Mathematica 11.3 Integration Test Results

Test results for the 1126 problems in "1.2.2.2 (d x)^m (a+b x^2+c x^4)^p.m"

Problem 8: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 299 leaves, 9 steps):

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

Result (type 3, 81 leaves):

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

Problem 10: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 299 leaves, 9 steps):

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

Result (type 3, 52 leaves):

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

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

$$\int \frac{1}{4-5 x^2+x^4} \, dx$$

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

$$-\frac{1}{6} \text{ArcTanh}\left[\frac{x}{2}\right]+\frac{\text{ArcTanh}[x]}{3}$$

Result (type 3, 37 leaves):

$$-\frac{1}{6} \text{Log}[1-x]+\frac{1}{12} \text{Log}[2-x]+\frac{1}{6} \text{Log}[1+x]-\frac{1}{12} \text{Log}[2+x]$$

Problem 13: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{9+5 x^2+x^4} \, dx$$

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

$$-\frac{\text{ArcTan}\left[\frac{1-2 x}{\sqrt{11}}\right]}{6 \sqrt{11}}+\frac{\text{ArcTan}\left[\frac{1+2 x}{\sqrt{11}}\right]}{6 \sqrt{11}}-\frac{1}{12} \text{Log}\left[3-x+x^2\right]+\frac{1}{12} \text{Log}\left[3+x+x^2\right]$$

Result (type 3, 91 leaves):

$$-\frac{i \,\text{ArcTan}\left[\frac{x}{\sqrt{\frac{1}{2} \left(5-i \sqrt{11}\right)}}\right]}{\sqrt{\frac{11}{2} \left(5-i \sqrt{11}\right)}}+\frac{i \,\text{ArcTan}\left[\frac{x}{\sqrt{\frac{1}{2} \left(5+i \sqrt{11}\right)}}\right]}{\sqrt{\frac{11}{2} \left(5+i \sqrt{11}\right)}}$$

Problem 14: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 74 leaves, 9 steps):

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

Result (type 3, 77 leaves):

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

Problem 15: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 176 leaves, 9 steps):

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

Result (type 3, 41 leaves):

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

Problem 16: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{2+5x^2-3x^4}}\,dx$$

Optimal (type 4, 10 leaves, 2 steps):

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{x}{\sqrt{2}}\right],-6\right]$$

Result (type 4, 65 leaves):

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

Problem 17: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 48 leaves, 2 steps):

$$\sqrt{\frac{1}{6}\left(2+\sqrt{10}\right)}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{1}{2}\left(-2+\sqrt{10}\right)}\,x\right],\frac{1}{3}\left(-7-2\sqrt{10}\right)\right]$$

Result (type 4, 49 leaves):

$$-\frac{i\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{1+\sqrt{\frac{5}{2}}}\,x\right],\frac{1}{3}\left(-7+2\sqrt{10}\right)\right]}{\sqrt{2+\sqrt{10}}}$$

Problem 18: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 48 leaves, 2 steps):

$$\sqrt{\frac{2}{-3+\sqrt{33}}}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{6}{3+\sqrt{33}}}\,x\right],\frac{1}{4}\left(-7-\sqrt{33}\right)\right]$$

Result (type 4, 53 leaves):

$$-i\sqrt{\frac{2}{3+\sqrt{33}}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{6}{-3+\sqrt{33}}}\,x\right],\frac{1}{4}\left(-7+\sqrt{33}\right)\right]$$

Problem 19: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 44 leaves, 2 steps):

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

Result (type 4, 49 leaves):

$$-\frac{i\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{3}{-1+\sqrt{7}}}\,x\right],\frac{1}{3}\left(-4+\sqrt{7}\right)\right]}{\sqrt{1+\sqrt{7}}}$$

Problem 20: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 12 leaves, 2 steps):

$$\frac{\text{EllipticF}\left[\text{ArcSin}[x],-\frac{3}{2}\right]}{\sqrt{2}}$$

Result (type 4, 63 leaves):

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

Problem 23: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 42 leaves, 2 steps):

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

Result (type 4, 51 leaves):

$$-\frac{i\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{3}{1+\sqrt{7}}}\,x\right],-\frac{4}{3}-\frac{\sqrt{7}}{3}\right]}{\sqrt{-1+\sqrt{7}}}$$

Problem 24: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 46 leaves, 2 steps):

$$\sqrt{\frac{2}{3+\sqrt{33}}}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{6}{-3+\sqrt{33}}}\,x\right],\frac{1}{4}\left(-7+\sqrt{33}\right)\right]$$

Result (type 4, 55 leaves):

$$-i\sqrt{\frac{2}{-3+\sqrt{33}}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{6}{3+\sqrt{33}}}\,x\right],-\frac{7}{4}-\frac{\sqrt{33}}{4}\right]$$

Problem 25: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 48 leaves, 2 steps):

$$\sqrt{\frac{1}{6}\left(-2+\sqrt{10}\right)}\ \text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{1}{2}\left(2+\sqrt{10}\right)}\ x\right],\ \frac{1}{3}\left(-7+2\sqrt{10}\right)\right]$$

Result (type 4, 49 leaves):

$$-\frac{i\ \text{EllipticF}\left[i\ \text{ArcSinh}\left[\sqrt{-1+\sqrt{\frac{5}{2}}}\ x\right],\ \frac{1}{3}\left(-7-2\sqrt{10}\right)\right]}{\sqrt{-2+\sqrt{10}}}$$

Problem 26: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{2-5x^2-3x^4}}\,dx$$

Optimal (type 4, 18 leaves, 2 steps):

$$\frac{\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{3}\ x\right],\ -\frac{1}{6}\right]}{\sqrt{6}}$$

Result (type 4, 54 leaves):

$$\frac{\sqrt{1-3x^2}\ \sqrt{2+x^2}\ \text{EllipticF}\left[\text{ArcSin}\left[\sqrt{3}\ x\right],\ -\frac{1}{6}\right]}{\sqrt{6}\ \sqrt{2-5x^2-3x^4}}$$

Problem 27: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{3+7x^2-2x^4}}\,dx$$

Optimal (type 4, 45 leaves, 2 steps):

$$\sqrt{\frac{2}{-7+\sqrt{73}}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{2x}{\sqrt{7+\sqrt{73}}}\right],\ \frac{1}{12}\left(-61-7\sqrt{73}\right)\right]$$

Result (type 4, 52 leaves):

$$-i\sqrt{\frac{2}{7+\sqrt{73}}}\ \text{EllipticF}\left[i\ \text{ArcSinh}\left[\frac{2x}{\sqrt{-7+\sqrt{73}}}\right],\ \frac{1}{12}\left(-61+7\sqrt{73}\right)\right]$$

Problem 28: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 44 leaves, 2 steps):

$$\sqrt{\frac{1}{6}\left(3+\sqrt{15}\right)}\ \text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{1}{3}\left(-3+\sqrt{15}\right)}\ x\right],-4-\sqrt{15}\right]$$

Result (type 4, 43 leaves):

$$-\frac{i\ \text{EllipticF}\left[i\ \text{ArcSinh}\left[\sqrt{1+\sqrt{\frac{5}{3}}}\ x\right],-4+\sqrt{15}\right]}{\sqrt{3+\sqrt{15}}}$$

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

$$\int \frac{1}{\sqrt{3+5x^2-2x^4}}\,dx$$

Optimal (type 4, 10 leaves, 2 steps):

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{x}{\sqrt{3}}\right],-6\right]$$

Result (type 4, 65 leaves):

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

Problem 30: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 44 leaves, 2 steps):

$$\frac{\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{2}{2+\sqrt{10}}}\ x\right],\frac{1}{3}\left(-7-2\sqrt{10}\right)\right]}{\sqrt{-2+\sqrt{10}}}$$

Result (type 4, 51 leaves):

$$-\frac{i\ \text{EllipticF}\left[i\ \text{ArcSinh}\left[\sqrt{\frac{2}{-2+\sqrt{10}}}\ x\right],-\frac{7}{3}+\frac{2\sqrt{10}}{3}\right]}{\sqrt{2+\sqrt{10}}}$$

Problem 31: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 45 leaves, 2 steps):

$$\sqrt{\frac{2}{-3+\sqrt{33}}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{2x}{\sqrt{3+\sqrt{33}}}\right],\frac{1}{4}\left(-7-\sqrt{33}\right)\right]$$

Result (type 4, 50 leaves):

$$-i\sqrt{\frac{2}{3+\sqrt{33}}}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{2x}{\sqrt{-3+\sqrt{33}}}\right],\frac{1}{4}\left(-7+\sqrt{33}\right)\right]$$

Problem 32: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 44 leaves, 2 steps):

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

Result (type 4, 49 leaves):

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

Problem 35: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 12 leaves, 2 steps):

$$\frac{\text{EllipticF}\left[\text{ArcSin}[x],-\frac{2}{3}\right]}{\sqrt{3}}$$

Result (type 4, 65 leaves):

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

Problem 36: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 42 leaves, 2 steps):

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

Result (type 4, 51 leaves):

$$-\frac{i\ \text{EllipticF}\left[i\ \text{ArcSinh}\left[\sqrt{\frac{2}{1+\sqrt{7}}}\ x\right],-\frac{4}{3}-\frac{\sqrt{7}}{3}\right]}{\sqrt{-1+\sqrt{7}}}$$

Problem 37: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 43 leaves, 2 steps):

$$\sqrt{\frac{2}{3+\sqrt{33}}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{2x}{\sqrt{-3+\sqrt{33}}}\right],\frac{1}{4}\left(-7+\sqrt{33}\right)\right]$$

Result (type 4, 52 leaves):

$$-i\sqrt{\frac{2}{-3+\sqrt{33}}}\ \text{EllipticF}\left[i\ \text{ArcSinh}\left[\frac{2x}{\sqrt{3+\sqrt{33}}}\right],-\frac{7}{4}-\frac{\sqrt{33}}{4}\right]$$

Problem 38: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 44 leaves, 2 steps):

$$\frac{\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{2}{-2+\sqrt{10}}}\ x\right],\frac{1}{3}\left(-7+2\sqrt{10}\right)\right]}{\sqrt{2+\sqrt{10}}}$$

Result (type 4, 51 leaves):

$$-\frac{i\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{2}{2+\sqrt{10}}}\,x\right],-\frac{7}{3}-\frac{2\sqrt{10}}{3}\right]}{\sqrt{-2+\sqrt{10}}}$$

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

$$\int \frac{1}{\sqrt{3-5x^2-2x^4}}\,dx$$

Optimal (type 4, 18 leaves, 2 steps):

$$\frac{\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{2}\,x\right],-\frac{1}{6}\right]}{\sqrt{6}}$$

Result (type 4, 54 leaves):

$$\frac{\sqrt{1-2x^2}\,\sqrt{3+x^2}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{2}\,x\right],-\frac{1}{6}\right]}{\sqrt{6}\,\sqrt{3-5x^2-2x^4}}$$

Problem 40: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{3-6x^2-2x^4}}\,dx$$

Optimal (type 4, 42 leaves, 2 steps):

$$\sqrt{\frac{1}{6}\left(-3+\sqrt{15}\right)}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{1}{3}\left(3+\sqrt{15}\right)}\,x\right],-4+\sqrt{15}\right]$$

Result (type 4, 45 leaves):

$$-\frac{i\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-1+\sqrt{\frac{5}{3}}}\,x\right],-4-\sqrt{15}\right]}{\sqrt{-3+\sqrt{15}}}$$

Problem 41: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{3-7x^2-2x^4}}\,dx$$

Optimal (type 4, 45 leaves, 2 steps):

$$\sqrt{\frac{2}{7+\sqrt{73}}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{2x}{\sqrt{-7+\sqrt{73}}}\right],\frac{1}{12}\left(-61+7\sqrt{73}\right)\right]$$

Result (type 4, 52 leaves) :

$$-i\sqrt{\frac{2}{-7+\sqrt{73}}}\ \text{EllipticF}\left[i\ \text{ArcSinh}\left[\frac{2\,x}{\sqrt{7+\sqrt{73}}}\right],\ \frac{1}{12}\left(-61-7\sqrt{73}\right)\right]$$

Problem 43: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 141 leaves, 1 step) :

$$\left(\sqrt{\frac{2-\left(2-\sqrt{10}\right)\,x^2}{2-\left(2+\sqrt{10}\right)\,x^2}}\ \sqrt{-2+\left(2+\sqrt{10}\right)\,x^2}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{3/4}\times 5^{1/4}\,x}{\sqrt{-2+\left(2+\sqrt{10}\right)\,x^2}}\right],\ \frac{1}{10}\left(5+\sqrt{10}\right)\right]\right)\Bigg/\left(2\times 10^{1/4}\sqrt{\frac{1}{2-\left(2+\sqrt{10}\right)\,x^2}}\ \sqrt{-2+4\,x^2+3\,x^4}\right)$$

Result (type 4, 81 leaves) :

$$-\left(\left(i\sqrt{2-4\,x^2-3\,x^4}\ \text{EllipticF}\left[i\ \text{ArcSinh}\left[\sqrt{-1+\sqrt{\frac{5}{2}}}\ x\right],\ \frac{1}{3}\left(-7-2\sqrt{10}\right)\right]\right)\Bigg/\left(\sqrt{-2+\sqrt{10}}\ \sqrt{-2+4\,x^2+3\,x^4}\right)\right)$$

Problem 44: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 146 leaves, 1 step) :

$$\left(\sqrt{\frac{4-\left(3-\sqrt{33}\right)x^2}{4-\left(3+\sqrt{33}\right)x^2}}\;\sqrt{-4+\left(3+\sqrt{33}\right)x^2}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{2}\;33^{1/4}\,x}{\sqrt{-4+\left(3+\sqrt{33}\right)x^2}}\right],\frac{1}{22}\left(11+\sqrt{33}\right)\right]\right)\Bigg/$$
$$\left(2\sqrt{2}\;33^{1/4}\sqrt{\frac{1}{4-\left(3+\sqrt{33}\right)x^2}}\;\sqrt{-2+3x^2+3x^4}\right)$$

Result (type 4, 83 leaves):

$$-\frac{i\sqrt{4-6x^2-6x^4}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{6}{3+\sqrt{33}}}\;x\right],-\frac{7}{4}-\frac{\sqrt{33}}{4}\right]}{\sqrt{-3+\sqrt{33}}\;\sqrt{-2+3x^2+3x^4}}$$

Problem 45: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 141 leaves, 1 step):

$$\left(\sqrt{\frac{2-\left(1-\sqrt{7}\right)x^2}{2-\left(1+\sqrt{7}\right)x^2}}\;\sqrt{-2+\left(1+\sqrt{7}\right)x^2}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{2}\;7^{1/4}\,x}{\sqrt{-2+\left(1+\sqrt{7}\right)x^2}}\right],\frac{1}{14}\left(7+\sqrt{7}\right)\right]\right)\Bigg/$$
$$\left(2\times7^{1/4}\sqrt{\frac{1}{2-\left(1+\sqrt{7}\right)x^2}}\;\sqrt{-2+2x^2+3x^4}\right)$$

Result (type 4, 83 leaves):

$$-\frac{i\sqrt{2-2x^2-3x^4}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{3}{1+\sqrt{7}}}\;x\right],-\frac{4}{3}-\frac{\sqrt{7}}{3}\right]}{\sqrt{-1+\sqrt{7}}\;\sqrt{-2+2x^2+3x^4}}$$

Problem 48: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 65 leaves, 1 step):

$$\frac{\sqrt{-1+x^2}\ \sqrt{2+3\,x^2}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{5}{2}}\ x}{\sqrt{-1+x^2}}\right],\frac{2}{5}\right]}{\sqrt{5}\ \sqrt{-2-x^2+3\,x^4}}$$

Result (type 4, 60 leaves):

$$-\frac{\text{i}\ \sqrt{1-x^2}\ \sqrt{2+3\,x^2}\ \text{EllipticF}\left[\text{i}\ \text{ArcSinh}\left[\sqrt{\frac{3}{2}}\ x\right],-\frac{2}{3}\right]}{\sqrt{-6-3\,x^2+9\,x^4}}$$

Problem 49: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 148 leaves, 1 step):

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

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

Result (type 4, 81 leaves):

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

Problem 50: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 153 leaves, 1 step):

$$\left(\sqrt{-4-\left(3-\sqrt{33}\right)x^2}\sqrt{\frac{4+\left(3+\sqrt{33}\right)x^2}{4+\left(3-\sqrt{33}\right)x^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{2}\ 33^{1/4}\,x}{\sqrt{-4-\left(3-\sqrt{33}\right)x^2}}\right],\frac{1}{22}\left(11-\sqrt{33}\right)\right]\right)\Big/$$

$$\left(2\sqrt{2}\ 33^{1/4}\sqrt{\frac{1}{4+\left(3-\sqrt{33}\right)x^2}}\sqrt{-2-3x^2+3x^4}\right)$$

Result (type 4, 81 leaves):

$$-\left(\left(\mathrm{i}\sqrt{4+6x^2-6x^4}\ \text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{6}{-3+\sqrt{33}}}\,x\right],\frac{1}{4}\left(-7+\sqrt{33}\right)\right]\right)\Big/\right.$$

$$\left.\left(\sqrt{3+\sqrt{33}}\sqrt{-2-3x^2+3x^4}\right)\right)$$

Problem 51: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 148 leaves, 1 step):

$$\left(\sqrt{-2-\left(2-\sqrt{10}\right)x^2}\sqrt{\frac{2+\left(2+\sqrt{10}\right)x^2}{2+\left(2-\sqrt{10}\right)x^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{3/4}\times 5^{1/4}\,x}{\sqrt{-2-\left(2-\sqrt{10}\right)x^2}}\right],\frac{1}{10}\left(5-\sqrt{10}\right)\right]\right)\Big/$$

$$\left(2\times 10^{1/4}\sqrt{\frac{1}{2+\left(2-\sqrt{10}\right)x^2}}\sqrt{-2-4x^2+3x^4}\right)$$

Result (type 4, 81 leaves):

$$-\left(\left(i \sqrt{2+4x^2-3x^4}\ \text{EllipticF}\left[i\ \text{ArcSinh}\left[\sqrt{1+\sqrt{\frac{5}{2}}}\ x\right],\ \frac{1}{3}\left(-7+2\sqrt{10}\right)\right]\right)\Big/\left(\sqrt{2+\sqrt{10}}\ \sqrt{-2-4x^2+3x^4}\right)\right)$$

Problem 52: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{-2-5x^2+3x^4}}\,dx$$

Optimal (type 4, 63 leaves, 1 step):

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

Result (type 4, 65 leaves):

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

Problem 53: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{-3+7x^2+2x^4}}\,dx$$

Optimal (type 4, 148 leaves, 1 step):

$$\left(\sqrt{\frac{6-\left(7-\sqrt{73}\right)x^2}{6-\left(7+\sqrt{73}\right)x^2}}\ \sqrt{-6+\left(7+\sqrt{73}\right)x^2}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{2}\ 73^{1/4}\ x}{\sqrt{-6+\left(7+\sqrt{73}\right)x^2}}\right],\ \frac{1}{146}\left(73+7\sqrt{73}\right)\right]\right)\Big/\left(2\sqrt{3}\ 73^{1/4}\sqrt{\frac{1}{6-\left(7+\sqrt{73}\right)x^2}}\ \sqrt{-3+7x^2+2x^4}\right)$$

Result (type 4, 80 leaves):

$$-\left(\left(i \sqrt{6-14 x^2-4 x^4} \text{ EllipticF}\left[i \text{ ArcSinh}\left[\frac{2 x}{\sqrt{7+\sqrt{73}}}\right], \frac{1}{12}\left(-61-7 \sqrt{73}\right)\right]\right) \Big/ \left(\sqrt{-7+\sqrt{73}} \sqrt{-3+7 x^2+2 x^4}\right)\right)$$

Problem 54: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 148 leaves, 1 step):

$$\left(\sqrt{\frac{3-\left(3-\sqrt{15}\right) x^2}{3-\left(3+\sqrt{15}\right) x^2}} \sqrt{-3+\left(3+\sqrt{15}\right) x^2} \text{ EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{2}\ 15^{1/4} x}{\sqrt{-3+\left(3+\sqrt{15}\right) x^2}}\right], \frac{1}{10}\left(5+\sqrt{15}\right)\right]\right) \Big/ \left(\sqrt{2}\ 3^{3/4} \times 5^{1/4} \sqrt{\frac{1}{3-\left(3+\sqrt{15}\right) x^2}} \sqrt{-3+6 x^2+2 x^4}\right)$$

Result (type 4, 77 leaves):

$$-\frac{i \sqrt{3-6 x^2-2 x^4} \text{ EllipticF}\left[i \text{ ArcSinh}\left[\sqrt{-1+\sqrt{\frac{5}{3}}}\ x\right], -4-\sqrt{15}\right]}{\sqrt{-3+\sqrt{15}} \sqrt{-3+6 x^2+2 x^4}}$$

Problem 56: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 148 leaves, 1 step):

$$\left(\sqrt{\frac{3-\left(2-\sqrt{10}\right)x^2}{3-\left(2+\sqrt{10}\right)x^2}}\,\sqrt{-3+\left(2+\sqrt{10}\right)x^2}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{3/4}\times 5^{1/4}\,x}{\sqrt{-3+\left(2+\sqrt{10}\right)x^2}}\right],\frac{1}{10}\left(5+\sqrt{10}\right)\right]\right)\Big/$$

$$\left(2^{3/4}\sqrt{3}\,5^{1/4}\sqrt{\frac{1}{3-\left(2+\sqrt{10}\right)x^2}}\,\sqrt{-3+4x^2+2x^4}\right)$$

Result (type 4, 83 leaves):

$$-\frac{i\sqrt{3-4x^2-2x^4}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{2}{2+\sqrt{10}}}\,x\right],-\frac{7}{3}-\frac{2\sqrt{10}}{3}\right]}{\sqrt{-2+\sqrt{10}}\,\sqrt{-3+4x^2+2x^4}}$$

Problem 57: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 146 leaves, 1 step):

$$\left(\sqrt{\frac{6-\left(3-\sqrt{33}\right)x^2}{6-\left(3+\sqrt{33}\right)x^2}}\,\sqrt{-6+\left(3+\sqrt{33}\right)x^2}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{2}\,33^{1/4}\,x}{\sqrt{-6+\left(3+\sqrt{33}\right)x^2}}\right],\frac{1}{22}\left(11+\sqrt{33}\right)\right]\right)\Big/$$

$$\left(2\times 3^{3/4}\times 11^{1/4}\sqrt{\frac{1}{6-\left(3+\sqrt{33}\right)x^2}}\,\sqrt{-3+3x^2+2x^4}\right)$$

Result (type 4, 80 leaves):

$$-\frac{i\sqrt{6-6x^2-4x^4}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{2x}{\sqrt{3+\sqrt{33}}}\right],-\frac{7}{4}-\frac{\sqrt{33}}{4}\right]}{\sqrt{-3+\sqrt{33}}\,\sqrt{-3+3x^2+2x^4}}$$

Problem 58: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 143 leaves, 1 step):

$$\left(\sqrt{\frac{3-\left(1-\sqrt{7}\right) x^2}{3-\left(1+\sqrt{7}\right) x^2}}\, \sqrt{-3+\left(1+\sqrt{7}\right) x^2}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{2}\, 7^{1/4}\, x}{\sqrt{-3+\left(1+\sqrt{7}\right) x^2}}\right], \frac{1}{14}\left(7+\sqrt{7}\right)\right]\right) \Bigg/ \left(\sqrt{6}\, 7^{1/4} \sqrt{\frac{1}{3-\left(1+\sqrt{7}\right) x^2}}\, \sqrt{-3+2 x^2+2 x^4}\right)$$

Result (type 4, 83 leaves):

$$-\frac{i \sqrt{3-2 x^2-2 x^4}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{2}{1+\sqrt{7}}}\, x\right], -\frac{4}{3}-\frac{\sqrt{7}}{3}\right]}{\sqrt{-1+\sqrt{7}}\, \sqrt{-3+2 x^2+2 x^4}}$$

Problem 59: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 63 leaves, 1 step):

$$\frac{\sqrt{-1+x^2}\, \sqrt{3+2 x^2}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{5}{3}}\, x}{\sqrt{-1+x^2}}\right], \frac{3}{5}\right]}{\sqrt{5}\, \sqrt{-3+x^2+2 x^4}}$$

Result (type 4, 63 leaves):

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

Problem 62: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 150 leaves, 1 step):

$$\left(\sqrt{-3-\left(1-\sqrt{7}\right)x^2}\,\sqrt{\frac{3+\left(1+\sqrt{7}\right)x^2}{3+\left(1-\sqrt{7}\right)x^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{2}\,7^{1/4}\,x}{\sqrt{-3-\left(1-\sqrt{7}\right)x^2}}\right],\frac{1}{14}\left(7-\sqrt{7}\right)\right]\right)\Bigg/$$
$$\left(\sqrt{6}\,7^{1/4}\sqrt{\frac{1}{3+\left(1-\sqrt{7}\right)x^2}}\,\sqrt{-3-2x^2+2x^4}\right)$$

Result (type 4, 81 leaves):

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

Problem 63: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 153 leaves, 1 step):

$$\left(\sqrt{-6-\left(3-\sqrt{33}\right)x^2}\,\sqrt{\frac{6+\left(3+\sqrt{33}\right)x^2}{6+\left(3-\sqrt{33}\right)x^2}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{2}\,33^{1/4}\,x}{\sqrt{-6-\left(3-\sqrt{33}\right)x^2}}\right],\frac{1}{22}\left(11-\sqrt{33}\right)\right]\right)\Bigg/$$
$$\left(2\times 3^{3/4}\times 11^{1/4}\sqrt{\frac{1}{6+\left(3-\sqrt{33}\right)x^2}}\,\sqrt{-3-3x^2+2x^4}\right)$$

