\right.}$$

$$\left(e\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\right.$$

$$\left.\left.\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\left(-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\Big/\right.}$$

$$\left(e\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\right.$$

$$\left.\left.\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\right)$$

$$\sqrt{\left(\left(\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)\right.\right.\right.}$$

$$\left(d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\right)\Bigg)\Bigg/\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\right.\right.$$

$$\left.\left.\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)\left(-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\right)\right)\Bigg)\Bigg)$$

$$\left(\left(2\,e\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\right.\right.$$

$$\text{EllipticE}\Bigg[\text{ArcSin}\Bigg[\sqrt{\left(\left(\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)\right.\right.\right.\right.}$$

$$\left(d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\right)\Bigg)\Bigg/\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\right.\right.$$

$$\left.\left.\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)\left(-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\right)\right)\Bigg)\Bigg],$$

$$\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)^2\Bigg/\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\right.$$

$$\left.\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)^2\Bigg]\Bigg)\Bigg/\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\right)+$$

$$\left(2\,e\left(\frac{1}{4\,e}\left(-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\right)\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\right.\right.\right.$$

$$\left.\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)-\frac{1}{4\,e}\left(-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\right)$$

$$\left.\left(\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\right)$$

$$\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{\left(\left(\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)\right.\right.\right.\right.}$$

$$\left(d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\right)\Bigg)\Bigg/\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\right.\right.$$

$$\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\Big)\Big(-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-4 e x\Big)\Big)\Big)\Big)\Big],$$

$$\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)^2\Big/\Big(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-$$

$$\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\Big)^2\Big]\Big)\Big/\Big(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}$$

$$\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\Big)-$$

$$\Big(\Big(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-$$

$$\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\Big)$$

$$\text{EllipticPi}\Big[\frac{-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}}{-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}},\ \text{ArcSin}\Big[$$

$$\sqrt{\Big(\Big(\Big(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\Big)}$$

$$\Big(d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}+4 e x\Big)\Big)\Big/\Big(\Big(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}+$$

$$\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\Big)\Big(-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-4 e x\Big)\Big)\Big)\Big],$$

$$\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)^2\Big/$$

$$\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right)^2\Big]\Big)\Big/$$

$$\left.\left.\left.\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right)\right)\right)$$

Problem 622: 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):

$$\left(\left(5 d^4+256 a e^3\right)^{1/4} \sqrt{\frac{e \left(8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4\right)}{\left(5 d^4+256 a e^3\right) \left(1+\frac{16 e^2 \left(\frac{d}{4 e}+x\right)^2}{\sqrt{5 d^4+256 a e^3}}\right)^2}} \left(1+\frac{16 e^2 \left(\frac{d}{4 e}+x\right)^2}{\sqrt{5 d^4+256 a e^3}}\right) \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{d+4 e x}{\left(5 d^4+256 a e^3\right)^{1/4}}\right], \frac{1}{2} \left(1+\frac{3 d^2}{\sqrt{5 d^4+256 a e^3}}\right)\right]\right) \Big/ \left(\sqrt{2}\, e \sqrt{8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4}\right)$$

Result (type 4, 1065 leaves):

$$-\left(\left(\left(\left(-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-4 e x\right) \left(d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}+4 e x\right) \sqrt{\left(-\left(\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}} \left(d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}+4 e x\right)\right) \Big/ \left(\left(\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}\right) \left(-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}-4 e x\right)\right)\right)\right)} \sqrt{\left(\left(\left(3 d^2-2 \sqrt{d^4-64 a e^3}-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}} \sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}+\right.\right.\right.}$$

$$d\left(\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2\sqrt{d^4-64 a e^3}}\right)+$$

$$4 e\left(\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2\sqrt{d^4-64 a e^3}}\right)x\Bigg)\Bigg/$$

$$\Bigg(\Bigg(\left(\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}+\sqrt{3 d^2+2\sqrt{d^4-64 a e^3}}\right)$$

$$\left(-d+\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}-4 e x\right)\Bigg)\Bigg)\Bigg)$$

$$\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{\Bigg(\Bigg(\Bigg(\left(\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2\sqrt{d^4-64 a e^3}}\right)}$$

$$\left(d+\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}+4 e x\right)\Bigg)\Bigg)\Bigg/\Bigg(\Bigg(\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}+$$

$$\sqrt{3 d^2+2\sqrt{d^4-64 a e^3}}\Bigg)\left(-d+\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}-4 e x\right)\Bigg)\Bigg)\Bigg]\Bigg],$$

$$\frac{\left(\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}+\sqrt{3 d^2+2\sqrt{d^4-64 a e^3}}\right)^2}{\left(\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2\sqrt{d^4-64 a e^3}}\right)^2}\Bigg]\Bigg)\Bigg/$$

$$\Bigg(2 e\left(\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}-\sqrt{3 d^2+2\sqrt{d^4-64 a e^3}}\right)$$

$$\sqrt{\Bigg(\Bigg(\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}\left(-d+\sqrt{3 d^2+2\sqrt{d^4-64 a e^3}}-4 e x\right)\Bigg)\Bigg/}$$

$$\Bigg(\Bigg(\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}+\sqrt{3 d^2+2\sqrt{d^4-64 a e^3}}\Bigg)$$

$$\left(-d+\sqrt{3 d^2-2\sqrt{d^4-64 a e^3}}-4 e x\right)\Bigg)\Bigg)\sqrt{8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4}\Bigg)$$

Problem 623: 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):

$$\frac{4\,e\left(\frac{d}{4\,e}+x\right)\left(13\,d^4 - 256\,a\,e^3 - 48\,d^2\,e^2\left(\frac{d}{4\,e}+x\right)^2\right)}{\left(5\,d^8 - 64\,a\,d^4\,e^3 - 16\,384\,a^2\,e^6\right)\sqrt{8\,a\,e^2 - d^3\,x + 8\,d\,e^2\,x^3 + 8\,e^3\,x^4}} + \frac{384\,d^2\,e^2\left(\frac{d}{4\,e}+x\right)\sqrt{8\,a\,e^2 - d^3\,x + 8\,d\,e^2\,x^3 + 8\,e^3\,x^4}}{\left(d^4 - 64\,a\,e^3\right)\left(5\,d^4 + 256\,a\,e^3\right)^{3/2}\left(1 + \frac{16\,e^2\left(\frac{d}{4\,e}+x\right)^2}{\sqrt{5\,d^4+256\,a\,e^3}}\right)} -$$

$$\left(12\sqrt{2}\,d^2\sqrt{\frac{e\left(8\,a\,e^2 - d^3\,x + 8\,d\,e^2\,x^3 + 8\,e^3\,x^4\right)}{\left(5\,d^4 + 256\,a\,e^3\right)\left(1 + \frac{16\,e^2\left(\frac{d}{4\,e}+x\right)^2}{\sqrt{5\,d^4+256\,a\,e^3}}\right)^2}}\left(1 + \frac{16\,e^2\left(\frac{d}{4\,e}+x\right)^2}{\sqrt{5\,d^4 + 256\,a\,e^3}}\right)\right.$$

$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{d + 4\,e\,x}{\left(5\,d^4 + 256\,a\,e^3\right)^{1/4}}\right], \frac{1}{2}\left(1 + \frac{3\,d^2}{\sqrt{5\,d^4 + 256\,a\,e^3}}\right)\right]\right) \Big/$$

$$\left(\left(d^4 - 64\,a\,e^3\right)\left(5\,d^4 + 256\,a\,e^3\right)^{1/4}\sqrt{8\,a\,e^2 - d^3\,x + 8\,d\,e^2\,x^3 + 8\,e^3\,x^4}\right) -$$

$$\left(2\sqrt{2}\left(5\,d^4 + 256\,a\,e^3 - 3\,d^2\sqrt{5\,d^4 + 256\,a\,e^3}\right)\sqrt{\frac{e\left(8\,a\,e^2 - d^3\,x + 8\,d\,e^2\,x^3 + 8\,e^3\,x^4\right)}{\left(5\,d^4 + 256\,a\,e^3\right)\left(1 + \frac{16\,e^2\left(\frac{d}{4\,e}+x\right)^2}{\sqrt{5\,d^4+256\,a\,e^3}}\right)^2}}\right.$$

$$\left.\left(1 + \frac{16\,e^2\left(\frac{d}{4\,e}+x\right)^2}{\sqrt{5\,d^4 + 256\,a\,e^3}}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{d + 4\,e\,x}{\left(5\,d^4 + 256\,a\,e^3\right)^{1/4}}\right], \frac{1}{2}\left(1 + \frac{3\,d^2}{\sqrt{5\,d^4 + 256\,a\,e^3}}\right)\right]\right) \Big/$$

$$\left(\left(d^4 - 64\,a\,e^3\right)\left(5\,d^4 + 256\,a\,e^3\right)^{3/4}\sqrt{8\,a\,e^2 - d^3\,x + 8\,d\,e^2\,x^3 + 8\,e^3\,x^4}\right)$$

Result (type 4, 7629 leaves):

$$\frac{2\left(-5\,d^5 + 128\,a\,d\,e^3 - 8\,d^4\,e\,x + 512\,a\,e^4\,x + 72\,d^3\,e^2\,x^2 + 96\,d^2\,e^3\,x^3\right)}{\left(-d^4 + 64\,a\,e^3\right)\left(5\,d^4 + 256\,a\,e^3\right)\sqrt{8\,a\,e^2 - d^3\,x + 8\,d\,e^2\,x^3 + 8\,e^3\,x^4}} - \frac{1}{\left(d^4 - 64\,a\,e^3\right)\left(5\,d^4 + 256\,a\,e^3\right)}$$

$$8\,e\left(\left(2\,d^4\left(\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\right.\right.$$

$$\sqrt{\left(\left(\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\right.\right.}$$

$$\left.\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\Big/$$

$$\left(\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\right.$$

$$\left.\left.\left.\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\right)\right)\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)^2$$

$$\sqrt{\left(\left(\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\right.\right.}$$

$$\left.\left(-\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\Big/\left(\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\right.\right.$$

$$\left.\left.\left.\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\right)$$

$$\sqrt{\left(\left(\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\right.\right.}$$

$$\left.\left(-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\Big/\left(\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\right.\right.$$

$$\left.\left.\left.\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\right)$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\right.\right.}\right.\right.$$

$$\left.\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\Big/\left(\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\right.\right.$$

$$\left.\left.\left.\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)\right)\right)\right],$$

$$\left(\left(\left(\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.\right.$$

$$\left.\left.\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right)\right/$$

$$\left(\left(\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.\right.$$

$$\left.\left.\left.\left(\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right)\right]\right)\right/$$

$$\left(\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.$$

$$\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)$$

$$\left.\sqrt{8 a e^2-d^3 x+8 d e^2 x^3+8 e^3 x^4}\right)+$$

$$\left(256 a e^3\left(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.$$

$$\sqrt{\left(\left(\left(\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.\right.\right.}$$

$$\left.\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)\right)\right/$$

$$\left(\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.$$

$$\left.\left.\left.\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)\right)\right)\right)\left(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\right)^2$$

$$\sqrt{\left(\left(\left(\left(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}\right)\right.\right.\right.}$$

$$\Bigg(-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}+x\Bigg)\Bigg)\Bigg/\Bigg(\Bigg(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+$$

$$\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\Bigg)\Bigg(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\Bigg)\Bigg)\Bigg)$$

$$\sqrt{}\Bigg(\Bigg(\Bigg(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}\Bigg)$$

$$\Bigg(-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}+x\Bigg)\Bigg)\Bigg/\Bigg(\Bigg(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+$$

$$\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\Bigg)\Bigg(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\Bigg)\Bigg)\Bigg)$$

$$\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{}\Bigg(\Bigg(\Bigg(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\Bigg)$$

$$\Bigg(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\Bigg)\Bigg)\Bigg/\Bigg(\Bigg(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+$$

$$\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\Bigg)\Bigg(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+x\Bigg)\Bigg)\Bigg)\Bigg],$$

$$\Bigg(\Bigg(\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\Bigg)$$

$$\Bigg(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\Bigg)\Bigg)\Bigg/$$

$$\Bigg(\Bigg(\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d-\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\Bigg)$$

$$\Bigg(\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}-\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\Bigg)\Bigg)\Bigg]\Bigg)\Bigg/$$

$$\Bigg(\Bigg(-\frac{-d-\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}\Bigg)$$

$$\Bigg(-\frac{-d+\sqrt{3 d^2-2 \sqrt{d^4-64 a e^3}}}{4 e}+\frac{-d+\sqrt{3 d^2+2 \sqrt{d^4-64 a e^3}}}{4 e}\Bigg)$$

$$\left.\sqrt{8\,a\,e^2 - d^3\,x + 8\,d\,e^2\,x^3 + 8\,e^3\,x^4}\,\right) -$$

$$\left(12\,d^3\,e\left(\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e} - \frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\right.$$

$$\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)^2$$

$$\sqrt{\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\left(-\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\right/}$$

$$\left(e\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\right.$$

$$\left.\left.\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\left(-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\right/}$$

$$\left(e\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\right.$$

$$\left.\left.\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\right)$$

$$\sqrt{\left(\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)\left(d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\right.\right.\right.}$$

$$\left.\left.4\,e\,x\right)\right)\Big/\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)\right.$$

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

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)}$$

$$\Big(d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\Big)\Big)\Big/\Big(\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+$$

$$\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)\Big(-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\Big)\Big)\Big)\Big],$$

$$\frac{\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)^2}{\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)^2}\Big]+\frac{1}{2\,e}$$

$$\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}\;\text{EllipticPi}\Big[\frac{-\frac{-d-\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}}{-\frac{-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}},$$

$$\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)}$$

$$\Big(d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\Big)\Big)\Big/\Big(\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+$$

$$\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)\Big(-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\Big)\Big)\Big)\Big],$$

$$\frac{\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)^2}{\Big(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\Big)^2}\Big]\Big)\Big)\Big/$$

$$\Big(\Big(-\frac{-d-\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Big)$$

$$\Big(\frac{-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}\Big)$$

$$\sqrt{8\,a\,e^2-d^3\,x+8\,d\,e^2\,x^3+8\,e^3\,x^4}\Big)-$$

$$\frac{1}{\sqrt{8\,a\,e^2-d^3\,x+8\,d\,e^2\,x^3+8\,e^3\,x^4}}\,24\,d^2\,e^2\left(\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right.$$

$$\left(-\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\left(-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)+$$

$$\frac{1}{2}\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)$$

$$\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)^2$$

$$\sqrt{\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\,\left(-\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\right/}$$

$$\left(e\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\right.$$

$$\left.\left.\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\,\left(-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\right/}$$

$$\left(e\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\right.$$

$$\left.\left.\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+x\right)\right)\right)$$

$$\sqrt{\left(\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)\left(d+\right.\right.\right.}$$

$$\left.\left.\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\right)\right)\Big/\left(\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\right.\right.$$

$$\left.\left.\left.\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)\left(-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\right)\right)\right)$$

$$\Bigg(\Bigg(2\,e\left(-\frac{-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)$$

$$\text{EllipticE}\Bigg[\text{ArcSin}\Bigg[\sqrt{\Bigg(\Bigg(\Bigg(\Bigg(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\Bigg)}$$

$$\left(d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\right)\Bigg)\Bigg/\Bigg(\Bigg(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+$$

$$\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\Bigg)\left(-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\right)\Bigg)\Bigg)\Bigg]\,,$$

$$\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)^2\Bigg/$$

$$\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\right)^2\Bigg]\Bigg)\Bigg/$$

$$\left(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\right)+\Bigg(2\,e\left(\frac{1}{4\,e}\left(-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\right)\right.$$

$$\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)-$$

$$\frac{1}{4\,e}\left(-d-\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}\right)\left(\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\right.$$

$$\left.\left.\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\right)\text{EllipticF}\Bigg[$$

$$\text{ArcSin}\Bigg[\sqrt{\Bigg(\Bigg(\Bigg(\Bigg(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\Bigg)}$$

$$\left(d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\right)\Bigg)\Bigg/\Bigg(\Bigg(\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}+$$

$$\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}\Bigg)\left(-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\right)\Bigg)\Bigg)\Bigg]\,,$$

$$\left(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\right)^2\Big/$$

$$\left.\left.\left(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\right)^2\,\right]\right)\Big/$$

$$\left(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}\,\left(-\frac{-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\right.\right.$$

$$\left.\left.\frac{-d+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\right)-$$

$$\left(\left(-\frac{-d-\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\right.\right.$$

$$\left.\frac{-d-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}-\frac{-d+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)$$

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

$$\text{ArcSin}\left[\sqrt{\left(\left(\left(\left(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\right)\right.\right.\right.}\right.$$

$$\left.\left.\left(d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+4\,e\,x\right)\right)\Big/\left(\left(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+\right.\right.$$

$$\left.\left.\left.\left.\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\right)\left(-d+\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-4\,e\,x\right)\right)\right)\right],$$

$$\left(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}+\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\right)^2\Big/$$

$$\left.\left.\left(\sqrt{3\,d^2-2\sqrt{d^4-64\,a\,e^3}}-\sqrt{3\,d^2+2\sqrt{d^4-64\,a\,e^3}}\right)^2\,\right]\right)\Big/$$

$$\left(-\frac{-d+\sqrt{3\,d^2-2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}+\frac{-d+\sqrt{3\,d^2+2\,\sqrt{d^4-64\,a\,e^3}}}{4\,e}\right)\Bigg)\Bigg)\Bigg)$$

Problem 624: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 452 leaves, 8 steps):

$$-\frac{16\,(7+2\,a)\,\left(1-\sqrt{4+a}\right)\,\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\,(-1+x)}{35\,\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}+$$

$$\frac{2}{35}\left(13+5\,a-3\,(-1+x)^2\right)\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}\,(-1+x)+$$

$$\frac{1}{7}\left(3+a-2\,(-1+x)^2-(-1+x)^4\right)^{3/2}(-1+x)+\Bigg(16\,(7+2\,a)\,\left(1-\sqrt{4+a}\right)$$

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

$$\left(35\,\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\,\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}\right)+\Bigg(4\,(3+a)\,(16+5\,a)\,\sqrt{1+\sqrt{4+a}}$$

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

$$\left(35\,\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\,\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}\right)$$

Result (type 4, 6287 leaves):

$$\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}\,\left(\frac{1}{7}\,(-4-3\,a)+\frac{1}{35}\,(-32+15\,a)\,x+\frac{14\,x^2}{5}-\frac{66\,x^3}{35}+\frac{5\,x^4}{7}-\frac{x^5}{7}\right)+$$

$$\frac{4}{35}\Bigg(\Bigg(\Bigg(40\,\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\Big],$$

$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\left(46\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\Big],$$

$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$

$$\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big]\Bigg)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Bigg(10\,a^2\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\Big],$$

$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$

$$\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right]\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\left(112\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.$$

$$\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}\right.\right.$$

$$\left.\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\right],$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\Big[$$

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}\right.$$

$$\left.\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.$$

$$\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Bigg)\Bigg)\Bigg],\ \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Bigg(32\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\ \Bigg(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)$$

$$\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{\Bigg(\Bigg(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Bigg)\Bigg/}$$

$$\Bigg(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Bigg)\Bigg)\Bigg],$$

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

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\Bigg[\sqrt{\Bigg(\Bigg(\Bigg(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)}$$

$$\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Bigg)\Bigg/\Bigg(\Bigg(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)$$

$$\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)\Big)\Big],\ \frac{\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)^2}{\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)^2}\Big]\Big)\Big)\Big/$$

$$\Big(\sqrt{-1-\sqrt{4+a}}\ \Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\ \sqrt{a+8x-8x^2+4x^3-x^4}\Big)-$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$28\Big(\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\ \Big(-1-\sqrt{-1+\sqrt{4+a}}+x\Big)\ \Big(-1+\sqrt{-1+\sqrt{4+a}}+x\Big)+$$

$$2\ \Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\ \Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)^2$$

$$\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\ \Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\ \Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)}$$

$$\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\ \Big(-1-\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\ \Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)}\ \sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\ \Big(-1+\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\ \Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)}$$

$$\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\ \text{EllipticE}\Big[\text{ArcSin}\Big[$$

$$\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\ \Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\ \Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)}\Big],$$

$$\frac{\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)^2}{\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)^2}\Big]\Big)\Big/\Big(2\sqrt{-1-\sqrt{4+a}}\Big)+$$

$$\Big(\Big(-\Big(-1-\sqrt{-1-\sqrt{4+a}}\Big)\ \Big(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)+$$

$$\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\Big)\text{ EllipticF}\Big[\text{ArcSin}\Big[$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\right.\right.$$

$$\left.\left.\sqrt{-1+\sqrt{4+a}}\right)\right)+\Bigg(4\text{ EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\Big[$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\Bigg)-$$