Result (type 4, 78 leaves):

$$-\frac{i\sqrt{6+6x^2-4x^4}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{2x}{\sqrt{-3+\sqrt{33}}}\right],\frac{1}{4}\left(-7+\sqrt{33}\right)\right]}{\sqrt{3+\sqrt{33}}\,\sqrt{-3-3x^2+2x^4}}$$

Problem 64: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 155 leaves, 1 step):

$$\left(\sqrt{-3-\left(2-\sqrt{10}\right)x^2}\,\sqrt{\frac{3+\left(2+\sqrt{10}\right)x^2}{3+\left(2-\sqrt{10}\right)x^2}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{2^{3/4}\times 5^{1/4}\,x}{\sqrt{-3-\left(2-\sqrt{10}\right)x^2}}\right],\frac{1}{10}\left(5-\sqrt{10}\right)\right]\right)\Big/$$

$$\left(2^{3/4}\sqrt{3}\;5^{1/4}\sqrt{\frac{1}{3+\left(2-\sqrt{10}\right)x^2}}\,\sqrt{-3-4x^2+2x^4}\right)$$

Result (type 4, 83 leaves):

$$-\frac{i\sqrt{3+4x^2-2x^4}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{2}{-2+\sqrt{10}}}\,x\right],-\frac{7}{3}+\frac{2\sqrt{10}}{3}\right]}{\sqrt{2+\sqrt{10}}\,\sqrt{-3-4x^2+2x^4}}$$

Problem 65: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{-3-5x^2+2x^4}}\,dx$$

Optimal (type 4, 63 leaves, 1 step):

$$\frac{\sqrt{-3+x^2}\,\sqrt{1+2x^2}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{7}\,x}{\sqrt{-3+x^2}}\right],\frac{1}{7}\right]}{\sqrt{7}\,\sqrt{-3-5x^2+2x^4}}$$

Result (type 4, 65 leaves):

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

Problem 66: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{2+5x^2+3x^4}}\,dx$$

Optimal (type 4, 52 leaves, 1 step):

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

Result (type 4, 58 leaves):

$$-\frac{i\sqrt{1+x^2}\ \sqrt{2+3x^2}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{3}{2}}\ x\right],\frac{2}{3}\right]}{\sqrt{6+15x^2+9x^4}}$$

Problem 67: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 90 leaves, 1 step):

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

Result (type 4, 144 leaves):

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

Problem 68: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 92 leaves, 1 step):

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

Result (type 4, 144 leaves):

$$-\left(\left(i\sqrt{1-\frac{6x^2}{-3-i\sqrt{15}}}\ \sqrt{1-\frac{6x^2}{-3+i\sqrt{15}}}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{6}{-3-i\sqrt{15}}}\ x\right],\frac{-3-i\sqrt{15}}{-3+i\sqrt{15}}\right]\right)\Big/\left(\sqrt{6}\ \sqrt{-\frac{1}{-3-i\sqrt{15}}}\ \sqrt{2+3x^2+3x^4}\right)\right)$$

Problem 69: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 92 leaves, 1 step):

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

Result (type 4, 144 leaves):

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

Problem 70: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 88 leaves, 1 step):

$$\left(\left(2+\sqrt{6}\,x^2\right)\sqrt{\frac{2+x^2+3x^4}{\left(2+\sqrt{6}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(\frac{3}{2}\right)^{1/4}x\right],\frac{1}{24}\left(12-\sqrt{6}\right)\right]\right)\Big/\left(2\times 6^{1/4}\sqrt{2+x^2+3x^4}\right)$$

Result (type 4, 142 leaves):

$$-\left(\left(i\sqrt{1-\frac{6x^2}{-1-i\sqrt{23}}}\sqrt{1-\frac{6x^2}{-1+i\sqrt{23}}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{6}{-1-i\sqrt{23}}}\,x\right],\frac{-1-i\sqrt{23}}{-1+i\sqrt{23}}\right]\right)\Big/\left(\sqrt{6}\sqrt{-\frac{1}{-1-i\sqrt{23}}}\sqrt{2+x^2+3x^4}\right)\right)$$

Problem 71: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 72 leaves, 1 step):

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

Result (type 4, 25 leaves):

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

Problem 72: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 90 leaves, 1 step):

$$\left(\left(2+\sqrt{6}\,x^2\right)\sqrt{\frac{2-x^2+3x^4}{\left(2+\sqrt{6}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(\frac{3}{2}\right)^{1/4}x\right],\frac{1}{24}\left(12+\sqrt{6}\right)\right]\right)\Big/\left(2\times 6^{1/4}\sqrt{2-x^2+3x^4}\right)$$

Result (type 4, 144 leaves):

$$-\left(\left(\text{i}\sqrt{1-\frac{6x^2}{1-\text{i}\sqrt{23}}}\sqrt{1-\frac{6x^2}{1+\text{i}\sqrt{23}}}\,\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\sqrt{-\frac{6}{1-\text{i}\sqrt{23}}}\,x\right],\frac{1-\text{i}\sqrt{23}}{1+\text{i}\sqrt{23}}\right]\right)\Big/\left(\sqrt{6}\sqrt{-\frac{1}{1-\text{i}\sqrt{23}}}\sqrt{2-x^2+3x^4}\right)\right)$$

Problem 73: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 90 leaves, 1 step):

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

Result (type 4, 144 leaves):

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

Problem 74: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 90 leaves, 1 step):

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

Result (type 4, 144 leaves):

$$-\left(\left(i \sqrt{1-\frac{6 x^2}{3-i \sqrt{15}}} \sqrt{1-\frac{6 x^2}{3+i \sqrt{15}}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{-\frac{6}{3-i \sqrt{15}}} x\right], \frac{3-i \sqrt{15}}{3+i \sqrt{15}}\right]\right) \Big/ \left(\sqrt{6} \sqrt{-\frac{1}{3-i \sqrt{15}}} \sqrt{2-3 x^2+3 x^4}\right)\right)$$

Problem 75: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 88 leaves, 1 step):

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

Result (type 4, 144 leaves):

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

Problem 78: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{3+9x^2+2x^4}}\,dx$$

Optimal (type 4, 110 leaves, 1 step):

$$\left(\sqrt{\frac{6+\left(9-\sqrt{57}\right)x^2}{6+\left(9+\sqrt{57}\right)x^2}}\left(6+\left(9+\sqrt{57}\right)x^2\right)\right.$$
$$\left.\text{EllipticF}\left[\text{ArcTan}\left[\sqrt{\frac{1}{6}\left(9+\sqrt{57}\right)}\,x\right],\frac{1}{4}\left(-19+3\sqrt{57}\right)\right]\right)\Big/\left(\sqrt{6\left(9+\sqrt{57}\right)}\sqrt{3+9x^2+2x^4}\right)$$

Result (type 4, 97 leaves):

$$-\frac{1}{2\sqrt{3+9x^2+2x^4}}$$
$$i\sqrt{\frac{-9+\sqrt{57}-4x^2}{-9+\sqrt{57}}}\sqrt{9+\sqrt{57}+4x^2}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{2x}{\sqrt{9+\sqrt{57}}}\right],\frac{23}{4}+\frac{3\sqrt{57}}{4}\right]$$

Problem 79: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 110 leaves, 1 step):

$$\left(\sqrt{\frac{3+\left(4-\sqrt{10}\right)x^2}{3+\left(4+\sqrt{10}\right)x^2}}\left(3+\left(4+\sqrt{10}\right)x^2\right)\right.$$
$$\left.\text{EllipticF}\left[\text{ArcTan}\left[\sqrt{\frac{1}{3}\left(4+\sqrt{10}\right)}\,x\right],-\frac{2}{3}\left(5-2\sqrt{10}\right)\right]\right)\Big/\left(\sqrt{3\left(4+\sqrt{10}\right)}\sqrt{3+8x^2+2x^4}\right)$$

Result (type 4, 98 leaves):

$$-\frac{1}{\sqrt{6+16x^2+4x^4}}$$
$$i\sqrt{\frac{-4+\sqrt{10}-2x^2}{-4+\sqrt{10}}}\sqrt{4+\sqrt{10}+2x^2}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{2}{4+\sqrt{10}}}\,x\right],\frac{13}{3}+\frac{4\sqrt{10}}{3}\right]$$

Problem 80: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{3+7x^2+2x^4}}\,dx$$

Optimal (type 4, 60 leaves, 1 step):

$$\frac{\sqrt{\frac{3+x^2}{1+2x^2}}\left(1+2x^2\right)\text{EllipticF}\left[\text{ArcTan}\left[\sqrt{2}\,x\right],\frac{5}{6}\right]}{\sqrt{6}\,\sqrt{3+7x^2+2x^4}}$$

Result (type 4, 61 leaves):

$$-\frac{i\sqrt{3+x^2}\,\sqrt{1+2x^2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{2}\,x\right],\frac{1}{6}\right]}{\sqrt{6}\,\sqrt{3+7x^2+2x^4}}$$

Problem 81: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{3+6x^2+2x^4}}\,dx$$

Optimal (type 4, 104 leaves, 1 step):

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

Result (type 4, 90 leaves):

$$-\frac{1}{\sqrt{6+12x^2+4x^4}}i\sqrt{\frac{-3+\sqrt{3}-2x^2}{-3+\sqrt{3}}}\,\sqrt{3+\sqrt{3}+2x^2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{1-\frac{1}{\sqrt{3}}}\,x\right],2+\sqrt{3}\right]$$

Problem 82: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{3+5x^2+2x^4}}\,dx$$

Optimal (type 4, 52 leaves, 1 step):

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

Result (type 4, 58 leaves):

$$-\frac{i\sqrt{1+x^2}\,\sqrt{3+2x^2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{2}{3}}\,x\right],\frac{3}{2}\right]}{\sqrt{6+10x^2+4x^4}}$$

Problem 83: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 90 leaves, 1 step):

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

Result (type 4, 144 leaves):

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

Problem 84: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 92 leaves, 1 step):

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

Result (type 4, 142 leaves):

$$-\left(\left(i\sqrt{1-\frac{4x^2}{-3-i\sqrt{15}}}\,\sqrt{1-\frac{4x^2}{-3+i\sqrt{15}}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[2\sqrt{-\frac{1}{-3-i\sqrt{15}}}\,x\right],\frac{-3-i\sqrt{15}}{-3+i\sqrt{15}}\right]\right)\Bigg/\left(2\sqrt{-\frac{1}{-3-i\sqrt{15}}}\,\sqrt{3+3x^2+2x^4}\right)\right)$$

Problem 85: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 92 leaves, 1 step):

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

Result (type 4, 144 leaves):

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

Problem 86: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 88 leaves, 1 step):

$$\left(\left(3+\sqrt{6}\,x^2\right)\sqrt{\frac{3+x^2+2x^4}{\left(3+\sqrt{6}\,x^2\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(\frac{2}{3}\right)^{1/4}x\right],\frac{1}{24}\left(12-\sqrt{6}\right)\right]\right)\Big/\left(2\times 6^{1/4}\sqrt{3+x^2+2x^4}\right)$$

Result (type 4, 140 leaves):

$$-\left(\left(i\sqrt{1-\frac{4x^2}{-1-i\sqrt{23}}}\sqrt{1-\frac{4x^2}{-1+i\sqrt{23}}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[2\sqrt{-\frac{1}{-1-i\sqrt{23}}}\,x\right],\frac{-1-i\sqrt{23}}{-1+i\sqrt{23}}\right]\right)\Big/\left(2\sqrt{-\frac{1}{-1-i\sqrt{23}}}\sqrt{3+x^2+2x^4}\right)\right)$$

Problem 87: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 72 leaves, 1 step):

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

Result (type 4, 25 leaves):

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

Problem 88: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 90 leaves, 1 step):

$$\left(\left(3+\sqrt{6}\, x^2\right) \sqrt{\frac{3-x^2+2 x^4}{\left(3+\sqrt{6}\, x^2\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\left(\frac{2}{3}\right)^{1/4} x\right], \frac{1}{24}\left(12+\sqrt{6}\right)\right]\right) \Big/ \left(2\times 6^{1/4} \sqrt{3-x^2+2 x^4}\right)$$

Result (type 4, 142 leaves):

$$-\left(\left(i \sqrt{1-\frac{4 x^2}{1-i \sqrt{23}}} \sqrt{1-\frac{4 x^2}{1+i \sqrt{23}}}\, \text{EllipticF}\left[i \text{ArcSinh}\left[2 \sqrt{-\frac{1}{1-i \sqrt{23}}}\, x\right], \frac{1-i \sqrt{23}}{1+i \sqrt{23}}\right]\right) \Big/ \left(2 \sqrt{-\frac{1}{1-i \sqrt{23}}} \sqrt{3-x^2+2 x^4}\right)\right)$$

Problem 89: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 90 leaves, 1 step):

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

Result (type 4, 144 leaves):

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

Problem 90: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 90 leaves, 1 step):

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

Result (type 4, 142 leaves):

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

Problem 91: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 88 leaves, 1 step):

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

Result (type 4, 144 leaves):

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

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

$$\int \frac{1}{\sqrt{-3+7x^2-2x^4}}\,dx$$

Optimal (type 4, 19 leaves, 2 steps):

$$-\frac{\text{EllipticF}\left[\text{ArcCos}\left[\frac{x}{\sqrt{3}}\right],\frac{6}{5}\right]}{\sqrt{5}}$$

Result (type 4, 58 leaves):

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

Problem 97: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\sqrt{-3+5x^2-2x^4}}\,dx$$

Optimal (type 4, 14 leaves, 2 steps):

$$-\text{EllipticF}\left[\text{ArcCos}\left[\sqrt{\frac{2}{3}}\,x\right],3\right]$$

Result (type 4, 53 leaves):

$$\frac{\sqrt{3-2x^2}\,\sqrt{1-x^2}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{2}{3}}\,x\right],\frac{3}{2}\right]}{\sqrt{-6+10x^2-4x^4}}$$

Problem 98: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 88 leaves, 1 step):

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

Result (type 4, 144 leaves):

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

Problem 99: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 90 leaves, 1 step):

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

Result (type 4, 142 leaves):

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

Problem 100: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 90 leaves, 1 step):

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

Result (type 4, 144 leaves):

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

Problem 101: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 88 leaves, 1 step):

$$\left((3+\sqrt{6}\,x^2)\sqrt{\frac{3-x^2+2x^4}{(3+\sqrt{6}\,x^2)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(\frac{2}{3}\right)^{1/4}x\right],\frac{1}{24}\left(12+\sqrt{6}\right)\right]\right)\Big/\left(2\times 6^{1/4}\sqrt{-3+x^2-2x^4}\right)$$

Result (type 4, 140 leaves) :

$$-\left(\left(i\sqrt{1-\frac{4x^2}{1-i\sqrt{23}}}\sqrt{1-\frac{4x^2}{1+i\sqrt{23}}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[2\sqrt{-\frac{1}{1-i\sqrt{23}}}\,x\right],\frac{1-i\sqrt{23}}{1+i\sqrt{23}}\right]\right)\Big/\left(2\sqrt{-\frac{1}{1-i\sqrt{23}}}\sqrt{-3+x^2-2x^4}\right)\right)$$

Problem 102: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 72 leaves, 1 step) :

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

Result (type 4, 47 leaves) :

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

Problem 103: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 90 leaves, 1 step) :

$$\left((3+\sqrt{6}\,x^2)\sqrt{\frac{3+x^2+2x^4}{(3+\sqrt{6}\,x^2)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(\frac{2}{3}\right)^{1/4}x\right],\frac{1}{24}\left(12-\sqrt{6}\right)\right]\right)\Big/\left(2\times 6^{1/4}\sqrt{-3-x^2-2x^4}\right)$$

Result (type 4, 142 leaves) :

$$-\left(\left(\mathrm{i}\sqrt{1-\frac{4x^2}{-1-\mathrm{i}\sqrt{23}}}\sqrt{1-\frac{4x^2}{-1+\mathrm{i}\sqrt{23}}}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[2\sqrt{-\frac{1}{-1-\mathrm{i}\sqrt{23}}}\,x\right],\frac{-1-\mathrm{i}\sqrt{23}}{-1+\mathrm{i}\sqrt{23}}\right]\right)\Big/\left(2\sqrt{-\frac{1}{-1-\mathrm{i}\sqrt{23}}}\sqrt{-3-x^2-2x^4}\right)\right)$$

Problem 104: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 92 leaves, 1 step):

$$\left(\left(3+\sqrt{6}\,x^2\right)\sqrt{\frac{3+2x^2+2x^4}{\left(3+\sqrt{6}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(\frac{2}{3}\right)^{1/4}x\right],\frac{1}{12}\left(6-\sqrt{6}\right)\right]\right)\Big/\left(2\times6^{1/4}\sqrt{-3-2x^2-2x^4}\right)$$

Result (type 4, 144 leaves):

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

Problem 105: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 92 leaves, 1 step):

$$\frac{\left(3+\sqrt{6}\,x^2\right)\sqrt{\frac{3+3x^2+2x^4}{\left(3+\sqrt{6}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(\frac{2}{3}\right)^{1/4}x\right],\frac{1}{8}\left(4-\sqrt{6}\right)\right]}{2\times6^{1/4}\sqrt{-3-3x^2-2x^4}}$$

Result (type 4, 142 leaves):

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

Problem 106: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 90 leaves, 1 step):

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

Result (type 4, 144 leaves):

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

Problem 107: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{-3-5x^2-2x^4}}\,dx$$

Optimal (type 4, 53 leaves, 2 steps):

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

Result (type 4, 63 leaves):

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

Problem 108: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 42 leaves, 2 steps):

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

Result (type 4, 85 leaves):

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

Problem 109: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{-2+5 x^2-3 x^4}}\,dx$$

Optimal (type 4, 6 leaves, 2 steps):

$$-\text{EllipticF}[\text{ArcCos}[x],3]$$

Result (type 4, 53 leaves):

$$\frac{\sqrt{2-3 x^2}\,\sqrt{1-x^2}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{3}{2}}\,x\right],\frac{2}{3}\right]}{\sqrt{-6+15 x^2-9 x^4}}$$

Problem 110: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 88 leaves, 1 step):

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

Result (type 4, 144 leaves):

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

Problem 111: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 90 leaves, 1 step):

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

Result (type 4, 144 leaves):

$$-\left(\left(i\sqrt{1-\frac{6x^2}{3-i\sqrt{15}}}\sqrt{1-\frac{6x^2}{3+i\sqrt{15}}}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{6}{3-i\sqrt{15}}}\,x\right],\frac{3-i\sqrt{15}}{3+i\sqrt{15}}\right]\right)\Big/\left(\sqrt{6}\sqrt{-\frac{1}{3-i\sqrt{15}}}\sqrt{-2+3x^2-3x^4}\right)\right)$$

Problem 112: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 90 leaves, 1 step):

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

Result (type 4, 144 leaves):

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

Problem 113: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 88 leaves, 1 step):

$$\left(\left(2+\sqrt{6}\ x^2\right)\sqrt{\frac{2-x^2+3x^4}{\left(2+\sqrt{6}\ x^2\right)^2}}\ \text{EllipticF}\left[2\,\text{ArcTan}\left[\left(\frac{3}{2}\right)^{1/4}x\right],\frac{1}{24}\left(12+\sqrt{6}\right)\right]\right)\Big/\left(2\times 6^{1/4}\sqrt{-2+x^2-3x^4}\right)$$

Result (type 4, 142 leaves):

$$-\left(\left(\left(i\sqrt{1-\frac{6x^2}{1-i\sqrt{23}}}\sqrt{1-\frac{6x^2}{1+i\sqrt{23}}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{6}{1-i\sqrt{23}}}\,x\right],\frac{1-i\sqrt{23}}{1+i\sqrt{23}}\right]\right)\right/\left(\sqrt{6}\sqrt{-\frac{1}{1-i\sqrt{23}}}\sqrt{-2+x^2-3x^4}\right)\right)$$

Problem 114: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 72 leaves, 1 step):

$$\frac{\left(2+\sqrt{6}\,x^2\right)\sqrt{\frac{2+3x^4}{\left(2+\sqrt{6}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(\frac{3}{2}\right)^{1/4}x\right],\frac{1}{2}\right]}{2\times6^{1/4}\sqrt{-2-3x^4}}$$

Result (type 4, 47 leaves):

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

Problem 115: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 90 leaves, 1 step):

$$\left(\left(2+\sqrt{6}\,x^2\right)\sqrt{\frac{2+x^2+3x^4}{\left(2+\sqrt{6}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(\frac{3}{2}\right)^{1/4}x\right],\frac{1}{24}\left(12-\sqrt{6}\right)\right]\right)\Big/\left(2\times6^{1/4}\sqrt{-2-x^2-3x^4}\right)$$

Result (type 4, 144 leaves):

$$-\left(\left(\left(i\sqrt{1-\frac{6x^2}{-1-i\sqrt{23}}}\sqrt{1-\frac{6x^2}{-1+i\sqrt{23}}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{6}{-1-i\sqrt{23}}}\,x\right],\frac{-1-i\sqrt{23}}{-1+i\sqrt{23}}\right]\right)\right/\left(\sqrt{6}\sqrt{-\frac{1}{-1-i\sqrt{23}}}\sqrt{-2-x^2-3x^4}\right)\right)$$

Problem 116: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 92 leaves, 1 step):

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

Result (type 4, 144 leaves):

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

Problem 117: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 92 leaves, 1 step):

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

Result (type 4, 144 leaves):

$$-\left(\left(i\sqrt{1-\frac{6x^2}{-3-i\sqrt{15}}}\sqrt{1-\frac{6x^2}{-3+i\sqrt{15}}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{-\frac{6}{-3-i\sqrt{15}}}\,x\right],\frac{-3-i\sqrt{15}}{-3+i\sqrt{15}}\right]\right)\Big/\left(\sqrt{6}\sqrt{-\frac{1}{-3-i\sqrt{15}}}\sqrt{-2-3x^2-3x^4}\right)\right)$$

Problem 118: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 90 leaves, 1 step):

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

Result (type 4, 144 leaves):

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

Problem 119: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{-2-5x^2-3x^4}}\,dx$$

Optimal (type 4, 52 leaves, 2 steps):

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

Result (type 4, 63 leaves):

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

Problem 120: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{2+5x^2+5x^4}}\,dx$$

Optimal (type 4, 92 leaves, 1 step):

$$\left(\left(2+\sqrt{10}\,x^2\right)\sqrt{\frac{2+5x^2+5x^4}{\left(2+\sqrt{10}\,x^2\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\left(\frac{5}{2}\right)^{1/4}x\right],\frac{1}{8}\left(4-\sqrt{10}\right)\right]\right)\Big/\left(2\times 10^{1/4}\sqrt{2+5x^2+5x^4}\right)$$

Result (type 4, 144 leaves):

$$-\left(\left(i \sqrt{1-\frac{10 x^2}{-5-i \sqrt{15}}} \sqrt{1-\frac{10 x^2}{-5+i \sqrt{15}}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{-\frac{10}{-5-i \sqrt{15}}} x\right], \frac{-5-i \sqrt{15}}{-5+i \sqrt{15}}\right]\right) \Big/ \left(\sqrt{10} \sqrt{-\frac{1}{-5-i \sqrt{15}}} \sqrt{2+5 x^2+5 x^4}\right)\right)$$

Problem 121: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{2+5 x^2+4 x^4}} \, dx$$

Optimal (type 4, 90 leaves, 1 step):

$$\frac{\left(1+\sqrt{2} x^2\right) \sqrt{\frac{2+5 x^2+4 x^4}{\left(1+\sqrt{2} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[2^{1/4} x\right], \frac{1}{16} \left(8-5 \sqrt{2}\right)\right]}{2 \times 2^{3/4} \sqrt{2+5 x^2+4 x^4}}$$

Result (type 4, 147 leaves):

$$-\left(\left(i \sqrt{1-\frac{8 x^2}{-5-i \sqrt{7}}} \sqrt{1-\frac{8 x^2}{-5+i \sqrt{7}}} \text{EllipticF}\left[i \text{ArcSinh}\left[2 \sqrt{-\frac{2}{-5-i \sqrt{7}}} x\right], \frac{-5-i \sqrt{7}}{-5+i \sqrt{7}}\right]\right) \Big/ \left(2 \sqrt{2} \sqrt{-\frac{1}{-5-i \sqrt{7}}} \sqrt{2+5 x^2+4 x^4}\right)\right)$$

Problem 122: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{2+5 x^2+3 x^4}} \, dx$$

Optimal (type 4, 52 leaves, 1 step):

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

Result (type 4, 58 leaves):

$$-\frac{i \sqrt{1+x^2} \sqrt{2+3 x^2} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{3}{2}} x\right], \frac{2}{3}\right]}{\sqrt{6+15 x^2+9 x^4}}$$

Problem 123: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{2+5 x^2+2 x^4}} \, dx$$

Optimal (type 4, 58 leaves, 1 step):

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

Result (type 4, 58 leaves):

$$-\frac{i\sqrt{2+x^2}\,\sqrt{1+2x^2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{2}\,x\right],\frac{1}{4}\right]}{2\sqrt{2+5x^2+2x^4}}$$

Problem 124: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{2+5x^2+x^4}}\,dx$$

Optimal (type 4, 108 leaves, 1 step):

$$\left(\sqrt{\frac{4+\left(5-\sqrt{17}\right)x^2}{4+\left(5+\sqrt{17}\right)x^2}}\left(4+\left(5+\sqrt{17}\right)x^2\right)\text{EllipticF}\left[\text{ArcTan}\left[\frac{1}{2}\sqrt{5+\sqrt{17}}\,x\right],\frac{1}{4}\left(-17+5\sqrt{17}\right)\right]\right)\Big/\left(2\sqrt{5+\sqrt{17}}\,\sqrt{2+5x^2+x^4}\right)$$

Result (type 4, 103 leaves):

$$-\left(\left(i\sqrt{5-\sqrt{17}+2x^2}\,\sqrt{5+\sqrt{17}+2x^2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{2}{5+\sqrt{17}}}\,x\right],\frac{21}{4}+\frac{5\sqrt{17}}{4}\right]\right)\Big/\left(\sqrt{2\left(5-\sqrt{17}\right)}\,\sqrt{2+5x^2+x^4}\right)\right)$$

Problem 125: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{2+5x^2-x^4}}\,dx$$

Optimal (type 4, 48 leaves, 2 steps):

$$\sqrt{\frac{2}{-5+\sqrt{33}}}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{2}{5+\sqrt{33}}}\,x\right],\frac{1}{4}\left(-29-5\sqrt{33}\right)\right]$$

Result (type 4, 55 leaves):

$$-i\sqrt{\frac{2}{5+\sqrt{33}}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{2}{-5+\sqrt{33}}}\,x\right],-\frac{29}{4}+\frac{5\sqrt{33}}{4}\right]$$

Problem 126: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{2+5x^2-2x^4}}\,dx$$

Optimal (type 4, 45 leaves, 2 steps):

$$\sqrt{\frac{2}{-5+\sqrt{41}}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{2x}{\sqrt{5+\sqrt{41}}}\right],\ \frac{1}{8}\left(-33-5\sqrt{41}\right)\right]$$

Result (type 4, 52 leaves):

$$-i\sqrt{\frac{2}{5+\sqrt{41}}}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{2x}{\sqrt{-5+\sqrt{41}}}\right],\ -\frac{33}{8}+\frac{5\sqrt{41}}{8}\right]$$

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

$$\int \frac{1}{\sqrt{2+5x^2-3x^4}}\,dx$$

Optimal (type 4, 10 leaves, 2 steps):

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{x}{\sqrt{2}}\right],\ -6\right]$$

Result (type 4, 65 leaves):

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

Problem 128: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{2+5x^2-4x^4}}\,dx$$

Optimal (type 4, 49 leaves, 2 steps):

$$\sqrt{\frac{2}{-5+\sqrt{57}}}\ \text{EllipticF}\left[\text{ArcSin}\left[2\sqrt{\frac{2}{5+\sqrt{57}}}\ x\right],\ \frac{1}{16}\left(-41-5\sqrt{57}\right)\right]$$

Result (type 4, 56 leaves):

$$-i\sqrt{\frac{2}{5+\sqrt{57}}}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[2\sqrt{\frac{2}{-5+\sqrt{57}}}\ x\right],\ \frac{1}{16}\left(-41+5\sqrt{57}\right)\right]$$

Problem 129: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{2+5x^2-5x^4}}\,dx$$

Optimal (type 4, 48 leaves, 2 steps):

$$\sqrt{\frac{2}{-5+\sqrt{65}}}\,\text{EllipticF}\left[\text{ArcSin}\left[\sqrt{\frac{10}{5+\sqrt{65}}}\,x\right],\frac{1}{4}\left(-9-\sqrt{65}\right)\right]$$

Result (type 4, 52 leaves):

$$-i\sqrt{\frac{2}{5+\sqrt{65}}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{1}{2}\sqrt{5+\sqrt{65}}\,x\right],\frac{1}{4}\left(-9+\sqrt{65}\right)\right]$$

Problem 130: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{2+5x^2-6x^4}}\,dx$$

Optimal (type 4, 49 leaves, 2 steps):

$$\sqrt{\frac{2}{-5+\sqrt{73}}}\,\text{EllipticF}\left[\text{ArcSin}\left[2\sqrt{\frac{3}{5+\sqrt{73}}}\,x\right],\frac{1}{24}\left(-49-5\sqrt{73}\right)\right]$$

Result (type 4, 56 leaves):

$$-i\sqrt{\frac{2}{5+\sqrt{73}}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[2\sqrt{\frac{3}{-5+\sqrt{73}}}\,x\right],\frac{1}{24}\left(-49+5\sqrt{73}\right)\right]$$

Problem 131: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{2+5x^2-7x^4}}\,dx$$

Optimal (type 4, 12 leaves, 2 steps):

$$\frac{\text{EllipticF}\left[\text{ArcSin}[x],-\frac{7}{2}\right]}{\sqrt{2}}$$

Result (type 4, 65 leaves):

$$-\frac{i\sqrt{1-x^2}\,\sqrt{2+7x^2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{7}{2}}\,x\right],-\frac{2}{7}\right]}{\sqrt{7}\,\sqrt{2+5x^2-7x^4}}$$

Problem 132: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{2+5x^2-8x^4}}\,dx$$

Optimal (type 4, 45 leaves, 2 steps):

$$\sqrt{\frac{2}{-5+\sqrt{89}}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{4x}{\sqrt{5+\sqrt{89}}}\right],\ \frac{1}{32}\left(-57-5\sqrt{89}\right)\right]$$

Result (type 4, 52 leaves):

$$-i\sqrt{\frac{2}{5+\sqrt{89}}}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{4x}{\sqrt{-5+\sqrt{89}}}\right],\ \frac{1}{32}\left(-57+5\sqrt{89}\right)\right]$$

Problem 133: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{\sqrt{2+5x^2-9x^4}}\,dx$$

Optimal (type 4, 49 leaves, 2 steps):

$$\sqrt{\frac{2}{-5+\sqrt{97}}}\ \text{EllipticF}\left[\text{ArcSin}\left[3\sqrt{\frac{2}{5+\sqrt{97}}}\ x\right],\ \frac{1}{36}\left(-61-5\sqrt{97}\right)\right]$$

Result (type 4, 56 leaves):

$$-i\sqrt{\frac{2}{5+\sqrt{97}}}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[3\sqrt{\frac{2}{-5+\sqrt{97}}}\ x\right],\ \frac{1}{36}\left(-61+5\sqrt{97}\right)\right]$$

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

$$\int \frac{\left(b x^2+c x^4\right)^3}{x^{15}}\,dx$$

Optimal (type 1, 19 leaves, 2 steps):

$$-\frac{\left(b+c x^2\right)^4}{8 b x^8}$$

Result (type 1, 43 leaves):

$$-\frac{b^3}{8x^8}-\frac{b^2 c}{2x^6}-\frac{3bc^2}{4x^4}-\frac{c^3}{2x^2}$$

Problem 352: Result unnecessarily involves imaginary or complex numbers.

$$\int x^{7/2}\sqrt{b x^2+c x^4}\,dx$$

Optimal (type 4, 323 leaves, 8 steps):

$$\frac{28 b^3 x^{3/2}\left(b+c x^2\right)}{195 c^{5/2}\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{b x^2+c x^4}}-\frac{28 b^2\sqrt{x}\,\sqrt{b x^2+c x^4}}{585 c^2}+\frac{4 b x^{5/2}\sqrt{b x^2+c x^4}}{117 c}+\frac{2}{13}x^{9/2}\sqrt{b x^2+c x^4}-\left(28 b^{13/4} x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(195 c^{11/4}\sqrt{b x^2+c x^4}\right)+\left(14 b^{13/4} x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(195 c^{11/4}\sqrt{b x^2+c x^4}\right)$$

Result (type 4, 201 leaves):

$$\left(2 x^{3/2}\left(\sqrt{c}\,x\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\left(-14 b^3-4 b^2 c x^2+55 b c^2 x^4+45 c^3 x^6\right)+42 b^{7/2}\sqrt{1+\frac{c x^2}{b}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]-42 b^{7/2}\sqrt{1+\frac{c x^2}{b}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]\right)\right)\Big/\left(585 c^{5/2}\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\sqrt{x^2\left(b+c x^2\right)}\right)$$

Problem 353: Result unnecessarily involves imaginary or complex numbers.

$$\int x^{5/2}\sqrt{b x^2+c x^4}\,dx$$

Optimal (type 4, 176 leaves, 6 steps):

$$-\frac{20\,b^2\sqrt{b\,x^2+c\,x^4}}{231\,c^2\sqrt{x}}+\frac{4\,b\,x^{3/2}\sqrt{b\,x^2+c\,x^4}}{77\,c}+\frac{2}{11}\,x^{7/2}\sqrt{b\,x^2+c\,x^4}+\left(10\,b^{11/4}\,x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(231\,c^{9/4}\sqrt{b\,x^2+c\,x^4}\right)$$

Result (type 4, 133 leaves):

$$\frac{1}{231}\sqrt{x^2\left(b+c\,x^2\right)}\left(\frac{2\left(-10\,b^2+6\,b\,c\,x^2+21\,c^2\,x^4\right)}{c^2\sqrt{x}}+\frac{20\,i\,b^3\sqrt{1+\frac{b}{c\,x^2}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\,c^2\left(b+c\,x^2\right)}\right)$$

Problem 354: Result unnecessarily involves imaginary or complex numbers.

$$\int x^{3/2}\sqrt{b\,x^2+c\,x^4}\,dx$$

Optimal (type 4, 293 leaves, 7 steps):

$$-\frac{4\,b^2\,x^{3/2}\left(b+c\,x^2\right)}{15\,c^{3/2}\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{b\,x^2+c\,x^4}}+\frac{4\,b\sqrt{x}\sqrt{b\,x^2+c\,x^4}}{45\,c}+\frac{2}{9}\,x^{5/2}\sqrt{b\,x^2+c\,x^4}+\left(4\,b^{9/4}\,x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(15\,c^{7/4}\sqrt{b\,x^2+c\,x^4}\right)-\left(2\,b^{9/4}\,x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(15\,c^{7/4}\sqrt{b\,x^2+c\,x^4}\right)$$

Result (type 4, 190 leaves):

$$\left(2 x^{3/2} \left(\sqrt{c}\, x \sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}} \left(2 b^2+7 b c x^2+5 c^2 x^4\right) - 6 b^{5/2} \sqrt{1+\frac{c x^2}{b}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}}\right], -1\right] + 6 b^{5/2} \sqrt{1+\frac{c x^2}{b}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}}\right], -1\right]\right)\right) \Big/ \left(45 c^{3/2} \sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}} \sqrt{x^2 \left(b+c x^2\right)}\right)$$

Problem 355: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{x} \sqrt{b x^2+c x^4}\, dx$$

Optimal (type 4, 146 leaves, 5 steps):

$$\frac{4 b \sqrt{b x^2+c x^4}}{21 c \sqrt{x}} + \frac{2}{7} x^{3/2} \sqrt{b x^2+c x^4} - \left(2 b^{7/4} x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(21 c^{5/4} \sqrt{b x^2+c x^4}\right)$$

Result (type 4, 120 leaves):

$$\frac{1}{21} \sqrt{x^2 \left(b+c x^2\right)} \left(\frac{4 b}{c \sqrt{x}} + 6 x^{3/2} - \frac{4 i b^2 \sqrt{1+\frac{b}{c x^2}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right], -1\right]}{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, c \left(b+c x^2\right)}\right)$$

Problem 356: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{b x^2+c x^4}}{\sqrt{x}}\, dx$$

Optimal (type 4, 263 leaves, 6 steps):

$$\frac{4\,b\,x^{3/2}\,\left(b+c\,x^2\right)}{5\,\sqrt{c}\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{b\,x^2+c\,x^4}}+\frac{2}{5}\,\sqrt{x}\,\sqrt{b\,x^2+c\,x^4}-$$
$$\left(4\,b^{5/4}\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\,\frac{1}{2}\right]\right)\Big/$$
$$\left(5\,c^{3/4}\,\sqrt{b\,x^2+c\,x^4}\right)+$$
$$\left(2\,b^{5/4}\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\,\frac{1}{2}\right]\right)\Big/$$
$$\left(5\,c^{3/4}\,\sqrt{b\,x^2+c\,x^4}\right)$$

Result (type 4, 176 leaves):

$$\left(2\,x^{3/2}\right.$$
$$\left(\sqrt{c}\,x\,\sqrt{\frac{i\,\sqrt{c}\,x}{\sqrt{b}}}\,\left(b+c\,x^2\right)+2\,b^{3/2}\,\sqrt{1+\frac{c\,x^2}{b}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{c}\,x}{\sqrt{b}}}\right],\,-1\right]-2\,b^{3/2}\right.$$
$$\left.\left.\sqrt{1+\frac{c\,x^2}{b}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{c}\,x}{\sqrt{b}}}\right],\,-1\right]\right)\right)\Big/\left(5\,\sqrt{c}\,\sqrt{\frac{i\,\sqrt{c}\,x}{\sqrt{b}}}\,\sqrt{x^2\,\left(b+c\,x^2\right)}\right)$$

Problem 357: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{b\,x^2+c\,x^4}}{x^{3/2}}\,dx$$

Optimal (type 4, 118 leaves, 4 steps):

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

Result (type 4, 102 leaves):

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

Problem 358: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{b x^2+c x^4}}{x^{5/2}}\,dx$$

Optimal (type 4, 254 leaves, 6 steps):

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

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

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

Result (type 4, 175 leaves):

$$-\left(\left(2\sqrt{x}\left(\sqrt{\frac{\mathrm{i}\sqrt{c}\,x}{\sqrt{b}}}\left(b+c x^2\right)-\right.\right.\right.$$

$$2\sqrt{b}\sqrt{c}\,x\sqrt{1+\frac{c x^2}{b}}\ \text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{\frac{\mathrm{i}\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]+2\sqrt{b}\sqrt{c}\,x$$

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

Problem 359: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{b x^2+c x^4}}{x^{7/2}}\,dx$$

Optimal (type 4, 118 leaves, 4 steps):

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

Result (type 4, 104 leaves) :

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

Problem 360: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{b x^2+c x^4}}{x^{9/2}} \, dx$$

Optimal (type 4, 293 leaves, 7 steps) :

$$\frac{4 c^{3/2} x^{3/2} \left(b+c x^2\right)}{5 b \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{b x^2+c x^4}}-\frac{2 \sqrt{b x^2+c x^4}}{5 x^{7/2}}-\frac{4 c \sqrt{b x^2+c x^4}}{5 b x^{3/2}}-$$

$$\left(4 c^{5/4} x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(5 b^{3/4} \sqrt{b x^2+c x^4}\right)+$$

$$\left(2 c^{5/4} x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(5 b^{3/4} \sqrt{b x^2+c x^4}\right)$$

Result (type 4, 196 leaves) :

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

Problem 361: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{b\,x^2+c\,x^4}}{x^{11/2}}\,dx$$

Optimal (type 4, 146 leaves, 5 steps):

$$-\frac{2\sqrt{b\,x^2+c\,x^4}}{7\,x^{9/2}}-\frac{4\,c\sqrt{b\,x^2+c\,x^4}}{21\,b\,x^{5/2}}-\left(2\,c^{7/4}\,x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(21\,b^{5/4}\sqrt{b\,x^2+c\,x^4}\right)$$

Result (type 4, 122 leaves):

$$\frac{1}{21}\sqrt{x^2\left(b+c\,x^2\right)}\left(-\frac{2\left(3\,b+2\,c\,x^2\right)}{b\,x^{9/2}}-\frac{4\,i\,c^2\sqrt{1+\frac{b}{c\,x^2}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]}{b\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\left(b+c\,x^2\right)}\right)$$

Problem 362: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{b\,x^2+c\,x^4}}{x^{13/2}}\,dx$$

Optimal (type 4, 323 leaves, 8 steps):

$$-\frac{4\,c^{5/2}\,x^{3/2}\,\left(b+c\,x^2\right)}{15\,b^2\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{b\,x^2+c\,x^4}}-\frac{2\,\sqrt{b\,x^2+c\,x^4}}{9\,x^{11/2}}-\frac{4\,c\,\sqrt{b\,x^2+c\,x^4}}{45\,b\,x^{7/2}}+\frac{4\,c^2\,\sqrt{b\,x^2+c\,x^4}}{15\,b^2\,x^{3/2}}+$$
$$\left(4\,c^{9/4}\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\,\frac{1}{2}\right]\right)\Big/$$
$$\left(15\,b^{7/4}\,\sqrt{b\,x^2+c\,x^4}\right)-$$
$$\left(2\,c^{9/4}\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\,\frac{1}{2}\right]\right)\Big/$$
$$\left(15\,b^{7/4}\,\sqrt{b\,x^2+c\,x^4}\right)$$

Result (type 4, 209 leaves):

$$\left(2\,\left(\sqrt{\frac{i\,\sqrt{c}\,x}{\sqrt{b}}}\,\left(-5\,b^3-7\,b^2\,c\,x^2+4\,b\,c^2\,x^4+6\,c^3\,x^6\right)-\right.\right.$$
$$6\,\sqrt{b}\,c^{5/2}\,x^5\,\sqrt{1+\frac{c\,x^2}{b}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{c}\,x}{\sqrt{b}}}\right],\,-1\right]+$$
$$\left.\left.6\,\sqrt{b}\,c^{5/2}\,x^5\,\sqrt{1+\frac{c\,x^2}{b}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{c}\,x}{\sqrt{b}}}\right],\,-1\right]\right)\right)\Big/$$
$$\left(45\,b^2\,x^{7/2}\,\sqrt{\frac{i\,\sqrt{c}\,x}{\sqrt{b}}}\,\sqrt{x^2\,\left(b+c\,x^2\right)}\right)$$

Problem 363: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\sqrt{b\,x^2+c\,x^4}}{x^{15/2}}\,dx$$

Optimal (type 4, 176 leaves, 6 steps):

$$-\frac{2\,\sqrt{b\,x^2+c\,x^4}}{11\,x^{13/2}}-\frac{4\,c\,\sqrt{b\,x^2+c\,x^4}}{77\,b\,x^{9/2}}+\frac{20\,c^2\,\sqrt{b\,x^2+c\,x^4}}{231\,b^2\,x^{5/2}}+$$
$$\left(10\,c^{11/4}\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\,\frac{1}{2}\right]\right)\Big/$$
$$\left(231\,b^{9/4}\,\sqrt{b\,x^2+c\,x^4}\right)$$

Result (type 4, 133 leaves):

$$\frac{1}{231}\sqrt{x^2\left(b+c\,x^2\right)}\left(\frac{2\left(-21\,b^2-6\,b\,c\,x^2+10\,c^2\,x^4\right)}{b^2\,x^{13/2}}+\frac{20\,\mathrm{i}\,c^3\sqrt{1+\frac{b}{c\,x^2}}\;\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]}{b^2\sqrt{\frac{\mathrm{i}\sqrt{b}}{\sqrt{c}}}\left(b+c\,x^2\right)}\right)$$

Problem 364: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 350 leaves, 9 steps):

$$\frac{56\,b^4\,x^{3/2}\left(b+c\,x^2\right)}{1105\,c^{5/2}\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{b\,x^2+c\,x^4}}-\frac{56\,b^3\sqrt{x}\,\sqrt{b\,x^2+c\,x^4}}{3315\,c^2}+$$
$$\frac{8\,b^2\,x^{5/2}\sqrt{b\,x^2+c\,x^4}}{663\,c}+\frac{12}{221}\,b\,x^{9/2}\sqrt{b\,x^2+c\,x^4}+\frac{2}{17}\,x^{5/2}\left(b\,x^2+c\,x^4\right)^{3/2}-$$
$$\left(56\,b^{17/4}\,x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\;\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Big/$$
$$\left(1105\,c^{11/4}\sqrt{b\,x^2+c\,x^4}\right)+$$
$$\left(28\,b^{17/4}\,x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Big/$$
$$\left(1105\,c^{11/4}\sqrt{b\,x^2+c\,x^4}\right)$$

Result (type 4, 212 leaves):

$$\left(2 x^{3/2} \left(\sqrt{c}\, x \sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}} \left(-28 b^4 - 8 b^3 c x^2 + 305 b^2 c^2 x^4 + 480 b c^3 x^6 + 195 c^4 x^8\right) + 84 b^{9/2} \sqrt{1 + \frac{c x^2}{b}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}}\right], -1\right] - 84 b^{9/2} \sqrt{1 + \frac{c x^2}{b}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}}\right], -1\right]\right)\right) \Big/ \left(3315 c^{5/2} \sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}} \sqrt{x^2 \left(b + c x^2\right)}\right)$$

Problem 365: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 203 leaves, 7 steps):

$$-\frac{8 b^3 \sqrt{b x^2 + c x^4}}{231 c^2 \sqrt{x}} + \frac{8 b^2 x^{3/2} \sqrt{b x^2 + c x^4}}{385 c} + \frac{4}{55} b x^{7/2} \sqrt{b x^2 + c x^4} + \frac{2}{15} x^{3/2} \left(b x^2 + c x^4\right)^{3/2} + \left(4 b^{15/4} x \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{\frac{b + c x^2}{\left(\sqrt{b} + \sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(231 c^{9/4} \sqrt{b x^2 + c x^4}\right)$$

Result (type 4, 164 leaves):

$$\left(2 \sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, x^{3/2} \left(-20 b^4 - 8 b^3 c x^2 + 131 b^2 c^2 x^4 + 196 b c^3 x^6 + 77 c^4 x^8\right) + 40\, i\, b^4 \sqrt{1 + \frac{b}{c x^2}}\, x^2\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right], -1\right]\right) \Big/ \left(1155 \sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, c^2 \sqrt{x^2 \left(b + c x^2\right)}\right)$$

Problem 366: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(b x^2 + c x^4\right)^{3/2}}{\sqrt{x}} dx$$

Optimal (type 4, 320 leaves, 8 steps):

$$-\frac{8 b^3 x^{3/2} \left(b+c x^2\right)}{65 c^{3/2} \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{b x^2+c x^4}}+\frac{8 b^2 \sqrt{x} \sqrt{b x^2+c x^4}}{195 c}+\frac{4}{39} b x^{5/2} \sqrt{b x^2+c x^4}+\frac{2}{13} \sqrt{x} \left(b x^2+c x^4\right)^{3/2}+\left(8 b^{13/4} x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(65 c^{7/4} \sqrt{b x^2+c x^4}\right)-\left(4 b^{13/4} x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(65 c^{7/4} \sqrt{b x^2+c x^4}\right)$$

Result (type 4, 201 leaves):

$$\left(2 x^{3/2} \left(\sqrt{c}\, x \sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}} \left(4 b^3+29 b^2 c x^2+40 b c^2 x^4+15 c^3 x^6\right)-12 b^{7/2} \sqrt{1+\frac{c x^2}{b}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}}\right], -1\right]+12 b^{7/2} \sqrt{1+\frac{c x^2}{b}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}}\right], -1\right]\right)\right) \Big/ \left(195 c^{3/2} \sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}} \sqrt{x^2 \left(b+c x^2\right)}\right)$$

Problem 367: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 173 leaves, 6 steps):

$$\frac{8 b^2 \sqrt{b x^2+c x^4}}{77 c \sqrt{x}}+\frac{12}{77} b x^{3/2} \sqrt{b x^2+c x^4}+\frac{2 \left(b x^2+c x^4\right)^{3/2}}{11 \sqrt{x}}-\left(4 b^{11/4} x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(77 c^{5/4} \sqrt{b x^2+c x^4}\right)$$

Result (type 4, 153 leaves):

$$\left(2 \sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, x^{3/2} \left(4 b^3+17 b^2 c x^2+20 b c^2 x^4+7 c^3 x^6\right)-8 i b^3 \sqrt{1+\frac{b}{c x^2}}\, x^2\, \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right], -1\right]\right) \Big/ \left(77 \sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, c \sqrt{x^2 \left(b+c x^2\right)}\right)$$

Problem 368: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 290 leaves, 7 steps):

$$\frac{8 b^2 x^{3/2} \left(b+c x^2\right)}{15 \sqrt{c} \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{b x^2+c x^4}}+\frac{4}{15} b \sqrt{x} \sqrt{b x^2+c x^4}+\frac{2 \left(b x^2+c x^4\right)^{3/2}}{9 x^{3/2}}-\left(8 b^{9/4} x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(15 c^{3/4} \sqrt{b x^2+c x^4}\right)+\left(4 b^{9/4} x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(15 c^{3/4} \sqrt{b x^2+c x^4}\right)$$

Result (type 4, 190 leaves):

$$\left(2 x^{3/2} \left(\sqrt{c}\, x \sqrt{\frac{\mathrm{i} \sqrt{c}\, x}{\sqrt{b}}} \left(11 b^2 + 16 b c x^2 + 5 c^2 x^4\right) + 12 b^{5/2} \sqrt{1 + \frac{c x^2}{b}}\, \text{EllipticE}\left[\mathrm{i}\, \text{ArcSinh}\left[\sqrt{\frac{\mathrm{i} \sqrt{c}\, x}{\sqrt{b}}}\right], -1\right] - 12 b^{5/2} \sqrt{1 + \frac{c x^2}{b}}\, \text{EllipticF}\left[\mathrm{i}\, \text{ArcSinh}\left[\sqrt{\frac{\mathrm{i} \sqrt{c}\, x}{\sqrt{b}}}\right], -1\right]\right)\right) \Big/ \left(45 \sqrt{c} \sqrt{\frac{\mathrm{i} \sqrt{c}\, x}{\sqrt{b}}} \sqrt{x^2 \left(b + c x^2\right)}\right)$$

Problem 369: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(b x^2 + c x^4\right)^{3/2}}{x^{7/2}}\, dx$$

Optimal (type 4, 143 leaves, 5 steps):

$$\frac{4 b \sqrt{b x^2 + c x^4}}{7 \sqrt{x}} + \frac{2 \left(b x^2 + c x^4\right)^{3/2}}{7 x^{5/2}} + \left(4 b^{7/4} x \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{\frac{b + c x^2}{\left(\sqrt{b} + \sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(7 c^{1/4} \sqrt{b x^2 + c x^4}\right)$$

Result (type 4, 119 leaves):