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

$$\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\Bigg(\Bigg(\Bigg(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\text{EllipticE}\Big[\text{ArcSin}\Big[$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\right)+$$

$$\Bigg(\Bigg(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+$$

$$\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\,\text{EllipticF}\Big[\text{ArcSin}\Big[$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\right.\right.$$

$$\left.\left.\sqrt{-1+\sqrt{4+a}}\right)\right)+\Bigg(4\,\text{EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\Big[$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\Bigg)\Bigg)$$

Problem 625: 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):

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

Result (type 4, 3470 leaves):

$$\left(-\frac{1}{3}+\frac{x}{3}\right)\sqrt{a+8x-8x^2+4x^3-x^4}+$$
$$\frac{2}{3}\left(\left(4\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.\right.$$
$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$
$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\right],\right.$$

$$\left.\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right]\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Bigg(2a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\right],\right.$$

$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$

$$\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right]\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Bigg(4\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\Bigg(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)$$

$$\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\Bigg],$$

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

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\Bigg[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\left.\left.\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.$$

$$\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Big)\Big)\Big],\ \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Big)\Big)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)-$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\ \sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\Bigg(\Bigg(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\Big[\text{ArcSin}\Big[$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\right)+$$

$$\Bigg(\Bigg(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+$$

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

Problem 626: 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):

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

Result (type 4, 540 leaves):

$$\left(2\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(1+\sqrt{-1+\sqrt{4+a}}-x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right.$$

$$\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right],\right.$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}\right.$$

$$\left.\sqrt{a-x\left(-8+8x-4x^2+x^3\right)}\right)$$

Problem 627: 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):

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

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

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

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

Result (type 4, 3526 leaves):

$$\frac{\left(6+a-8x-ax+3x^2-x^3\right)\sqrt{a+8x-8x^2+4x^3-x^4}}{2(3+a)(4+a)\left(-a-8x+8x^2-4x^3+x^4\right)}+$$

$$\frac{1}{2(3+a)(4+a)}\left(\left(4\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.\right.$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\right],\right.$$

$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\left(2a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\right],\right.$$

$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\left(4 \left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right) \left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.$$

$$\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right) \left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right) \left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}} \left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right) \left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}} \left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right) \left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}} \left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right) \left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right) \Big/ \left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right) \left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\right],\right.$$

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

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}, \text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right.\right.\right.}\right.$$

$$\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big) \Big/ \left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.$$

$$\left.\left.\left.\left.\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\right], \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\Bigg)\Bigg) \Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}} \left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right) \sqrt{a+8 x-8 x^2+4 x^3-x^4}\right) -$$

$$\frac{1}{\sqrt{a+8 x-8 x^2+4 x^3-x^4}}$$

$$\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\Bigg(\Bigg(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\Big[\text{ArcSin}\Big[$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\right)+$$

$$\Bigg(\Bigg(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+$$

$$\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\text{EllipticF}\Big[$$

$$\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Big],$$

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

$$\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\right],$$

$$\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Bigg/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)$$

Problem 628: 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):

$$\frac{\left(5+a+(-1+x)^2\right)(-1+x)}{6\left(12+7a+a^2\right)\left(3+a-2(-1+x)^2-(-1+x)^4\right)^{3/2}}+\frac{\left(104+47a+5a^2+4(7+2a)(-1+x)^2\right)(-1+x)}{12(3+a)^2(4+a)^2\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}-\frac{(7+2a)\left(1-\sqrt{4+a}\right)\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)(-1+x)}{3(3+a)^2(4+a)^2\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+\left((7+2a)\left(1-\sqrt{4+a}\right)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]\right)\Big/\left(3(3+a)^2(4+a)^2\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}\right)+\left((16+5a)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]\right)\Big/\left(12(3+a)(4+a)^2\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}\right)$$

Result (type 4, 6386 leaves):

$$\sqrt{a+8x-8x^2+4x^3-x^4}\left(\frac{-6-a+8x+ax-3x^2+x^3}{6(3+a)(4+a)\left(-a-8x+8x^2-4x^3+x^4\right)^2}+\left(132+55a+5a^2-188x-71ax-5a^2x+84x^2+24ax^2-28x^3-8ax^3\right)\Big/\left(12(3+a)^2(4+a)^2\left(-a-8x+8x^2-4x^3+x^4\right)\right)\right)+$$

$$\frac{1}{12(3+a)^2(4+a)^2}\left(\left(40\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.\right.$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\right],\right.$$
$$\left.\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right]\Bigg)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Bigg(46\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\Big],$$
$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$
$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big]\right)\Big/$$
$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$
$$\Bigg(10a^2\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$
$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$
$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$
$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$
$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\Big],$$
$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$
$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\left(112\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.$$

$$\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right/}\right.\right.$$

$$\left.\left.\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\right],$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\ \text{EllipticPi}\Bigg[$$

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right.\right.\right.}\right.$$

$$\left.\left.\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.$$

$$\left.\left.\left.\left.\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\right],\ \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\Bigg)\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\left(32\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.$$

$$\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\right],\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\left[\right.$$

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\right],$$

$$\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)-$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$28\left(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+\right.$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\overline{\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\overline{\left.\left.\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\overline{\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcSin}\left[\right.\right.\right.\right.$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\overline{\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\right],$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\right)+$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\right.\right.$$

$$\left.\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\text{EllipticF}\left[\text{ArcSin}\left[\right.\right.$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\overline{\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\right],$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right) \Big/ \left(2\sqrt{-1-\sqrt{4+a}}\ \left(-\sqrt{-1-\sqrt{4+a}}+\right.\right.$$

$$\left.\left.\sqrt{-1+\sqrt{4+a}}\right)\right) + \left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\left[\right.\right.\right.$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\right],$$

$$\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right) \Big/ \left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right) -$$

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

$$\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\left.\left.\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)$$

$$\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcSin}\left[\right.\right.\right.\right.$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\right],$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right/\left(2\sqrt{-1-\sqrt{4+a}}\right)+$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\right.\right.$$

$$\left.\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\text{EllipticF}\Big[\text{ArcSin}\Big[$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right/}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\Big],$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\right.\right.$$

$$\left.\left.\sqrt{-1+\sqrt{4+a}}\right)\right)+\left(4\,\text{EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\Big[\right.$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right/}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\Big],$$

$$\left.\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)\right)$$

Problem 629: 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):

$$\frac{3}{16}(4+a)\left(1+(-1+x)^2\right)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}+$$
$$\frac{1}{8}\left(1+(-1+x)^2\right)\left(3+a-2(-1+x)^2-(-1+x)^4\right)^{3/2}-$$
$$\frac{16(7+2a)\left(1-\sqrt{4+a}\right)\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)(-1+x)}{35\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+$$
$$\frac{2}{35}\left(13+5a-3(-1+x)^2\right)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}\,(-1+x)+$$
$$\frac{1}{7}\left(3+a-2(-1+x)^2-(-1+x)^4\right)^{3/2}(-1+x)+$$
$$\frac{3}{16}(4+a)^2\,\text{ArcTan}\left[\frac{1+(-1+x)^2}{\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}\right]+\left(16(7+2a)\left(1-\sqrt{4+a}\right)\right.$$
$$\left.\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]\right)\Big/$$
$$\left(35\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}\right)+\left(4(3+a)(16+5a)\sqrt{1+\sqrt{4+a}}\right.$$
$$\left.\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]\right)\Big/$$
$$\left(35\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}\right)$$

Result (type 4, 7235 leaves):

$$\left(\left(\frac{1}{56}(52+11a)-\frac{1}{280}(116+55a)\,x+\frac{1}{80}(-36+25a)\,x^2+\frac{74x^3}{35}-\frac{43x^4}{28}+\frac{17x^5}{28}-\frac{x^6}{8}\right)\right.$$
$$\left.\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^{3/2}\right)\Big/\left(a+8x-8x^2+4x^3-x^4\right)+$$
$$\frac{1}{280\left(a+8x-8x^2+4x^3-x^4\right)^{3/2}}\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^{3/2}$$
$$\left(-\left(\left(2080\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.\right.\right.$$
$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Bigg)$$

$$\sqrt{\Bigg(\Bigg(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\Bigg)\Big/\Bigg(\Bigg(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Bigg)}$$

$$\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Bigg)\Bigg)\sqrt{\Bigg(\Bigg(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\Bigg)\Big/}$$

$$\Bigg(\Bigg(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Bigg)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Bigg)\Bigg)$$

$$\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{\Bigg(\Bigg(\Bigg(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Bigg)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Bigg)\Big/}$$

$$\Bigg(\Bigg(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Bigg)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Bigg)\Bigg)\Bigg],$$

$$\Bigg(\Bigg(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Bigg)\Bigg(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Bigg)\Bigg)\Big/$$

$$\Bigg(\Bigg(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Bigg)\Bigg(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Bigg)\Bigg)\Bigg]\Bigg)\Big/$$

$$\Bigg(\sqrt{-1-\sqrt{4+a}}\Bigg(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Bigg)\sqrt{a+8x-8x^2+4x^3-x^4}\Bigg)\Bigg)-$$

$$\Bigg(208\,a\Bigg(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Bigg)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\Bigg(\Bigg(\Bigg(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Bigg)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Bigg)\Big/}$$

$$\Bigg(\Bigg(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Bigg)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Bigg)\Bigg)$$

$$\sqrt{\Bigg(\Bigg(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\Bigg)\Big/\Bigg(\Bigg(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Bigg)}$$

$$\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Bigg)\Bigg)\sqrt{\Bigg(\Bigg(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\Bigg)\Big/}$$

$$\Bigg(\Bigg(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Bigg)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Bigg)\Bigg)$$

$$\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[\sqrt{\Bigg(\Bigg(\Bigg(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Bigg)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Bigg)\Big/}$$

$$\Bigg(\Bigg(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Bigg)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Bigg)\Bigg)\Bigg],$$

$$\Bigg(\Bigg(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Bigg)\Bigg(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Bigg)\Bigg)\Big/$$

$$\Bigg(\Bigg(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Bigg)\Bigg(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Bigg)\Bigg)\Bigg]\Bigg)\Big/$$

$$\Bigg(\sqrt{-1-\sqrt{4+a}}\Bigg(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Bigg)\sqrt{a+8x-8x^2+4x^3-x^4}\Bigg)+$$

$$\Bigg(110\,a^2\Bigg(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Bigg)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$
$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$
$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\right],\right.$$
$$\left.\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right]\Bigg)\Bigg/$$
$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$
$$\Bigg(6944\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$
$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}$$
$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\Bigg(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)$$
$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\right],\right.$$

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

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)$$

$$\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)\Big],\ \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Big)\Big)\Big/$$

$$\Big(\sqrt{-1-\sqrt{4+a}}\ \Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\sqrt{a+8x-8x^2+4x^3-x^4}\Big)+$$

$$\Big(2704\,a\Big(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)^2$$

$$\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)$$

$$\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\ \Big(-1-\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\ \Big(-1+\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)\Big(\Big(-1-\sqrt{-1-\sqrt{4+a}}\Big)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)\Big],$$

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

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}, \text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)}\Big], \frac{\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)^2}{\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)^2}\Big]\Big)\Big)\Big/$$

$$\Big(\sqrt{-1-\sqrt{4+a}}\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\sqrt{a+8x-8x^2+4x^3-x^4}\Big)+$$

$$\Bigg(210\,a^2\Big(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)^2$$

$$\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)}$$

$$\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\Big(-1-\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)}\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\Big(-1+\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)}\Bigg(\Big(-1-\sqrt{-1-\sqrt{4+a}}\Big)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)}\Big],$$

$$\frac{\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)^2}{\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)^2}\Big]+2\sqrt{-1-\sqrt{4+a}}\ \text{EllipticPi}\Big[$$

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}, \text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Bigg)\Bigg)\Bigg],\ \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Bigg)\Bigg/$$

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

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

$$896\left(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+\right.$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\ \sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\Bigg(\Bigg(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\Big[\text{ArcSin}\Big[$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\right)+$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\right.\right.$$

$$\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\Big)\ \text{EllipticF}\Big[$$

$$\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\right.\right.$$

$$\left.\left.\sqrt{-1+\sqrt{4+a}}\right)\right)+\Bigg(4\,\text{EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},$$

$$\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\Bigg)-$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}\,256\,a\,\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)$$

$$\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\left.\left.\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)$$

$$\Bigg(\Bigg(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\,\text{EllipticE}\Big[\text{ArcSin}\Big[$$

$$\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)}\Big],$$

$$\frac{\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)^2}{\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)^2}\Big]\Big)\Big/\Big(2\sqrt{-1-\sqrt{4+a}}\Big)+$$

$$\Big(\Big(-\Big(-1-\sqrt{-1-\sqrt{4+a}}\Big)\Big(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)+$$

$$\Big(-1+\sqrt{-1-\sqrt{4+a}}\Big)\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big)\,\text{EllipticF}\Big[$$

$$\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)}\Big],$$

$$\frac{\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)^2}{\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)^2}\Big]\Big)\Big/\Big(2\sqrt{-1-\sqrt{4+a}}\Big(-\sqrt{-1-\sqrt{4+a}}+$$

$$\sqrt{-1+\sqrt{4+a}}\Big)\Big)+\Big(4\,\text{EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},$$

$$\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)}\Big],$$

$$\frac{\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)^2}{\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)^2}\Big]\Big)\Big/\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Bigg)\Bigg)$$

Problem 630: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 466 leaves, 12 steps):

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

Result (type 4, 4389 leaves):

$$\left(\frac{1}{6}-\frac{x}{6}+\frac{x^2}{4}\right)\sqrt{a-x\left(-8+8x-4x^2+x^3\right)} + \frac{1}{6\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$\sqrt{a-x\left(-8+8x-4x^2+x^3\right)}\left(-\left(\left(8\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.\right.\right.$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\Big],$$

$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)\Bigg)+$$

$$\Bigg(2a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\left.\left.\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\Big],$$

$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Bigg(40\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)))\ \sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\ \left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\ \left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big)\ \Big(\Big(-1-\sqrt{-1-\sqrt{4+a}}\Big)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\ \left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\ \left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Big)\Big)\Big],$$

$$\frac{\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)^2}{\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)^2}\Big]+2\sqrt{-1-\sqrt{4+a}}\ \text{EllipticPi}\Big[$$

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/\ \Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)$$

$$\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Big)\Big)\Big],\ \frac{\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)^2}{\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)^2}\Big]\Big)\Big)\Big/$$

$$\Big(\sqrt{-1-\sqrt{4+a}}\ \Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\ \sqrt{a+8x-8x^2+4x^3-x^4}\Big)+$$

$$\Big(6a\ \Big(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\ \left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\ \left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\ \left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Big)\Big)$$

$$\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\ \left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\Big)\Big/\ \Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big)\ \sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\ \left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right/}\right.\right.$$

$$\left.\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\right],$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\ \text{EllipticPi}\Big[$$

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right.\right.\right.}\right.$$

$$\left.\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.$$

$$\left.\left.\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\Big],\ \left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)-$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$4\left(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+\right.$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right/}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\right/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.}$$

$$\left.\left.\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\right/}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)$$

$$\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcSin}\left[\right.\right.\right.\right.$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\right],$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\right)+$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\right.\right.$$

$$\left.\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\text{EllipticF}\left[\right.$$

$$\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}\right.$$

$$\left.\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\right],$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\right.\right.$$

$$\left.\left.\sqrt{-1+\sqrt{4+a}}\right)\right)+\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.\right.$$

$$\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}\right.$$

$$\left.\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\right],$$

$$\left.\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)\right)$$

Problem 631: 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):

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

Result (type 4, 865 leaves):

$$\Bigg(2\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}\ \Bigg(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Big)\Big)\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]+2\sqrt{-1-\sqrt{4+a}}$$

$$\text{EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},$$

$$\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Big)\Big)\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Bigg)\Bigg/\Bigg(\sqrt{-1-\sqrt{4+a}}$$

$$\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a-x\left(-8+8x-4x^2+x^3\right)}\Bigg)$$

Problem 632: 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):

$$\frac{1+(-1+x)^2}{2\,(4+a)\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}+\frac{\left(5+a+(-1+x)^2\right)(-1+x)}{2\left(12+7a+a^2\right)\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}-$$

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

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

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

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

Result (type 4, 3593 leaves):

$$\left(\left(-a-2x+ax-ax^2-x^3\right)\left(a+8x-8x^2+4x^3-x^4\right)^2\right)\Big/$$

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

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

$$\left(a+8x-8x^2+4x^3-x^4\right)^{3/2}\left(\left(4\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.\right.$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big)\Big)\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big)\Big],$$

$$\Big(\Big(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big)\Big/$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big)\Big]\Big)\Big/$$

$$\Big(\sqrt{-1-\sqrt{4+a}}\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\sqrt{a+8x-8x^2+4x^3-x^4}\Big)+$$

$$\Big(2a\Big(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\Big(\Big(\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big)$$

$$\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big)\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big)\Big],$$

$$\Big(\Big(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big)\Big/$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big)\Big]\Big)\Big/$$

$$\Big(\sqrt{-1-\sqrt{4+a}}\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\sqrt{a+8x-8x^2+4x^3-x^4}\Big)+$$

$$\Big(4\Big(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\Big)\Big)$$

$$\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big)\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big)\Bigg(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Big)\Big)\Big]\Big],$$

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

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)$$

$$\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Big)\Big)\Big],\ \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Bigg)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)-$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Big)\Big)$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\left.\left.\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)$$

$$\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcSin}\left[\right.\right.\right.\right.$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\Big],$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\right)+$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\,\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\right.\right.$$

$$\left.\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\,\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\text{EllipticF}\left[\text{ArcSin}\left[\right.\right.$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\Big],$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\,\left(-\sqrt{-1-\sqrt{4+a}}+\right.\right.$$

$$\left.\left.\sqrt{-1+\sqrt{4+a}}\right)\right)+\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\left[\right.\right.\right.$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\Big],$$

$$\left.\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\middle/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)\right)$$

Problem 633: 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):

$$\frac{1+(-1+x)^2}{6\,(4+a)\left(3+a-2(-1+x)^2-(-1+x)^4\right)^{3/2}}+\frac{1+(-1+x)^2}{3\,(4+a)^2\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+\frac{\left(5+a+(-1+x)^2\right)(-1+x)}{6\left(12+7a+a^2\right)\left(3+a-2(-1+x)^2-(-1+x)^4\right)^{3/2}}+$$

$$\frac{\left(104+47a+5a^2+4(7+2a)(-1+x)^2\right)(-1+x)}{12\,(3+a)^2(4+a)^2\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}-\frac{(7+2a)\left(1-\sqrt{4+a}\right)\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)(-1+x)}{3\,(3+a)^2(4+a)^2\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+$$

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

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

$$\left((16+5a)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]\right)\Bigg/$$

$$\left(12\,(3+a)(4+a)^2\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}\right)$$

Result (type 4, 6452 leaves):

$$\left(\left(a+8x-8x^2+4x^3-x^4\right)^3\left(\frac{a+2x-ax+ax^2+x^3}{6\,(3+a)(4+a)\left(-a-8x+8x^2-4x^3+x^4\right)^2}+\right.\right.$$

$$\left(60+7a-3a^2-116x-23ax+3a^2x+48x^2-4a^2x^2-28x^3-8ax^3\right)\Big/$$

$$\left(12\,(3+a)^2\,(4+a)^2\,\left(-a-8x+8x^2-4x^3+x^4\right)\right)\Big)\Big)\Big/$$

$$\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^{5/2}+\frac{1}{12\,(3+a)^2\,(4+a)^2\,\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^{5/2}}$$

$$\left(a+8x-8x^2+4x^3-x^4\right)^{5/2}\Bigg(\Bigg(40\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\Big],$$

$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$

$$\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big]\Bigg)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Bigg(46\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\Big],$$

$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\left(10a^2\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\left.\left.\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\Big],$$

$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big]\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\left(112\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big)\Big)\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\Big(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big)\Bigg(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\Big(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Big)\Big)\Big)\Big],$$