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

Problem 370: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 286 leaves, 7 steps):

$$\frac{24\, b \sqrt{c}\, x^{3/2} \left(b + c\, x^2\right)}{5 \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{b\, x^2 + c\, x^4}} + \frac{12}{5} c \sqrt{x} \sqrt{b\, x^2 + c\, x^4} - \frac{2 \left(b\, x^2 + c\, x^4\right)^{3/2}}{x^{7/2}} - \frac{1}{5 \sqrt{b\, x^2 + c\, x^4}}$$
$$24\, b^{5/4} c^{1/4} x \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{\frac{b + c\, x^2}{\left(\sqrt{b} + \sqrt{c}\, x\right)^2}}\ \text{EllipticE}\left[2\, \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right] +$$
$$\frac{1}{5 \sqrt{b\, x^2 + c\, x^4}} 12\, b^{5/4} c^{1/4} x \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{\frac{b + c\, x^2}{\left(\sqrt{b} + \sqrt{c}\, x\right)^2}}\ \text{EllipticF}\left[2\, \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]$$

Result (type 4, 190 leaves):

$$\left(2 \sqrt{x} \left(\sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}} \left(-5\, b^2 - 4\, b\, c\, x^2 + c^2 x^4\right) + 12\, b^{3/2} \sqrt{c}\, x \sqrt{1 + \frac{c\, x^2}{b}}\ \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}}\right], -1\right] - 12\, b^{3/2} \sqrt{c}\, x \sqrt{1 + \frac{c\, x^2}{b}}\ \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}}\right], -1\right]\right)\right) \Big/ \left(5 \sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}} \sqrt{x^2 \left(b + c\, x^2\right)}\right)$$

Problem 371: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(b\, x^2 + c\, x^4\right)^{3/2}}{x^{11/2}}\, dx$$

Optimal (type 4, 143 leaves, 5 steps):

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

Result (type 4, 111 leaves):

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

Problem 372: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 287 leaves, 7 steps):

$$\frac{24 c^{3/2} x^{3/2} \left(b + c x^2\right)}{5 \left(\sqrt{b} + \sqrt{c} x\right) \sqrt{b x^2 + c x^4}} - \frac{12 c \sqrt{b x^2 + c x^4}}{5 x^{3/2}} - \frac{2 \left(b x^2 + c x^4\right)^{3/2}}{5 x^{11/2}} - \frac{1}{5 \sqrt{b x^2 + c x^4}} 24 b^{1/4} c^{5/4} x \left(\sqrt{b} + \sqrt{c} x\right) \sqrt{\frac{b + c x^2}{\left(\sqrt{b} + \sqrt{c} x\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right] + \frac{1}{5 \sqrt{b x^2 + c x^4}} 12 b^{1/4} c^{5/4} x \left(\sqrt{b} + \sqrt{c} x\right) \sqrt{\frac{b + c x^2}{\left(\sqrt{b} + \sqrt{c} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]$$

Result (type 4, 193 leaves):

$$-\left(\left(2 \left(\sqrt{\frac{i \sqrt{c} x}{\sqrt{b}}} \left(b^2 + 8 b c x^2 + 7 c^2 x^4\right) - 12 \sqrt{b} c^{3/2} x^3 \sqrt{1 + \frac{c x^2}{b}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c} x}{\sqrt{b}}}\right], -1\right] + 12 \sqrt{b} c^{3/2} x^3 \sqrt{1 + \frac{c x^2}{b}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c} x}{\sqrt{b}}}\right], -1\right]\right)\right) \Big/ \left(5 x^{3/2} \sqrt{\frac{i \sqrt{c} x}{\sqrt{b}}} \sqrt{x^2 \left(b + c x^2\right)}\right)\right)$$

Problem 373: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\left(b x^2 + c x^4\right)^{3/2}}{x^{15/2}} \, dx$$

Optimal (type 4, 143 leaves, 5 steps):

$$-\frac{4 c \sqrt{b x^2 + c x^4}}{7 x^{5/2}} - \frac{2 \left(b x^2 + c x^4\right)^{3/2}}{7 x^{13/2}} + \left(4 c^{7/4} x \left(\sqrt{b} + \sqrt{c} x\right) \sqrt{\frac{b + c x^2}{\left(\sqrt{b} + \sqrt{c} x\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(7 b^{1/4} \sqrt{b x^2 + c x^4}\right)$$

Result (type 4, 120 leaves):

$$\frac{2\left(-b^2-4\,b\,c\,x^2-3\,c^2\,x^4+\frac{4\,i\,c^2\,\sqrt{1+\frac{b}{c\,x^2}}\;x^{9/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\,\sqrt{b}}{\sqrt{c}}}}\right)}{7\,x^{5/2}\,\sqrt{x^2\,\left(b+c\,x^2\right)}}$$

Problem 374: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(b\,x^2+c\,x^4\right)^{3/2}}{x^{17/2}}\,dx$$

Optimal (type 4, 320 leaves, 8 steps):

$$\frac{8\,c^{5/2}\,x^{3/2}\,\left(b+c\,x^2\right)}{15\,b\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{b\,x^2+c\,x^4}}-\frac{4\,c\,\sqrt{b\,x^2+c\,x^4}}{15\,x^{7/2}}-\frac{8\,c^2\,\sqrt{b\,x^2+c\,x^4}}{15\,b\,x^{3/2}}-\frac{2\,\left(b\,x^2+c\,x^4\right)^{3/2}}{9\,x^{15/2}}-$$

$$\left(8\,c^{9/4}\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\;\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Big/$$

$$\left(15\,b^{3/4}\,\sqrt{b\,x^2+c\,x^4}\right)+$$

$$\left(4\,c^{9/4}\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Big/$$

$$\left(15\,b^{3/4}\,\sqrt{b\,x^2+c\,x^4}\right)$$

Result (type 4, 209 leaves):

$$-\left(\left(2\left(\sqrt{\frac{i\,\sqrt{c}\,x}{\sqrt{b}}}\,\left(5\,b^3+16\,b^2\,c\,x^2+23\,b\,c^2\,x^4+12\,c^3\,x^6\right)-\right.\right.\right.$$

$$12\,\sqrt{b}\,c^{5/2}\,x^5\,\sqrt{1+\frac{c\,x^2}{b}}\;\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]+12\,\sqrt{b}\,c^{5/2}\,x^5\,\sqrt{1+\frac{c\,x^2}{b}}$$

$$\left.\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]\right)\right)\Big/\left(45\,b\,x^{7/2}\,\sqrt{\frac{i\,\sqrt{c}\,x}{\sqrt{b}}}\,\sqrt{x^2\,\left(b+c\,x^2\right)}\right)\right)$$

Problem 375: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(b\,x^2+c\,x^4\right)^{3/2}}{x^{19/2}}\,dx$$

Optimal (type 4, 173 leaves, 6 steps):

$$-\frac{12\,c\,\sqrt{b\,x^2+c\,x^4}}{77\,x^{9/2}}-\frac{8\,c^2\,\sqrt{b\,x^2+c\,x^4}}{77\,b\,x^{5/2}}-\frac{2\,\left(b\,x^2+c\,x^4\right)^{3/2}}{11\,x^{17/2}}-\left(4\,c^{11/4}\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(77\,b^{5/4}\,\sqrt{b\,x^2+c\,x^4}\right)$$

Result (type 4, 154 leaves) :

$$-\left(\left(2\left(\sqrt{\frac{i\,\sqrt{b}}{\sqrt{c}}}\left(7\,b^3+20\,b^2\,c\,x^2+17\,b\,c^2\,x^4+4\,c^3\,x^6\right)+4\,i\,c^3\,\sqrt{1+\frac{b}{c\,x^2}}\;x^{13/2}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\,\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Big/\left(77\,b\,\sqrt{\frac{i\,\sqrt{b}}{\sqrt{c}}}\;x^{9/2}\,\sqrt{x^2\left(b+c\,x^2\right)}\right)\right)$$

Problem 376: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(b\,x^2+c\,x^4\right)^{3/2}}{x^{21/2}}\,dx$$

Optimal (type 4, 350 leaves, 9 steps) :

$$-\frac{8\,c^{7/2}\,x^{3/2}\,\left(b+c\,x^2\right)}{65\,b^2\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{b\,x^2+c\,x^4}}-\frac{4\,c\,\sqrt{b\,x^2+c\,x^4}}{39\,x^{11/2}}-\frac{8\,c^2\,\sqrt{b\,x^2+c\,x^4}}{195\,b\,x^{7/2}}+\frac{8\,c^3\,\sqrt{b\,x^2+c\,x^4}}{65\,b^2\,x^{3/2}}-\frac{2\,\left(b\,x^2+c\,x^4\right)^{3/2}}{13\,x^{19/2}}+\left(8\,c^{13/4}\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\;\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(65\,b^{7/4}\,\sqrt{b\,x^2+c\,x^4}\right)-\left(4\,c^{13/4}\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(65\,b^{7/4}\,\sqrt{b\,x^2+c\,x^4}\right)$$

Result (type 4, 220 leaves) :

$$\left(2\left(\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\left(-15\,b^4-40\,b^3\,c\,x^2-29\,b^2\,c^2\,x^4+8\,b\,c^3\,x^6+12\,c^4\,x^8\right)-12\,\sqrt{b}\,c^{7/2}\,x^7\,\sqrt{1+\frac{c\,x^2}{b}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]+12\,\sqrt{b}\,c^{7/2}\,x^7\,\sqrt{1+\frac{c\,x^2}{b}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]\right)\right)\Bigg/\left(195\,b^2\,x^{11/2}\,\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\,\sqrt{x^2\left(b+c\,x^2\right)}\right)$$

Problem 377: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(b\,x^2+c\,x^4\right)^{3/2}}{x^{23/2}}\,dx$$

Optimal (type 4, 203 leaves, 7 steps):

$$-\frac{4\,c\,\sqrt{b\,x^2+c\,x^4}}{55\,x^{13/2}}-\frac{8\,c^2\,\sqrt{b\,x^2+c\,x^4}}{385\,b\,x^{9/2}}+\frac{8\,c^3\,\sqrt{b\,x^2+c\,x^4}}{231\,b^2\,x^{5/2}}-\frac{2\left(b\,x^2+c\,x^4\right)^{3/2}}{15\,x^{21/2}}+\left(4\,c^{15/4}\,x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Bigg/\left(231\,b^{9/4}\,\sqrt{b\,x^2+c\,x^4}\right)$$

Result (type 4, 165 leaves):

$$\left(2\left(\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\left(-77\,b^4-196\,b^3\,c\,x^2-131\,b^2\,c^2\,x^4+8\,b\,c^3\,x^6+20\,c^4\,x^8\right)+20\,i\,c^4\,\sqrt{1+\frac{b}{c\,x^2}}\,x^{17/2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]\right)\right)\Bigg/\left(1155\,b^2\,\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\,x^{13/2}\,\sqrt{x^2\left(b+c\,x^2\right)}\right)$$

Problem 378: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{13/2}}{\sqrt{b x^2 + c x^4}} \, dx$$

Optimal (type 4, 179 leaves, 6 steps):

$$\frac{30 b^2 \sqrt{b x^2 + c x^4}}{77 c^3 \sqrt{x}} - \frac{18 b x^{3/2} \sqrt{b x^2 + c x^4}}{77 c^2} + \frac{2 x^{7/2} \sqrt{b x^2 + c x^4}}{11 c} - \left(15 b^{11/4} x \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{\frac{b + c x^2}{\left(\sqrt{b} + \sqrt{c}\, x\right)^2}} \, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(77 c^{13/4} \sqrt{b x^2 + c x^4}\right)$$

Result (type 4, 153 leaves):

$$\left(2 \sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, x^{3/2} \left(15 b^3 + 6 b^2 c x^2 - 2 b c^2 x^4 + 7 c^3 x^6\right) - 30\, i\, b^3 \sqrt{1 + \frac{b}{c x^2}}\, x^2\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right], -1\right]\right) \Big/ \left(77 \sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, c^3 \sqrt{x^2 \left(b + c x^2\right)}\right)$$

Problem 379: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{11/2}}{\sqrt{b x^2 + c x^4}} \, dx$$

Optimal (type 4, 296 leaves, 7 steps):

$$\frac{14 b^2 x^{3/2} \left(b+c x^2\right)}{15 c^{5/2} \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{b x^2+c x^4}}-\frac{14 b \sqrt{x} \sqrt{b x^2+c x^4}}{45 c^2}+\frac{2 x^{5/2} \sqrt{b x^2+c x^4}}{9 c}-$$
$$\left(14 b^{9/4} x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/$$
$$\left(15 c^{11/4} \sqrt{b x^2+c x^4}\right)+$$
$$\left(7 b^{9/4} x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/$$
$$\left(15 c^{11/4} \sqrt{b x^2+c x^4}\right)$$

Result (type 4, 190 leaves):

$$\left(2 x^{3/2} \left(\sqrt{c}\, x \sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}} \left(-7 b^2-2 b c x^2+5 c^2 x^4\right)+\right.\right.$$
$$21 b^{5/2} \sqrt{1+\frac{c x^2}{b}}\, \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}}\right], -1\right]-$$
$$\left.\left.21 b^{5/2} \sqrt{1+\frac{c x^2}{b}}\, \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}}\right], -1\right]\right)\right) \Big/$$
$$\left(45 c^{5/2} \sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}} \sqrt{x^2 \left(b+c x^2\right)}\right)$$

Problem 380: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{9/2}}{\sqrt{b x^2+c x^4}}\, dx$$

Optimal (type 4, 149 leaves, 5 steps):

$$-\frac{10 b \sqrt{b x^2+c x^4}}{21 c^2 \sqrt{x}}+\frac{2 x^{3/2} \sqrt{b x^2+c x^4}}{7 c}+$$
$$\left(5 b^{7/4} x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/$$
$$\left(21 c^{9/4} \sqrt{b x^2+c x^4}\right)$$

Result (type 4, 144 leaves):

$$\frac{x\left(b+c x^2\right)\left(-\frac{10 b\sqrt{x}}{21 c^2}+\frac{2 x^{5/2}}{7 c}\right)}{\sqrt{x^2\left(b+c x^2\right)}}+\frac{10\, i\, b^2\sqrt{1+\frac{b}{c x^2}}\; x^2\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]}{21\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\; c^2\sqrt{x^2\left(b+c x^2\right)}}$$

Problem 381: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^{7/2}}{\sqrt{b x^2+c x^4}}\,dx$$

Optimal (type 4, 266 leaves, 6 steps):

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

Result (type 4, 176 leaves):

$$\left(2 x^{3/2}\right.$$
$$\left(\sqrt{c}\, x\sqrt{\frac{i\sqrt{c}\, x}{\sqrt{b}}}\left(b+c x^2\right)-3 b^{3/2}\sqrt{1+\frac{c x^2}{b}}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\, x}{\sqrt{b}}}\right],-1\right]+3 b^{3/2}\right.$$
$$\left.\left.\sqrt{1+\frac{c x^2}{b}}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\, x}{\sqrt{b}}}\right],-1\right]\right)\right)\Big/\left(5 c^{3/2}\sqrt{\frac{i\sqrt{c}\, x}{\sqrt{b}}}\sqrt{x^2\left(b+c x^2\right)}\right)$$

Problem 382: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^{5/2}}{\sqrt{b x^2+c x^4}}\,dx$$

Optimal (type 4, 121 leaves, 4 steps):

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

Result (type 4, 126 leaves):

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

Problem 383: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{3/2}}{\sqrt{b x^2+c x^4}}\, dx$$

Optimal (type 4, 231 leaves, 5 steps):

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

Result (type 4, 112 leaves):

$$\left(2\, i\, x^{5/2} \sqrt{1+\frac{c x^2}{b}}\right.$$
$$\left.\left(\text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}}\right], -1\right]-\text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}}\right], -1\right]\right)\right) \Big/$$
$$\left(\left(\frac{i \sqrt{c}\, x}{\sqrt{b}}\right)^{3/2} \sqrt{x^2 \left(b+c x^2\right)}\right)$$

Problem 384: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\sqrt{x}}{\sqrt{b x^2+c x^4}}\, dx$$

Optimal (type 4, 90 leaves, 3 steps):

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

Result (type 4, 85 leaves):

$$\frac{2\,i\,\sqrt{1+\frac{b}{c\,x^2}}\,x^2\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i\sqrt{b}}{\sqrt{c}}}\,\sqrt{x^2\left(b+c\,x^2\right)}}$$

Problem 385: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 259 leaves, 6 steps):

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

Result (type 4, 177 leaves):

$$-\left(\left(2\sqrt{x}\left(\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\left(b+c\,x^2\right)-\sqrt{b}\,\sqrt{c}\,x\,\sqrt{1+\frac{c\,x^2}{b}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]+\right.\right.\right.$$
$$\left.\left.\sqrt{b}\,\sqrt{c}\,x\,\sqrt{1+\frac{c\,x^2}{b}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]\right)\right)\Big/$$
$$\left.\left(b\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\,\sqrt{x^2\left(b+c\,x^2\right)}\right)\right)$$

Problem 386: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 121 leaves, 4 steps):

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

Result (type 4, 110 leaves):

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

Problem 387: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^{5/2} \sqrt{b x^2 + c x^4}} \, dx$$

Optimal (type 4, 296 leaves, 7 steps):

$$-\frac{6 c^{3/2} x^{3/2} \left(b + c x^2\right)}{5 b^2 \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{b x^2 + c x^4}} - \frac{2 \sqrt{b x^2 + c x^4}}{5 b x^{7/2}} + \frac{6 c \sqrt{b x^2 + c x^4}}{5 b^2 x^{3/2}} +$$

$$\left(6 c^{5/4} x \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{\frac{b + c x^2}{\left(\sqrt{b} + \sqrt{c}\, x\right)^2}}\, \text{EllipticE}\left[2\, \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/$$

$$\left(5 b^{7/4} \sqrt{b x^2 + c x^4}\right) -$$

$$\left(3 c^{5/4} x \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{\frac{b + c x^2}{\left(\sqrt{b} + \sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2\, \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/$$

$$\left(5 b^{7/4} \sqrt{b x^2 + c x^4}\right)$$

Result (type 4, 199 leaves):

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

Problem 388: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^{7/2} \sqrt{b\, x^2 + c\, x^4}}\, dx$$

Optimal (type 4, 149 leaves, 5 steps):

$$-\frac{2 \sqrt{b\, x^2 + c\, x^4}}{7\, b\, x^{9/2}} + \frac{10\, c \sqrt{b\, x^2 + c\, x^4}}{21\, b^2\, x^{5/2}} + \left(5\, c^{7/4}\, x \left(\sqrt{b} + \sqrt{c}\, x\right) \sqrt{\frac{b + c\, x^2}{\left(\sqrt{b} + \sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2\, \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right], \frac{1}{2}\right]\right) \Big/ \left(21\, b^{9/4} \sqrt{b\, x^2 + c\, x^4}\right)$$

Result (type 4, 144 leaves):

$$\frac{\left(-\frac{2}{7\, b\, x^{7/2}} + \frac{10\, c}{21\, b^2\, x^{3/2}}\right) x \left(b + c\, x^2\right)}{\sqrt{x^2 \left(b + c\, x^2\right)}} + \frac{10\, i\, c^2 \sqrt{1 + \frac{b}{c\, x^2}}\, x^2\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right], -1\right]}{21\, b^2 \sqrt{\frac{i \sqrt{b}}{\sqrt{c}}} \sqrt{x^2 \left(b + c\, x^2\right)}}$$

Problem 389: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^{9/2} \sqrt{b\, x^2 + c\, x^4}}\, dx$$

Optimal (type 4, 326 leaves, 8 steps):

$$\frac{14\,c^{5/2}\,x^{3/2}\,\left(b+c\,x^2\right)}{15\,b^3\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{b\,x^2+c\,x^4}}-\frac{2\,\sqrt{b\,x^2+c\,x^4}}{9\,b\,x^{11/2}}+\frac{14\,c\,\sqrt{b\,x^2+c\,x^4}}{45\,b^2\,x^{7/2}}-\frac{14\,c^2\,\sqrt{b\,x^2+c\,x^4}}{15\,b^3\,x^{3/2}}-$$
$$\left(14\,c^{9/4}\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\;\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\,\frac{1}{2}\right]\right)\Big/$$
$$\left(15\,b^{11/4}\,\sqrt{b\,x^2+c\,x^4}\right)+$$
$$\left(7\,c^{9/4}\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\,\frac{1}{2}\right]\right)\Big/$$
$$\left(15\,b^{11/4}\,\sqrt{b\,x^2+c\,x^4}\right)$$

Result (type 4, 210 leaves):

$$\left(-2\,\sqrt{\frac{i\,\sqrt{c}\,x}{\sqrt{b}}}\,\left(5\,b^3-2\,b^2\,c\,x^2+14\,b\,c^2\,x^4+21\,c^3\,x^6\right)+\right.$$
$$42\,\sqrt{b}\,c^{5/2}\,x^5\,\sqrt{1+\frac{c\,x^2}{b}}\;\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{c}\,x}{\sqrt{b}}}\right],\,-1\right]-$$
$$\left.42\,\sqrt{b}\,c^{5/2}\,x^5\,\sqrt{1+\frac{c\,x^2}{b}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\,\sqrt{c}\,x}{\sqrt{b}}}\right],\,-1\right]\right)\Big/$$
$$\left(45\,b^3\,x^{7/2}\,\sqrt{\frac{i\,\sqrt{c}\,x}{\sqrt{b}}}\,\sqrt{x^2\,\left(b+c\,x^2\right)}\right)$$

Problem 390: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^{11/2}\,\sqrt{b\,x^2+c\,x^4}}\,dx$$

Optimal (type 4, 179 leaves, 6 steps):

$$-\frac{2\,\sqrt{b\,x^2+c\,x^4}}{11\,b\,x^{13/2}}+\frac{18\,c\,\sqrt{b\,x^2+c\,x^4}}{77\,b^2\,x^{9/2}}-\frac{30\,c^2\,\sqrt{b\,x^2+c\,x^4}}{77\,b^3\,x^{5/2}}-$$
$$\left(15\,c^{11/4}\,x\,\left(\sqrt{b}+\sqrt{c}\,x\right)\,\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\,\sqrt{x}}{b^{1/4}}\right],\,\frac{1}{2}\right]\right)\Big/$$
$$\left(77\,b^{13/4}\,\sqrt{b\,x^2+c\,x^4}\right)$$

Result (type 4, 134 leaves):

$$\left(2\left(-7 b^3+2 b^2 c x^2-6 b c^2 x^4-15 c^3 x^6-\frac{15 i c^3 \sqrt{1+\frac{b}{c x^2}}\, x^{13/2}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]}{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}\right)\right)\Big/\left(77 b^3 x^{9/2} \sqrt{x^2 \left(b+c x^2\right)}\right)$$

Problem 391: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{17/2}}{\left(b x^2+c x^4\right)^{3/2}}\, dx$$

Optimal (type 4, 174 leaves, 6 steps):

$$-\frac{x^{11/2}}{c \sqrt{b x^2+c x^4}}-\frac{15 b \sqrt{b x^2+c x^4}}{7 c^3 \sqrt{x}}+\frac{9 x^{3/2} \sqrt{b x^2+c x^4}}{7 c^2}+\left(15 b^{7/4} x \left(\sqrt{b}+\sqrt{c}\, x\right) \sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\, \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} \sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(14 c^{13/4} \sqrt{b x^2+c x^4}\right)$$

Result (type 4, 141 leaves):

$$\left(\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, x^{3/2} \left(-15 b^2-6 b c x^2+2 c^2 x^4\right)+15 i b^2 \sqrt{1+\frac{b}{c x^2}}\, x^2\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]\right)\Big/\left(7 \sqrt{\frac{i \sqrt{b}}{\sqrt{c}}}\, c^3 \sqrt{x^2 \left(b+c x^2\right)}\right)$$

Problem 392: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{15/2}}{\left(b x^2+c x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 291 leaves, 7 steps):

$$-\frac{x^{9/2}}{c\sqrt{b x^2+c x^4}}-\frac{21 b x^{3/2}\left(b+c x^2\right)}{5 c^{5/2}\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{b x^2+c x^4}}+\frac{7\sqrt{x}\,\sqrt{b x^2+c x^4}}{5 c^2}+\left(21 b^{5/4} x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(5 c^{11/4}\sqrt{b x^2+c x^4}\right)-\left(21 b^{5/4} x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(10 c^{11/4}\sqrt{b x^2+c x^4}\right)$$

Result (type 4, 179 leaves):

$$\left(x^{3/2}\left(\sqrt{c}\,x\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\left(7 b+2 c x^2\right)-21 b^{3/2}\sqrt{1+\frac{c x^2}{b}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]+21 b^{3/2}\sqrt{1+\frac{c x^2}{b}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]\right)\right)\Big/\left(5 c^{5/2}\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\sqrt{x^2\left(b+c x^2\right)}\right)$$

Problem 393: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 146 leaves, 5 steps):

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

Result (type 4, 128 leaves):

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

Problem 394: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^{11/2}}{\left(b x^2+c x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 259 leaves, 6 steps):

$$-\frac{x^{5/2}}{c\sqrt{b x^2+c x^4}}+\frac{3 x^{3/2}\left(b+c x^2\right)}{c^{3/2}\left(\sqrt{b}+\sqrt{c}\, x\right)\sqrt{b x^2+c x^4}}-\frac{1}{c^{7/4}\sqrt{b x^2+c x^4}}3 b^{1/4} x\left(\sqrt{b}+\sqrt{c}\, x\right)\sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\ \text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]+\left(3 b^{1/4} x\left(\sqrt{b}+\sqrt{c}\, x\right)\sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\, x\right)^2}}\ \text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Big/\left(2 c^{7/4}\sqrt{b x^2+c x^4}\right)$$

Result (type 4, 167 leaves):

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

Problem 395: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 119 leaves, 4 steps):

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

Result (type 4, 115 leaves):

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

Problem 396: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^{7/2}}{\left(b x^2 + c x^4\right)^{3/2}}\, dx$$

Optimal (type 4, 260 leaves, 6 steps):

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

Result (type 4, 168 leaves):

$$\left(i\, x^{5/2} \left(\sqrt{c}\, x \sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}} - \sqrt{b} \sqrt{1 + \frac{c x^2}{b}}\ \text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}}\right], -1\right] + \sqrt{b} \sqrt{1 + \frac{c x^2}{b}}\ \text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}\, x}{\sqrt{b}}}\right], -1\right]\right)\right) \Big/ \left(b^{3/2} \left(\frac{i \sqrt{c}\, x}{\sqrt{b}}\right)^{3/2} \sqrt{x^2 \left(b + c x^2\right)}\right)$$

Problem 397: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 118 leaves, 4 steps):

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

Result (type 4, 114 leaves):

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

Problem 398: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 286 leaves, 7 steps):

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

Result (type 4, 181 leaves):

$$-\left(\left(\sqrt{x}\left(\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\left(2b+3cx^2\right)-3\sqrt{b}\sqrt{c}\,x\sqrt{1+\frac{cx^2}{b}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]+3\sqrt{b}\sqrt{c}\,x\sqrt{1+\frac{cx^2}{b}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]\right)\right)\Big/\left(b^2\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\sqrt{x^2\left(b+cx^2\right)}\right)\right)$$

Problem 399: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 145 leaves, 5 steps):

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

Result (type 4, 110 leaves):

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

Problem 400: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 320 leaves, 8 steps):

$$\frac{1}{b\,x^{3/2}\sqrt{b\,x^2+c\,x^4}}-\frac{21\,c^{3/2}\,x^{3/2}\left(b+c\,x^2\right)}{5\,b^3\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{b\,x^2+c\,x^4}}-\frac{7\sqrt{b\,x^2+c\,x^4}}{5\,b^2\,x^{7/2}}+\frac{21\,c\sqrt{b\,x^2+c\,x^4}}{5\,b^3\,x^{3/2}}+$$
$$\left(21\,c^{5/4}\,x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Bigg/$$
$$\left(5\,b^{11/4}\sqrt{b\,x^2+c\,x^4}\right)-$$
$$\left(21\,c^{5/4}\,x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Bigg/$$
$$\left(10\,b^{11/4}\sqrt{b\,x^2+c\,x^4}\right)$$

Result (type 4, 198 leaves) :

$$\left(\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\left(-2\,b^2+14\,b\,c\,x^2+21\,c^2\,x^4\right)-\right.$$
$$21\sqrt{b}\;c^{3/2}\,x^3\sqrt{1+\frac{c\,x^2}{b}}\;\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]+$$
$$\left.21\sqrt{b}\;c^{3/2}\,x^3\sqrt{1+\frac{c\,x^2}{b}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]\right)\Bigg/$$
$$\left(5\,b^3\,x^{3/2}\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\sqrt{x^2\left(b+c\,x^2\right)}\right)$$

Problem 401: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 173 leaves, 6 steps) :

$$\frac{1}{b\,x^{5/2}\sqrt{b\,x^2+c\,x^4}}-\frac{9\sqrt{b\,x^2+c\,x^4}}{7\,b^2\,x^{9/2}}+\frac{15\,c\sqrt{b\,x^2+c\,x^4}}{7\,b^3\,x^{5/2}}+$$
$$\left(15\,c^{7/4}\,x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c\,x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Bigg/$$
$$\left(14\,b^{13/4}\sqrt{b\,x^2+c\,x^4}\right)$$

Result (type 4, 143 leaves):

$$\left(\sqrt{\frac{\mathrm{i}\sqrt{b}}{\sqrt{c}}}\left(-2 b^2+6 b c x^2+15 c^2 x^4\right)+15\,\mathrm{i}\, c^2\sqrt{1+\frac{b}{c x^2}}\, x^{9/2}\,\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{\frac{\mathrm{i}\sqrt{b}}{\sqrt{c}}}}{\sqrt{x}}\right],-1\right]\right)\Bigg/\left(7 b^3\sqrt{\frac{\mathrm{i}\sqrt{b}}{\sqrt{c}}}\, x^{5/2}\sqrt{x^2\left(b+c x^2\right)}\right)$$

Problem 402: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^{5/2}\left(b x^2+c x^4\right)^{3/2}}\,dx$$

Optimal (type 4, 350 leaves, 9 steps):

$$\frac{1}{b x^{7/2}\sqrt{b x^2+c x^4}}+\frac{77 c^{5/2} x^{3/2}\left(b+c x^2\right)}{15 b^4\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{b x^2+c x^4}}-\frac{11\sqrt{b x^2+c x^4}}{9 b^2 x^{11/2}}+\frac{77 c\sqrt{b x^2+c x^4}}{45 b^3 x^{7/2}}-\frac{77 c^2\sqrt{b x^2+c x^4}}{15 b^4 x^{3/2}}-\left(77 c^{9/4} x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Bigg/\left(15 b^{15/4}\sqrt{b x^2+c x^4}\right)+\left(77 c^{9/4} x\left(\sqrt{b}+\sqrt{c}\,x\right)\sqrt{\frac{b+c x^2}{\left(\sqrt{b}+\sqrt{c}\,x\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}\sqrt{x}}{b^{1/4}}\right],\frac{1}{2}\right]\right)\Bigg/\left(30 b^{15/4}\sqrt{b x^2+c x^4}\right)$$

Result (type 4, 210 leaves):

$$\left(-\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\left(10\,b^3-22\,b^2\,c\,x^2+154\,b\,c^2\,x^4+231\,c^3\,x^6\right)+\right.$$
$$231\sqrt{b}\,c^{5/2}\,x^5\sqrt{1+\frac{c\,x^2}{b}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]-$$
$$\left.231\sqrt{b}\,c^{5/2}\,x^5\sqrt{1+\frac{c\,x^2}{b}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\right],-1\right]\right)\Bigg/$$
$$\left(45\,b^4\,x^{7/2}\sqrt{\frac{i\sqrt{c}\,x}{\sqrt{b}}}\sqrt{x^2\left(b+c\,x^2\right)}\right)$$

Problem 407: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 45 leaves, 3 steps):

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

Result (type 5, 109 leaves):

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

Problem 408: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 45 leaves, 3 steps):

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

Result (type 5, 164 leaves):

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

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

$$\int \frac{\left(a^2+2 a b x^2+b^2 x^4\right)^2}{x^{11}} \, dx$$

Optimal (type 1, 19 leaves, 2 steps):

$$-\frac{\left(a+b x^2\right)^5}{10 a x^{10}}$$

Result (type 1, 52 leaves):

$$-\frac{a^4}{10 x^{10}}-\frac{a^3 b}{2 x^8}-\frac{a^2 b^2}{x^6}-\frac{a b^3}{x^4}-\frac{b^4}{2 x^2}$$

Problem 449: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 34 leaves, 4 steps):

$$-\frac{a \left(a+b x^2\right)^7}{14 b^2}+\frac{\left(a+b x^2\right)^8}{16 b^2}$$

Result (type 1, 77 leaves):

$$\frac{a^6 x^4}{4}+a^5 b x^6+\frac{15}{8} a^4 b^2 x^8+2 a^3 b^3 x^{10}+\frac{5}{4} a^2 b^4 x^{12}+\frac{3}{7} a b^5 x^{14}+\frac{b^6 x^{16}}{16}$$

Problem 467: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a^2+2 a b x^2+b^2 x^4\right)^3}{x^{15}} \, dx$$

Optimal (type 1, 19 leaves, 2 steps):

$$-\frac{\left(a+b x^2\right)^7}{14 a x^{14}}$$

Result (type 1, 82 leaves):

$$-\frac{a^6}{14 x^{14}}-\frac{a^5 b}{2 x^{12}}-\frac{3 a^4 b^2}{2 x^{10}}-\frac{5 a^3 b^3}{2 x^8}-\frac{5 a^2 b^4}{2 x^6}-\frac{3 a b^5}{2 x^4}-\frac{b^6}{2 x^2}$$

Problem 515: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 19 leaves, 2 steps):

$$\frac{x^{10}}{10 a \left(a+b x^2\right)^5}$$

Result (type 1, 57 leaves):

$$-\frac{a^4+5 a^3 b x^2+10 a^2 b^2 x^4+10 a b^3 x^6+5 b^4 x^8}{10 b^5 \left(a+b x^2\right)^5}$$

Problem 659: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 298 leaves, 4 steps):

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

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

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

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

Result (type 5, 64 leaves):

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

Problem 660: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 256 leaves, 3 steps):

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

Result (type 5, 49 leaves):

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

Problem 661: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 289 leaves, 4 steps):

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

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

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

Result (type 5, 72 leaves):

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

Problem 662: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 618 leaves, 6 steps):

$$-\frac{3x\left(a+bx^2\right)}{2b\left(a^2+2abx^2+b^2x^4\right)^{2/3}}-\frac{9ax\left(1+\frac{bx^2}{a}\right)^{4/3}}{2b\left(a^2+2abx^2+b^2x^4\right)^{2/3}\left(1-\sqrt{3}-\left(1+\frac{bx^2}{a}\right)^{1/3}\right)}+$$

$$\left(9\times 3^{1/4}\sqrt{2+\sqrt{3}}\;a^2\left(1+\frac{bx^2}{a}\right)^{4/3}\left(1-\left(1+\frac{bx^2}{a}\right)^{1/3}\right)\sqrt{\frac{1+\left(1+\frac{bx^2}{a}\right)^{1/3}+\left(1+\frac{bx^2}{a}\right)^{2/3}}{\left(1-\sqrt{3}-\left(1+\frac{bx^2}{a}\right)^{1/3}\right)^2}}\right.$$

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

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

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

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

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

Result (type 5, 64 leaves) :

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

Problem 663: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 609 leaves, 6 steps) :

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

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

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

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

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

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

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

Result (type 5, 64 leaves):

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

Problem 664: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 649 leaves, 7 steps):

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

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

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

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

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

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

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

Result (type 5, 79 leaves):

$$-\left(\left(\left(a+b x^2\right)\left(6 a+15 b x^2-5 b x^2\left(1+\frac{b x^2}{a}\right)^{1/3}\text{Hypergeometric2F1}\left[\frac{1}{3},\frac{1}{2},\frac{3}{2},-\frac{b x^2}{a}\right]\right)\right)\Big/\left(6 a^2 x\left(\left(a+b x^2\right)^2\right)^{2/3}\right)\right)$$

Problem 909: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 3, 105 leaves):

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

Problem 910: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 89 leaves, 8 steps):

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

Result (type 3, 163 leaves):

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

Problem 911: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 432 leaves, 10 steps):

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

Result (type 3, 164 leaves) :

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

Problem 912: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 331 leaves, 9 steps) :

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

Result (type 3, 143 leaves) :

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

Problem 913: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 359 leaves, 9 steps):

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

Result (type 3, 119 leaves):

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

Problem 914: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 433 leaves, 10 steps):

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

Result (type 3, 174 leaves):

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

Problem 918: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 74 leaves, 9 steps):

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

Result (type 3, 94 leaves):

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

Problem 919: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 188 leaves, 9 steps):

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

Result (type 3, 39 leaves):

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

Problem 930: Result unnecessarily involves imaginary or complex numbers.

$$\int x^4 \sqrt{a+b x^2+c x^4}\, dx$$

Optimal (type 4, 395 leaves, 5 steps):

$$-\frac{2\left(2 b^2-5 a c\right) x \sqrt{a+b x^2+c x^4}}{105 c^2}+\frac{b\left(8 b^2-29 a c\right) x \sqrt{a+b x^2+c x^4}}{105 c^{5/2}\left(\sqrt{a}+\sqrt{c}\, x^2\right)}+\frac{x^3\left(b+5 c x^2\right) \sqrt{a+b x^2+c x^4}}{35 c}-\left(a^{1/4} b\left(8 b^2-29 a c\right)\left(\sqrt{a}+\sqrt{c}\, x^2\right) \sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c}\, x^2\right)^2}}\ \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{4}\left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right) \Big/ \left(105 c^{11/4} \sqrt{a+b x^2+c x^4}\right)+\left(a^{1/4}\left(8 b^3-29 a b c+2 \sqrt{a} \sqrt{c}\left(2 b^2-5 a c\right)\right)\left(\sqrt{a}+\sqrt{c}\, x^2\right) \sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c}\, x^2\right)^2}}\ \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{4}\left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right) \Big/ \left(210 c^{11/4} \sqrt{a+b x^2+c x^4}\right)$$

Result (type 4, 538 leaves):

$$\frac{1}{420 c^3 \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} \sqrt{a+b x^2+c x^4}}\left(4 c \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\left(10 a^2 c-4 b^3 x^2-b^2 c x^4+18 b c^2 x^6+15 c^3 x^8+a\left(-4 b^2+13 b c x^2+25 c^2 x^4\right)\right)+i b\left(8 b^2-29 a c\right)\left(-b+\sqrt{b^2-4 a c}\right) \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}\ \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]-i\left(-8 b^4+37 a b^2 c-20 a^2 c^2+8 b^3 \sqrt{b^2-4 a c}-29 a b c \sqrt{b^2-4 a c}\right) \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}\ \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right)$$

Problem 931: Result unnecessarily involves imaginary or complex numbers.

$$\int x^2 \sqrt{a+b x^2+c x^4}\, dx$$

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

$$-\frac{2\left(b^2-3 a c\right) x \sqrt{a+b x^2+c x^4}}{15 c^{3/2}\left(\sqrt{a}+\sqrt{c}\, x^2\right)}+\frac{x\left(b+3 c x^2\right) \sqrt{a+b x^2+c x^4}}{15 c}+\left(2 a^{1/4}\left(b^2-3 a c\right)\left(\sqrt{a}+\sqrt{c}\, x^2\right) \sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c}\, x^2\right)^2}}\ \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{4}\left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right) \Big/ \left(15 c^{7/4} \sqrt{a+b x^2+c x^4}\right)-\left(a^{1/4}\left(2 b^2+\sqrt{a}\, b \sqrt{c}-6 a c\right)\left(\sqrt{a}+\sqrt{c}\, x^2\right) \sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c}\, x^2\right)^2}}\ \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{4}\left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right) \Big/ \left(30 c^{7/4} \sqrt{a+b x^2+c x^4}\right)$$

Result (type 4, 479 leaves):

$$\frac{1}{30 c^2 \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, \sqrt{a+b x^2+c x^4}}\left(2 c \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\left(b+3 c x^2\right)\left(a+b x^2+c x^4\right)-i\left(b^2-3 a c\right)\left(-b+\sqrt{b^2-4 a c}\right) \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}\ \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]+i\left(-b^3+4 a b c+b^2 \sqrt{b^2-4 a c}-3 a c \sqrt{b^2-4 a c}\right) \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}\ \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right)$$

Problem 932: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{a+b x^2+c x^4}\, dx$$

Optimal (type 4, 309 leaves, 4 steps):

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

Result (type 4, 445 leaves):

$$\left(4 c \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x \left(a+b x^2+c x^4\right)+i b \left(-b+\sqrt{b^2-4 a c}\right) \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}\, \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]-i \left(-b^2+4 a c+b \sqrt{b^2-4 a c}\right) \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}\, \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right) \Big/ \left(12 c \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} \sqrt{a+b x^2+c x^4}\right)$$

Problem 933: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 303 leaves, 4 steps):

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

Result (type 4, 435 leaves):

$$\left(-2 \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} \left(a+b x^2+c x^4\right)+\right.$$
$$i \left(-b+\sqrt{b^2-4 a c}\right) x \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}$$
$$\text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right],\frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]-$$
$$i \sqrt{2} \sqrt{b^2-4 a c}\, x \sqrt{\frac{b-\sqrt{b^2-4 a c}+2 c x^2}{b-\sqrt{b^2-4 a c}}} \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}}$$
$$\left.\text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right],\frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right)\Big/$$
$$\left(2 \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x \sqrt{a+b x^2+c x^4}\right)$$

Problem 934: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 341 leaves, 5 steps):

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

Result (type 4, 459 leaves):

$$\frac{1}{12 a \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x^3 \sqrt{a+b x^2+c x^4}} \left(-4 \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} \left(a+b x^2\right) \left(a+b x^2+c x^4\right)+i b \left(-b+\sqrt{b^2-4 a c}\right) x^3 \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}\, \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]-i \left(-b^2+4 a c+b \sqrt{b^2-4 a c}\right) x^3 \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}\, \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right)$$

Problem 935: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 397 leaves, 6 steps):

$$-\frac{\sqrt{a+b x^2+c x^4}}{5 x^5}-\frac{b \sqrt{a+b x^2+c x^4}}{15 a x^3}+\frac{2 \left(b^2-3 a c\right) \sqrt{a+b x^2+c x^4}}{15 a^2 x}-\frac{2 \sqrt{c} \left(b^2-3 a c\right) x \sqrt{a+b x^2+c x^4}}{15 a^2 \left(\sqrt{a}+\sqrt{c} x^2\right)}+\left(2 c^{1/4} \left(b^2-3 a c\right) \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}}\ \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{4} \left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right) \Big/ \left(15 a^{7/4} \sqrt{a+b x^2+c x^4}\right)-\left(c^{1/4} \left(2 b^2+\sqrt{a}\, b \sqrt{c}-6 a c\right) \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}}\ \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{4} \left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right) \Big/ \left(30 a^{7/4} \sqrt{a+b x^2+c x^4}\right)$$

Result (type 4, 530 leaves):

$$\frac{1}{30 a^2 \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x^5 \sqrt{a+b x^2+c x^4}}\left(-2 \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} \left(3 a^3-2 b^2 x^6 \left(b+c x^2\right)+a^2 \left(4 b x^2+9 c x^4\right)+a \left(-b^2 x^4+7 b c x^6+6 c^2 x^8\right)\right)-i \left(b^2-3 a c\right) \left(-b+\sqrt{b^2-4 a c}\right) x^5 \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}\ \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]+i \left(-b^3+4 a b c+b^2 \sqrt{b^2-4 a c}-3 a c \sqrt{b^2-4 a c}\right) x^5 \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}\ \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right)$$

Problem 947: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 495 leaves, 6 steps):

$$\frac{\left(8 b^4-51 a b^2 c+60 a^2 c^2\right) x \sqrt{a+b x^2+c x^4}}{1155 c^3}-\frac{8 b \left(2 b^2-9 a c\right) \left(b^2-3 a c\right) x \sqrt{a+b x^2+c x^4}}{1155 c^{7/2} \left(\sqrt{a}+\sqrt{c} x^2\right)}-$$
$$\frac{x^3 \left(b \left(2 b^2+a c\right)+10 c \left(b^2-3 a c\right) x^2\right) \sqrt{a+b x^2+c x^4}}{385 c^2}+\frac{x^3 \left(b+3 c x^2\right) \left(a+b x^2+c x^4\right)^{3/2}}{33 c}+$$
$$\left(8 a^{1/4} b \left(2 b^2-9 a c\right) \left(b^2-3 a c\right) \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{4} \left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right) \Big/ \left(1155 c^{15/4} \sqrt{a+b x^2+c x^4}\right)-$$
$$\left(a^{1/4} \left(8 b \left(2 b^2-9 a c\right) \left(b^2-3 a c\right)+\sqrt{a} \sqrt{c} \left(8 b^4-51 a b^2 c+60 a^2 c^2\right)\right)\right.$$
$$\left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}}$$
$$\left.\text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{4} \left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right) \Big/ \left(2310 c^{15/4} \sqrt{a+b x^2+c x^4}\right)$$

Result (type 4, 657 leaves) :

$$\frac{1}{2310\, c^4 \sqrt{\frac{c}{b+\sqrt{b^2-4ac}}}\sqrt{a+b x^2+c x^4}}$$

$$\Bigg(2 c \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\; x \left(60 a^3 c^2+a^2 c \left(-51 b^2+92 b c x^2+255 c^2 x^4\right)+\right.$$
$$a \left(8 b^4-57 b^3 c x^2-14 b^2 c^2 x^4+367 b c^3 x^6+300 c^4 x^8\right)+$$
$$\left.x^2 \left(8 b^5+2 b^4 c x^2-b^3 c^2 x^4+145 b^2 c^3 x^6+245 b c^4 x^8+105 c^5 x^{10}\right)\right)-$$
$$4\, i\, b \left(2 b^4-15 a b^2 c+27 a^2 c^2\right)\left(-b+\sqrt{b^2-4 a c}\right)\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}}$$
$$\sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}$$
$$\text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\; x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]+$$
$$i \left(-8 b^6+68 a b^4 c-159 a^2 b^2 c^2+60 a^3 c^3+8 b^5 \sqrt{b^2-4 a c}-60 a b^3 c \sqrt{b^2-4 a c}+\right.$$
$$\left.108 a^2 b c^2 \sqrt{b^2-4 a c}\right)\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}}\;\sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}$$
$$\left.\text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\; x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right)$$

Problem 948: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 443 leaves, 5 steps):

$$\frac{\left(8 b^4-57 a b^2 c+84 a^2 c^2\right) x \sqrt{a+b x^2+c x^4}}{315 c^{5/2}\left(\sqrt{a}+\sqrt{c}\, x^2\right)}-$$

$$\frac{x\left(b\left(4 b^2-9 a c\right)+6 c\left(2 b^2-7 a c\right) x^2\right) \sqrt{a+b x^2+c x^4}}{315 c^2}+\frac{x\left(3 b+7 c x^2\right)\left(a+b x^2+c x^4\right)^{3/2}}{63 c}-$$

$$\left(a^{1/4}\left(8 b^4-57 a b^2 c+84 a^2 c^2\right)\left(\sqrt{a}+\sqrt{c}\, x^2\right) \sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c}\, x^2\right)^2}}\right.$$

$$\left.\text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{4}\left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right) \Big/ \left(315 c^{11/4} \sqrt{a+b x^2+c x^4}\right)+$$

$$\left(a^{1/4}\left(8 b^4-57 a b^2 c+84 a^2 c^2+4 \sqrt{a}\, b \sqrt{c}\left(b^2-6 a c\right)\right)\left(\sqrt{a}+\sqrt{c}\, x^2\right) \sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c}\, x^2\right)^2}}\right.$$

$$\left.\text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{4}\left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right) \Big/ \left(630 c^{11/4} \sqrt{a+b x^2+c x^4}\right)$$

Result (type 4, 602 leaves):

$$\frac{1}{1260 c^3 \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} \sqrt{a+b x^2+c x^4}}$$

$$\left(4 c \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\left(-4 b^4 x^2-b^3 c x^4+53 b^2 c^2 x^6+85 b c^3 x^8+35 c^4 x^{10}+a^2 c\left(24 b+77 c x^2\right)+\right.\right.$$

$$\left.a\left(-4 b^3+27 b^2 c x^2+151 b c^2 x^4+112 c^3 x^6\right)\right)+i\left(8 b^4-57 a b^2 c+84 a^2 c^2\right)$$

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

$$\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]-$$

$$i\left(-8 b^5+65 a b^3 c-132 a^2 b c^2+8 b^4 \sqrt{b^2-4 a c}-57 a b^2 c \sqrt{b^2-4 a c}+84 a^2 c^2 \sqrt{b^2-4 a c}\right)$$

$$\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}$$

$$\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right)$$

Problem 949: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 381 leaves, 5 steps):

$$-\frac{2 b \left(b^2-8 a c\right) x \sqrt{a+b x^2+c x^4}}{35 c^{3/2} \left(\sqrt{a}+\sqrt{c} x^2\right)}+\frac{x \left(b^2+10 a c+3 b c x^2\right) \sqrt{a+b x^2+c x^4}}{35 c}+\frac{1}{7} x \left(a+b x^2+c x^4\right)^{3/2}+\left(2 a^{1/4} b \left(b^2-8 a c\right) \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{4} \left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right)\Big/\left(35 c^{7/4} \sqrt{a+b x^2+c x^4}\right)-\left(a^{1/4} \left(\sqrt{a} \sqrt{c} \left(b^2-20 a c\right)+2 b \left(b^2-8 a c\right)\right) \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{4} \left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right)\Big/\left(70 c^{7/4} \sqrt{a+b x^2+c x^4}\right)$$

Result (type 4, 533 leaves):

$$\frac{1}{70 c^2 \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} \sqrt{a+b x^2+c x^4}}\left(2 c \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} x \left(15 a^2 c+a \left(b^2+23 b c x^2+20 c^2 x^4\right)+x^2 \left(b^3+9 b^2 c x^2+13 b c^2 x^4+5 c^3 x^6\right)\right)-i b \left(b^2-8 a c\right) \left(-b+\sqrt{b^2-4 a c}\right) \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} x\right],\frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]+i \left(-b^4+9 a b^2 c-20 a^2 c^2+b^3 \sqrt{b^2-4 a c}-8 a b c \sqrt{b^2-4 a c}\right) \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} x\right],\frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right)$$

Problem 950: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 361 leaves, 5 steps):

$$\frac{\left(b^2+12 a c\right) x \sqrt{a+b x^2+c x^4}}{5 \sqrt{c} \left(\sqrt{a}+\sqrt{c} x^2\right)}+\frac{1}{5} x \left(7 b+6 c x^2\right) \sqrt{a+b x^2+c x^4}-\frac{\left(a+b x^2+c x^4\right)^{3/2}}{x}-\left(a^{1/4} \left(b^2+12 a c\right) \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}}\ \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{4} \left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right) \Big/ \left(5 c^{3/4} \sqrt{a+b x^2+c x^4}\right)+\left(a^{1/4} \left(b^2+8 \sqrt{a} b \sqrt{c}+12 a c\right) \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}}\ \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right], \frac{1}{4} \left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right) \Big/ \left(10 c^{3/4} \sqrt{a+b x^2+c x^4}\right)$$