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

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)}$$

$$\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/\Big(\Big(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)$$

$$\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Big)\Big)\Big)\Big],\ \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Bigg)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Bigg(32\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\Big(\Big(\Big(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\Big(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Big)\Big)\Big)$$

$$\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\Big)\Big/\Big(\Big(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}$$

$$\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big)\Big)\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\right.$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\Big/}$$

$$\overline{\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)}\Big],$$

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

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right.\right.\right.}$$

$$\left.\left.\left.\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.$$

$$\left.\left.\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\Big],\ \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)-$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$28\left(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+\right.$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\Big/}$$

$$\overline{\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.}$$

$$\overline{\left.\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)}\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\right)\Big/}$$

$$\overline{\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)}$$

$$\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right) \text{EllipticE}\left[\text{ArcSin}\left[\right.\right.\right.\right.$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right/}$$

$$\left.\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\right],$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\right)+$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\right.\right.$$

$$\left.\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\text{EllipticF}\left[\right.$$

$$\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right/}\right.$$

$$\left.\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\right],$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\right.\right.$$

$$\left.\left.\sqrt{-1+\sqrt{4+a}}\right)\right)+\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.\right.$$

$$\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right/}\right.$$

$$\left.\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\right],$$

$$\left.\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)-$$

$$\frac{1}{\sqrt{a+8\,x-8\,x^2+4\,x^3-x^4}}\,8\,a\,\Bigg(\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\,\Big(-1-\sqrt{-1+\sqrt{4+a}}+x\Big)$$

$$\Big(-1+\sqrt{-1+\sqrt{4+a}}+x\Big)+$$

$$2\,\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\,\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)^2$$

$$\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\,\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\,\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)}$$

$$\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\,\Big(-1-\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\,\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)}\,\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\,\Big(-1+\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\,\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)}$$

$$\Bigg(\Bigg(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\,\text{EllipticE}\Big[\text{ArcSin}\Big[$$

$$\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\,\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\,\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)}\Big],$$

$$\frac{\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)^2}{\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)^2}\Big]\Bigg)\Big/\Big(2\,\sqrt{-1-\sqrt{4+a}}\Big)+$$

$$\Bigg(\Big(-\Big(-1-\sqrt{-1-\sqrt{4+a}}\Big)\,\Big(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)+$$

$$\Big(-1+\sqrt{-1-\sqrt{4+a}}\Big)\,\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big)\,\text{EllipticF}\Big[$$

$$\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\,\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\,\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Big)\Big/\Big(2\sqrt{-1-\sqrt{4+a}}\,\Big(-\sqrt{-1-\sqrt{4+a}}+$$

$$\sqrt{-1+\sqrt{4+a}}\Big)\Big)+\Big(4\,\text{EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},$$

$$\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Big)\Big/\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big)\Big)\Big)$$

Problem 634: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 585 leaves, 15 steps) :

$$\frac{3}{8}(4+a)\left(1+(-1+x)^2\right)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}+$$
$$\frac{1}{4}\left(1+(-1+x)^2\right)\left(3+a-2(-1+x)^2-(-1+x)^4\right)^{3/2}+$$
$$\frac{4\left(140+111a+21a^2\right)\left(1-\sqrt{4+a}\right)\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)(-1+x)}{315\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+$$
$$\frac{2}{315}\left(2(80+27a)+3(20+7a)(-1+x)^2\right)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}\,(-1+x)+$$
$$\frac{1}{63}\left(15+7(-1+x)^2\right)\left(3+a-2(-1+x)^2-(-1+x)^4\right)^{3/2}(-1+x)+$$
$$\frac{3}{8}(4+a)^2\,\text{ArcTan}\left[\frac{1+(-1+x)^2}{\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}\right]-\left(4\left(140+111a+21a^2\right)\left(1-\sqrt{4+a}\right)\right.$$
$$\left.\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]\right)\Big/$$
$$\left(315\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}\right)+\left(4(3+a)(100+33a)\right.$$
$$\left.\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]\right)\Big/$$
$$\left(315\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}\right)$$

Result (type 4, 8500 leaves):

$$\left(\left(\frac{1}{252}(404+107a)+\frac{(460+81a)x}{1260}-\frac{1}{360}(100+39a)x^2+\frac{1}{315}(-80+77a)x^3+\frac{71x^4}{42}-\right.\right.$$
$$\left.\left.\frac{163x^5}{126}+\frac{19x^6}{36}-\frac{x^7}{9}\right)\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^{3/2}\right)\Big/\left(a+8x-8x^2+4x^3-x^4\right)+$$
$$\frac{1}{1260\left(a+8x-8x^2+4x^3-x^4\right)^{3/2}}\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^{3/2}$$
$$\left(-\left(\left(16160\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.\right.\right.$$
$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)$$

$$\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\Big(-1-\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\Big(-1+\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)\Big],$$

$$\Big(\Big(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big)\Big/$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big)\Big]\Big)\Big/$$

$$\Big(\sqrt{-1-\sqrt{4+a}}\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\sqrt{a+8x-8x^2+4x^3-x^4}\Big)\Big)-$$

$$\Big(5200\,a\Big(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)^2$$

$$\sqrt{\Big(\Big(\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)$$

$$\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\Big(-1-\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\Big(-1+\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)\Big],$$

$$\Big(\Big(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big)\Big/$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big)\Big]\Big)\Big/$$

$$\Big(\sqrt{-1-\sqrt{4+a}}\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\sqrt{a+8x-8x^2+4x^3-x^4}\Big)-$$

$$\Big(162\,a^2\Big(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)^2$$

$$\sqrt{\Big(\Big(\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)$$

$$\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\Big(-1-\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\Big(-1+\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)\Big]\text{,}$$

$$\Big(\Big(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big)\Big/$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big)\Big]\Big)\Big/$$

$$\Big(\sqrt{-1-\sqrt{4+a}}\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\sqrt{a+8x-8x^2+4x^3-x^4}\Big)+$$

$$\Big(21280\Big(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)^2$$

$$\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)$$

$$\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\Big(-1-\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\Big(-1+\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)\Big(\Big(-1-\sqrt{-1-\sqrt{4+a}}\Big)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)\Big]\text{,}$$

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

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/\Big(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)$$

$$\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Big)\Big)\Big],\ \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Big)\Big)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Bigg(8016\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\Big(\Big(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Big)\Big)$$

$$\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\Big)\Big/\Big(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)}$$

$$\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big)\ \sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big)\ \Bigg(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Big)\Big)\Big],$$

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

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)$$

$$\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)\Big],\frac{\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)^2}{\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)^2}\Big]\Big)\Big)\Big/$$

$$\Big(\sqrt{-1-\sqrt{4+a}}\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\sqrt{a+8x-8x^2+4x^3-x^4}\Big)+$$

$$\Big(546a^2\Big(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)^2$$

$$\sqrt{\Big(\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)$$

$$\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\Big(-1-\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\Big(-1+\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)\Big(\Big(-1-\sqrt{-1-\sqrt{4+a}}\Big)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)\Big],$$

$$\frac{\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)^2}{\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)^2}\Big]+2\sqrt{-1-\sqrt{4+a}}\;\text{EllipticPi}\Big[$$

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)$$

$$\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Bigg)\Bigg)\Bigg],\ \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$2240\left(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+\right.$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\Big[\text{ArcSin}\Big[\right.\right.$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Bigg/\left(2\sqrt{-1-\sqrt{4+a}}\right)+$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\right.\right.$$

$$\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\text{ EllipticF}\Big[$$

$$\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+\Bigg(4\text{ EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},$$

$$\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\Bigg)+$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}\,1776\,a\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\Bigg(\Bigg(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\Big[\text{ArcSin}\Big[$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\right)+$$

$$\Bigg(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\right.$$

$$\left.\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\text{EllipticF}\Big[$$

$$\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\right.\right.$$

$$\left.\left.\sqrt{-1+\sqrt{4+a}}\right)\right)+\Bigg(4\,\text{EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},$$

$$\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\Bigg)+$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}} 336 a^2 \Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)$$

$$\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\Bigg(\Bigg(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\Big[\text{ArcSin}\Big[$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\right)+$$

$$\Bigg(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\right.$$

$$\left.\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\text{EllipticF}\Big[$$

$$\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Bigg/\Bigg(2\sqrt{-1-\sqrt{4+a}}\,\Bigg(-\sqrt{-1-\sqrt{4+a}}+$$

$$\sqrt{-1+\sqrt{4+a}}\Bigg)\Bigg)+\Bigg(4\,\text{EllipticPi}\Bigg[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},$$

$$\text{ArcSin}\Bigg[\sqrt{\Bigg(\Bigg(\Bigg(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Bigg)\Bigg(-1+\sqrt{-1-\sqrt{4+a}}+x\Bigg)\Bigg)\Bigg/}$$

$$\Bigg(\Bigg(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Bigg)\Bigg(1+\sqrt{-1-\sqrt{4+a}}-x\Bigg)\Bigg)\Bigg)\Bigg],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Bigg/\Bigg(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Bigg)\Bigg)\Bigg)\Bigg)$$

Problem 635: 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):

$$\frac{1}{2}\left(1+(-1+x)^2\right)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}+\frac{2(8+3a)\left(1-\sqrt{4+a}\right)\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)(-1+x)}{15\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+$$

$$\frac{1}{15}\left(7+3(-1+x)^2\right)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}\,(-1+x)+$$

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

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

$$\left.\left.-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]\right)\Bigg/\left(15\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}\right)+$$

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

$$\left(15\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2(-1+x)^2-(-1+x)^4}\right)$$

Result (type 4, 5647 leaves):

$$\left(\frac{1}{3}+\frac{x}{15}-\frac{x^2}{10}+\frac{x^3}{5}\right)\sqrt{a-x\left(-8+8x-4x^2+x^3\right)}+\frac{1}{15\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$\sqrt{a-x\left(-8+8x-4x^2+x^3\right)}\left(-\left(\left(40\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.\right.\right.$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\overline{\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\overline{\left.\left.\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\overline{\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}\right.\right.$$

$$\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Bigg)\Bigg]\Big],$$

$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$

$$\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big]\Bigg)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)\Bigg)-$$

$$\Bigg(2a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\left.\left.\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\Big],$$

$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$

$$\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big]\Bigg)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Bigg(56\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\left.\left.\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\Bigg(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\middle/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\Big],$$

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

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\left.\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.$$

$$\left.\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\Big],\ \frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Bigg)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Bigg(6a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\middle/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\left.\left.\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\middle/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\Bigg(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)\Big],$$

$$\frac{\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)^2}{\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)^2}\Big]+2\sqrt{-1-\sqrt{4+a}}\ \text{EllipticPi}\Big[$$

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)$$

$$\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)\Big],\ \frac{\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)^2}{\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)^2}\Big]\Big)\Big)\Big/$$

$$\Big(\sqrt{-1-\sqrt{4+a}}\ \Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\sqrt{a+8x-8x^2+4x^3-x^4}\Big)+$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$16\Big(\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big(-1-\sqrt{-1+\sqrt{4+a}}+x\Big)\Big(-1+\sqrt{-1+\sqrt{4+a}}+x\Big)+$$

$$2\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)^2$$

$$\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)$$

$$\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\ \Big(-1-\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\ \Big(-1+\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)$$

$$\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\ \text{EllipticE}\Big[\text{ArcSin}\Big[$$

$$\sqrt{\left(\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\right)+$$

$$\Bigg(\Bigg(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+$$

$$\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\text{ EllipticF}\Big[$$

$$\text{ArcSin}\Big[\sqrt{\left(\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\right.\right.$$

$$\left.\left.\sqrt{-1+\sqrt{4+a}}\right)\right)+\Bigg(4\text{ EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},$$

$$\text{ArcSin}\Big[\sqrt{\left(\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\Bigg)+$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}\,6\,a\,\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)$$

$$\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\ \sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

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

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\text{EllipticF}\left[\right.\right.$$

$$\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\right],$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\right.\right.$$

$$\left.\left.\sqrt{-1+\sqrt{4+a}}\right)\right)+\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.\right.$$

$$\text{ArcSin}\left[\sqrt{\left(\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right/\right.\right.}$$

$$\left.\left.\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)\right)\right],$$

$$\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)\right)$$

Problem 636: 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):

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

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

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

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

Result (type 4, 1247 leaves):

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

$$\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\frac{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\sqrt{\frac{\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)}}$$

$$\Bigg(\Bigg(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)$$

$$\text{EllipticE}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\Big(\Big(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\Big)\Big)\Big]\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\right)+$$

$$\Bigg(\Big(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+$$

$$\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\Big)\Big)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\Big)\Big],$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\right) \Big/ \left(2\sqrt{-1-\sqrt{4+a}}\right.$$

$$\left.\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+\left(4\,\text{EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\right.$$

$$\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\Big)\Big/}$$

$$\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\Big)\Big],$$

$$\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\right)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)$$

Problem 637: 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):

$$\frac{1+(-1+x)^2}{(4+a)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+$$

$$\frac{(4+a)\left(2+(-1+x)^2\right)(-1+x)}{2\left(12+7a+a^2\right)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}-\frac{\left(1-\sqrt{4+a}\right)\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)(-1+x)}{2(3+a)\sqrt{3+a-2(-1+x)^2-(-1+x)^4}}+$$

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

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

Result (type 4, 2941 leaves):

$$\left(\left(-a-8x-ax+6x^2+ax^2-4x^3-ax^3\right)\left(a+8x-8x^2+4x^3-x^4\right)^2\right)\Big/$$

$$\left(2(3+a)(4+a)\left(-a-8x+8x^2-4x^3+x^4\right)\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^{3/2}\right)-$$

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

$$\left(a+8\,x-8\,x^2+4\,x^3-x^4\right)^{3/2}\left(\left(2\,\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.\right.$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right/}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\right/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.}$$

$$\left.\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big)\;\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\right/}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right/}\right.\right.$$

$$\left.\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\right],$$

$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$

$$\left.\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right]\right)\Big/$$

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

$$\left(4\,\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\,\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right/}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\,\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\,\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\right/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.}$$

$$\left.\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big)\;\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\,\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\right/}$$

$$\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\Bigg/\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\right.$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)}\Big],$$

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

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Bigg)\Bigg/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$\Bigg(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)}\ \sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)}$$

$$\Bigg(\Bigg(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\Bigg[\text{ArcSin}\Bigg[$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Bigg],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\right)+$$

$$\Bigg(\Bigg(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+$$

$$\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\text{EllipticF}\Bigg[\text{ArcSin}\Bigg[$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Bigg],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Big/\Bigg(2\sqrt{-1-\sqrt{4+a}}\Bigg(-\sqrt{-1-\sqrt{4+a}}+$$

$$\sqrt{-1+\sqrt{4+a}}\Bigg)\Bigg)+\Bigg(4\,\text{EllipticPi}\Bigg[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\Bigg[$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Bigg],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Bigg]\Bigg)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\Bigg)\Bigg)$$

Problem 638: 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):

$$\frac{1+(-1+x)^2}{3\,(4+a)\left(3+a-2\,(-1+x)^2-(-1+x)^4\right)^{3/2}}+\frac{2\left(1+(-1+x)^2\right)}{3\,(4+a)^2\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}+\frac{(4+a)\left(2+(-1+x)^2\right)(-1+x)}{6\left(12+7a+a^2\right)\left(3+a-2\,(-1+x)^2-(-1+x)^4\right)^{3/2}}+\frac{\left(29+7a+(13+3a)\,(-1+x)^2\right)(-1+x)}{12\,(3+a)^2\,(4+a)\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}-\frac{(13+3a)\left(1-\sqrt{4+a}\right)\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)(-1+x)}{12\,(3+a)^2\,(4+a)\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}+\left((13+3a)\left(1-\sqrt{4+a}\right)\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticE}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]\right)\Bigg/\left(12\,(3+a)^2\,(4+a)\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}\right)+\frac{\sqrt{1+\sqrt{4+a}}\left(1+\frac{(-1+x)^2}{1-\sqrt{4+a}}\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{-1+x}{\sqrt{1+\sqrt{4+a}}}\right],-\frac{2\sqrt{4+a}}{1-\sqrt{4+a}}\right]}{12\left(12+7a+a^2\right)\sqrt{\frac{1+\frac{(-1+x)^2}{1-\sqrt{4+a}}}{1+\frac{(-1+x)^2}{1+\sqrt{4+a}}}}\sqrt{3+a-2\,(-1+x)^2-(-1+x)^4}}$$

Result (type 4, 5812 leaves):

$$\left(\left(a+8x-8x^2+4x^3-x^4\right)^3\left(\frac{a+8x+ax-6x^2-ax^2+4x^3+ax^3}{6\,(3+a)\,(4+a)\left(-a-8x+8x^2-4x^3+x^4\right)^2}+\left(24-14a-6a^2-128x-36ax+84x^2+27ax^2+a^2x^2-52x^3-25ax^3-3a^2x^3\right)\Big/\left(12\,(3+a)^2\,(4+a)^2\left(-a-8x+8x^2-4x^3+x^4\right)\right)\right)\right)\Bigg/\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^{5/2}-\frac{1}{12\,(3+a)^2\,(4+a)\left(a-x\left(-8+8x-4x^2+x^3\right)\right)^{5/2}}$$

$$\left(a+8x-8x^2+4x^3-x^4\right)^{5/2}\left(\left(20\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.\right.$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\left.\left.\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\Big],$$

$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$

$$\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big]\Big)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\Big(4a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right.\right.}$$

$$\left.\left.\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)$$

$$\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\right.}$$

$$\left.\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)\Big],$$

$$\left(\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big/$$

$$\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\Big]\Big)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)-$$

$$\left(52\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\right.$$

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

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\right],\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)-$$

$$\left(12\,a\left(-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2\right.$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\ \sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\ \left(\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\right.$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\right],\right.$$

$$\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]+2\sqrt{-1-\sqrt{4+a}}\ \text{EllipticPi}\Big[$$

$$\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\ \text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\right],$$

$$\left.\left.\left.\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\right)\Big/$$

$$\left(\sqrt{-1-\sqrt{4+a}}\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\sqrt{a+8x-8x^2+4x^3-x^4}\right)+$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}$$

$$13\left(\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)+\right.$$

$$2\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)^2$$

$$\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}$$

$$\sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1-\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}\ \sqrt{\left(\left(\sqrt{-1-\sqrt{4+a}}\left(-1+\sqrt{-1+\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1-\sqrt{-1-\sqrt{4+a}}+x\right)\right)\right)}$$

$$\Bigg(\Bigg(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\text{EllipticE}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\right)+$$

$$\Bigg(\Bigg(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\Bigg)\text{EllipticF}\Big[$$

$$\text{ArcSin}\Big[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\Big],$$

$$\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\Big]\Bigg)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+\Bigg(4\,\text{EllipticPi}\Big[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},$$

$$\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)\Big],$$

$$\frac{\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)^2}{\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)^2}\Big]\Bigg)\Big/\Big(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Bigg)\Bigg)+$$

$$\frac{1}{\sqrt{a+8x-8x^2+4x^3-x^4}}\,3a\Bigg(\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big(-1-\sqrt{-1+\sqrt{4+a}}+x\Big)$$

$$\Big(-1+\sqrt{-1+\sqrt{4+a}}+x\Big)+$$

$$2\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)^2$$

$$\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)$$

$$\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\Big(-1-\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)}$$

$$\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)\sqrt{\Big(\Big(\sqrt{-1-\sqrt{4+a}}\Big(-1+\sqrt{-1+\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1-\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big)$$

$$\Bigg(\Bigg(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\,\text{EllipticE}\Big[\text{ArcSin}\Big[$$

$$\sqrt{\Big(\Big(\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)\Big(-1+\sqrt{-1-\sqrt{4+a}}+x\Big)\Big)\Big/}$$

$$\Big(\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)\Big(1+\sqrt{-1-\sqrt{4+a}}-x\Big)\Big)\Big)\Big],$$

$$\frac{\Big(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\Big)^2}{\Big(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\Big)^2}\Big]\Bigg)\Big/\Big(2\sqrt{-1-\sqrt{4+a}}\Big)+$$

$$\left(\left(-\left(-1-\sqrt{-1-\sqrt{4+a}}\right)\left(-2-\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)+\left(-1+\sqrt{-1-\sqrt{4+a}}\right)\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\right)\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(2\sqrt{-1-\sqrt{4+a}}\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)+\left(4\,\text{EllipticPi}\left[\frac{\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}}{-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}},\text{ArcSin}\left[\sqrt{\left(\left(\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)\left(-1+\sqrt{-1-\sqrt{4+a}}+x\right)\right)\Big/\left(\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\left(1+\sqrt{-1-\sqrt{4+a}}-x\right)\right)\right)}\right],\frac{\left(\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)^2}{\left(\sqrt{-1-\sqrt{4+a}}-\sqrt{-1+\sqrt{4+a}}\right)^2}\right]\right)\Big/\left(-\sqrt{-1-\sqrt{4+a}}+\sqrt{-1+\sqrt{4+a}}\right)\right)\right)$$