Result (type 4, 505 leaves):

$$\frac{1}{20 c \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x \sqrt{a+b x^2+c x^4}}\left(4 c \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} \left(-5 a^2-3 a b x^2+2 b^2 x^4-4 a c x^4+3 b c x^6+c^2 x^8\right)+i \left(b^2+12 a c\right) \left(-b+\sqrt{b^2-4 a c}\right) x \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}\ \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]-i \left(-b^3+4 a b c+b^2 \sqrt{b^2-4 a c}+12 a c \sqrt{b^2-4 a c}\right) x \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}\ \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right)$$

Problem 951: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 353 leaves, 5 steps):

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

Result (type 4, 473 leaves):

$$\frac{1}{6 \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x^3 \sqrt{a+b x^2+c x^4}}\left(2 \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} \left(-a^2-5 a b x^2-4 b^2 x^4-3 b c x^6+c^2 x^8\right)+4 i b \left(-b+\sqrt{b^2-4 a c}\right) x^3 \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}\, \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]-i \left(-b^2+4 a c+4 b \sqrt{b^2-4 a c}\right) x^3 \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}\, \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right)$$

Problem 952: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 400 leaves, 6 steps):

$$-\frac{\left(b^2+12 a c\right)\sqrt{a+b x^2+c x^4}}{5 a x}+\frac{\sqrt{c}\left(b^2+12 a c\right) x\sqrt{a+b x^2+c x^4}}{5 a\left(\sqrt{a}+\sqrt{c}\,x^2\right)}-\frac{\left(b-6 c x^2\right)\sqrt{a+b x^2+c x^4}}{5 x^3}-\frac{\left(a+b x^2+c x^4\right)^{3/2}}{5 x^5}-\left(c^{1/4}\left(b^2+12 a c\right)\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{4}\left(2-\frac{b}{\sqrt{a}\sqrt{c}}\right)\right]\right)\Big/\left(5 a^{3/4}\sqrt{a+b x^2+c x^4}\right)+\left(c^{1/4}\left(b^2+8\sqrt{a}\,b\sqrt{c}+12 a c\right)\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{4}\left(2-\frac{b}{\sqrt{a}\sqrt{c}}\right)\right]\right)\Big/\left(10 a^{3/4}\sqrt{a+b x^2+c x^4}\right)$$

Result (type 4, 527 leaves):

$$\frac{1}{20 a\sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\,x^5\sqrt{a+b x^2+c x^4}}\left(-4\sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\left(a^3+b^2 x^6\left(b+c x^2\right)+a^2\left(3 b x^2+8 c x^4\right)+a\left(3 b^2 x^4+9 b c x^6+7 c^2 x^8\right)\right)+i\left(b^2+12 a c\right)\left(-b+\sqrt{b^2-4 a c}\right)x^5\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}}\sqrt{\frac{2 b-2\sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{2}\sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\,x\right],\frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]-i\left(-b^3+4 a b c+b^2\sqrt{b^2-4 a c}+12 a c\sqrt{b^2-4 a c}\right)x^5\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}}\sqrt{\frac{2 b-2\sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{2}\sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\,x\right],\frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right)$$

Problem 953: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 447 leaves, 7 steps):

$$-\frac{\left(b^2-20 a c\right) \sqrt{a+b x^2+c x^4}}{35 a x^3}+\frac{2 b \left(b^2-8 a c\right) \sqrt{a+b x^2+c x^4}}{35 a^2 x}-\frac{2 b \sqrt{c} \left(b^2-8 a c\right) x \sqrt{a+b x^2+c x^4}}{35 a^2 \left(\sqrt{a}+\sqrt{c} x^2\right)}-\frac{3 \left(b+10 c x^2\right) \sqrt{a+b x^2+c x^4}}{35 x^5}-\frac{\left(a+b x^2+c x^4\right)^{3/2}}{7 x^7}+\left(2 b c^{1/4} \left(b^2-8 a c\right) \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \text{EllipticE}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{4} \left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right)\Big/\left(35 a^{7/4} \sqrt{a+b x^2+c x^4}\right)-\left(c^{1/4} \left(\sqrt{a} \sqrt{c} \left(b^2-20 a c\right)+2 b \left(b^2-8 a c\right)\right) \left(\sqrt{a}+\sqrt{c} x^2\right) \sqrt{\frac{a+b x^2+c x^4}{\left(\sqrt{a}+\sqrt{c} x^2\right)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{c^{1/4} x}{a^{1/4}}\right],\frac{1}{4} \left(2-\frac{b}{\sqrt{a} \sqrt{c}}\right)\right]\right)\Big/\left(70 a^{7/4} \sqrt{a+b x^2+c x^4}\right)$$

Result (type 4, 572 leaves) :

$$\frac{1}{70 a^2 \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} x^7 \sqrt{a+b x^2+c x^4}}\left(-2 \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} \left(5 a^4-2 b^3 x^8 \left(b+c x^2\right)+a^3 \left(13 b x^2+20 c x^4\right)+a b x^6 \left(-b^2+17 b c x^2+16 c^2 x^4\right)+3 a^2 \left(3 b^2 x^4+13 b c x^6+5 c^2 x^8\right)\right)-i b \left(b^2-8 a c\right) \left(-b+\sqrt{b^2-4 a c}\right) x^7 \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}} \text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} x\right],\frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]+i \left(-b^4+9 a b^2 c-20 a^2 c^2+b^3 \sqrt{b^2-4 a c}-8 a b c \sqrt{b^2-4 a c}\right) x^7 \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}} \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} x\right],\frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right)$$

Problem 954: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 48 leaves, 5 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 963: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 313 leaves, 4 steps):

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

Result (type 4, 444 leaves):

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

$$\dot{\imath}\,b\,\left(-b+\sqrt{b^2-4\,a\,c}\right)\,\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}}}\,\sqrt{\frac{2\,b-2\,\sqrt{b^2-4\,a\,c}+4\,c\,x^2}{b-\sqrt{b^2-4\,a\,c}}}$$

$$\text{EllipticE}\left[\dot{\imath}\,\text{ArcSinh}\left[\sqrt{2}\,\sqrt{\frac{c}{b+\sqrt{b^2-4\,a\,c}}}\;x\right],\,\frac{b+\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}}\right]+$$

$$\dot{\imath}\,\left(-b^2+a\,c+b\,\sqrt{b^2-4\,a\,c}\right)\,\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}}}\,\sqrt{\frac{2\,b-2\,\sqrt{b^2-4\,a\,c}+4\,c\,x^2}{b-\sqrt{b^2-4\,a\,c}}}$$

$$\left.\text{EllipticF}\left[\dot{\imath}\,\text{ArcSinh}\left[\sqrt{2}\,\sqrt{\frac{c}{b+\sqrt{b^2-4\,a\,c}}}\;x\right],\,\frac{b+\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

$$\left(6\,c^2\,\sqrt{\frac{c}{b+\sqrt{b^2-4\,a\,c}}}\,\sqrt{a+b\,x^2+c\,x^4}\right)$$

Problem 964: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 267 leaves, 3 steps):

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

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

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

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

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

Result (type 4, 278 leaves):

$$\left(i\left(-b+\sqrt{b^2-4ac}\right)\sqrt{\frac{b+\sqrt{b^2-4ac}+2cx^2}{b+\sqrt{b^2-4ac}}}\sqrt{1+\frac{2cx^2}{b-\sqrt{b^2-4ac}}}\right.$$
$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{2}\sqrt{\frac{c}{b+\sqrt{b^2-4ac}}}\,x\right],\frac{b+\sqrt{b^2-4ac}}{b-\sqrt{b^2-4ac}}\right]-\right.$$
$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{2}\sqrt{\frac{c}{b+\sqrt{b^2-4ac}}}\,x\right],\frac{b+\sqrt{b^2-4ac}}{b-\sqrt{b^2-4ac}}\right]\right)\right)\Big/$$
$$\left(2\sqrt{2}\,c\sqrt{\frac{c}{b+\sqrt{b^2-4ac}}}\sqrt{a+bx^2+cx^4}\right)$$

Problem 965: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{\sqrt{a+bx^2+cx^4}}\,dx$$

Optimal (type 4, 114 leaves, 1 step):

$$\left(\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+bx^2+cx^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}x}{a^{1/4}}\right],\frac{1}{4}\left(2-\frac{b}{\sqrt{a}\sqrt{c}}\right)\right]\right)\Big/$$
$$\left(2a^{1/4}c^{1/4}\sqrt{a+bx^2+cx^4}\right)$$

Result (type 4, 186 leaves):

$$-\left(\left(i\sqrt{\frac{b+\sqrt{b^2-4ac}+2cx^2}{b+\sqrt{b^2-4ac}}}\sqrt{1+\frac{2cx^2}{b-\sqrt{b^2-4ac}}}\right.\right.$$
$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{2}\sqrt{\frac{c}{b+\sqrt{b^2-4ac}}}\,x\right],\frac{b+\sqrt{b^2-4ac}}{b-\sqrt{b^2-4ac}}\right]\right)\Big/$$
$$\left.\left(\sqrt{2}\sqrt{\frac{c}{b+\sqrt{b^2-4ac}}}\sqrt{a+bx^2+cx^4}\right)\right)$$

Problem 966: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{1}{x^2\sqrt{a+bx^2+cx^4}}\,dx$$

Optimal (type 4, 294 leaves, 5 steps):

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

Result (type 4, 298 leaves):

$$\left(-\frac{4\left(a+b x^2+c x^4\right)}{x}+\frac{1}{\sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}}\,\mathbb{i}\sqrt{2}\left(-b+\sqrt{b^2-4 a c}\right)\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}}\right.$$
$$\sqrt{1+\frac{2 c x^2}{b-\sqrt{b^2-4 a c}}}\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\sqrt{2}\sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right],\frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]-\right.$$
$$\left.\left.\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\sqrt{2}\sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right],\frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right)\right)\bigg/\left(4\, a\sqrt{a+b x^2+c x^4}\right)$$

Problem 967: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 345 leaves, 5 steps):

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

Result (type 4, 459 leaves) :

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

Problem 968: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^7}{\sqrt{a+b x^2-c x^4}}\, dx$$

Optimal (type 3, 124 leaves, 5 steps) :

$$-\frac{x^4 \sqrt{a+b x^2-c x^4}}{6 c}-\frac{\left(15 b^2+16 a c+10 b c x^2\right) \sqrt{a+b x^2-c x^4}}{48 c^3}-$$
$$\frac{b \left(5 b^2+12 a c\right) \text{ArcTan}\left[\frac{b-2 c x^2}{2 \sqrt{c} \sqrt{a+b x^2-c x^4}}\right]}{32 c^{7/2}}$$

Result (type 3, 112 leaves):

$$\frac{1}{96\, c^{7/2}}\left(-2\sqrt{c}\,\sqrt{a+b\,x^2-c\,x^4}\,\left(15\,b^2+10\,b\,c\,x^2+8\,c\,\left(2\,a+c\,x^4\right)\right)+3\,i\,\left(5\,b^3+12\,a\,b\,c\right)\,\text{Log}\left[\frac{i\,\left(b-2\,c\,x^2\right)}{\sqrt{c}}+2\,\sqrt{a+b\,x^2-c\,x^4}\,\right]\right)$$

Problem 969: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x^5}{\sqrt{a+b\,x^2-c\,x^4}}\,dx$$

Optimal (type 3, 107 leaves, 5 steps):

$$-\frac{3\,b\,\sqrt{a+b\,x^2-c\,x^4}}{8\,c^2}-\frac{x^2\,\sqrt{a+b\,x^2-c\,x^4}}{4\,c}-\frac{\left(3\,b^2+4\,a\,c\right)\,\text{ArcTan}\left[\frac{b-2\,c\,x^2}{2\,\sqrt{c}\,\sqrt{a+b\,x^2-c\,x^4}}\right]}{16\,c^{5/2}}$$

Result (type 3, 94 leaves):

$$-\frac{\left(3\,b+2\,c\,x^2\right)\,\sqrt{a+b\,x^2-c\,x^4}}{8\,c^2}+\frac{i\,\left(3\,b^2+4\,a\,c\right)\,\text{Log}\left[\frac{i\,\left(b-2\,c\,x^2\right)}{\sqrt{c}}+2\,\sqrt{a+b\,x^2-c\,x^4}\,\right]}{16\,c^{5/2}}$$

Problem 970: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 70 leaves, 4 steps):

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

Result (type 3, 77 leaves):

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

Problem 971: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x}{\sqrt{a+b\,x^2-c\,x^4}}\,dx$$

Optimal (type 3, 44 leaves, 3 steps):

$$-\frac{\text{ArcTan}\left[\frac{b-2\,c\,x^2}{2\,\sqrt{c}\,\sqrt{a+b\,x^2-c\,x^4}}\right]}{2\,\sqrt{c}}$$

Result (type 3, 51 leaves):

$$\frac{i \operatorname{Log}\left[-\frac{i\left(-b+2 c x^2\right)}{\sqrt{c}}+2 \sqrt{a+b x^2-c x^4}\right]}{2 \sqrt{c}}$$

Problem 976: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^4}{\sqrt{a+b x^2-c x^4}} \, dx$$

Optimal (type 4, 409 leaves, 5 steps):

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

Result (type 4, 459 leaves):

$$\frac{1}{6 c^2 \sqrt{-\frac{c}{b+\sqrt{b^2+4 a c}}} \sqrt{a+b x^2-c x^4}} \left(2 c \sqrt{-\frac{c}{b+\sqrt{b^2+4 a c}}} x \left(-a-b x^2+c x^4\right)-i \sqrt{2} b \left(-b+\sqrt{b^2+4 a c}\right) \sqrt{\frac{b+\sqrt{b^2+4 a c}-2 c x^2}{b+\sqrt{b^2+4 a c}}} \sqrt{\frac{-b+\sqrt{b^2+4 a c}+2 c x^2}{-b+\sqrt{b^2+4 a c}}} \operatorname{EllipticE}\left[i \operatorname{ArcSinh}\left[\sqrt{2} \sqrt{-\frac{c}{b+\sqrt{b^2+4 a c}}} x\right], \frac{b+\sqrt{b^2+4 a c}}{b-\sqrt{b^2+4 a c}}\right]+i \sqrt{2} \left(-b^2-a c+b \sqrt{b^2+4 a c}\right) \sqrt{\frac{b+\sqrt{b^2+4 a c}-2 c x^2}{b+\sqrt{b^2+4 a c}}} \sqrt{\frac{-b+\sqrt{b^2+4 a c}+2 c x^2}{-b+\sqrt{b^2+4 a c}}} \operatorname{EllipticF}\left[i \operatorname{ArcSinh}\left[\sqrt{2} \sqrt{-\frac{c}{b+\sqrt{b^2+4 a c}}} x\right], \frac{b+\sqrt{b^2+4 a c}}{b-\sqrt{b^2+4 a c}}\right]\right)$$

Problem 977: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2}{\sqrt{a+b x^2-c x^4}}\,dx$$

Optimal (type 4, 377 leaves, 4 steps):

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

Result (type 4, 271 leaves):

$$-\left(\left(i\left(-b+\sqrt{b^2+4 a c}\right)\sqrt{1+\frac{2 c x^2}{-b+\sqrt{b^2+4 a c}}}\sqrt{1-\frac{2 c x^2}{b+\sqrt{b^2+4 a c}}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{2}\sqrt{-\frac{c}{b+\sqrt{b^2+4 a c}}}\,x\right],-\frac{b+\sqrt{b^2+4 a c}}{-b+\sqrt{b^2+4 a c}}\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{2}\sqrt{-\frac{c}{b+\sqrt{b^2+4 a c}}}\,x\right],-\frac{b+\sqrt{b^2+4 a c}}{-b+\sqrt{b^2+4 a c}}\right]\right)\right)\Big/\left(2\sqrt{2}\,c\sqrt{-\frac{c}{b+\sqrt{b^2+4 a c}}}\sqrt{a+b x^2-c x^4}\right)\right)$$

Problem 978: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 169 leaves, 2 steps):

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

Result (type 4, 177 leaves):

$$-\left(\left(\left(\text{i}\sqrt{1+\frac{2cx^2}{-b+\sqrt{b^2+4ac}}}\sqrt{1-\frac{2cx^2}{b+\sqrt{b^2+4ac}}}\right.\right.\right.$$
$$\left.\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[\sqrt{2}\sqrt{-\frac{c}{b+\sqrt{b^2+4ac}}}\,x\right],-\frac{b+\sqrt{b^2+4ac}}{-b+\sqrt{b^2+4ac}}\right]\right)\Big/$$
$$\left.\left.\left(\sqrt{2}\sqrt{-\frac{c}{b+\sqrt{b^2+4ac}}}\sqrt{a+bx^2-cx^4}\right)\right)\right)$$

Problem 979: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 408 leaves, 6 steps):

$$-\frac{\sqrt{a+bx^2-cx^4}}{ax}+\left(\left(b-\sqrt{b^2+4ac}\right)\sqrt{b+\sqrt{b^2+4ac}}\sqrt{1-\frac{2cx^2}{b-\sqrt{b^2+4ac}}}\sqrt{1-\frac{2cx^2}{b+\sqrt{b^2+4ac}}}\right.$$
$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{2}\sqrt{c}\,x}{\sqrt{b+\sqrt{b^2+4ac}}}\right],\frac{b+\sqrt{b^2+4ac}}{b-\sqrt{b^2+4ac}}\right]\right)\Big/\left(2\sqrt{2}\,a\sqrt{c}\sqrt{a+bx^2-cx^4}\right)-$$
$$\left(\left(b-\sqrt{b^2+4ac}\right)\sqrt{b+\sqrt{b^2+4ac}}\sqrt{1-\frac{2cx^2}{b-\sqrt{b^2+4ac}}}\sqrt{1-\frac{2cx^2}{b+\sqrt{b^2+4ac}}}\right.$$
$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{2}\sqrt{c}\,x}{\sqrt{b+\sqrt{b^2+4ac}}}\right],\frac{b+\sqrt{b^2+4ac}}{b-\sqrt{b^2+4ac}}\right]\right)\Big/\left(2\sqrt{2}\,a\sqrt{c}\sqrt{a+bx^2-cx^4}\right)$$

Result (type 4, 283 leaves):

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

$$\sqrt{1-\frac{2cx^2}{b+\sqrt{b^2+4ac}}}\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{2}\sqrt{-\frac{c}{b+\sqrt{b^2+4ac}}}\,x\right],\frac{b+\sqrt{b^2+4ac}}{b-\sqrt{b^2+4ac}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\sqrt{2}\sqrt{-\frac{c}{b+\sqrt{b^2+4ac}}}\,x\right],\frac{b+\sqrt{b^2+4ac}}{b-\sqrt{b^2+4ac}}\right]\right)\right)\Big/\left(4a\sqrt{a+bx^2-cx^4}\right)$$

Problem 980: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 445 leaves, 6 steps):

$$-\frac{\sqrt{a+bx^2-cx^4}}{3ax^3}+\frac{2b\sqrt{a+bx^2-cx^4}}{3a^2x}-$$

$$\left(b\left(b-\sqrt{b^2+4ac}\right)\sqrt{b+\sqrt{b^2+4ac}}\sqrt{1-\frac{2cx^2}{b-\sqrt{b^2+4ac}}}\sqrt{1-\frac{2cx^2}{b+\sqrt{b^2+4ac}}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{2}\sqrt{c}\,x}{\sqrt{b+\sqrt{b^2+4ac}}}\right],\frac{b+\sqrt{b^2+4ac}}{b-\sqrt{b^2+4ac}}\right]\right)\Big/\left(3\sqrt{2}\,a^2\sqrt{c}\sqrt{a+bx^2-cx^4}\right)+$$

$$\left(\sqrt{b+\sqrt{b^2+4ac}}\left(b^2+ac-b\sqrt{b^2+4ac}\right)\sqrt{1-\frac{2cx^2}{b-\sqrt{b^2+4ac}}}\sqrt{1-\frac{2cx^2}{b+\sqrt{b^2+4ac}}}\right.$$

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

Result (type 4, 472 leaves):

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

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

$$\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{2}\,\sqrt{-\frac{c}{b+\sqrt{b^2+4\,a\,c}}}\,x\right],\,\frac{b+\sqrt{b^2+4\,a\,c}}{b-\sqrt{b^2+4\,a\,c}}\right]+$$

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

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{2}\,\sqrt{-\frac{c}{b+\sqrt{b^2+4\,a\,c}}}\,x\right],\,\frac{b+\sqrt{b^2+4\,a\,c}}{b-\sqrt{b^2+4\,a\,c}}\right]\right)$$

Problem 989: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 408 leaves, 5 steps):

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

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

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

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

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

Result (type 4, 489 leaves):

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

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

$$\text{EllipticE}\left[i \,\text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]+$$

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

$$\left.\sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}\, \text{EllipticF}\left[i \,\text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right)$$

Problem 990: Result unnecessarily involves imaginary or complex numbers.

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

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

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

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

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

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

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

Result (type 4, 452 leaves):

$$\left(4\,c\,\sqrt{\frac{c}{b+\sqrt{b^2-4\,a\,c}}}\,x\,\left(2\,a+b\,x^2\right)-\right.$$
$$i\,b\,\left(-b+\sqrt{b^2-4\,a\,c}\right)\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}}}\,\sqrt{\frac{2\,b-2\,\sqrt{b^2-4\,a\,c}+4\,c\,x^2}{b-\sqrt{b^2-4\,a\,c}}}$$
$$\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{2}\,\sqrt{\frac{c}{b+\sqrt{b^2-4\,a\,c}}}\,x\right],\,\frac{b+\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}}\right]+$$
$$i\,\left(-b^2+4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}}}\,\sqrt{\frac{2\,b-2\,\sqrt{b^2-4\,a\,c}+4\,c\,x^2}{b-\sqrt{b^2-4\,a\,c}}}$$
$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{2}\,\sqrt{\frac{c}{b+\sqrt{b^2-4\,a\,c}}}\,x\right],\,\frac{b+\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}}\right]\right)\Bigg/$$
$$\left(4\,c\,\left(b^2-4\,a\,c\right)\sqrt{\frac{c}{b+\sqrt{b^2-4\,a\,c}}}\,\sqrt{a+b\,x^2+c\,x^4}\right)$$

Problem 991: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 341 leaves, 4 steps):

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

Result (type 4, 437 leaves):

$$\left(-2\sqrt{\frac{c}{b+\sqrt{b^2-4ac}}}\,x\left(b+2cx^2\right)+\right.$$
$$i\left(-b+\sqrt{b^2-4ac}\right)\sqrt{\frac{b+\sqrt{b^2-4ac}+2cx^2}{b+\sqrt{b^2-4ac}}}\sqrt{\frac{2b-2\sqrt{b^2-4ac}+4cx^2}{b-\sqrt{b^2-4ac}}}$$
$$\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{2}\sqrt{\frac{c}{b+\sqrt{b^2-4ac}}}\,x\right],\frac{b+\sqrt{b^2-4ac}}{b-\sqrt{b^2-4ac}}\right]-$$
$$i\sqrt{2}\sqrt{b^2-4ac}\sqrt{\frac{b-\sqrt{b^2-4ac}+2cx^2}{b-\sqrt{b^2-4ac}}}\sqrt{\frac{b+\sqrt{b^2-4ac}+2cx^2}{b+\sqrt{b^2-4ac}}}$$
$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{2}\sqrt{\frac{c}{b+\sqrt{b^2-4ac}}}\,x\right],\frac{b+\sqrt{b^2-4ac}}{b-\sqrt{b^2-4ac}}\right]\right)\Big/$$
$$\left(2\left(b^2-4ac\right)\sqrt{\frac{c}{b+\sqrt{b^2-4ac}}}\sqrt{a+bx^2+cx^4}\right)$$

Problem 992: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 353 leaves, 4 steps):

$$\frac{x\left(b^2-2ac+bcx^2\right)}{a\left(b^2-4ac\right)\sqrt{a+bx^2+cx^4}}-\frac{b\sqrt{c}\,x\sqrt{a+bx^2+cx^4}}{a\left(b^2-4ac\right)\left(\sqrt{a}+\sqrt{c}\,x^2\right)}+$$
$$\left(b\,c^{1/4}\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+bx^2+cx^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}x}{a^{1/4}}\right],\frac{1}{4}\left(2-\frac{b}{\sqrt{a}\sqrt{c}}\right)\right]\right)\Big/$$
$$\left(a^{3/4}\left(b^2-4ac\right)\sqrt{a+bx^2+cx^4}\right)-$$
$$\left(c^{1/4}\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+bx^2+cx^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}x}{a^{1/4}}\right],\frac{1}{4}\left(2-\frac{b}{\sqrt{a}\sqrt{c}}\right)\right]\right)\Big/$$
$$\left(2a^{3/4}\left(b-2\sqrt{a}\sqrt{c}\right)\sqrt{a+bx^2+cx^4}\right)$$

Result (type 4, 456 leaves):

$$-\left(\left(-4\sqrt{\frac{c}{b+\sqrt{b^2-4ac}}}\,x\,\left(b^2-2ac+bcx^2\right)+\right.\right.$$
$$i\,b\left(-b+\sqrt{b^2-4ac}\right)\sqrt{\frac{b+\sqrt{b^2-4ac}+2cx^2}{b+\sqrt{b^2-4ac}}}\sqrt{\frac{2b-2\sqrt{b^2-4ac}+4cx^2}{b-\sqrt{b^2-4ac}}}$$
$$\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{2}\sqrt{\frac{c}{b+\sqrt{b^2-4ac}}}\,x\right],\frac{b+\sqrt{b^2-4ac}}{b-\sqrt{b^2-4ac}}\right]-$$
$$i\left(-b^2+4ac+b\sqrt{b^2-4ac}\right)\sqrt{\frac{b+\sqrt{b^2-4ac}+2cx^2}{b+\sqrt{b^2-4ac}}}\sqrt{\frac{2b-2\sqrt{b^2-4ac}+4cx^2}{b-\sqrt{b^2-4ac}}}$$
$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{2}\sqrt{\frac{c}{b+\sqrt{b^2-4ac}}}\,x\right],\frac{b+\sqrt{b^2-4ac}}{b-\sqrt{b^2-4ac}}\right]\right)\Big/$$
$$\left.\left(4a\left(b^2-4ac\right)\sqrt{\frac{c}{b+\sqrt{b^2-4ac}}}\sqrt{a+bx^2+cx^4}\right)\right)$$