Problem 639: 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):

$$-\left(\left(x^2\sqrt{\frac{261-6\left(1+\frac{4}{x}\right)^2+\left(1+\frac{4}{x}\right)^4}{\left(87+\frac{\sqrt{29}\,(4+x)^2}{x^2}\right)^2}}\left(87+\frac{\sqrt{29}\,(4+x)^2}{x^2}\right)\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{4+x}{\sqrt{3}\,29^{1/4}\,x}\right],\frac{1}{58}\left(29+\sqrt{29}\right)\right]\right)\Big/\left(8\sqrt{3}\,29^{1/4}\sqrt{8+8x-x^3+8x^4}\right)\right)$$

Result (type 4, 927 leaves):

$$
\begin{aligned}
&-\Bigg(\Bigg(2\,\text{EllipticF}\Big[\\
&\quad \text{ArcSin}\Big[\sqrt{\Big(\big(\big(x-\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,1]\big)\,\big(\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/\big(\big(x-\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,2]\big)\,\big(\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],\\
&\quad \big(\big(\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,2]-\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]\big)\big)\Big/\\
&\quad \big(\big(\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\,\&,\,2]-\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,4]\big)\big)\Big]\\
&\quad \big(x-\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,2]\big)^2\\
&\quad \sqrt{\Big(\big(\big(\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,1]-\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,2]\big)\,\big(x-\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,3]\big)\big)\Big/\big(\big(x-\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,2]\big)\,\big(\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,1]-\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,3]\big)\big)\Big)}\\
&\quad \big(\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,1]-\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,4]\big)\\
&\quad \sqrt{\Big(\big(\big(x-\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,1]\big)\,\big(\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,1]-\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,2]\big)\,\big(x-\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,4]\big)\,\big(\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/\Big(\big(x-\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,2]\big)^2\,\big(\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,1]-\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,4]\big)^2\Big)\Big)}\Bigg)\Bigg/\\
&\Bigg(\sqrt{8+8\,x-x^3+8\,x^4}\,\big(-\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,1]+\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,2]\big)\\
&\quad \big(\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,2]-\text{Root}[8+8\,\#1-\#1^3+8\,\#1^4\,\&,\,4]\big)\Bigg)\Bigg)
\end{aligned}
$$

Problem 640: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(8+8\,x-x^3+8\,x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 431 leaves, 10 steps):

$$-\frac{\left(66-\left(1+\frac{4}{x}\right)^2\right) x^2}{1008 \sqrt{8+8 x-x^3+8 x^4}}+\frac{\left(216-7 \left(1+\frac{4}{x}\right)^2\right) \left(1+\frac{4}{x}\right) x^2}{12528 \sqrt{8+8 x-x^3+8 x^4}}+$$

$$\frac{7 \left(261-6 \left(1+\frac{4}{x}\right)^2+\left(1+\frac{4}{x}\right)^4\right) \left(1+\frac{4}{x}\right) x^2}{432 \sqrt{29} \sqrt{8+8 x-x^3+8 x^4} \left(87+\frac{\sqrt{29} (4+x)^2}{x^2}\right)}-$$

$$\left(7 x^2 \sqrt{\frac{261-6 \left(1+\frac{4}{x}\right)^2+\left(1+\frac{4}{x}\right)^4}{\left(87+\frac{\sqrt{29} (4+x)^2}{x^2}\right)^2}} \left(87+\frac{\sqrt{29} (4+x)^2}{x^2}\right)\right.$$

$$\left.\text{EllipticE}\left[2 \text{ArcTan}\left[\frac{4+x}{\sqrt{3}\, 29^{1/4} x}\right], \frac{1}{58} \left(29+\sqrt{29}\right)\right]\right) \Big/ \left(144 \sqrt{3}\, 29^{3/4} \sqrt{8+8 x-x^3+8 x^4}\right)+$$

$$\left(\left(14-5 \sqrt{29}\right) x^2 \sqrt{\frac{261-6 \left(1+\frac{4}{x}\right)^2+\left(1+\frac{4}{x}\right)^4}{\left(87+\frac{\sqrt{29} (4+x)^2}{x^2}\right)^2}} \left(87+\frac{\sqrt{29} (4+x)^2}{x^2}\right)\right.$$

$$\left.\text{EllipticF}\left[2 \text{ArcTan}\left[\frac{4+x}{\sqrt{3}\, 29^{1/4} x}\right], \frac{1}{58} \left(29+\sqrt{29}\right)\right]\right) \Big/ \left(576 \sqrt{3}\, 29^{3/4} \sqrt{8+8 x-x^3+8 x^4}\right)$$

Result (type 4, 4865 leaves):

$$\frac{544+1539 x-1146 x^2+784 x^3}{21924 \sqrt{8+8 x-x^3+8 x^4}}+$$

$$\frac{1}{6264} \Bigg(\Big(28 \left(x-\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 2\right]\right)^2 \Big(-\text{EllipticF}\Big[\text{ArcSin}\Big[$$

$$\sqrt{}\Big(\Big(\left(x-\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 1\right]\right) \left(\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 2\right]-\right.$$

$$\left.\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 4\right]\right)\Big) \Big/ \Big(\left(x-\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 2\right]\right)$$

$$\left(\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 1\right]-\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 4\right]\right)\Big)\Big)\Big],$$

$$-\Big(\Big(\left(\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 2\right]-\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 3\right]\right)$$

$$\left(\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 1\right]-\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 4\right]\right)\Big) \Big/$$

$$\Big(\left(-\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 1\right]+\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 3\right]\right)$$

$$\left(\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 2\right]-\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 4\right]\right)\Big)\Big)\Big]$$

$$\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 2\right]+\text{EllipticPi}\Big[\Big(-\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 1\right]+$$

$$\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 4\right]\Big) \Big/$$

$$\left(-\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 2\right]+\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 4\right]\right),$$

$$\text{ArcSin}\Big[\sqrt{}\Big(\Big(\left(x-\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 1\right]\right) \left(\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 2\right]-\right.$$

$$\left.\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 4\right]\right)\Big) \Big/ \Big(\left(x-\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 2\right]\right)$$

$$\left(\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 1\right]-\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 4\right]\right)\Big)\Big)\Big],$$

$$-\Big(\Big(\left(\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 2\right]-\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 3\right]\right)$$

$$\left(\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 1\right]-\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 4\right]\right)\Big) \Big/$$

$$\Big(\left(-\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 1\right]+\text{Root}\left[8+8 \#1-\#1^3+8 \#1^4 \&, 3\right]\right)$$

```
(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])))) /
(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])) -
1/Sqrt[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])) / ((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 &, 3] - Root[8 + 8 #1 - #1^3 + 8 #1^4 &, 4])))
```

Problem 641: 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):

$$-\left(\left(\left(\sqrt{5}+\left(1+\frac{1}{x}\right)^2\right)\sqrt{\frac{5-2\left(1+\frac{1}{x}\right)^2+\left(1+\frac{1}{x}\right)^4}{\left(\sqrt{5}+\left(1+\frac{1}{x}\right)^2\right)^2}}\,x^2\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{1+\frac{1}{x}}{5^{1/4}}\right],\frac{1}{10}\left(5+\sqrt{5}\right)\right]\right)\Big/\left(2\times 5^{1/4}\sqrt{1+4x+4x^2+4x^4}\right)\right)$$

Result (type 4, 249 leaves):

$$\left((2-i)\sqrt{-\frac{1}{10}+\frac{i}{5}}\sqrt{\frac{\left(2i+\sqrt{-1-2i}-\sqrt{-1+2i}\right)\left(-i+\sqrt{-1-2i}-2x\right)}{\left(-2i+\sqrt{-1-2i}+\sqrt{-1+2i}\right)\left(i+\sqrt{-1-2i}+2x\right)}}\left(1+2x+2ix^2\right)\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{\left(2i+\sqrt{-1-2i}+\sqrt{-1+2i}\right)\left(-i+\sqrt{-1+2i}+2x\right)}{\sqrt{-1+2i}\left(i+\sqrt{-1-2i}+2x\right)}}}{\sqrt{2}}\right],\frac{1}{2}\left(5-\sqrt{5}\right)\right]\right)\Big/$$
$$\left(\sqrt{\frac{(1+2i)\left((-1+i)+\sqrt{-1-2i}\right)\left(1+2x+2ix^2\right)}{\left(i+\sqrt{-1-2i}+2x\right)^2}}\sqrt{1+4x+4x^2+4x^4}\right)$$

Problem 642: 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):

$$-\frac{\left(3-\left(1+\frac{1}{x}\right)^2\right)x^2}{\sqrt{1+4x+4x^2+4x^4}}+\frac{\left(13-9\left(1+\frac{1}{x}\right)^2\right)\left(1+\frac{1}{x}\right)x^2}{10\sqrt{1+4x+4x^2+4x^4}}+\frac{9\left(5-2\left(1+\frac{1}{x}\right)^2+\left(1+\frac{1}{x}\right)^4\right)\left(1+\frac{1}{x}\right)x^2}{10\left(\sqrt{5}+\left(1+\frac{1}{x}\right)^2\right)\sqrt{1+4x+4x^2+4x^4}}-$$

$$\left(9\left(\sqrt{5}+\left(1+\frac{1}{x}\right)^2\right)\sqrt{\frac{5-2\left(1+\frac{1}{x}\right)^2+\left(1+\frac{1}{x}\right)^4}{\left(\sqrt{5}+\left(1+\frac{1}{x}\right)^2\right)^2}}\,x^2\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{1+\frac{1}{x}}{5^{1/4}}\right],\frac{1}{10}\left(5+\sqrt{5}\right)\right]\right)\Big/$$

$$\left(2\times 5^{3/4}\sqrt{1+4x+4x^2+4x^4}\right)+\left(3\left(3-\sqrt{5}\right)\left(\sqrt{5}+\left(1+\frac{1}{x}\right)^2\right)\sqrt{\frac{5-2\left(1+\frac{1}{x}\right)^2+\left(1+\frac{1}{x}\right)^4}{\left(\sqrt{5}+\left(1+\frac{1}{x}\right)^2\right)^2}}\right.$$

$$\left.x^2\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{1+\frac{1}{x}}{5^{1/4}}\right],\frac{1}{10}\left(5+\sqrt{5}\right)\right]\right)\Big/\left(4\times 5^{3/4}\sqrt{1+4x+4x^2+4x^4}\right)$$

Result (type 4, 3334 leaves):

$$\frac{19+42x-16x^2+36x^3}{10\sqrt{1+4x+4x^2+4x^4}}-$$

$$\frac{3}{5}\left(-\left(\left(2\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(x-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,1\right]\right)\left(-\text{Root}\left[\right.\right.\right.\right.\right.\right.\right.\right.\right.$$

$$1+4\#1+4\#1^2+4\#1^4\,\&,2\right]+\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,4\right]\right)\right)\Big/$$

$$\left(\left(x-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,2\right]\right)\left(-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,1\right]+\right.\right.$$

$$\left.\left.\left.\left.\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,4\right]\right)\right)\right)}\right],$$

$$\left(\left(\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,2\right]-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,3\right]\right)\right.$$

$$\left.\left(\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,1\right]-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,4\right]\right)\right)\Big/$$

$$\left(\left(\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,1\right]-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,3\right]\right)\right.$$

$$\left.\left.\left(\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,2\right]-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,4\right]\right)\right)\right]$$

$$\left(x-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,2\right]\right)^2$$

$$\sqrt{\left(\left(\left(-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,1\right]+\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,2\right]\right)\right.\right.}$$

$$\left.\left(x-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,3\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,2\right]\right)\right.$$

$$\left.\left.\left(-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,1\right]+\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,3\right]\right)\right)\right)$$

$$\left(\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,1\right]-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,4\right]\right)$$

$$\sqrt{\left(\left(\left(-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,1\right]+\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,2\right]\right)\right.\right.}$$

$$\left.\left(x-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,4\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,2\right]\right)\right.$$

$$\left.\left.\left(-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,1\right]+\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,4\right]\right)\right)\right)$$

$$\sqrt{\left(\left(\left(x-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,1\right]\right)\left(-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,2\right]+\right.\right.\right.}$$

$$\left.\left.\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,4\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,2\right]\right)\right.$$

$$\left.\left.\left.\left(-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,1\right]+\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,4\right]\right)\right)\right)\right)\Big/$$

$$\left(\sqrt{1+4x+4x^2+4x^4}\left(-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,1\right]+\right.\right.$$

$$\left.\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,2\right]\right)$$

$$\left.\left.\left(-\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,2\right]+\text{Root}\left[1+4\#1+4\#1^2+4\#1^4\,\&,4\right]\right)\right)\right)+$$

```
      1
─────────────────────── 6 ((x - Root[1 + 4 #1 + 4 #1^2 + 4 #1^4 &, 1])
Sqrt[1 + 4 x + 4 x^2 + 4 x^4]
    (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
    Sqrt[(((-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])))]
    Sqrt[(((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])))]
    Sqrt[(((-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[Sqrt[(((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[Sqrt[(((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[Sqrt[(((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])
```

$$(\text{Root}[1+4\,\#1+4\,\#1^2+4\,\#1^4\,\&,\,2]-\text{Root}[1+4\,\#1+4\,\#1^2+4\,\#1^4\,\&,\,4])))]$$
$$(-\text{Root}[1+4\,\#1+4\,\#1^2+4\,\#1^4\,\&,\,1]-\text{Root}[1+4\,\#1+4\,\#1^2+4\,\#1^4\,\&,\,2]-$$
$$\text{Root}[1+4\,\#1+4\,\#1^2+4\,\#1^4\,\&,\,3]-\text{Root}[1+4\,\#1+4\,\#1^2+4\,\#1^4\,\&,\,4]))\Big/$$
$$(-\text{Root}[1+4\,\#1+4\,\#1^2+4\,\#1^4\,\&,\,2]+\text{Root}[1+4\,\#1+4\,\#1^2+4\,\#1^4\,\&,\,4])))\Big)$$

Problem 643: 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):

$$-\left(\left(\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)\sqrt{\frac{517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4}{\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)^2}}\;x^2\right.\right.$$
$$\left.\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{4+3\,x}{517^{1/4}\,x}\right],\,\frac{517+19\sqrt{517}}{1034}\right]\right)\Big/\left(8\times517^{1/4}\sqrt{8+24\,x+8\,x^2-15\,x^3+8\,x^4}\right)\right)$$

Result (type 4, 1148 leaves):

```
- ((2 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])
    √(((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 &, 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]) (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 &, 4])^2))) /
   (√(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])))
```

Problem 644: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(8+24x+8x^2-15x^3+8x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 434 leaves, 10 steps) :

$$-\frac{\left(172-7\left(3+\frac{4}{x}\right)^2\right)x^2}{208\sqrt{8+24x+8x^2-15x^3+8x^4}}+\frac{\left(50896-2455\left(3+\frac{4}{x}\right)^2\right)\left(3+\frac{4}{x}\right)x^2}{322608\sqrt{8+24x+8x^2-15x^3+8x^4}}+$$

$$\frac{2455\left(517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4\right)\left(3+\frac{4}{x}\right)x^2}{322608\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)\sqrt{8+24x+8x^2-15x^3+8x^4}}-$$

$$\Bigg(2455\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)\sqrt{\frac{517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4}{\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)^2}}\;x^2\,\text{EllipticE}\Big[$$

$$2\,\text{ArcTan}\left[\frac{4+3x}{517^{1/4}x}\right],\frac{517+19\sqrt{517}}{1034}\Big]\Bigg)\Big/\left(624\times517^{3/4}\sqrt{8+24x+8x^2-15x^3+8x^4}\right)+$$

$$\Bigg(\left(4910-203\sqrt{517}\right)\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)\sqrt{\frac{517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4}{\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)^2}}\;x^2$$

$$\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{4+3x}{517^{1/4}x}\right],\frac{517+19\sqrt{517}}{1034}\right]\Bigg)\Big/\left(2496\times517^{3/4}\sqrt{8+24x+8x^2-15x^3+8x^4}\right)$$

Result (type 4, 6019 leaves):

$$\frac{72888+89033x-94314x^2+39280x^3}{80652\sqrt{8+24x+8x^2-15x^3+8x^4}}+$$

$$\frac{1}{161304}\Big(\Big(147300\,(x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2])^2$$

$$(-\text{EllipticF}[\text{ArcSin}[\sqrt{(((x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1])}$$

$$(\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+$$

$$8\#1^4\&,4]))/((x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2])$$

$$(\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]-\text{Root}[8+24\#1+8\#1^2-$$

$$15\#1^3+8\#1^4\&,4])))}],-(((\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,$$

$$2]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,3])(\text{Root}[8+24\#1+$$

$$8\#1^2-15\#1^3+8\#1^4\&,1]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]))/$$

$$((-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-$$

$$15\#1^3+8\#1^4\&,3])(\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,$$

$$2]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4])))]$$

$$\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]+\text{EllipticPi}[$$

$$(-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,$$

$$4])/(-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]+$$

$$\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]),$$

$$\text{ArcSin}[\sqrt{(((x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1])(\text{Root}[8+24\#1+}$$

$$8\#1^2-15\#1^3+8\#1^4\&,2]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]))/$$

$$((x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2])(\text{Root}[8+24\#1+8\#1^2-$$

```
          15 #1^3 + 8 #1^4 &, 1] - 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]))))]
   (-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])) +
(121 522 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) 78560 ((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])))],
             -(((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])))]
          (-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 &, 2]) + (EllipticF[ArcSin[
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```
√(((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])))]
 (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]) -
   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]))) /
((-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])) -
(EllipticPi[(-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 &, 4]), 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])))]
  (-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 &, 3] -
    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 &, 4]))))
```

Problem 645: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(8+24x+8x^2-15x^3+8x^4\right)^{5/2}}\,dx$$

Optimal (type 4, 577 leaves, 12 steps):

$$-\frac{\left(124415-6308\left(3+\frac{4}{x}\right)^2\right)x^2}{97344\sqrt{8+24x+8x^2-15x^3+8x^4}}-$$

$$\frac{\left(64489-1399\left(3+\frac{4}{x}\right)^2\right)x^2}{624\left(517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4\right)\sqrt{8+24x+8x^2-15x^3+8x^4}}+$$

$$\frac{\left(18932921731-1086525994\left(3+\frac{4}{x}\right)^2\right)\left(3+\frac{4}{x}\right)x^2}{78056941248\sqrt{8+24x+8x^2-15x^3+8x^4}}+$$

$$\frac{\left(11921698-359497\left(3+\frac{4}{x}\right)^2\right)\left(3+\frac{4}{x}\right)x^2}{483912\left(517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4\right)\sqrt{8+24x+8x^2-15x^3+8x^4}}+$$

$$\frac{543262997\left(517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4\right)\left(3+\frac{4}{x}\right)x^2}{39028470624\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)\sqrt{8+24x+8x^2-15x^3+8x^4}}-$$

$$\left(543262997\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)\sqrt{\frac{517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4}{\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)^2}}\,x^2\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{4+3x}{517^{1/4}x}\right],\right.\right.$$

$$\left.\left.\frac{517+19\sqrt{517}}{1034}\right]\right)\Big/\left(75490272\times517^{3/4}\sqrt{8+24x+8x^2-15x^3+8x^4}\right)+$$

$$\left(\left(4346103976-175318963\sqrt{517}\right)\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)\sqrt{\frac{517-38\left(3+\frac{4}{x}\right)^2+\left(3+\frac{4}{x}\right)^4}{\left(\sqrt{517}+\left(3+\frac{4}{x}\right)^2\right)^2}}\right.$$

$$\left.x^2\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{4+3x}{517^{1/4}x}\right],\frac{517+19\sqrt{517}}{1034}\right]\right)\Big/$$

$$\left(1207844352\times517^{3/4}\sqrt{8+24x+8x^2-15x^3+8x^4}\right)$$

Result (type 4, 6084 leaves):

$$\sqrt{8+24x+8x^2-15x^3+8x^4}\left(\frac{72888+89033x-94314x^2+39280x^3}{241956\left(8+24x+8x^2-15x^3+8x^4\right)^2}+\right.$$

$$\left(65072399400+77274145879x-83050578336x^2+34768831808x^3\right)\Big/$$

$$\left.\left(39028470624\left(8+24x+8x^2-15x^3+8x^4\right)\right)\right)+$$

$$\frac{1}{78056941248}\left(\left(130383119280\left(x-\text{Root}\left[8+24\,\sharp1+8\,\sharp1^2-15\,\sharp1^3+8\,\sharp1^4\,\&,2\right]\right)^2\left(-\text{EllipticF}\left[\right.\right.\right.\right.$$

$$\text{ArcSin}\left[\sqrt{}\left(\left(\left(x-\text{Root}\left[8+24\,\sharp1+8\,\sharp1^2-15\,\sharp1^3+8\,\sharp1^4\,\&,1\right]\right)\left(\text{Root}\left[8+24\,\sharp1+8\,\sharp1^2-\right.\right.\right.\right.\right.$$

```
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])))] Root[8 + 24 #1 + 8 #1^2 - 15 #1^3 + 8 #1^4 &, 2] +
EllipticPi[(-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 &, 4]),
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])))]
(-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])))) /
(Sqrt[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])) +
(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] +
```