Problem 993: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 428 leaves, 5 steps):

$$\frac{b^2-2ac+bcx^2}{a\left(b^2-4ac\right)x\sqrt{a+bx^2+cx^4}}-\frac{2\left(b^2-3ac\right)\sqrt{a+bx^2+cx^4}}{a^2\left(b^2-4ac\right)x}+$$
$$\frac{2\sqrt{c}\left(b^2-3ac\right)x\sqrt{a+bx^2+cx^4}}{a^2\left(b^2-4ac\right)\left(\sqrt{a}+\sqrt{c}\,x^2\right)}-\left(2c^{1/4}\left(b^2-3ac\right)\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+bx^2+cx^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\right.$$
$$\left.\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}x}{a^{1/4}}\right],\frac{1}{4}\left(2-\frac{b}{\sqrt{a}\sqrt{c}}\right)\right]\right)\Big/\left(a^{7/4}\left(b^2-4ac\right)\sqrt{a+bx^2+cx^4}\right)+$$
$$\left(c^{1/4}\left(2b^2+\sqrt{a}\,b\sqrt{c}-6ac\right)\left(\sqrt{a}+\sqrt{c}\,x^2\right)\sqrt{\frac{a+bx^2+cx^4}{\left(\sqrt{a}+\sqrt{c}\,x^2\right)^2}}\right.$$
$$\left.\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{c^{1/4}x}{a^{1/4}}\right],\frac{1}{4}\left(2-\frac{b}{\sqrt{a}\sqrt{c}}\right)\right]\right)\Big/\left(2a^{7/4}\left(b^2-4ac\right)\sqrt{a+bx^2+cx^4}\right)$$

Result (type 4, 515 leaves):

$$-\frac{1}{2 a^2 \left(b^2-4 a c\right) \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x \sqrt{a+b x^2+c x^4}}$$
$$\left(2 \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}} \left(-4 a^2 c+2 b^2 x^2 \left(b+c x^2\right)+a \left(b^2-7 b c x^2-6 c^2 x^4\right)\right)-\right.$$
$$i \left(b^2-3 a c\right) \left(-b+\sqrt{b^2-4 a c}\right) x \sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}$$
$$\text{EllipticE}\left[i \,\text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]+$$
$$i \left(-b^3+4 a b c+b^2 \sqrt{b^2-4 a c}-3 a c \sqrt{b^2-4 a c}\right) x$$
$$\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{b+\sqrt{b^2-4 a c}}} \sqrt{\frac{2 b-2 \sqrt{b^2-4 a c}+4 c x^2}{b-\sqrt{b^2-4 a c}}}$$
$$\left.\text{EllipticF}\left[i \,\text{ArcSinh}\left[\sqrt{2} \sqrt{\frac{c}{b+\sqrt{b^2-4 a c}}}\, x\right], \frac{b+\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}}\right]\right)$$

Problem 1003: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 108 leaves, 3 steps):

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

Result (type 4, 92 leaves):

$$\frac{x \left(a+c x^4\right)+\frac{i a \sqrt{1+\frac{c x^4}{a}}\, \text{EllipticF}\left[i \,\text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}}\, x\right],-1\right]}{\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}}}}{3 c \sqrt{a+c x^4}}$$

Problem 1005: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 210 leaves, 4 steps):

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

Result (type 4, 104 leaves):

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

Problem 1007: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 88 leaves, 2 steps):

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

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 1009: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 232 leaves, 5 steps):

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

Result (type 4, 121 leaves):

$$\frac{1}{\sqrt{a+c x^4}}\left(-\frac{a+c x^4}{a x}-i \sqrt{\frac{i \sqrt{c}}{\sqrt{a}}}\sqrt{1+\frac{c x^4}{a}}\right.$$
$$\left.\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}}\, x\right], -1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}}\, x\right], -1\right]\right)\right)$$

Problem 1011: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 110 leaves, 3 steps):

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

Result (type 4, 95 leaves):

$$\frac{-\frac{a+c x^4}{x^3}+\frac{i c \sqrt{1+\frac{c x^4}{a}}\, \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}}\, x\right],-1\right]}{\sqrt{\frac{i \sqrt{c}}{\sqrt{a}}}}}{3 a \sqrt{a+c x^4}}$$

Problem 1039: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 12 leaves, 2 steps):

$$\frac{\text{EllipticF}\left[\text{ArcSin}[x], -\frac{1}{3}\right]}{\sqrt{3}}$$

Result (type 4, 18 leaves):

$$-\mathrm{i}\ \mathrm{EllipticF}\left[\mathrm{i}\ \mathrm{ArcSinh}\left[\frac{x}{\sqrt{3}}\right],-3\right]$$

Problem 1040: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{-1+5x^2-x^4}}\,dx$$

Optimal (type 4, 39 leaves, 2 steps):

$$-\frac{\mathrm{EllipticF}\left[\mathrm{ArcCos}\left[\sqrt{\frac{2}{5+\sqrt{21}}}\ x\right],\frac{1}{42}\left(21+5\sqrt{21}\right)\right]}{21^{1/4}}$$

Result (type 4, 87 leaves):

$$\frac{1}{2\sqrt{-1+5x^2-x^4}}\sqrt{5-\sqrt{21}-2x^2}\ \sqrt{2+\left(-5+\sqrt{21}\right)x^2}\ \mathrm{EllipticF}\left[\mathrm{ArcSin}\left[\sqrt{\frac{1}{2}\left(5+\sqrt{21}\right)}\ x\right],\frac{23}{2}-\frac{5\sqrt{21}}{2}\right]$$

Problem 1062: Result is not expressed in closed-form.

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

Optimal (type 3, 389 leaves, 9 steps):

$$\frac{2x^{3/2}}{3c}-\frac{\left(b+\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\mathrm{ArcTan}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]}{2^{3/4}c^{7/4}\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}-\frac{\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\mathrm{ArcTan}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}\right]}{2^{3/4}c^{7/4}\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}+$$

$$\frac{\left(b+\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\mathrm{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]}{2^{3/4}c^{7/4}\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}+\frac{\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\mathrm{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}\right]}{2^{3/4}c^{7/4}\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}$$

Result (type 7, 80 leaves):

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

Problem 1063: Result is not expressed in closed-form.

$$\int \frac{x^{7/2}}{a+b x^2+c x^4}\,dx$$

Optimal (type 3, 385 leaves, 9 steps):

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

Result (type 7, 80 leaves):

$$-\frac{-4\sqrt{x}+\text{RootSum}\left[a+b\,\#1^4+c\,\#1^8\,\&,\ \frac{a\,\text{Log}\left[\sqrt{x}-\#1\right]+b\,\text{Log}\left[\sqrt{x}-\#1\right]\#1^4}{b\,\#1^3+2c\,\#1^7}\,\&\right]}{2c}$$

Problem 1064: Result is not expressed in closed-form.

$$\int\frac{x^{5/2}}{a+b x^2+c x^4}\,dx$$

Optimal (type 3, 331 leaves, 8 steps):

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

Result (type 7, 48 leaves):

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

Problem 1065: Result is not expressed in closed-form.

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

Optimal (type 3, 331 leaves, 8 steps):

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

Result (type 7, 46 leaves):

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

Problem 1066: Result is not expressed in closed-form.

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

Optimal (type 3, 331 leaves, 8 steps):

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

Result (type 7, 47 leaves):

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

Problem 1067: Result is not expressed in closed-form.

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

Optimal (type 3, 331 leaves, 8 steps):

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

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

Result (type 7, 49 leaves):

$$\frac{1}{2} \text{RootSum}\left[a+b \#1^4+c \#1^8 \&, \frac{\text{Log}\left[\sqrt{x}-\#1\right]}{b \#1^3+2 c \#1^7} \&\right]$$

Problem 1068: Result is not expressed in closed-form.

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

Optimal (type 3, 371 leaves, 9 steps):

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

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

Result (type 7, 78 leaves):

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

Problem 1069: Result is not expressed in closed-form.

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

Optimal (type 3, 371 leaves, 9 steps):

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

Result (type 7, 82 leaves):

$$-\frac{\frac{4}{x^{3/2}}+3\,\text{RootSum}\left[a+b\,\sharp1^4+c\,\sharp1^8\,\&,\ \frac{b\,\text{Log}\left[\sqrt{x}-\sharp1\right]+c\,\text{Log}\left[\sqrt{x}-\sharp1\right]\,\sharp1^4}{b\,\sharp1^3+2\,c\,\sharp1^7}\,\&\right]}{6\,a}$$

Problem 1070: Result is not expressed in closed-form.

$$\int\frac{1}{x^{7/2}\left(a+b\,x^2+c\,x^4\right)}\,dx$$

Optimal (type 3, 412 leaves, 10 steps):

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

Result (type 7, 107 leaves):

$$-\frac{1}{10\,a^2}\left(\frac{4\,a}{x^{5/2}}-\frac{20\,b}{\sqrt{x}}-\right.$$
$$\left.5\,\text{RootSum}\left[a+b\,\sharp1^4+c\,\sharp1^8\,\&,\ \frac{b^2\,\text{Log}\left[\sqrt{x}-\sharp1\right]-a\,c\,\text{Log}\left[\sqrt{x}-\sharp1\right]+b\,c\,\text{Log}\left[\sqrt{x}-\sharp1\right]\,\sharp1^4}{b\,\sharp1+2\,c\,\sharp1^5}\,\&\right]\right)$$

Problem 1071: Result is not expressed in closed-form.

$$\int \frac{x^{13/2}}{\left(a+b x^2+c x^4\right)^2} \, dx$$

Optimal (type 3, 544 leaves, 10 steps):

$$-\frac{b x^{3/2}}{2 c \left(b^2-4 a c\right)}+\frac{x^{7/2} \left(2 a+b x^2\right)}{2 \left(b^2-4 a c\right) \left(a+b x^2+c x^4\right)}+$$
$$\frac{\left(3 b^3-20 a b c+\left(3 b^2-14 a c\right) \sqrt{b^2-4 a c}\right) \text{ArcTan}\left[\frac{2^{1/4} c^{1/4} \sqrt{x}}{\left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{4\times 2^{3/4} c^{7/4} \left(b^2-4 a c\right)^{3/2} \left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}-$$
$$\frac{\left(3 b^3-20 a b c-\left(3 b^2-14 a c\right) \sqrt{b^2-4 a c}\right) \text{ArcTan}\left[\frac{2^{1/4} c^{1/4} \sqrt{x}}{\left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{4\times 2^{3/4} c^{7/4} \left(b^2-4 a c\right)^{3/2} \left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}-$$
$$\frac{\left(3 b^3-20 a b c+\left(3 b^2-14 a c\right) \sqrt{b^2-4 a c}\right) \text{ArcTanh}\left[\frac{2^{1/4} c^{1/4} \sqrt{x}}{\left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{4\times 2^{3/4} c^{7/4} \left(b^2-4 a c\right)^{3/2} \left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}+$$
$$\frac{\left(3 b^3-20 a b c-\left(3 b^2-14 a c\right) \sqrt{b^2-4 a c}\right) \text{ArcTanh}\left[\frac{2^{1/4} c^{1/4} \sqrt{x}}{\left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{4\times 2^{3/4} c^{7/4} \left(b^2-4 a c\right)^{3/2} \left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}$$

Result (type 7, 144 leaves):

$$\frac{1}{8 c \left(b^2-4 a c\right)}\left(-\frac{4 x^{3/2} \left(b^2 x^2+a \left(b-2 c x^2\right)\right)}{a+b x^2+c x^4}+\text{RootSum}\left[a+b \#1^4+c \#1^8\&,\right.\right.$$
$$\left.\left.\frac{1}{b \#1+2 c \#1^5}\left(3 a b \text{Log}\left[\sqrt{x}-\#1\right]+3 b^2 \text{Log}\left[\sqrt{x}-\#1\right] \#1^4-14 a c \text{Log}\left[\sqrt{x}-\#1\right] \#1^4\right)\&\right]\right)$$

Problem 1072: Result is not expressed in closed-form.

$$\int \frac{x^{11/2}}{\left(a+b x^2+c x^4\right)^2} \, dx$$

Optimal (type 3, 520 leaves, 10 steps):

$$-\frac{b\sqrt{x}}{2c\left(b^2-4ac\right)}+\frac{x^{5/2}\left(2a+bx^2\right)}{2\left(b^2-4ac\right)\left(a+bx^2+cx^4\right)}-\frac{\left(b^2-10ac+\frac{b\left(b^2-12ac\right)}{\sqrt{b^2-4ac}}\right)\text{ArcTan}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]}{4\times 2^{1/4}c^{5/4}\left(b^2-4ac\right)\left(-b-\sqrt{b^2-4ac}\right)^{3/4}}-$$

$$\frac{\left(b^2-10ac-\frac{b\left(b^2-12ac\right)}{\sqrt{b^2-4ac}}\right)\text{ArcTan}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}\right]}{4\times 2^{1/4}c^{5/4}\left(b^2-4ac\right)\left(-b+\sqrt{b^2-4ac}\right)^{3/4}}-$$

$$\frac{\left(b^2-10ac+\frac{b\left(b^2-12ac\right)}{\sqrt{b^2-4ac}}\right)\text{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]}{4\times 2^{1/4}c^{5/4}\left(b^2-4ac\right)\left(-b-\sqrt{b^2-4ac}\right)^{3/4}}-$$

$$\frac{\left(b^2-10ac-\frac{b\left(b^2-12ac\right)}{\sqrt{b^2-4ac}}\right)\text{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}\right]}{4\times 2^{1/4}c^{5/4}\left(b^2-4ac\right)\left(-b+\sqrt{b^2-4ac}\right)^{3/4}}$$

Result (type 7, 144 leaves):

$$\frac{1}{8c\left(b^2-4ac\right)}\left(-\frac{4\sqrt{x}\left(b^2x^2+a\left(b-2cx^2\right)\right)}{a+bx^2+cx^4}+\right.$$

$$\left.\text{RootSum}\left[a+b\,\sharp1^4+c\,\sharp1^8\,\&,\frac{a\,b\,\text{Log}\left[\sqrt{x}-\sharp1\right]+b^2\,\text{Log}\left[\sqrt{x}-\sharp1\right]\sharp1^4-10\,a\,c\,\text{Log}\left[\sqrt{x}-\sharp1\right]\sharp1^4}{b\,\sharp1^3+2\,c\,\sharp1^7}\,\&\right]\right)$$

Problem 1073: Result is not expressed in closed-form.

$$\int\frac{x^{9/2}}{\left(a+bx^2+cx^4\right)^2}\,dx$$

Optimal (type 3, 471 leaves, 9 steps):

$$\frac{x^{3/2}\left(2a+bx^2\right)}{2\left(b^2-4ac\right)\left(a+bx^2+cx^4\right)}+\frac{\left(b^2+12ac+b\sqrt{b^2-4ac}\right)\text{ArcTan}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]}{4\times 2^{3/4}c^{3/4}\left(b^2-4ac\right)^{3/2}\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}+$$

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

$$\frac{\left(b^2+12ac+b\sqrt{b^2-4ac}\right)\text{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]}{4\times 2^{3/4}c^{3/4}\left(b^2-4ac\right)^{3/2}\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}-\frac{\left(b-\frac{b^2+12ac}{\sqrt{b^2-4ac}}\right)\text{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}\right]}{4\times 2^{3/4}c^{3/4}\left(b^2-4ac\right)\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}$$

Result (type 7, 124 leaves):

$$-\frac{-2ax^{3/2}-bx^{7/2}}{2\left(b^2-4ac\right)\left(a+bx^2+cx^4\right)}+\frac{\text{RootSum}\left[a+b\,\#1^4+c\,\#1^8\,\&,\ \frac{-6a\,\text{Log}\left[\sqrt{x}-\#1\right]+b\,\text{Log}\left[\sqrt{x}-\#1\right]\#1^4}{b\,\#1+2c\,\#1^5}\,\&\right]}{8\left(b^2-4ac\right)}$$

Problem 1074: Result is not expressed in closed-form.

$$\int \frac{x^{7/2}}{\left(a+bx^2+cx^4\right)^2}\,dx$$

Optimal (type 3, 483 leaves, 9 steps):

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

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

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

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

Result (type 7, 127 leaves):

$$-\frac{-2\,a\,\sqrt{x}\,-b\,x^{5/2}}{2\,\left(b^2-4\,a\,c\right)\,\left(a+b\,x^2+c\,x^4\right)}+\frac{\text{RootSum}\left[a+b\,\#1^4+c\,\#1^8\,\&,\,\frac{-2\,a\,\text{Log}\left[\sqrt{x}\,-\#1\right]+3\,b\,\text{Log}\left[\sqrt{x}\,-\#1\right]\,\#1^4}{b\,\#1^3+2\,c\,\#1^7}\,\&\right]}{8\,\left(b^2-4\,a\,c\right)}$$

Problem 1075: Result is not expressed in closed-form.

$$\int \frac{x^{5/2}}{\left(a+b\,x^2+c\,x^4\right)^2}\,dx$$

Optimal (type 3, 450 leaves, 9 steps):

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

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

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

Result (type 7, 109 leaves):

$$-\frac{1}{8\,\left(b^2-4\,a\,c\right)}$$

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

Problem 1076: Result is not expressed in closed-form.

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

Optimal (type 3, 442 leaves, 9 steps):

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

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

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

Result (type 7, 111 leaves):

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

Problem 1077: Result is not expressed in closed-form.

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

Optimal (type 3, 489 leaves, 9 steps):

$$\frac{x^{3/2}\,\left(b^2-2\,a\,c+b\,c\,x^2\right)}{2\,a\,\left(b^2-4\,a\,c\right)\,\left(a+b\,x^2+c\,x^4\right)}+\frac{c^{1/4}\,\left(b-\frac{b^2-20\,a\,c}{\sqrt{b^2-4\,a\,c}}\right)\,\text{ArcTan}\left[\frac{2^{1/4}\,c^{1/4}\,\sqrt{x}}{\left(-b-\sqrt{b^2-4\,a\,c}\right)^{1/4}}\right]}{4\times 2^{3/4}\,a\,\left(b^2-4\,a\,c\right)\,\left(-b-\sqrt{b^2-4\,a\,c}\right)^{1/4}}+$$

$$\frac{c^{1/4}\,\left(b+\frac{b^2-20\,a\,c}{\sqrt{b^2-4\,a\,c}}\right)\,\text{ArcTan}\left[\frac{2^{1/4}\,c^{1/4}\,\sqrt{x}}{\left(-b+\sqrt{b^2-4\,a\,c}\right)^{1/4}}\right]}{4\times 2^{3/4}\,a\,\left(b^2-4\,a\,c\right)\,\left(-b+\sqrt{b^2-4\,a\,c}\right)^{1/4}}-$$

$$\frac{c^{1/4}\,\left(b-\frac{b^2-20\,a\,c}{\sqrt{b^2-4\,a\,c}}\right)\,\text{ArcTanh}\left[\frac{2^{1/4}\,c^{1/4}\,\sqrt{x}}{\left(-b-\sqrt{b^2-4\,a\,c}\right)^{1/4}}\right]}{4\times 2^{3/4}\,a\,\left(b^2-4\,a\,c\right)\,\left(-b-\sqrt{b^2-4\,a\,c}\right)^{1/4}}-\frac{c^{1/4}\,\left(b+\frac{b^2-20\,a\,c}{\sqrt{b^2-4\,a\,c}}\right)\,\text{ArcTanh}\left[\frac{2^{1/4}\,c^{1/4}\,\sqrt{x}}{\left(-b+\sqrt{b^2-4\,a\,c}\right)^{1/4}}\right]}{4\times 2^{3/4}\,a\,\left(b^2-4\,a\,c\right)\,\left(-b+\sqrt{b^2-4\,a\,c}\right)^{1/4}}$$

Result (type 7, 149 leaves):

$$-\left(\left(4 x^{3/2}\left(b^2-2 a c+b c x^2\right)+\left(a+b x^2+c x^4\right) \text{RootSum}\left[a+b \#1^4+c \#1^8\&,\frac{1}{b \#1+2 c \#1^5}\left(b^2 \text{Log}\left[\sqrt{x}-\#1\right]-10 a c \text{Log}\left[\sqrt{x}-\#1\right]+b c \text{Log}\left[\sqrt{x}-\#1\right] \#1^4\right)\&\right]\right)\Big/\left(8 a\left(-b^2+4 a c\right)\left(a+b x^2+c x^4\right)\right)\right)$$

Problem 1078: Result is not expressed in closed-form.

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

Optimal (type 3, 503 leaves, 9 steps):

$$\frac{\sqrt{x}\left(b^2-2 a c+b c x^2\right)}{2 a\left(b^2-4 a c\right)\left(a+b x^2+c x^4\right)}+\frac{c^{3/4}\left(3 b^2-28 a c-3 b \sqrt{b^2-4 a c}\right) \text{ArcTan}\left[\frac{2^{1/4} c^{1/4} \sqrt{x}}{\left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{4\times 2^{1/4} a\left(b^2-4 a c\right)^{3/2}\left(-b-\sqrt{b^2-4 a c}\right)^{3/4}}-\frac{c^{3/4}\left(3 b^2-28 a c+3 b \sqrt{b^2-4 a c}\right) \text{ArcTan}\left[\frac{2^{1/4} c^{1/4} \sqrt{x}}{\left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{4\times 2^{1/4} a\left(b^2-4 a c\right)^{3/2}\left(-b+\sqrt{b^2-4 a c}\right)^{3/4}}+\frac{c^{3/4}\left(3 b^2-28 a c-3 b \sqrt{b^2-4 a c}\right) \text{ArcTanh}\left[\frac{2^{1/4} c^{1/4} \sqrt{x}}{\left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{4\times 2^{1/4} a\left(b^2-4 a c\right)^{3/2}\left(-b-\sqrt{b^2-4 a c}\right)^{3/4}}-\frac{c^{3/4}\left(3 b^2-28 a c+3 b \sqrt{b^2-4 a c}\right) \text{ArcTanh}\left[\frac{2^{1/4} c^{1/4} \sqrt{x}}{\left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{4\times 2^{1/4} a\left(b^2-4 a c\right)^{3/2}\left(-b+\sqrt{b^2-4 a c}\right)^{3/4}}$$

Result (type 7, 153 leaves):

$$-\left(\left(4 \sqrt{x}\left(b^2-2 a c+b c x^2\right)+\left(a+b x^2+c x^4\right) \text{RootSum}\left[a+b \#1^4+c \#1^8\&,\frac{1}{b \#1^3+2 c \#1^7}\left(3 b^2 \text{Log}\left[\sqrt{x}-\#1\right]-14 a c \text{Log}\left[\sqrt{x}-\#1\right]+3 b c \text{Log}\left[\sqrt{x}-\#1\right] \#1^4\right)\&\right]\right)\Big/\left(8 a\left(-b^2+4 a c\right)\left(a+b x^2+c x^4\right)\right)\right)$$

Problem 1079: Result is not expressed in closed-form.