$\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4])) /$

$((x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]) (-\text{Root}[8+24\#1+8\#1^2-$

$15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4])))],$

$((\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,3])$

$(\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]-$

$\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4])) /$

$((\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,$

$3]) (\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]-$

$\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4])))]$

$(x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2])^2$

$\surd(((-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,$

$2]) (x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,3])) /$

$((x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]) (-\text{Root}[8+24\#1+8\#1^2-$

$15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,3])))$

$(\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4])$

$\surd(((-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,$

$2]) (x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4])) /$

$((x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]) (-\text{Root}[8+24\#1+8\#1^2-$

$15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4])))$

$\surd(((x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]) (-\text{Root}[8+24\#1+8\#1^2-$

$15\#1^3+8\#1^4\&,2]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4])) /$

$((x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]) (-\text{Root}[8+24\#1+8\#1^2-$

$15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4]))))) /$

$(\sqrt{8+24x+8x^2-15x^3+8x^4} (-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]+$

$\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2])$

$(-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]+$

$\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4])) -$

$\frac{1}{\sqrt{8+24x+8x^2-15x^3+8x^4}} 69537663616$

$((x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1])$

$(x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,3])$

$(x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4])+$

$(x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2])^2$

$\surd(((-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,$

$2]) (x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,3])) /$

$((x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]) (-\text{Root}[8+24\#1+8\#1^2-$

$15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,3])))$

$\surd(((x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]) (\text{Root}[8+24\#1+8\#1^2-$

$15\#1^3+8\#1^4\&,2]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4])) /$

$((x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,2]) (\text{Root}[8+24\#1+8\#1^2-$

$15\#1^3+8\#1^4\&,1]-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4])))$

$\surd(((-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,1]+\text{Root}[8+24\#1+8\#1^2-$

$15\#1^3+8\#1^4\&,2]) (x-\text{Root}[8+24\#1+8\#1^2-15\#1^3+8\#1^4\&,4])) /$

```
((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])))],
      -(((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])))]
    (-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 &, 2]) + (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])))]
    (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]) -
      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]))) /
  ((-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])) -
 (EllipticPi[(-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 &, 4]), 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])))]
```

$\left(-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,1\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,3\right]-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(-\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,2\right]+\text{Root}\left[8+24\,\#1+8\,\#1^2-15\,\#1^3+8\,\#1^4\,\&,\,4\right]\right)\right)\right)\Bigg)$

Problem 646: 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):

$$-\left(\left(\sqrt{\frac{613-182\left(1-\frac{6}{x}\right)^2+\left(-1+\frac{6}{x}\right)^4}{\left(\sqrt{613}+\frac{(6-x)^2}{x^2}\right)^2}}\left(\sqrt{613}+\frac{(6-x)^2}{x^2}\right)x^2\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{6-x}{613^{1/4}\,x}\right],\frac{613+91\sqrt{613}}{1226}\right]\right)\Big/\left(12\times 613^{1/4}\sqrt{9-6x-44x^2+15x^3+3x^4}\right)\right)$$

Result (type 4, 826 leaves):

$$-\left(\left(2\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\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)\right)\Big/\left(\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)\right)\right)}\right],\left(\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)\right)\Big/\left(\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)\right)\right]\sqrt{\frac{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]}{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]}}\left(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]\right)^2\sqrt{\frac{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,3\right]}{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]}}\sqrt{\frac{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]}{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]}}\right)\Big/\left(\sqrt{\left(9-6\,x-44\,x^2+15\,x^3+3\,x^4\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\,\&,\,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)\right)\right)$$

Problem 647: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(9-6\,x-44\,x^2+15\,x^3+3\,x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 444 leaves, 10 steps):

$$-\frac{\left(176-23\left(1-\frac{6}{x}\right)^2\right)x^2}{51759\sqrt{9-6x-44x^2+15x^3+3x^4}}+\frac{\left(45401-3722\left(1-\frac{6}{x}\right)^2\right)\left(1-\frac{6}{x}\right)x^2}{31728267\sqrt{9-6x-44x^2+15x^3+3x^4}}+$$

$$\frac{3722\left(613-182\left(1-\frac{6}{x}\right)^2+\left(-1+\frac{6}{x}\right)^4\right)\left(1-\frac{6}{x}\right)x^2}{31728267\left(\sqrt{613}+\frac{(6-x)^2}{x^2}\right)\sqrt{9-6x-44x^2+15x^3+3x^4}}+$$

$$\left(3722\sqrt{\frac{613-182\left(1-\frac{6}{x}\right)^2+\left(-1+\frac{6}{x}\right)^4}{\left(\sqrt{613}+\frac{(6-x)^2}{x^2}\right)^2}}\left(\sqrt{613}+\frac{(6-x)^2}{x^2}\right)x^2\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{6-x}{613^{1/4}x}\right],\frac{613+91\sqrt{613}}{1226}\right]\right)\Big/\left(51759\times 613^{3/4}\sqrt{9-6x-44x^2+15x^3+3x^4}\right)-$$

$$\left(\left(7444-145\sqrt{613}\right)\sqrt{\frac{613-182\left(1-\frac{6}{x}\right)^2+\left(-1+\frac{6}{x}\right)^4}{\left(\sqrt{613}+\frac{(6-x)^2}{x^2}\right)^2}}\left(\sqrt{613}+\frac{(6-x)^2}{x^2}\right)x^2\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{6-x}{613^{1/4}x}\right],\frac{613+91\sqrt{613}}{1226}\right]\right)\Big/\left(207036\times 613^{3/4}\sqrt{9-6x-44x^2+15x^3+3x^4}\right)$$

Result (type 4, 5428 leaves):

$$-\frac{2\left(-106926-592639x+232005x^2+44664x^3\right)}{10576089\sqrt{9-6x-44x^2+15x^3+3x^4}}+$$

$$\frac{1}{3525363}\Bigg(\Bigg(148880\left(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,2\right]\right)^2$$

$$\Big(-\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{}\Big(\Big(\Big(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,1\right]\Big)$$
$$\Big(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,2\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,4\right]\Big)\Big)\Big/\Big(\Big(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,2\right]\Big)$$
$$\Big(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,1\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,4\right]\Big)\Big)\Big)\Big],-\Big(\Big(\Big(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,2\right]-$$
$$\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,3\right]\Big)\Big(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,1\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,4\right]\Big)\Big)\Big/$$
$$\Big(\Big(-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,1\right]+\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,3\right]\Big)\Big(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,2\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,4\right]\Big)\Big)\Big)\Big]$$
$$\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,2\right]+\text{EllipticPi}\Big[$$
$$\Big(-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,1\right]+\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,4\right]\Big)\Big/\Big(-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,2\right]+$$
$$\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,4\right]\Big),$$
$$\text{ArcSin}\Big[\sqrt{}\Big(\Big(\Big(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,1\right]\Big)\Big(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,2\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,4\right]\Big)\Big)\Big/$$

$$\left(\left(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]\right)\left(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)\right)\Big]\Big],$$

$$-\Big(\Big(\left(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,3\right]\right)\left(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)\Big)\Big/$$

$$\left(\left(-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]+\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,3\right]\right)\left(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)\right)\Big)\Big]$$

$$\left(-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]+\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]\right)\right)\sqrt{\frac{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,3\right]}{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]}}$$

$$\sqrt{\frac{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]}{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]}}$$

$$\left(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)$$

$$\sqrt{\Big(\Big(\left(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]\right)\left(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)\Big)\Big/\Big(\left(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]\right)\left(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)\Big)\Big)}\Bigg)\Bigg/$$

$$\Bigg(\sqrt{9-6\,x-44\,x^2+15\,x^3+3\,x^4}\;\left(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)$$

$$\sqrt{\left(\left(-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]+\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,3\right]\right)\left(-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]+\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)\right)}\Bigg)-$$

$$\Bigg(54\,294\,\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\left(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]\right)}$$

$$\left(-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]+\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)\Big)\Big/$$

$$\left(\left(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]\right)\left(-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]+\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)\right)\Big)\Big],$$

$$\Big(\left(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,3\right]\right)$$

$$\left(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)\Big)\Big/$$

$$\left(\left(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,3\right]\right)\left(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)\right)\Big]$$

$$\sqrt{\frac{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]}{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]}}$$

$$\left(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]\right)^2$$

$$\sqrt{\frac{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,3\right]}{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]}}$$

$$\sqrt{\frac{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]}{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]}}$$

$$\left(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]-\right.$$

$$\left.\left.\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)\right)\Big/$$

$$\left(\sqrt{9-6\,x-44\,x^2+15\,x^3+3\,x^4}\;\left(-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]+\right.\right.$$

$$\left.\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)$$

$$\sqrt{\left(\left(-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]+\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\right.\right.\right.}$$

$$\left.\left.3\right]\right)\;\left(-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]+\right.$$

$$\left.\left.\left.\left.\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)\right)\right)\right)+$$

$$\frac{1}{\sqrt{9-6\,x-44\,x^2+15\,x^3+3\,x^4}}\,29\,776\,\left(\left(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]\right)\right.$$

$$\left(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,3\right]\right)$$

$$\left(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)+$$

$$\left(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]\right)^2$$

$$\left(-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]+\right.$$

$$\left.\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]\right)$$

$$\sqrt{\frac{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,3\right]}{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]}}$$

$$\sqrt{\frac{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]}{x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]}}$$

$$\sqrt{\left(\left(\left(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]\right)\;\left(\text{Root}\left[9-6\,\#1-44\,\#1^2+\right.\right.\right.\right.}$$

$$\left.\left.\left.15\,\#1^3+3\,\#1^4\,\&,\,2\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)\right)\Big/$$

$$\left(\left(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]\right)\;\left(\text{Root}\left[9-6\,\#1-44\,\#1^2+\right.\right.\right.$$

$$\left.\left.\left.\left.15\,\#1^3+3\,\#1^4\,\&,\,1\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)\right)\right)$$

$$\sqrt{\left(\left(-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]+\text{Root}\left[9-6\,\#1-44\,\#1^2+\right.\right.\right.}$$

$$\left.\left.15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)\Big/\left(-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\right.\right.$$

$$\left.\left.\left.1\right]+\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,3\right]\right)\right)$$

$$\left(\left(\text{EllipticE}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,1\right]\right)\right.\right.\right.}\right.\right.\right.\right.$$

$$\left(\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\,2\right]-\text{Root}\left[9-6\,\#1-44\,\#1^2+\right.\right.$$

$$\left.\left.\left.15\,\#1^3+3\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[9-6\,\#1-44\,\#1^2+15\,\#1^3+3\,\#1^4\,\&,\right.\right.\right.$$

```
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])))],
 -(((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 &, 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 &, 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]))))
```

Problem 660: Unable to integrate problem.

$$\int \frac{x-\sqrt{x^6}}{x\left(1-x^4\right)}\,dx$$

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):

$$\int \frac{x-\sqrt{x^6}}{x\left(1-x^4\right)}\,dx$$

Problem 661: 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 662: 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 663: 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 664: 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 665: 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 686: 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 687: 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 689: 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):

$\text{ArcSin}[4+x]$

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 690: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{(-3-x)\,(5+x)}}\,dx$$

Optimal (type 3, 4 leaves, 3 steps):

$\text{ArcSin}[4+x]$

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 698: 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 700: 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 704: 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 706: 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 707: 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 709: 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 712: 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 714: 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 716: 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 718: 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 768: 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 769: 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 770: 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 771: 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 775: 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 776: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{2-\frac{b}{x^2}}}{-b+2x^2}\,dx$$

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):

$$-\frac{i\,\sqrt{2-\frac{b}{x^2}}\;x\,\text{Log}\left[\frac{2\left(-i\,\sqrt{b}+\sqrt{-b+2x^2}\right)}{x}\right]}{\sqrt{b}\,\sqrt{-b+2x^2}}$$

Problem 783: 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 784: 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 786: 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 808: 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 813: 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 814: 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 815: 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 818: 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 826: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{x}{x-\sqrt{1+2\,x^2}}\,dx$$

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 838: 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 841: 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 844: 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):

$$\frac{1}{3}\,x\sqrt{3-2x^2-x^4}-\frac{2\,\text{EllipticE}\left[\text{ArcSin}[x],-\frac{1}{3}\right]}{\sqrt{3}}+\frac{4\,\text{EllipticF}\left[\text{ArcSin}[x],-\frac{1}{3}\right]}{\sqrt{3}}$$

Result (type 4, 59 leaves):

$$\frac{1}{3}\left(x\sqrt{3-2x^2-x^4}-2\,i\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{x}{\sqrt{3}}\right],-3\right]-4\,i\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{x}{\sqrt{3}}\right],-3\right]\right)$$

Problem 845: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{(1-x^2)\,(3+x^2)}}\,dx$$

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 856: Unable to integrate problem.

$$\int\sqrt{1-x^2+x\sqrt{-1+x^2}}\,dx$$

Optimal (type 3, 63 leaves, ? steps):

$$\frac{1}{4}\left(3x+\sqrt{-1+x^2}\right)\sqrt{1-x^2+x\sqrt{-1+x^2}}+\frac{3\,\text{ArcSin}\left[x-\sqrt{-1+x^2}\right]}{4\sqrt{2}}$$

Result (type 8, 24 leaves):

$$\int\sqrt{1-x^2+x\sqrt{-1+x^2}}\,dx$$

Problem 857: 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):

$$-\left(\left((1+x)\left(1+2x-2\sqrt{x}\sqrt{1+x}\right)^2\left(2\sqrt{-x+\sqrt{x}\sqrt{1+x}}\left(-3-2x+2\sqrt{x}\sqrt{1+x}\right)+3\sqrt{-2-4x+4\sqrt{x}\sqrt{1+x}}\,\text{Log}\left[2\sqrt{-x+\sqrt{x}\sqrt{1+x}}+\sqrt{-2-4x+4\sqrt{x}\sqrt{1+x}}\right]\right)\right)\Big/\left(4\left(-\sqrt{x}+\sqrt{1+x}\right)^3\left(1+x-\sqrt{x}\sqrt{1+x}\right)^2\right)\right)$$

Problem 858: 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 859: 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) :

$$\frac{1}{4}\Big(2\sqrt{1+2i}\,\mathrm{ArcTan}\Big[\Big((8+8i)-(1-4i)x^3+5i\sqrt{1+2i}\sqrt{2+2x+x^2}+x^2\Big((-2+13i)+5\sqrt{1+2i}\sqrt{2+2x+x^2}\Big)+(1+i)x\Big((9+5i)+5\sqrt{1+2i}\sqrt{2+2x+x^2}\Big)\Big)\Big/\Big((4+14i)+(2+2i)x+(4-11i)x^2-(3+8i)x^3\Big)\Big]+2i\sqrt{1-2i}\,\mathrm{ArcTanh}\Big[\Big((-8+8i)+(1+4i)x^3+5i\sqrt{1-2i}\sqrt{2+2x+x^2}+x^2\Big((2+13i)-5\sqrt{1-2i}\sqrt{2+2x+x^2}\Big)+(1+i)x\Big((5+9i)+5i\sqrt{1-2i}\sqrt{2+2x+x^2}\Big)\Big)\Big/\Big((-14-4i)-(2+2i)x+(11-4i)x^2+(8+3i)x^3\Big)\Big]+i\Big(\Big(\sqrt{1-2i}-\sqrt{1+2i}\Big)\mathrm{Log}\big[1+x^2\big]-\sqrt{1-2i}\,\mathrm{Log}\Big[(7-4i)+(8-4i)x+(3-2i)x^2+4\sqrt{1-2i}\sqrt{2+2x+x^2}+2\sqrt{1-2i}\,x\sqrt{2+2x+x^2}\Big]+\sqrt{1+2i}\,\mathrm{Log}\Big[(7+4i)+(8+4i)x+(3+2i)x^2+4\sqrt{1+2i}\sqrt{2+2x+x^2}+2\sqrt{1+2i}\,x\sqrt{2+2x+x^2}\Big]\Big)\Big)$$

Problem 863: 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):

$$\frac{\mathrm{ArcTanh}\Big[\frac{\sqrt{b}\,d^2\left(\frac{c}{d}+x\right)^2}{\sqrt{a+b d^4\left(\frac{c}{d}+x\right)^4}}\Big]}{2\sqrt{b}\,d^2}-\left(c\left(\sqrt{a}+\sqrt{b}\,d^2\left(\frac{c}{d}+x\right)^2\right)\sqrt{\frac{a+b d^4\left(\frac{c}{d}+x\right)^4}{\left(\sqrt{a}+\sqrt{b}\,d^2\left(\frac{c}{d}+x\right)^2\right)^2}}\,\mathrm{EllipticF}\Big[2\,\mathrm{ArcTan}\Big[\frac{b^{1/4}(c+d x)}{a^{1/4}}\Big],\frac{1}{2}\Big]\right)\Big/\left(2 a^{1/4} b^{1/4} d^2\sqrt{a+b d^4\left(\frac{c}{d}+x\right)^4}\right)$$

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 864: 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):

$$\left(\left(\sqrt{a}+\sqrt{b}\,d^2\left(\frac{c}{d}+x\right)^2\right)\sqrt{\frac{a+bd^4\left(\frac{c}{d}+x\right)^4}{\left(\sqrt{a}+\sqrt{b}\,d^2\left(\frac{c}{d}+x\right)^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{b^{1/4}(c+dx)}{a^{1/4}}\right],\frac{1}{2}\right]\right)\Big/$$
$$\left(2a^{1/4}b^{1/4}d\sqrt{a+bd^4\left(\frac{c}{d}+x\right)^4}\right)$$

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 865: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int\frac{a-cx^4}{\sqrt{a+bx^2+cx^4}\left(ad+aex^2+cdx^4\right)}\,dx$$

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):

$$\left(i \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}}\, \sqrt{1+\frac{2 c x^2}{b-\sqrt{b^2-4 a c}}}\left(\text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{2}\, \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right] - \text{EllipticPi}\left[\frac{\left(b+\sqrt{b^2-4 a c}\right) d}{a e-\sqrt{a}\, \sqrt{-4 c d^2+a e^2}}, i\, \text{ArcSinh}\left[\sqrt{2}\, \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right] - \text{EllipticPi}\left[\frac{\left(b+\sqrt{b^2-4 a c}\right) d}{a e+\sqrt{a}\, \sqrt{-4 c d^2+a e^2}}, i\, \text{ArcSinh}\left[\sqrt{2}\, \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right)\right) \Bigg/ \left(\sqrt{2}\, \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, d\, \sqrt{a+b x^2+c x^4}\right)$$

Problem 866: 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):

$$\left(i \sqrt{2+\frac{4 c x^2}{-b+\sqrt{b^2-4 a c}}} \sqrt{1-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}}} \left(\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{-b+\sqrt{b^2-4 a c}}} x\right], \frac{b-\sqrt{b^2-4 a c}}{b+\sqrt{b^2-4 a c}}\right] - \text{EllipticPi}\left[\frac{\left(b-\sqrt{b^2-4 a c}\right) d}{-a e+\sqrt{a} \sqrt{-4 c d^2+a e^2}}, i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{-b+\sqrt{b^2-4 a c}}} x\right], \frac{b-\sqrt{b^2-4 a c}}{b+\sqrt{b^2-4 a c}}\right] - \text{EllipticPi}\left[\frac{\left(-b+\sqrt{b^2-4 a c}\right) d}{a e+\sqrt{a} \sqrt{-4 c d^2+a e^2}}, i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{-b+\sqrt{b^2-4 a c}}} x\right], \frac{b-\sqrt{b^2-4 a c}}{b+\sqrt{b^2-4 a c}}\right]\right)\right) \Big/ \left(2 \sqrt{\frac{c}{-b+\sqrt{b^2-4 a c}}} d \sqrt{a-b x^2+c x^4}\right)$$

Problem 870: 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):

$$\frac{e f \text{ArcTan}\left[\frac{a b+\left(4 a^2+b^2-2 a c\right) x+a b x^2}{2 a \sqrt{2 a-c} \sqrt{a+b x+c x^2+b x^3+a x^4}}\right]}{a \sqrt{2 a-c} d}$$

Result (type 4, 13 884 leaves):

$$-\frac{1}{d} e f$$

$$\left(-\left(\left(8 \left(x-\text{Root}\left[a+b \#1+c \#1^2+b \#1^3+a \#1^4 \&, 2\right]\right)^2 \left(\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(x-\text{Root}\left[a+b \#1+c \#1^2+b \#1^3+a \#1^4 \&, 1\right]\right) \left(\text{Root}\left[a+b \#1+c \#1^2+b \#1^3+a \#1^4 \&, 2\right]-\text{Root}\left[a+b \#1+c \#1^2+b \#1^3+a \#1^4 \&, 4\right]\right)\right) \Big/ \left(\left(x-\text{Root}\left[a+b \#1+c \#1^2+b \#1^3+a \#1^4 \&, 2\right]\right) \left(\text{Root}\left[a+b \#1+c \#1^2+b \#1^3+a \#1^4 \&, 1\right]-\text{Root}\left[a+b \#1+c \#1^2+b \#1^3+a \#1^4 \&, 4\right]\right)\right)\right)}\right], -\left(\left(\left(\text{Root}\left[a+b \#1+c \#1^2+b \#1^3+a \#1^4 \&, 2\right]-\text{Root}\left[a+b \#1+c \#1^2+b \#1^3+a \#1^4 \&, 3\right]\right) \left(\text{Root}\left[a+b \#1+c \#1^2+b \#1^3+a \#1^4 \&, 1\right]-\text{Root}\left[a+b \#1+c \#1^2+b \#1^3+a \#1^4 \&, 4\right]\right)\right) \Big/ \left(\left(-\text{Root}\left[a+b \#1+c \#1^2+b \#1^3+a \#1^4 \&, 1\right]+\text{Root}\left[a+b \#1+c \#1^2+b \#1^3+a \#1^4 \&, 3\right]\right) \left(\text{Root}\left[a+b \#1+c \#1^2+b \#1^3+a \#1^4 \&, 2\right]-\text{Root}\left[a+b \#1+c \#1^2+b \#1^3+a \#1^4 \&, 4\right]\right)\right)\right)\right]$$

$$\left(-b+\sqrt{-4 a^2+b^2}-2 a \text{Root}\left[a+b \#1+c \#1^2+b \#1^3+a \#1^4 \&, 1\right]\right) -$$

$$2\,a\,\text{EllipticPi}\Big[\Big(\Big(b-\sqrt{-4\,a^2+b^2}+2\,a\,\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\Big)$$

$$\Big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]+\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\Big)\Big)\Big/$$

$$\Big(\Big(b-\sqrt{-4\,a^2+b^2}+2\,a\,\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]\Big)$$

$$\Big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]+\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\Big)\Big),$$

$$\text{ArcSin}\Big[\sqrt{\Big(\Big(\big(x-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]\big)\,\big(\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\big)\Big)\Big/}$$

$$\Big(\big(x-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\big)\,\big(\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\big)\Big)\Big)\Big],$$

$$-\Big(\Big(\big(\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3\big]\big)\,\big(\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\big)\Big)\Big/$$

$$\Big(\big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]+\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3\big]\big)\,\big(\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\big)\Big)\Big)\Big]\,\Big(-\text{Root}\big[$$

$$a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]+\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\Big)\Big)$$

$$\sqrt{\Big(\Big(\big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]+\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\big)\,\big(x-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3\big]\big)\Big)\Big/}$$

$$\Big(\big(x-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\big)\,\big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]+\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3\big]\big)\Big)\Big)$$

$$\sqrt{\Big(\Big(\big(x-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]\big)\,\big(\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\big)\Big)\Big/}$$

$$\Big(\big(x-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\big)\,\big(\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\big)\Big)\Big)$$

$$\sqrt{\Big(\Big(\big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]+\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\big)\,\big(x-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\big)\Big)\Big/}$$

$$\Big(\big(x-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\big)\,\big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]+\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\big)\Big)\Big)$$

$$\Big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]+\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\Big)\Big)\Big/$$

$$\Big(\Big(-\frac{-b-\sqrt{-4\,a^2+b^2}}{2\,a}+\frac{-b+\sqrt{-4\,a^2+b^2}}{2\,a}\Big)\sqrt{x\,\big(b+c\,x+b\,x^2\big)+a\,\big(1+x^4\big)}$$

$$\Big(b-\sqrt{-4\,a^2+b^2}+2\,a\,\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]\Big)$$

$$\Big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]+\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\Big)$$

$$\Big(-b+\sqrt{-4\,a^2+b^2}-2\,a\,\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\Big)$$

$$\Big(\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]-$$

```
            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 + 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[√(((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 &,
```

$$1] + \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 4]))))$$

$$(-\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 1] + \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 4])) \Big/$$

$$\left(a^2 \left(-\frac{-b - \sqrt{-4 a^2 + b^2}}{2 a} + \frac{-b + \sqrt{-4 a^2 + b^2}}{2 a}\right)\right.$$

$$\sqrt{x \left(b + c x + b x^2\right) + a \left(1 + x^4\right)}$$

$$\left(b - \sqrt{-4 a^2 + b^2} + 2 a \,\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 1]\right)$$

$$(-\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 1] + \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 2])$$

$$\left(-b + \sqrt{-4 a^2 + b^2} - 2 a \,\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 2]\right)$$

$$\left.(\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 2] - \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 4])\right) -$$

$$\left(2 b \sqrt{-4 a^2 + b^2} \,(x - \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 2])^2\right.$$

$$\Big(\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{}(((x - \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 1]) \,(\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 2] - \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 4])) \Big/$$

$$((x - \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 2]) \,(\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 1] - \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 4])))\Big],$$

$$-(((\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 2] - \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 3]) \,(\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 1] - \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 4])) \Big/$$

$$((-\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 1] + \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 3]) \,(\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 2] - \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 4])))\Big]$$

$$\left(-b + \sqrt{-4 a^2 + b^2} - 2 a \,\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 1]\right) -$$

$$2 a \,\text{EllipticPi}\Big[\Big(\left(b - \sqrt{-4 a^2 + b^2} + 2 a \,\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 2]\right)$$

$$(-\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 1] + \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 4])\Big) \Big/$$

$$\Big(\left(b - \sqrt{-4 a^2 + b^2} + 2 a \,\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 1]\right) \,(-\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 2] + \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 4])\Big),$$

$$\text{ArcSin}\Big[\sqrt{}(((x - \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 1]) \,(\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 2] - \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 4])) \Big/$$

$$((x - \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 2]) \,(\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 1] - \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 4])))\Big],$$

$$-(((\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 2] - \text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 3]) \,(\text{Root}[a + b \#1 + c \#1^2 + b \#1^3 + a \#1^4 \&, 1] - \text{Root}[a + b \#1 + c \#1^2 +$$

$$b\,\#1^3+a\,\#1^4\,\&,\,4\big]\big)\big)\Big/\Big(\Big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]+$$
$$\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3\big]\Big)\,\Big(\text{Root}\big[a+b\,\#1+c\,\#1^2+$$
$$b\,\#1^3+a\,\#1^4\,\&,\,2\big]-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\Big)\Big)\Big)\Big]$$
$$\Big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]+\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\Big)\Bigg)$$
$$\sqrt{\Big(\Big(\Big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]+\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\Big)}$$
$$\Big(x-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3\big]\Big)\Big)\Big/$$
$$\Big(\Big(x-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\Big)\,\Big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,$$
$$1\big]+\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3\big]\Big)\Big)\Big)$$
$$\sqrt{\Big(\Big(\Big(x-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]\Big)\,\Big(\text{Root}\big[a+b\,\#1+c\,\#1^2+}$$
$$b\,\#1^3+a\,\#1^4\,\&,\,2\big]-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\Big)\Big)\Big/$$
$$\Big(\Big(x-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\Big)\,\Big(\text{Root}\big[a+b\,\#1+c\,\#1^2+$$
$$b\,\#1^3+a\,\#1^4\,\&,\,1\big]-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\Big)\Big)\Big)$$
$$\sqrt{\Big(\Big(\Big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]+\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\Big)}$$
$$\Big(x-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\Big)\Big)\Big/$$
$$\Big(\Big(x-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\Big)\,\Big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,$$
$$1\big]+\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\Big)\Big)\Big)$$
$$\Big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]+\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\Big)\Bigg)\Bigg/$$
$$\Bigg(a^2\left(-\frac{-b-\sqrt{-4\,a^2+b^2}}{2\,a}+\frac{-b+\sqrt{-4\,a^2+b^2}}{2\,a}\right)$$
$$\sqrt{x\,\left(b+c\,x+b\,x^2\right)+a\,\left(1+x^4\right)}$$
$$\Big(b-\sqrt{-4\,a^2+b^2}+$$
$$2\,a\,\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]\Big)$$
$$\Big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]+$$
$$\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\Big)$$
$$\Big(-b+\sqrt{-4\,a^2+b^2}-2\,a\,\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\Big)$$
$$\Big(\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]-$$
$$\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\Big)\Bigg)-$$
$$\Bigg(8\,\Big(x-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\Big)^2$$
$$\Bigg(\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\Big(\Big(\Big(x-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]\Big)\,\Big(\text{Root}\big[a+b\,\#1+}$$
$$c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\Big)\Big)\Big/$$
$$\Big(\Big(x-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]\Big)\,\Big(\text{Root}\big[a+b\,\#1+c\,\#1^2+$$
$$b\,\#1^3+a\,\#1^4\,\&,\,1\big]-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\Big)\Big)\Big)\Big],$$
$$-\Big(\Big(\Big(\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,$$
$$3\big]\Big)\,\Big(\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]-\text{Root}\big[a+b\,\#1+c\,\#1^2+$$
$$b\,\#1^3+a\,\#1^4\,\&,\,4\big]\Big)\Big)\Big/\Big(\Big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\big]+$$
$$\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3\big]\Big)\,\Big(\text{Root}\big[a+b\,\#1+c\,\#1^2+$$
$$b\,\#1^3+a\,\#1^4\,\&,\,2\big]-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\big]\Big)\Big)\Big)\Big]$$

$$\left(-b-\sqrt{-4\,a^2+b^2}\;-2\,a\,\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]\right)-$$

$$2\,a\,\text{EllipticPi}\Big[\Big(\Big(b+\sqrt{-4\,a^2+b^2}\;+2\,a\,\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\Big)$$

$$\Big(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+$$

$$\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\Big)\Big)\Big/$$

$$\Big(\Big(b+\sqrt{-4\,a^2+b^2}\;+2\,a\,\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]\Big)\;\Big(-\text{Root}\big[a+b\,\#1+$$

$$c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\Big)\Big),$$

$$\text{ArcSin}\Big[\sqrt{}\Big(\Big(\Big(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]\Big)\;\Big(\text{Root}\big[a+b\,\#1+$$

$$c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\big]-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\Big)\Big)\Big/$$

$$\Big(\Big(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\Big)\;\Big(\text{Root}\big[a+b\,\#1+c\,\#1^2+$$

$$b\,\#1^3+a\,\#1^4\,\&,\,1\big]-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\Big)\Big)\Big)\Big],$$

$$-\Big(\Big(\Big(\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,$$

$$3\big]\Big)\;\Big(\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]-\text{Root}\big[a+b\,\#1+c\,\#1^2+$$

$$b\,\#1^3+a\,\#1^4\,\&,\,4\big]\Big)\Big)\Big/\Big(\Big(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+$$

$$\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3\right]\Big)\;\Big(\text{Root}\big[a+b\,\#1+c\,\#1^2+$$

$$b\,\#1^3+a\,\#1^4\,\&,\,2\big]-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\Big)\Big)\Big)\Big]$$

$$\Big(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\Big)\Big)$$

$$\sqrt{}\Big(\Big(\Big(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\Big)$$

$$\Big(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3\right]\Big)\Big)\Big/$$

$$\Big(\Big(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\Big)\;\Big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,$$

$$1\big]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3\right]\Big)\Big)\Big)$$

$$\sqrt{}\Big(\Big(\Big(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]\Big)\;\Big(\text{Root}\big[a+b\,\#1+c\,\#1^2+$$

$$b\,\#1^3+a\,\#1^4\,\&,\,2\big]-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\Big)\Big)\Big/$$

$$\Big(\Big(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\Big)\;\Big(\text{Root}\big[a+b\,\#1+c\,\#1^2+$$

$$b\,\#1^3+a\,\#1^4\,\&,\,1\big]-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\Big)\Big)\Big)$$

$$\sqrt{}\Big(\Big(\Big(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\Big)$$

$$\Big(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\Big)\Big)\Big/$$

$$\Big(\Big(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\Big)\;\Big(-\text{Root}\big[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,$$

$$1\big]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\Big)\Big)\Big)$$

$$\Big(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\Big)\Big)\Big/$$

$$\Big(\Big(\frac{-b-\sqrt{-4\,a^2+b^2}}{2\,a}-\frac{-b+\sqrt{-4\,a^2+b^2}}{2\,a}\Big)$$

$$\sqrt{x\,\left(b+c\,x+b\,x^2\right)+a\,\left(1+x^4\right)}$$

$$\Big(b+\sqrt{-4\,a^2+b^2}\;+$$

$$2\,a\,\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]\Big)$$

$$\Big(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+$$

$$\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\Big)$$

$$\Big(-b-\sqrt{-4\,a^2+b^2}\;-2\,a\,\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\Big)$$

(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]) (-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])) /

$$\left(a^2\left(\frac{-b-\sqrt{-4a^2+b^2}}{2a}-\frac{-b+\sqrt{-4a^2+b^2}}{2a}\right)\sqrt{x\left(b+c x+b x^2\right)+a\left(1+x^4\right)}\right.$$

$\left(b+\sqrt{-4a^2+b^2}+\right.$ 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])

$\left(-b-\sqrt{-4a^2+b^2}\right.$ - 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])) +

$\left(2b\sqrt{-4a^2+b^2}\right.$ (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])))]

$\left(-b-\sqrt{-4a^2+b^2}\right.$ - 2 a Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 1]) -

2 a EllipticPi[(($b+\sqrt{-4a^2+b^2}$ + 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])) /

(($b+\sqrt{-4a^2+b^2}$ + 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 &,

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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 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]) (-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]))]
  (x - Root[a + b #1 + c #1^2 + b #1^3 + a #1^4 &, 2])^2
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$$\sqrt{\left(\left(\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)\right)\right)}$$
$$\left(\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)$$
$$\sqrt{\left(\left(\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\right)}$$
$$\sqrt{\left(\left(\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]\right)\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\right)}\Bigg/$$
$$\left(a\sqrt{x\left(b+c\,x+b\,x^2\right)+a\left(1+x^4\right)}\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(-\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,2\right]+\text{Root}\left[a+b\,\#1+c\,\#1^2+b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)$$

Problem 871: 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):

$$\frac{1}{d}e\,f$$
$$\Bigg(-\Bigg(\Bigg(8\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)^2\Bigg(\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]\right)\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\right)}\Big],$$
$$-\left(\left(\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\right)\Big]$$

$$\left(b+\sqrt{-4 a^2+b^2}-2 a \,\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,1\right]\right)-$$

$$2 a \,\text{EllipticPi}\Big[\Big(\Big(-b-\sqrt{-4 a^2+b^2}+2 a \,\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,2\right]\Big)$$

$$\Big(-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,1\right]+$$

$$\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,4\right]\Big)\Big)\Big/$$

$$\Big(\Big(-b-\sqrt{-4 a^2+b^2}+2 a \,\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,1\right]\Big)\ \Big(-\text{Root}\big[a-b \,\#1-$$

$$c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,2\big]+\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,4\right]\Big)\Big),$$

$$\text{ArcSin}\Big[\sqrt{}\Big(\Big(\Big(x-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,1\right]\Big)\ \Big(\text{Root}\big[a-b \,\#1-$$

$$c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,2\big]-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,4\right]\Big)\Big)\Big/$$

$$\Big(\Big(x-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,2\right]\Big)\ \Big(\text{Root}\big[a-b \,\#1-c \,\#1^2-$$

$$b \,\#1^3+a \,\#1^4 \,\&,\,1\big]-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,4\right]\Big)\Big)\Big)\Big],$$

$$-\Big(\Big(\Big(\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,2\right]-\text{Root}\big[a-b \,\#1-c \,\#1^2-$$

$$b \,\#1^3+a \,\#1^4 \,\&,\,3\big]\Big)\ \Big(\text{Root}\big[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,$$

$$1\big]-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,4\right]\Big)\Big)\Big/$$

$$\Big(\Big(-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,1\right]+\text{Root}\big[a-b \,\#1-c \,\#1^2-$$

$$b \,\#1^3+a \,\#1^4 \,\&,\,3\big]\Big)\ \Big(\text{Root}\big[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,$$

$$2\big]-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,4\right]\Big)\Big)\Big)\Big]$$

$$\Big(-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,1\right]+\text{Root}\big[a-b \,\#1-c \,\#1^2-$$

$$b \,\#1^3+a \,\#1^4 \,\&,\,2\big]\Big)\Big)$$

$$\sqrt{}\Big(\Big(\Big(-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,1\right]+\text{Root}\big[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,$$

$$2\big]\Big)\ \Big(x-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,3\right]\Big)\Big)\Big/$$

$$\Big(\Big(x-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,2\right]\Big)\ \Big(-\text{Root}\big[a-b \,\#1-c \,\#1^2-$$

$$b \,\#1^3+a \,\#1^4 \,\&,\,1\big]+\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,3\right]\Big)\Big)\Big)$$

$$\sqrt{}\Big(\Big(\Big(x-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,1\right]\Big)\ \Big(\text{Root}\big[a-b \,\#1-c \,\#1^2-$$

$$b \,\#1^3+a \,\#1^4 \,\&,\,2\big]-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,4\right]\Big)\Big)\Big/$$

$$\Big(\Big(x-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,2\right]\Big)\ \Big(\text{Root}\big[a-b \,\#1-c \,\#1^2-$$

$$b \,\#1^3+a \,\#1^4 \,\&,\,1\big]-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,4\right]\Big)\Big)\Big)$$

$$\sqrt{}\Big(\Big(\Big(-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,1\right]+\text{Root}\big[a-b \,\#1-c \,\#1^2-b \,\#1^3+$$

$$a \,\#1^4 \,\&,\,2\big]\Big)\ \Big(x-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,4\right]\Big)\Big)\Big/$$

$$\Big(\Big(x-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,2\right]\Big)\ \Big(-\text{Root}\big[a-b \,\#1-c \,\#1^2-$$

$$b \,\#1^3+a \,\#1^4 \,\&,\,1\big]+\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,4\right]\Big)\Big)\Big)$$

$$\Big(-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,1\right]+\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,4\right]\Big)\Big)\Big/$$

$$\Big(\Big(-\frac{b-\sqrt{-4 a^2+b^2}}{2 a}+\frac{b+\sqrt{-4 a^2+b^2}}{2 a}\Big)$$

$$\sqrt{x\left(b+c x+b x^2\right)-a\left(1+x^4\right)}$$

$$\Big(-b-\sqrt{-4 a^2+b^2}+2 a \,\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,1\right]\Big)$$

$$\Big(-\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,1\right]+$$

$$\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,2\right]\Big)$$

$$\Big(b+\sqrt{-4 a^2+b^2}-2 a \,\text{Root}\left[a-b \,\#1-c \,\#1^2-b \,\#1^3+a \,\#1^4 \,\&,\,2\right]\Big)$$

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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]))) +
(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])) /
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((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])) /

$$\left(a^2 \left(-\frac{b - \sqrt{-4 a^2 + b^2}}{2 a} + \frac{b + \sqrt{-4 a^2 + b^2}}{2 a}\right)\right.$$

$\sqrt{x (b + c x + b x^2) - a (1 + x^4)}$

$\left(-b - \sqrt{-4 a^2 + b^2} + 2 a \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 1]\right)$

(-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])

$\left(b + \sqrt{-4 a^2 + b^2} - 2 a \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 2]\right)$

(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])) +

$\left(2 b \sqrt{-4 a^2 + b^2} \left(x - \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 2]\right)^2\right.$

(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])))]

$\left(b + \sqrt{-4 a^2 + b^2} - 2 a \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 1]\right)$ -

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])))],

$$-\left(\left(\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\right)\Big]$$

$$\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\Big)$$

$$\sqrt{\left(\left(\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)\right)\right)}$$

$$\sqrt{\left(\left(\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]\right)\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\right)}$$

$$\sqrt{\left(\left(\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\right)}$$

$$\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\Big)\Big/$$

$$\Bigg(a^2\left(-\frac{b-\sqrt{-4\,a^2+b^2}}{2\,a}+\frac{b+\sqrt{-4\,a^2+b^2}}{2\,a}\right)\sqrt{x\,\left(b+c\,x+b\,x^2\right)-a\,\left(1+x^4\right)}\left(-b-\sqrt{-4\,a^2+b^2}+2\,a\,\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]\right)$$
$$\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(b+\sqrt{-4\,a^2+b^2}-2\,a\,\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)$$
$$\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\Bigg)-$$

$$\Bigg(8\,\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)^2$$
$$\Bigg(\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{\left(\left(\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]\right)\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\right)}\Big],$$
$$-\left(\left(\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-\right.\right.\right.\right.$$

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              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])) /
  (((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^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 - 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[√(((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])))

$\sqrt{(((-\text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 1] + \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 2])}$
$(x - \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 4]))) /$
$((x - \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 2]) (-\text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&,$
$1] + \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 4])))$
$(-\text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 1] + \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 4])) \Big/$

$\left(a^2 \left(\frac{b - \sqrt{-4 a^2 + b^2}}{2 a} - \frac{b + \sqrt{-4 a^2 + b^2}}{2 a}\right)\right.$
$\sqrt{x (b + c x + b x^2) - a (1 + x^4)}$
$\left(-b + \sqrt{-4 a^2 + b^2} +\right.$
$\left.2 a \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 1]\right)$
$(-\text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 1] +$
$\text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 2])$
$\left(b - \sqrt{-4 a^2 + b^2} - 2 a \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 2]\right)$
$(\text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 2] -$
$\left.\text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 4])\right) -$

$\left(2 b \sqrt{-4 a^2 + b^2} (x - \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 2])^2\right.$
$\Big(\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{(((x - \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 1])}$
$(\text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 2] - \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&,$
$4])) / ((x - \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 2]) (\text{Root}[a - b \#1 -$
$c \#1^2 - b \#1^3 + a \#1^4 \&, 1] - \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 4])))\Big],$
$-(((\text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 2] - \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 +$
$a \#1^4 \&, 3]) (\text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 1] - \text{Root}[a - b \#1 -$
$c \#1^2 - b \#1^3 + a \#1^4 \&, 4])) / ((-\text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 1] +$
$\text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 3]) (\text{Root}[a - b \#1 - c \#1^2 -$
$b \#1^3 + a \#1^4 \&, 2] - \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 4])))\Big]$
$\left(b - \sqrt{-4 a^2 + b^2} - 2 a \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 1]\right) -$
$2 a \text{EllipticPi}\Big[\Big(\Big(-b + \sqrt{-4 a^2 + b^2} + 2 a \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 2]\Big)$
$(-\text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 1] +$
$\text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 4])\Big) \Big/$
$\Big(\Big(-b + \sqrt{-4 a^2 + b^2} + 2 a \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 1]\Big) (-\text{Root}[a -$
$b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 2] + \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 4])\Big),$
$\text{ArcSin}\Big[\sqrt{(((x - \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 1]) (\text{Root}[a - b \#1 -}$
$c \#1^2 - b \#1^3 + a \#1^4 \&, 2] - \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 4])) /$
$((x - \text{Root}[a - b \#1 - c \#1^2 - b \#1^3 + a \#1^4 \&, 2]) (\text{Root}[a - b \#1 - c \#1^2 -$

$$\text{b} \#1^3 + \text{a} \#1^4 \&, 1] - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 4]))))],$$

$$-(((\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 2] - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 +$$

$$\text{a} \#1^4 \&, 3]) (\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 1] - \text{Root}[\text{a} - \text{b} \#1 -$$

$$\text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 4])) / ((-\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 1] +$$

$$\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 3]) (\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 -$$

$$\text{b} \#1^3 + \text{a} \#1^4 \&, 2] - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 4]))))]$$

$$(-\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 1] + \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 2]))$$

$$\sqrt{}(((-\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 1] + \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 2])$$

$$(\text{x} - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 3])) /$$

$$((\text{x} - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 2]) (-\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&,$$

$$1] + \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 3])))$$

$$\sqrt{}(((\text{x} - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 1]) (\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 +$$

$$\text{a} \#1^4 \&, 2] - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 4])) /$$

$$((\text{x} - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 2]) (\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 -$$

$$\text{b} \#1^3 + \text{a} \#1^4 \&, 1] - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 4])))$$

$$\sqrt{}(((-\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 1] + \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 2])$$

$$(\text{x} - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 4])) /$$

$$((\text{x} - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 2]) (-\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&,$$

$$1] + \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 4])))$$

$$(-\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 1] + \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 4])) /$$

$$\left(\text{a}^2 \left(\frac{\text{b} - \sqrt{-4\,\text{a}^2 + \text{b}^2}}{2\,\text{a}} - \frac{\text{b} + \sqrt{-4\,\text{a}^2 + \text{b}^2}}{2\,\text{a}}\right)\right.$$

$$\sqrt{\text{x}\,(\text{b} + \text{c}\,\text{x} + \text{b}\,\text{x}^2) - \text{a}\,(1 + \text{x}^4)}$$

$$\left(-\text{b} + \sqrt{-4\,\text{a}^2 + \text{b}^2} + \right.$$

$$\left. 2\,\text{a}\,\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 1]\right)$$

$$(-\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 1] +$$

$$\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 2])$$

$$\left(\text{b} - \sqrt{-4\,\text{a}^2 + \text{b}^2} - 2\,\text{a}\,\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 2]\right)$$

$$(\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 2] -$$

$$\left.\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 4])\right) +$$

$$(2\,\text{EllipticF}[\text{ArcSin}[\sqrt{}(((\text{x} - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 1]) (-\text{Root}[\text{a} - \text{b} \#1 -$$

$$\text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 2] + \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 4])) /$$

$$((\text{x} - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 2]) (-\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 -$$

$$\text{b} \#1^3 + \text{a} \#1^4 \&, 1] + \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 4])))],$$

$$((\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 2] - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 3])$$

$$(\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 1] - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 4])) /$$

$$((\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 1] - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 3])$$

$$(\text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 2] - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 4]))]$$

$$(\text{x} - \text{Root}[\text{a} - \text{b} \#1 - \text{c} \#1^2 - \text{b} \#1^3 + \text{a} \#1^4 \&, 2])^2$$

$$\sqrt{\left(\left(\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,3\right]\right)\right)\right)}$$

$$\left(\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)$$

$$\sqrt{\left(\left(\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\right)}$$

$$\sqrt{\left(\left(\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]\right)\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)\right)}\Bigg/$$

$$\left(a\sqrt{x\left(b+c\,x+b\,x^2\right)-a\left(1+x^4\right)}\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,1\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]\right)\left(-\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,2\right]+\text{Root}\left[a-b\,\#1-c\,\#1^2-b\,\#1^3+a\,\#1^4\,\&,\,4\right]\right)\right)$$

Problem 872: 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):

$$-\left(\left(x\sqrt{a\,x\left(a\,x+b\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\right)}\left(-1+a\,x^2+b\,x\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\right)\right.\right.$$

$$\left.\left(\text{Log}\left[1-\frac{\sqrt{a\,x\left(a\,x+b\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\right)}}{\sqrt{2}\,a\,x}\right]-\text{Log}\left[1+\frac{\sqrt{a\,x\left(a\,x+b\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\right)}}{\sqrt{2}\,a\,x}\right]\right)\right)\Bigg/$$

$$\left.\left(\sqrt{2}\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\left(x\left(a\,x+b\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\right)\right)^{3/2}\right)\right)$$

Problem 873: 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):

$$\frac{\sqrt{2}\,b\,\text{ArcSin}\left[\frac{a\,x-b\sqrt{\frac{a}{b^2}+\frac{a^2x^2}{b^2}}}{\sqrt{a}}\right]}{\sqrt{a}}$$

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 874: 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):

$$\frac{\sqrt{2}\, b\, \text{ArcSinh}\left[\frac{a x+b \sqrt{-\frac{a}{b^2}+\frac{a^2 x^2}{b^2}}}{\sqrt{a}}\right]}{\sqrt{a}}$$

Result (type 3, 199 leaves):

$$-\left(\left(x\sqrt{a\,x\left(a\,x+b\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\right)}\left(-1+a\,x^2+b\,x\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\right)\right.\right.$$

$$\left.\left(\text{Log}\left[1-\frac{\sqrt{a\,x\left(a\,x+b\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\right)}}{\sqrt{2}\,a\,x}\right]-\text{Log}\left[1+\frac{\sqrt{a\,x\left(a\,x+b\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\right)}}{\sqrt{2}\,a\,x}\right]\right)\right)\Bigg/$$

$$\left.\left(\sqrt{2}\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\left(x\left(a\,x+b\sqrt{\frac{a\left(-1+a\,x^2\right)}{b^2}}\right)\right)^{3/2}\right)\right)$$

Problem 875: 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):

$$\left(b^2 \sqrt{\frac{a\left(1+a x^2\right)}{b^2}} \sqrt{a x \left(a x-b \sqrt{\frac{a\left(1+a x^2\right)}{b^2}}\right)} \sqrt{x \left(-a x+b \sqrt{\frac{a\left(1+a x^2\right)}{b^2}}\right)}\right.$$

$$\left.\left(\text{Log}\left[1-\frac{\sqrt{a x \left(a x-b \sqrt{\frac{a (1+a x^2)}{b^2}}\right)}}{\sqrt{2}\, a x}\right]-\text{Log}\left[1+\frac{\sqrt{a x \left(a x-b \sqrt{\frac{a (1+a x^2)}{b^2}}\right)}}{\sqrt{2}\, a x}\right]\right)\right) \Big/$$

$$\left(\sqrt{2}\, a^2 x \left(-1-a x^2+b x \sqrt{\frac{a\left(1+a x^2\right)}{b^2}}\right)\right)$$

Problem 876: 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 877: Unable to integrate problem.

$$\int \frac{1}{x\left(3+3 x+x^2\right)\left(3+3 x+3 x^2+x^3\right)^{1/3}}\, dx$$

Optimal (type 3, 123 leaves, 9 steps):

$$-\frac{\text{ArcTan}\left[\frac{1}{\sqrt{3}}+\frac{2 (1+x)}{3^{1/6}\left(2+(1+x)^3\right)^{1/3}}\right]}{3^{5/6}}+\frac{\text{Log}\left[1-\frac{3^{1/3}(1+x)}{\left(2+(1+x)^3\right)^{1/3}}\right]}{3\times 3^{1/3}}-\frac{\text{Log}\left[1+\frac{3^{2/3}(1+x)^2}{\left(2+(1+x)^3\right)^{2/3}}+\frac{3^{1/3}(1+x)}{\left(2+(1+x)^3\right)^{1/3}}\right]}{6\times 3^{1/3}}$$

Result (type 8, 33 leaves):

$$\int \frac{1}{x\left(3+3x+x^2\right)\left(3+3x+3x^2+x^3\right)^{1/3}}\,dx$$

Problem 878: 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):

$$\frac{\sqrt{3}\,\text{ArcTan}\left[\frac{1-\frac{2\times 2^{1/3}(1-x)}{\left(1-x^3\right)^{1/3}}}{\sqrt{3}}\right]}{2^{2/3}}-\frac{\text{Log}\left[1+2\left(1-x\right)^3-x^3\right]}{2\times 2^{2/3}}+\frac{3\,\text{Log}\left[2^{1/3}\left(1-x\right)+\left(1-x^3\right)^{1/3}\right]}{2\times 2^{2/3}}$$

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 879: 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) :

$$-\left(\left(7x^3\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},x^4,-x^4\right]\right)\Big/\left(3\sqrt{-1+x^4}\left(1+x^4\right)\left(-7\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},1,\frac{7}{4},x^4,-x^4\right]+2x^4\left(2\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},2,\frac{11}{4},x^4,-x^4\right]-\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},1,\frac{11}{4},x^4,-x^4\right]\right)\right)\right)\right)$$

Problem 880: 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):

$$\left(\text{i}\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}}}\;\sqrt{1+\frac{2\,c\,x^2}{b-\sqrt{b^2-4\,a\,c}}}\right.$$
$$\left(\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\sqrt{2}\,\sqrt{\frac{c}{b+\sqrt{b^2-4\,a\,c}}}\;x\right],\frac{b+\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}}\right]-\right.$$
$$\text{EllipticPi}\left[\frac{\left(b+\sqrt{b^2-4\,a\,c}\right)d}{2\,a\,e},\text{i}\,\text{ArcSinh}\left[\sqrt{2}\,\sqrt{\frac{c}{b+\sqrt{b^2-4\,a\,c}}}\;x\right],\frac{b+\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}}\right]-$$
$$\left.\left.\text{EllipticPi}\left[\frac{\left(b+\sqrt{b^2-4\,a\,c}\right)e}{2\,c\,d},\text{i}\,\text{ArcSinh}\left[\sqrt{2}\,\sqrt{\frac{c}{b+\sqrt{b^2-4\,a\,c}}}\;x\right],\frac{b+\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}}\right]\right)\right)\Bigg/$$
$$\left(\sqrt{2}\,\sqrt{\frac{c}{b+\sqrt{b^2-4\,a\,c}}}\;d\,e\,\sqrt{a+b\,x^2+c\,x^4}\right)$$

Problem 882: 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):

$$\text{ArcSin}[x]-\frac{\text{ArcTan}\left[\frac{1-2\,x^2}{\sqrt{3}}\right]}{\sqrt{3}}-\frac{\text{ArcTan}\left[\frac{x}{\sqrt{-\frac{\text{i}-\sqrt{3}}{\text{i}+\sqrt{3}}}\;\sqrt{1-x^2}}\right]}{\sqrt{3}}-\frac{\text{ArcTan}\left[\frac{\sqrt{-\frac{\text{i}-\sqrt{3}}{\text{i}+\sqrt{3}}}\;x}{\sqrt{1-x^2}}\right]}{\sqrt{3}}$$

Result (type 3, 2681 leaves):

$$\frac{\left(1+x\,\sqrt{1-x^2}\right)\text{ArcSin}[x]}{x\left(\frac{1}{x}+\sqrt{1-x^2}\right)}+$$
$$\left(\left(-\text{i}+\sqrt{3}\right)\left(1+x\,\sqrt{1-x^2}\right)\text{ArcTan}\left[\left(x\left(7\,\text{i}-\sqrt{3}+8\,\text{i}\,\sqrt{3}\,x+7\,\text{i}\,x^2+\sqrt{3}\,x^2\right)\right)\Big/\right.\right.$$
$$\left(-6\,\text{i}+2\,\sqrt{3}+3\,x-11\,\text{i}\,\sqrt{3}\,x-18\,\text{i}\,x^2-2\,\sqrt{3}\,x^2-3\,x^3-3\,\text{i}\,\sqrt{3}\,x^3-2\,\text{i}\,\sqrt{2\left(1-\text{i}\,\sqrt{3}\right)}\right.$$
$$\left.\left.\left.\sqrt{1-x^2}-2\,\text{i}\,\sqrt{6\left(1-\text{i}\,\sqrt{3}\right)}\;x\,\sqrt{1-x^2}-2\,\text{i}\,\sqrt{2\left(1-\text{i}\,\sqrt{3}\right)}\;x^2\,\sqrt{1-x^2}\right)\right]\right)\Bigg/$$

$$\left(2\sqrt{6\left(1-\mathrm{i}\sqrt{3}\right)}\ x\left(\frac{1}{x}+\sqrt{1-x^2}\right)\right)-\left(\left(-\mathrm{i}+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\right.$$

$$\text{ArcTan}\Big[\left(x\left(7\,\mathrm{i}-\sqrt{3}-8\,\mathrm{i}\sqrt{3}\,x+7\,\mathrm{i}\,x^2+\sqrt{3}\,x^2\right)\right)\Big/\left(6\,\mathrm{i}-2\sqrt{3}+3\,x-11\,\mathrm{i}\sqrt{3}\,x+18\,\mathrm{i}\,x^2+\right.$$

$$2\sqrt{3}\,x^2-3\,x^3-3\,\mathrm{i}\sqrt{3}\,x^3+2\,\mathrm{i}\sqrt{2\left(1-\mathrm{i}\sqrt{3}\right)}\sqrt{1-x^2}-2\,\mathrm{i}\sqrt{6\left(1-\mathrm{i}\sqrt{3}\right)}\,x\sqrt{1-x^2}+$$

$$\left.\left.2\,\mathrm{i}\sqrt{2\left(1-\mathrm{i}\sqrt{3}\right)}\,x^2\sqrt{1-x^2}\right)\Big]\right)\Big/\left(2\sqrt{6\left(1-\mathrm{i}\sqrt{3}\right)}\ x\left(\frac{1}{x}+\sqrt{1-x^2}\right)\right)-$$

$$\left(\left(\mathrm{i}+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\text{ArcTan}\Big[\left(x\left(-7\,\mathrm{i}-\sqrt{3}-8\,\mathrm{i}\sqrt{3}\,x-7\,\mathrm{i}\,x^2+\sqrt{3}\,x^2\right)\right)\Big/\right.$$

$$\left(-6\,\mathrm{i}-2\sqrt{3}-3\,x-11\,\mathrm{i}\sqrt{3}\,x-18\,\mathrm{i}\,x^2+2\sqrt{3}\,x^2+3\,x^3-3\,\mathrm{i}\sqrt{3}\,x^3-2\,\mathrm{i}\sqrt{2\left(1+\mathrm{i}\sqrt{3}\right)}\right.$$

$$\left.\left.\sqrt{1-x^2}-2\,\mathrm{i}\sqrt{6\left(1+\mathrm{i}\sqrt{3}\right)}\,x\sqrt{1-x^2}-2\,\mathrm{i}\sqrt{2\left(1+\mathrm{i}\sqrt{3}\right)}\,x^2\sqrt{1-x^2}\right)\Big]\right)\Big/$$

$$\left(2\sqrt{6\left(1+\mathrm{i}\sqrt{3}\right)}\ x\left(\frac{1}{x}+\sqrt{1-x^2}\right)\right)+\left(\left(\mathrm{i}+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\right.$$

$$\text{ArcTan}\Big[\left(x\left(-7\,\mathrm{i}-\sqrt{3}+8\,\mathrm{i}\sqrt{3}\,x-7\,\mathrm{i}\,x^2+\sqrt{3}\,x^2\right)\right)\Big/\left(6\,\mathrm{i}+2\sqrt{3}-3\,x-11\,\mathrm{i}\sqrt{3}\,x+18\,\mathrm{i}\,x^2-\right.$$

$$2\sqrt{3}\,x^2+3\,x^3-3\,\mathrm{i}\sqrt{3}\,x^3+2\,\mathrm{i}\sqrt{2\left(1+\mathrm{i}\sqrt{3}\right)}\sqrt{1-x^2}-2\,\mathrm{i}\sqrt{6\left(1+\mathrm{i}\sqrt{3}\right)}\,x\sqrt{1-x^2}+$$

$$\left.\left.2\,\mathrm{i}\sqrt{2\left(1+\mathrm{i}\sqrt{3}\right)}\,x^2\sqrt{1-x^2}\right)\Big]\right)\Big/\left(2\sqrt{6\left(1+\mathrm{i}\sqrt{3}\right)}\ x\left(\frac{1}{x}+\sqrt{1-x^2}\right)\right)+$$

$$\frac{\mathrm{i}\left(-\mathrm{i}+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\text{Log}\Big[\left(-\mathrm{i}+\sqrt{3}-2\,x\right)^2\left(\mathrm{i}+\sqrt{3}-2\,x\right)^2\Big]}{4\sqrt{6\left(1-\mathrm{i}\sqrt{3}\right)}\ x\left(\frac{1}{x}+\sqrt{1-x^2}\right)}-$$

$$\frac{\mathrm{i}\left(\mathrm{i}+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\text{Log}\Big[\left(-\mathrm{i}+\sqrt{3}-2\,x\right)^2\left(\mathrm{i}+\sqrt{3}-2\,x\right)^2\Big]}{4\sqrt{6\left(1+\mathrm{i}\sqrt{3}\right)}\ x\left(\frac{1}{x}+\sqrt{1-x^2}\right)}-$$

$$\frac{\mathrm{i}\left(-\mathrm{i}+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\text{Log}\Big[\left(-\mathrm{i}+\sqrt{3}+2\,x\right)^2\left(\mathrm{i}+\sqrt{3}+2\,x\right)^2\Big]}{4\sqrt{6\left(1-\mathrm{i}\sqrt{3}\right)}\ x\left(\frac{1}{x}+\sqrt{1-x^2}\right)}+$$

$$\frac{i\left(i+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\text{Log}\left[\left(-i+\sqrt{3}+2x\right)^2\left(i+\sqrt{3}+2x\right)^2\right]}{4\sqrt{6\left(1+i\sqrt{3}\right)}\;x\left(\frac{1}{x}+\sqrt{1-x^2}\right)}-$$

$$\frac{i\left(1+x\sqrt{1-x^2}\right)\text{Log}\left[-\frac{1}{2}-\frac{i\sqrt{3}}{2}+x^2\right]}{2\sqrt{3}\;x\left(\frac{1}{x}+\sqrt{1-x^2}\right)}+$$

$$\frac{i\left(1+x\sqrt{1-x^2}\right)\text{Log}\left[-\frac{1}{2}+\frac{i\sqrt{3}}{2}+x^2\right]}{2\sqrt{3}\;x\left(\frac{1}{x}+\sqrt{1-x^2}\right)}-$$

$$\left(i\left(-i+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\text{Log}\left[3i+\sqrt{3}-3x-5i\sqrt{3}\;x+10ix^2+3x^3-3i\sqrt{3}\;x^3+\right.\right.$$
$$ix^4-\sqrt{3}\;x^4+2i\sqrt{2\left(1-i\sqrt{3}\right)}\;\sqrt{1-x^2}-3i\sqrt{6\left(1-i\sqrt{3}\right)}\;x\sqrt{1-x^2}+$$
$$\left.\left.5i\sqrt{2\left(1-i\sqrt{3}\right)}\;x^2\sqrt{1-x^2}-i\sqrt{6\left(1-i\sqrt{3}\right)}\;x^3\sqrt{1-x^2}\right]\right)\Big/$$
$$\left(4\sqrt{6\left(1-i\sqrt{3}\right)}\;x\left(\frac{1}{x}+\sqrt{1-x^2}\right)\right)+\left(i\left(-i+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\right.$$
$$\text{Log}\left[3i+\sqrt{3}+3x+5i\sqrt{3}\;x+10ix^2-3x^3+3i\sqrt{3}\;x^3+ix^4-\sqrt{3}\;x^4+\right.$$
$$2i\sqrt{2\left(1-i\sqrt{3}\right)}\;\sqrt{1-x^2}+3i\sqrt{6\left(1-i\sqrt{3}\right)}\;x\sqrt{1-x^2}+5i\sqrt{2\left(1-i\sqrt{3}\right)}\;x^2\sqrt{1-x^2}+$$
$$\left.\left.i\sqrt{6\left(1-i\sqrt{3}\right)}\;x^3\sqrt{1-x^2}\right]\right)\Big/\left(4\sqrt{6\left(1-i\sqrt{3}\right)}\;x\left(\frac{1}{x}+\sqrt{1-x^2}\right)\right)-$$

$$\left(i\left(i+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\text{Log}\left[-3i+\sqrt{3}+3x-5i\sqrt{3}\;x-10ix^2-3x^3-3i\sqrt{3}\;x^3-\right.\right.$$
$$ix^4-\sqrt{3}\;x^4-2i\sqrt{2\left(1+i\sqrt{3}\right)}\;\sqrt{1-x^2}-3i\sqrt{6\left(1+i\sqrt{3}\right)}\;x\sqrt{1-x^2}-$$
$$\left.\left.5i\sqrt{2\left(1+i\sqrt{3}\right)}\;x^2\sqrt{1-x^2}-i\sqrt{6\left(1+i\sqrt{3}\right)}\;x^3\sqrt{1-x^2}\right]\right)\Big/$$
$$\left(4\sqrt{6\left(1+i\sqrt{3}\right)}\;x\left(\frac{1}{x}+\sqrt{1-x^2}\right)\right)+\left(i\left(i+\sqrt{3}\right)\left(1+x\sqrt{1-x^2}\right)\right.$$
$$\text{Log}\left[-3i+\sqrt{3}-3x+5i\sqrt{3}\;x-10ix^2+3x^3+3i\sqrt{3}\;x^3-ix^4-\sqrt{3}\;x^4-\right.$$
$$2i\sqrt{2\left(1+i\sqrt{3}\right)}\;\sqrt{1-x^2}+3i\sqrt{6\left(1+i\sqrt{3}\right)}\;x\sqrt{1-x^2}-5i\sqrt{2\left(1+i\sqrt{3}\right)}\;x^2\sqrt{1-x^2}+$$
$$\left.\left.i\sqrt{6\left(1+i\sqrt{3}\right)}\;x^3\sqrt{1-x^2}\right]\right)\Big/\left(4\sqrt{6\left(1+i\sqrt{3}\right)}\;x\left(\frac{1}{x}+\sqrt{1-x^2}\right)\right)$$

Problem 883: 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):

$$\text{ArcSin}[x]+$$
$$\left(\left(-i+\sqrt{3}\right)\text{ArcTan}\left[\left(x\left(7i-\sqrt{3}+8i\sqrt{3}\,x+7ix^2+\sqrt{3}\,x^2\right)\right)\Big/\left(-6i+2\sqrt{3}+3x-11i\sqrt{3}\,x-\right.\right.\right.$$
$$18ix^2-2\sqrt{3}\,x^2-3x^3-3i\sqrt{3}\,x^3-2i\sqrt{2\left(1-i\sqrt{3}\right)}\sqrt{1-x^2}-$$
$$\left.\left.\left.2i\sqrt{6\left(1-i\sqrt{3}\right)}\,x\sqrt{1-x^2}-2i\sqrt{2\left(1-i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}\right)\right]\right)\Big/\left(2\sqrt{6\left(1-i\sqrt{3}\right)}\right)-$$
$$\left(\left(-i+\sqrt{3}\right)\text{ArcTan}\left[\left(x\left(7i-\sqrt{3}-8i\sqrt{3}\,x+7ix^2+\sqrt{3}\,x^2\right)\right)\Big/\right.\right.$$
$$\left(6i-2\sqrt{3}+3x-11i\sqrt{3}\,x+18ix^2+2\sqrt{3}\,x^2-3x^3-3i\sqrt{3}\,x^3+2i\sqrt{2\left(1-i\sqrt{3}\right)}\right.$$
$$\left.\left.\left.\sqrt{1-x^2}-2i\sqrt{6\left(1-i\sqrt{3}\right)}\,x\sqrt{1-x^2}+2i\sqrt{2\left(1-i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}\right)\right]\right)\Big/$$
$$\left(2\sqrt{6\left(1-i\sqrt{3}\right)}\right)-\left(\left(i+\sqrt{3}\right)\text{ArcTan}\left[\left(x\left(-7i-\sqrt{3}-8i\sqrt{3}\,x-7ix^2+\sqrt{3}\,x^2\right)\right)\Big/\right.\right.$$
$$\left(-6i-2\sqrt{3}-3x-11i\sqrt{3}\,x-18ix^2+2\sqrt{3}\,x^2+3x^3-3i\sqrt{3}\,x^3-2i\sqrt{2\left(1+i\sqrt{3}\right)}\right.$$
$$\left.\left.\left.\sqrt{1-x^2}-2i\sqrt{6\left(1+i\sqrt{3}\right)}\,x\sqrt{1-x^2}-2i\sqrt{2\left(1+i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}\right)\right]\right)\Big/$$
$$\left(2\sqrt{6\left(1+i\sqrt{3}\right)}\right)+\left(\left(i+\sqrt{3}\right)\text{ArcTan}\left[\left(x\left(-7i-\sqrt{3}+8i\sqrt{3}\,x-7ix^2+\sqrt{3}\,x^2\right)\right)\Big/\right.\right.$$
$$\left(6i+2\sqrt{3}-3x-11i\sqrt{3}\,x+18ix^2-2\sqrt{3}\,x^2+3x^3-3i\sqrt{3}\,x^3+2i\sqrt{2\left(1+i\sqrt{3}\right)}\right.$$
$$\left.\left.\left.\sqrt{1-x^2}-2i\sqrt{6\left(1+i\sqrt{3}\right)}\,x\sqrt{1-x^2}+2i\sqrt{2\left(1+i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}\right)\right]\right)\Big/$$

$$\left(2\sqrt{6\left(1+i\sqrt{3}\right)}\right)+\frac{i\left(-i+\sqrt{3}\right)\text{Log}\left[\left(-i+\sqrt{3}-2x\right)^2\left(i+\sqrt{3}-2x\right)^2\right]}{4\sqrt{6\left(1-i\sqrt{3}\right)}}-$$

$$\frac{i\left(i+\sqrt{3}\right)\text{Log}\left[\left(-i+\sqrt{3}-2x\right)^2\left(i+\sqrt{3}-2x\right)^2\right]}{4\sqrt{6\left(1+i\sqrt{3}\right)}}-$$

$$\frac{i\left(-i+\sqrt{3}\right)\text{Log}\left[\left(-i+\sqrt{3}+2x\right)^2\left(i+\sqrt{3}+2x\right)^2\right]}{4\sqrt{6\left(1-i\sqrt{3}\right)}}+$$

$$\frac{i\left(i+\sqrt{3}\right)\text{Log}\left[\left(-i+\sqrt{3}+2x\right)^2\left(i+\sqrt{3}+2x\right)^2\right]}{4\sqrt{6\left(1+i\sqrt{3}\right)}}-$$

$$\frac{i\,\text{Log}\left[-\frac{1}{2}-\frac{i\sqrt{3}}{2}+x^2\right]}{2\sqrt{3}}+$$

$$\frac{i\,\text{Log}\left[-\frac{1}{2}+\frac{i\sqrt{3}}{2}+x^2\right]}{2\sqrt{3}}-$$

$$\left(i\left(-i+\sqrt{3}\right)\text{Log}\left[3i+\sqrt{3}-3x-5i\sqrt{3}\,x+10i\,x^2+3x^3-3i\sqrt{3}\,x^3+\right.\right.$$
$$i\,x^4-\sqrt{3}\,x^4+2i\sqrt{2\left(1-i\sqrt{3}\right)}\sqrt{1-x^2}-3i\sqrt{6\left(1-i\sqrt{3}\right)}\,x\sqrt{1-x^2}+$$
$$\left.\left.5i\sqrt{2\left(1-i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}-i\sqrt{6\left(1-i\sqrt{3}\right)}\,x^3\sqrt{1-x^2}\right]\right)\Big/\left(4\sqrt{6\left(1-i\sqrt{3}\right)}\right)+$$

$$\left(i\left(-i+\sqrt{3}\right)\text{Log}\left[3i+\sqrt{3}+3x+5i\sqrt{3}\,x+10i\,x^2-3x^3+3i\sqrt{3}\,x^3+i\,x^4-\right.\right.$$
$$\sqrt{3}\,x^4+2i\sqrt{2\left(1-i\sqrt{3}\right)}\sqrt{1-x^2}+3i\sqrt{6\left(1-i\sqrt{3}\right)}\,x\sqrt{1-x^2}+$$
$$\left.\left.5i\sqrt{2\left(1-i\sqrt{3}\right)}\,x^2\sqrt{1-x^2}+i\sqrt{6\left(1-i\sqrt{3}\right)}\,x^3\sqrt{1-x^2}\right]\right)\Big/\left(4\sqrt{6\left(1-i\sqrt{3}\right)}\right)-$$

$$\left(i\left(i+\sqrt{3}\right)\text{Log}\left[-3i+\sqrt{3}+3x-5i\sqrt{3}\,x-10i\,x^2-3x^3-3i\sqrt{3}\,x^3-i\,x^4-\right.\right.$$
$$\sqrt{3}\,x^4-2i\sqrt{2\left(1+i\sqrt{3}\right)}\sqrt{1-x^2}-3i\sqrt{6\left(1+i\sqrt{3}\right)}\,x\sqrt{1-x^2}-$$

$$5\,i\,\sqrt{2\left(1+i\sqrt{3}\right)}\;x^2\sqrt{1-x^2}-i\,\sqrt{6\left(1+i\sqrt{3}\right)}\;x^3\sqrt{1-x^2}\,\Big]\Bigg)\Bigg/\left(4\sqrt{6\left(1+i\sqrt{3}\right)}\right)+$$

$$\Bigg(i\left(i+\sqrt{3}\right)\text{Log}\Big[-3\,i+\sqrt{3}-3\,x+5\,i\sqrt{3}\,x-10\,i\,x^2+3\,x^3+3\,i\sqrt{3}\,x^3-i\,x^4-$$
$$\sqrt{3}\,x^4-2\,i\sqrt{2\left(1+i\sqrt{3}\right)}\sqrt{1-x^2}+3\,i\sqrt{6\left(1+i\sqrt{3}\right)}\;x\sqrt{1-x^2}-$$
$$5\,i\sqrt{2\left(1+i\sqrt{3}\right)}\;x^2\sqrt{1-x^2}+i\sqrt{6\left(1+i\sqrt{3}\right)}\;x^3\sqrt{1-x^2}\,\Big]\Bigg)\Bigg/\left(4\sqrt{6\left(1+i\sqrt{3}\right)}\right)$$

Problem 885: 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):

$$\frac{1}{18\,432\,c^2}\text{Log}\Big[20\,738\,073\,600\,000\,000\,b^8\,c^4+597\,005\,697\,024\,000\,000\,b^6\,c^6\,x^2+2\,583\,100\,705\,996\,800\,000\,b^5\,c^7\,x^3+$$
$$951\,050\,714\,480\,640\,000\,b^4\,c^8\,x^4+21\,641\,687\,369\,515\,008\,000\,b^3\,c^9\,x^5+$$
$$32\,462\,531\,054\,272\,512\,000\,b^2\,c^{10}\,x^6+149\,587\,343\,098\,087\,735\,296\,c^{12}\,x^8+$$
$$5\,308\,416\sqrt{-44\,375\,b^4+576\,000\,b^3\,c\,x+576\,000\,b^2\,c^2\,x^2+5\,308\,416\,c^4\,x^4}$$
$$\left(12\,203\,125\,b^6\,c^4+79\,200\,000\,b^5\,c^5\,x+38\,880\,000\,b^4\,c^6\,x^2+\right.$$
$$\left.1\,105\,920\,000\,b^3\,c^7\,x^3+1\,990\,656\,000\,b^2\,c^8\,x^4+12\,230\,590\,464\,c^{10}\,x^6\right)\Big]$$

Result (type 4, 1671 leaves):

$$\left(2\left(x-\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]}{c}\right)^2\right.$$
$$\Bigg(-\frac{1}{c}b\,\text{EllipticF}\Big[\text{ArcSin}\Big[\sqrt{}\Big(\Big(\Big(c\,x-b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\right.$$
$$\left.1\right]\Big)\;\Big(\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]-$$
$$\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]\Big)\Big)\Big/$$
$$\Big(\Big(c\,x-b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]\Big)$$
$$\Big(\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]-$$
$$\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]\Big)\Big)\Big)\Big],$$
$$-\Big(\Big(\Big(\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]-$$
$$\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,3\right]\Big)$$
$$\Big(\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]-$$
$$\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]\Big)\Big)\Big/$$
$$\Big(\Big(-\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]+$$
$$\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,3\right]\Big)$$
$$\Big(\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]-$$
$$\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]\Big)\Big)\Big)\Big]$$

Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 2] +
1/c EllipticPi[(-1/c b Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 1] +
1/c b Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 4]) /
(-1/c b Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 2] + 1/c
b Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 4]),
ArcSin[√(((c x - b Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 1])
(Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 2] -
Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 4])) /
((c x - b Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 2])
(Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 1] -
Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 4])))],
-(((Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 2] - Root[
-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 3])
(Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 1] - Root[
-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 4])) /
((-Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 1] + Root[
-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 3])
(Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 2] - Root[
-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 4])))]
(-b Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 1] +
b Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 2]))

√((((-b Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 1] +
b Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 2])
(x - 1/c b Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 3])) /
(c (x - 1/c b Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 2])
(-1/c b Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 1] + 1/c
b Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 3])))
√(((c x - b Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 1])
(Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 2] -
Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 4])) /
((c x - b Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 2])
(Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 1] -
Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 4])))
(b Root[-44 375 + 576 000 ⌗1 + 576 000 ⌗1^2 + 5 308 416 ⌗1^4 &, 1] / c -

$$\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]}{c}\Bigg)$$

$$\sqrt{\left(\left(\left(-b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]+b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]\right)\left(x-\frac{1}{c}b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(c\left(x-\frac{1}{c}b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]\right)\left(-\frac{1}{c}b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]+\frac{1}{c}b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]\right)\right)\right)}\Bigg)\Bigg/$$

$$\left(\sqrt{-44\,375\,b^4+576\,000\,b^3\,c\,x+576\,000\,b^2\,c^2\,x^2+5\,308\,416\,c^4\,x^4}\left(-\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,1\right]}{c}+\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]}{c}\right)\left(\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,2\right]}{c}-\frac{b\,\text{Root}\left[-44\,375+576\,000\,\#1+576\,000\,\#1^2+5\,308\,416\,\#1^4\,\&,\,4\right]}{c}\right)\right)$$

Problem 886: 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):

$$\frac{1}{16}\,\text{Log}\left[921+2864\,x+9280\,x^2+13\,440\,x^3+17\,024\,x^4+19\,456\,x^5+12\,288\,x^6+8192\,x^7+4096\,x^8+\sqrt{9+120\,x+64\,x^2+64\,x^3+64\,x^4}\,\left(179+444\,x+744\,x^2+1280\,x^3+960\,x^4+768\,x^5+512\,x^6\right)\right]$$

Result (type 4, 2787 leaves):

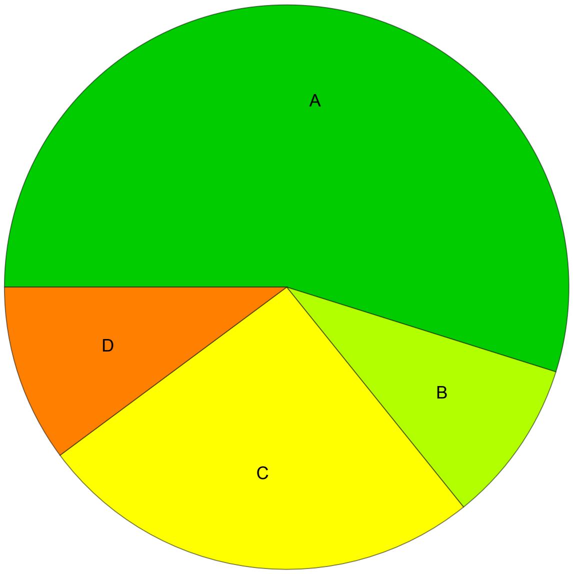
$$\Bigg(8\left(x-\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,2\right]\right)^2\left(-\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\left(\left(\left(x-\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,1\right]\right)\left(\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,2\right]-\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,4\right]\right)\right)\Big/\left(\left(x-\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,2\right]\right)\left(\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,1\right]-\text{Root}\left[9+120\,\#1+64\,\#1^2+64\,\#1^3+64\,\#1^4\,\&,\,4\right]\right)\right)\right)}\right],$$

```
- (((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 &, 2] + EllipticPi[
  (-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 &, 4]),
  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])))) /
(Sqrt[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])))) /
(√(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]))
```

Summary of Integration Test Results

886 integration problems



A - 486 optimal antiderivatives

B - 83 more than twice size of optimal antiderivatives

C - 227 unnecessarily complex antiderivatives

D - 90 unable to integrate problems

E - 0 integration timeouts