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

Optimal (type 3, 573 leaves, 10 steps):

$$-\frac{5 b^2-18 a c}{2 a^2 \left(b^2-4 a c\right) \sqrt{x}}+\frac{b^2-2 a c+b c x^2}{2 a \left(b^2-4 a c\right) \sqrt{x} \left(a+b x^2+c x^4\right)}+$$
$$\left(c^{1/4} \left(5 b^3-28 a b c-\left(5 b^2-18 a c\right) \sqrt{b^2-4 a c}\right) \text{ArcTan}\left[\frac{2^{1/4} c^{1/4} \sqrt{x}}{\left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}\right]\right) \Big/$$
$$\left(4 \times 2^{3/4} a^2 \left(b^2-4 a c\right)^{3/2} \left(-b-\sqrt{b^2-4 a c}\right)^{1/4}\right)-$$
$$\left(c^{1/4} \left(5 b^3-28 a b c+\left(5 b^2-18 a c\right) \sqrt{b^2-4 a c}\right) \text{ArcTan}\left[\frac{2^{1/4} c^{1/4} \sqrt{x}}{\left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}\right]\right) \Big/$$
$$\left(4 \times 2^{3/4} a^2 \left(b^2-4 a c\right)^{3/2} \left(-b+\sqrt{b^2-4 a c}\right)^{1/4}\right)-$$
$$\left(c^{1/4} \left(5 b^3-28 a b c-\left(5 b^2-18 a c\right) \sqrt{b^2-4 a c}\right) \text{ArcTanh}\left[\frac{2^{1/4} c^{1/4} \sqrt{x}}{\left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}\right]\right) \Big/$$
$$\left(4 \times 2^{3/4} a^2 \left(b^2-4 a c\right)^{3/2} \left(-b-\sqrt{b^2-4 a c}\right)^{1/4}\right)+$$
$$\left(c^{1/4} \left(5 b^3-28 a b c+\left(5 b^2-18 a c\right) \sqrt{b^2-4 a c}\right) \text{ArcTanh}\left[\frac{2^{1/4} c^{1/4} \sqrt{x}}{\left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}\right]\right) \Big/$$
$$\left(4 \times 2^{3/4} a^2 \left(b^2-4 a c\right)^{3/2} \left(-b+\sqrt{b^2-4 a c}\right)^{1/4}\right)$$

Result (type 7, 190 leaves):

$$-\frac{1}{8 a^2}\left(\frac{16}{\sqrt{x}}+\frac{4 x^{3/2} \left(b^3-3 a b c+b^2 c x^2-2 a c^2 x^2\right)}{\left(b^2-4 a c\right) \left(a+b x^2+c x^4\right)}+\right.$$
$$\frac{1}{b^2-4 a c}\text{RootSum}\left[a+b \,\#1^4+c \,\#1^8\,\&,\ \frac{1}{b \,\#1+2 c \,\#1^5}\left(5 b^3 \text{Log}\left[\sqrt{x}-\#1\right]-\right.\right.$$
$$\left.\left.\left.23 a b c \text{Log}\left[\sqrt{x}-\#1\right]+5 b^2 c \text{Log}\left[\sqrt{x}-\#1\right] \#1^4-18 a c^2 \text{Log}\left[\sqrt{x}-\#1\right] \#1^4\right)\&\right]\right)$$

Problem 1080: Result is not expressed in closed-form.

$$\int \frac{x^{15/2}}{\left(a+b x^2+c x^4\right)^3} \, dx$$

Optimal (type 3, 621 leaves, 11 steps):

$$-\frac{3\left(b^2+12 a c\right)\sqrt{x}}{16 c\left(b^2-4 a c\right)^2}+\frac{x^{9/2}\left(2 a+b x^2\right)}{4\left(b^2-4 a c\right)\left(a+b x^2+c x^4\right)^2}+$$

$$\frac{3 x^{5/2}\left(8 a b+\left(b^2+12 a c\right) x^2\right)}{16\left(b^2-4 a c\right)^2\left(a+b x^2+c x^4\right)}-\frac{3\left(b^3-28 a b c+\frac{b^4-30 a b^2 c-24 a^2 c^2}{\sqrt{b^2-4 a c}}\right)\text{ArcTan}\left[\frac{2^{1/4} c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{32\times 2^{1/4} c^{5/4}\left(b^2-4 a c\right)^2\left(-b-\sqrt{b^2-4 a c}\right)^{3/4}}-$$

$$\frac{3\left(b^3-28 a b c-\frac{b^4-30 a b^2 c-24 a^2 c^2}{\sqrt{b^2-4 a c}}\right)\text{ArcTan}\left[\frac{2^{1/4} c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{32\times 2^{1/4} c^{5/4}\left(b^2-4 a c\right)^2\left(-b+\sqrt{b^2-4 a c}\right)^{3/4}}-$$

$$\frac{3\left(b^3-28 a b c+\frac{b^4-30 a b^2 c-24 a^2 c^2}{\sqrt{b^2-4 a c}}\right)\text{ArcTanh}\left[\frac{2^{1/4} c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{32\times 2^{1/4} c^{5/4}\left(b^2-4 a c\right)^2\left(-b-\sqrt{b^2-4 a c}\right)^{3/4}}-$$

$$\frac{3\left(b^3-28 a b c-\frac{b^4-30 a b^2 c-24 a^2 c^2}{\sqrt{b^2-4 a c}}\right)\text{ArcTanh}\left[\frac{2^{1/4} c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{32\times 2^{1/4} c^{5/4}\left(b^2-4 a c\right)^2\left(-b+\sqrt{b^2-4 a c}\right)^{3/4}}$$

Result (type 7, 254 leaves):

$$\Big(4\sqrt{x}\left(-4 b^4+21 a b^2 c-68 a^2 c^2+b^3 c x^2-28 a b c^2 x^2\right)\left(a+b x^2+c x^4\right)+$$
$$16\left(b^2-4 a c\right)\sqrt{x}\left(-2 a^2 c+b^3 x^2+a b\left(b-3 c x^2\right)\right)+3 c\left(a+b x^2+c x^4\right)^2$$
$$\text{RootSum}\Big[a+b\,\#1^4+c\,\#1^8\,\&,\ \frac{1}{b\,\#1^3+2 c\,\#1^7}\Big(a b^2\,\text{Log}\left[\sqrt{x}-\#1\right]+12 a^2 c\,\text{Log}\left[\sqrt{x}-\#1\right]+b^3$$
$$\text{Log}\left[\sqrt{x}-\#1\right]\#1^4-28 a b c\,\text{Log}\left[\sqrt{x}-\#1\right]\#1^4\Big)\,\&\Big]\Big)\Big/\left(64 c^2\left(b^2-4 a c\right)^2\left(a+b x^2+c x^4\right)^2\right)$$

Problem 1081: Result is not expressed in closed-form.

$$\int\frac{x^{13/2}}{\left(a+b x^2+c x^4\right)^3}\,dx$$

Optimal (type 3, 569 leaves, 10 steps):

$$\frac{x^{7/2}\left(2a+bx^2\right)}{4\left(b^2-4ac\right)\left(a+bx^2+cx^4\right)^2}+\frac{x^{3/2}\left(24ab+\left(5b^2+28ac\right)x^2\right)}{16\left(b^2-4ac\right)^2\left(a+bx^2+cx^4\right)}+$$

$$\frac{\left(5b^3+172abc+\sqrt{b^2-4ac}\left(5b^2+28ac\right)\right)\text{ArcTan}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]}{32\times 2^{3/4}c^{3/4}\left(b^2-4ac\right)^{5/2}\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}+$$

$$\frac{\left(5b^2+28ac-\frac{5b^3+172abc}{\sqrt{b^2-4ac}}\right)\text{ArcTan}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}\right]}{32\times 2^{3/4}c^{3/4}\left(b^2-4ac\right)^2\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}-$$

$$\left(\left(5b^3+172abc+\sqrt{b^2-4ac}\left(5b^2+28ac\right)\right)\text{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]\right)\Big/$$
$$\left(32\times 2^{3/4}c^{3/4}\left(b^2-4ac\right)^{5/2}\left(-b-\sqrt{b^2-4ac}\right)^{1/4}\right)-$$

$$\frac{\left(5b^2+28ac-\frac{5b^3+172abc}{\sqrt{b^2-4ac}}\right)\text{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}\right]}{32\times 2^{3/4}c^{3/4}\left(b^2-4ac\right)^2\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}$$

Result (type 7, 216 leaves):

$$\Big(4x^{3/2}\left(4b^3+8abc+5b^2cx^2+28ac^2x^2\right)\left(a+bx^2+cx^4\right)-$$
$$16\left(b^2-4ac\right)x^{3/2}\left(b^2x^2+a\left(b-2cx^2\right)\right)+c\left(a+bx^2+cx^4\right)^2\text{RootSum}\Big[a+b\,\#1^4+c\,\#1^8\,\&,$$
$$\frac{1}{b\,\#1+2c\,\#1^5}\left(-72ab\,\text{Log}\left[\sqrt{x}-\#1\right]+5b^2\,\text{Log}\left[\sqrt{x}-\#1\right]\#1^4+28ac\,\text{Log}\left[\sqrt{x}-\#1\right]\#1^4\right)\&\Big]\Big)\Big/$$
$$\left(64c\left(b^2-4ac\right)^2\left(a+bx^2+cx^4\right)^2\right)$$

Problem 1082: Result is not expressed in closed-form.

$$\int\frac{x^{11/2}}{\left(a+bx^2+cx^4\right)^3}\,dx$$

Optimal (type 3, 569 leaves, 10 steps):

$$\frac{x^{5/2}\left(2a+bx^2\right)}{4\left(b^2-4ac\right)\left(a+bx^2+cx^4\right)^2}+\frac{\sqrt{x}\left(24ab+\left(7b^2+20ac\right)x^2\right)}{16\left(b^2-4ac\right)^2\left(a+bx^2+cx^4\right)}-$$

$$\frac{3\left(7b^3+36abc+\sqrt{b^2-4ac}\left(7b^2+20ac\right)\right)\text{ArcTan}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]}{32\times 2^{1/4}c^{1/4}\left(b^2-4ac\right)^{5/2}\left(-b-\sqrt{b^2-4ac}\right)^{3/4}}-$$

$$\frac{3\left(7b^2+20ac-\frac{7b^3+36abc}{\sqrt{b^2-4ac}}\right)\text{ArcTan}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}\right]}{32\times 2^{1/4}c^{1/4}\left(b^2-4ac\right)^2\left(-b+\sqrt{b^2-4ac}\right)^{3/4}}-$$

$$\left(3\left(7b^3+36abc+\sqrt{b^2-4ac}\left(7b^2+20ac\right)\right)\text{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]\right)\Big/$$
$$\left(32\times 2^{1/4}c^{1/4}\left(b^2-4ac\right)^{5/2}\left(-b-\sqrt{b^2-4ac}\right)^{3/4}\right)-$$

$$\frac{3\left(7b^2+20ac-\frac{7b^3+36abc}{\sqrt{b^2-4ac}}\right)\text{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}\right]}{32\times 2^{1/4}c^{1/4}\left(b^2-4ac\right)^2\left(-b+\sqrt{b^2-4ac}\right)^{3/4}}$$

Result (type 7, 219 leaves):

$$\Big(4\sqrt{x}\left(4b^3+8abc+7b^2cx^2+20ac^2x^2\right)\left(a+bx^2+cx^4\right)-$$
$$16\left(b^2-4ac\right)\sqrt{x}\left(b^2x^2+a\left(b-2cx^2\right)\right)+3c\left(a+bx^2+cx^4\right)^2\text{RootSum}\Big[a+b\,\#1^4+c\,\#1^8\,\&,$$
$$\frac{1}{b\,\#1^3+2c\,\#1^7}\left(-8ab\,\text{Log}\left[\sqrt{x}-\#1\right]+7b^2\,\text{Log}\left[\sqrt{x}-\#1\right]\#1^4+20ac\,\text{Log}\left[\sqrt{x}-\#1\right]\#1^4\right)\&\Big]\Big)\Big/$$
$$\left(64c\left(b^2-4ac\right)^2\left(a+bx^2+cx^4\right)^2\right)$$

Problem 1083: Result is not expressed in closed-form.

$$\int\frac{x^{9/2}}{\left(a+bx^2+cx^4\right)^3}\,dx$$

Optimal (type 3, 533 leaves, 10 steps):

$$\frac{x^{3/2}\left(2a+bx^2\right)}{4\left(b^2-4ac\right)\left(a+bx^2+cx^4\right)^2}-\frac{3x^{3/2}\left(5b^2-4ac+8bcx^2\right)}{16\left(b^2-4ac\right)^2\left(a+bx^2+cx^4\right)}-$$

$$\frac{3c^{1/4}\left(11b^2+20ac+4b\sqrt{b^2-4ac}\right)\mathrm{ArcTan}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]}{16\times 2^{3/4}\left(b^2-4ac\right)^{5/2}\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}+$$

$$\frac{3c^{1/4}\left(11b^2+20ac-4b\sqrt{b^2-4ac}\right)\mathrm{ArcTan}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}\right]}{16\times 2^{3/4}\left(b^2-4ac\right)^{5/2}\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}+$$

$$\frac{3c^{1/4}\left(11b^2+20ac+4b\sqrt{b^2-4ac}\right)\mathrm{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]}{16\times 2^{3/4}\left(b^2-4ac\right)^{5/2}\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}-$$

$$\frac{3c^{1/4}\left(11b^2+20ac-4b\sqrt{b^2-4ac}\right)\mathrm{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}\right]}{16\times 2^{3/4}\left(b^2-4ac\right)^{5/2}\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}$$

Result (type 7, 176 leaves):

$$\frac{1}{64\left(b^2-4ac\right)^2}\left(\frac{16\left(b^2-4ac\right)x^{3/2}\left(2a+bx^2\right)}{\left(a+bx^2+cx^4\right)^2}-\frac{12x^{3/2}\left(5b^2-4ac+8bcx^2\right)}{a+bx^2+cx^4}-3\,\mathrm{RootSum}\left[a+b\,\#1^4+c\,\#1^8\,\&,\right.\right.$$
$$\left.\left.\frac{1}{b\,\#1+2c\,\#1^5}\left(-7b^2\,\mathrm{Log}\left[\sqrt{x}-\#1\right]-20ac\,\mathrm{Log}\left[\sqrt{x}-\#1\right]+8bc\,\mathrm{Log}\left[\sqrt{x}-\#1\right]\#1^4\right)\&\right]\right)$$

Problem 1084: Result is not expressed in closed-form.

$$\int\frac{x^{7/2}}{\left(a+bx^2+cx^4\right)^3}\,dx$$

Optimal (type 3, 533 leaves, 10 steps):

$$\frac{\sqrt{x}\,(2a+bx^2)}{4\,(b^2-4ac)\,(a+bx^2+cx^4)^2}-\frac{\sqrt{x}\,(13b^2-4ac+24bcx^2)}{16\,(b^2-4ac)^2\,(a+bx^2+cx^4)}+$$

$$\frac{c^{3/4}\left(41b^2+28ac+36b\sqrt{b^2-4ac}\right)\text{ArcTan}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]}{16\times 2^{1/4}\,(b^2-4ac)^{5/2}\left(-b-\sqrt{b^2-4ac}\right)^{3/4}}-$$

$$\frac{c^{3/4}\left(41b^2+28ac-36b\sqrt{b^2-4ac}\right)\text{ArcTan}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}\right]}{16\times 2^{1/4}\,(b^2-4ac)^{5/2}\left(-b+\sqrt{b^2-4ac}\right)^{3/4}}+$$

$$\frac{c^{3/4}\left(41b^2+28ac+36b\sqrt{b^2-4ac}\right)\text{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]}{16\times 2^{1/4}\,(b^2-4ac)^{5/2}\left(-b-\sqrt{b^2-4ac}\right)^{3/4}}-$$

$$\frac{c^{3/4}\left(41b^2+28ac-36b\sqrt{b^2-4ac}\right)\text{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}\right]}{16\times 2^{1/4}\,(b^2-4ac)^{5/2}\left(-b+\sqrt{b^2-4ac}\right)^{3/4}}$$

Result (type 7, 177 leaves):

$$-\frac{1}{64\,(b^2-4ac)^2}\left(\frac{1}{(a+bx^2+cx^4)^2}4\sqrt{x}\,\left(28a^2c+a\left(5b^2+36bcx^2-4c^2x^4\right)+bx^2\left(9b^2+37bcx^2+24c^2x^4\right)\right)+\right.$$
$$\text{RootSum}\Big[a+b\,\sharp1^4+c\,\sharp1^8\,\&,$$
$$\left.\frac{1}{b\,\sharp1^3+2c\,\sharp1^7}\left(-5b^2\,\text{Log}\left[\sqrt{x}-\sharp1\right]-28ac\,\text{Log}\left[\sqrt{x}-\sharp1\right]+72bc\,\text{Log}\left[\sqrt{x}-\sharp1\right]\sharp1^4\right)\&\Big]\right)$$

Problem 1085: Result is not expressed in closed-form.

$$\int\frac{x^{5/2}}{(a+bx^2+cx^4)^3}\,dx$$

Optimal (type 3, 594 leaves, 10 steps):

$$-\frac{x^{3/2}\left(b+2cx^2\right)}{4\left(b^2-4ac\right)\left(a+bx^2+cx^4\right)^2}+\frac{3x^{3/2}\left(b\left(b^2+4ac\right)+c\left(b^2+12ac\right)x^2\right)}{16a\left(b^2-4ac\right)^2\left(a+bx^2+cx^4\right)}+$$

$$\frac{3c^{1/4}\left(b^2+12ac-\frac{b^3}{\sqrt{b^2-4ac}}+\frac{68abc}{\sqrt{b^2-4ac}}\right)\text{ArcTan}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]}{32\times 2^{3/4}a\left(b^2-4ac\right)^2\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}+$$

$$\left(3c^{1/4}\left(b^3-68abc+\sqrt{b^2-4ac}\left(b^2+12ac\right)\right)\text{ArcTan}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}\right]\right)\Big/$$

$$\left(32\times 2^{3/4}a\left(b^2-4ac\right)^{5/2}\left(-b+\sqrt{b^2-4ac}\right)^{1/4}\right)-$$

$$\frac{3c^{1/4}\left(b^2+12ac-\frac{b^3}{\sqrt{b^2-4ac}}+\frac{68abc}{\sqrt{b^2-4ac}}\right)\text{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]}{32\times 2^{3/4}a\left(b^2-4ac\right)^2\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}-$$

$$\left(3c^{1/4}\left(b^3-68abc+\sqrt{b^2-4ac}\left(b^2+12ac\right)\right)\text{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}\right]\right)\Big/$$

$$\left(32\times 2^{3/4}a\left(b^2-4ac\right)^{5/2}\left(-b+\sqrt{b^2-4ac}\right)^{1/4}\right)$$

Result (type 7, 222 leaves):

$$\Big(-16a\left(b^2-4ac\right)x^{3/2}\left(b+2cx^2\right)+$$
$$12x^{3/2}\left(b^3+4abc+b^2cx^2+12ac^2x^2\right)\left(a+bx^2+cx^4\right)+3\left(a+bx^2+cx^4\right)^2$$
$$\text{RootSum}\Big[a+b\,\#1^4+c\,\#1^8\,\&,\ \frac{1}{b\,\#1+2c\,\#1^5}\Big(b^3\,\text{Log}\left[\sqrt{x}-\#1\right]-28abc\,\text{Log}\left[\sqrt{x}-\#1\right]+b^2c$$
$$\text{Log}\left[\sqrt{x}-\#1\right]\#1^4+12ac^2\,\text{Log}\left[\sqrt{x}-\#1\right]\#1^4\Big)\,\&\Big]\Big)\Big/\left(64a\left(b^2-4ac\right)^2\left(a+bx^2+cx^4\right)^2\right)$$

Problem 1086: Result is not expressed in closed-form.

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

Optimal (type 3, 594 leaves, 10 steps):

$$-\frac{\sqrt{x}\left(b+2 c x^2\right)}{4\left(b^2-4 a c\right)\left(a+b x^2+c x^4\right)^2}+\frac{\sqrt{x}\left(b\left(b^2+20 a c\right)+c\left(b^2+44 a c\right) x^2\right)}{16 a\left(b^2-4 a c\right)^2\left(a+b x^2+c x^4\right)}-$$

$$\frac{3 c^{3/4}\left(b^2+44 a c-\frac{b^3}{\sqrt{b^2-4 a c}}+\frac{68 a b c}{\sqrt{b^2-4 a c}}\right) \text{ArcTan}\left[\frac{2^{1/4} c^{1/4} \sqrt{x}}{\left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{32\times 2^{1/4} a\left(b^2-4 a c\right)^2\left(-b-\sqrt{b^2-4 a c}\right)^{3/4}}-$$

$$\left(3 c^{3/4}\left(b^3-68 a b c+\sqrt{b^2-4 a c}\left(b^2+44 a c\right)\right) \text{ArcTan}\left[\frac{2^{1/4} c^{1/4} \sqrt{x}}{\left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}\right]\right)\Big/$$

$$\left(32\times 2^{1/4} a\left(b^2-4 a c\right)^{5/2}\left(-b+\sqrt{b^2-4 a c}\right)^{3/4}\right)-$$

$$\frac{3 c^{3/4}\left(b^2+44 a c-\frac{b^3}{\sqrt{b^2-4 a c}}+\frac{68 a b c}{\sqrt{b^2-4 a c}}\right) \text{ArcTanh}\left[\frac{2^{1/4} c^{1/4} \sqrt{x}}{\left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{32\times 2^{1/4} a\left(b^2-4 a c\right)^2\left(-b-\sqrt{b^2-4 a c}\right)^{3/4}}-$$

$$\left(3 c^{3/4}\left(b^3-68 a b c+\sqrt{b^2-4 a c}\left(b^2+44 a c\right)\right) \text{ArcTanh}\left[\frac{2^{1/4} c^{1/4} \sqrt{x}}{\left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}\right]\right)\Big/$$

$$\left(32\times 2^{1/4} a\left(b^2-4 a c\right)^{5/2}\left(-b+\sqrt{b^2-4 a c}\right)^{3/4}\right)$$

Result (type 7, 224 leaves):

$$\Bigg(-16 a\left(b^2-4 a c\right)\sqrt{x}\left(b+2 c x^2\right)+$$
$$4\sqrt{x}\left(b^3+20 a b c+b^2 c x^2+44 a c^2 x^2\right)\left(a+b x^2+c x^4\right)+3\left(a+b x^2+c x^4\right)^2$$
$$\text{RootSum}\Big[a+b \#1^4+c \#1^8\&,\frac{1}{b \#1^3+2 c \#1^7}\Big(b^3 \text{Log}\left[\sqrt{x}-\#1\right]-12 a b c \text{Log}\left[\sqrt{x}-\#1\right]+b^2 c$$
$$\text{Log}\left[\sqrt{x}-\#1\right]\#1^4+44 a c^2 \text{Log}\left[\sqrt{x}-\#1\right]\#1^4\Big)\&\Big]\Bigg)\Big/\left(64 a\left(b^2-4 a c\right)^2\left(a+b x^2+c x^4\right)^2\right)$$

Problem 1087: Result is not expressed in closed-form.

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

Optimal (type 3, 658 leaves, 10 steps):

$$\frac{x^{3/2}\left(b^2-2ac+bcx^2\right)}{4a\left(b^2-4ac\right)\left(a+bx^2+cx^4\right)^2}+\frac{x^{3/2}\left(5b^4-45ab^2c+52a^2c^2+bc\left(5b^2-44ac\right)x^2\right)}{16a^2\left(b^2-4ac\right)^2\left(a+bx^2+cx^4\right)}-$$
$$\left(c^{1/4}\left(5b^4-54ab^2c+520a^2c^2-b\left(5b^2-44ac\right)\sqrt{b^2-4ac}\right)\text{ArcTan}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]\right)\Big/$$
$$\left(32\times2^{3/4}a^2\left(b^2-4ac\right)^{5/2}\left(-b-\sqrt{b^2-4ac}\right)^{1/4}\right)+$$
$$\left(c^{1/4}\left(5b^4-54ab^2c+520a^2c^2+b\left(5b^2-44ac\right)\sqrt{b^2-4ac}\right)\text{ArcTan}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}\right]\right)\Big/$$
$$\left(32\times2^{3/4}a^2\left(b^2-4ac\right)^{5/2}\left(-b+\sqrt{b^2-4ac}\right)^{1/4}\right)+$$
$$\left(c^{1/4}\left(5b^4-54ab^2c+520a^2c^2-b\left(5b^2-44ac\right)\sqrt{b^2-4ac}\right)\text{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b-\sqrt{b^2-4ac}\right)^{1/4}}\right]\right)\Big/$$
$$\left(32\times2^{3/4}a^2\left(b^2-4ac\right)^{5/2}\left(-b-\sqrt{b^2-4ac}\right)^{1/4}\right)-$$
$$\left(c^{1/4}\left(5b^4-54ab^2c+520a^2c^2+b\left(5b^2-44ac\right)\sqrt{b^2-4ac}\right)\text{ArcTanh}\left[\frac{2^{1/4}c^{1/4}\sqrt{x}}{\left(-b+\sqrt{b^2-4ac}\right)^{1/4}}\right]\right)\Big/$$
$$\left(32\times2^{3/4}a^2\left(b^2-4ac\right)^{5/2}\left(-b+\sqrt{b^2-4ac}\right)^{1/4}\right)$$

Result (type 7, 254 leaves):

$$\frac{1}{64a^2\left(b^2-4ac\right)^2}\left(-\frac{16a\left(-b^2+4ac\right)x^{3/2}\left(b^2-2ac+bcx^2\right)}{\left(a+bx^2+cx^4\right)^2}+\right.$$
$$\frac{4x^{3/2}\left(5b^4-45ab^2c+52a^2c^2+5b^3cx^2-44abc^2x^2\right)}{a+bx^2+cx^4}+$$
$$\text{RootSum}\left[a+b\,\#1^4+c\,\#1^8\,\&,\frac{1}{b\,\#1+2c\,\#1^5}\left(5b^4\,\text{Log}\left[\sqrt{x}-\#1\right]-49ab^2c\,\text{Log}\left[\sqrt{x}-\#1\right]+\right.\right.$$
$$\left.\left.\left.260a^2c^2\,\text{Log}\left[\sqrt{x}-\#1\right]+5b^3c\,\text{Log}\left[\sqrt{x}-\#1\right]\#1^4-44abc^2\,\text{Log}\left[\sqrt{x}-\#1\right]\#1^4\right)\&\right]\right)$$

Problem 1088: Result is not expressed in closed-form.

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

Optimal (type 3, 658 leaves, 10 steps):

$$\frac{\sqrt{x}\,\left(b^2-2\,a\,c+b\,c\,x^2\right)}{4\,a\,\left(b^2-4\,a\,c\right)\,\left(a+b\,x^2+c\,x^4\right)^2}+\frac{\sqrt{x}\,\left(7\,b^4-55\,a\,b^2\,c+60\,a^2\,c^2+b\,c\,\left(7\,b^2-52\,a\,c\right)\,x^2\right)}{16\,a^2\,\left(b^2-4\,a\,c\right)^2\,\left(a+b\,x^2+c\,x^4\right)}+$$

$$\left(3\,c^{3/4}\,\left(7\,b^4-66\,a\,b^2\,c+280\,a^2\,c^2-b\,\left(7\,b^2-52\,a\,c\right)\,\sqrt{b^2-4\,a\,c}\right)\,\text{ArcTan}\left[\frac{2^{1/4}\,c^{1/4}\,\sqrt{x}}{\left(-b-\sqrt{b^2-4\,a\,c}\right)^{1/4}}\right]\right)\Big/$$

$$\left(32\times 2^{1/4}\,a^2\,\left(b^2-4\,a\,c\right)^{5/2}\,\left(-b-\sqrt{b^2-4\,a\,c}\right)^{3/4}\right)-$$

$$\left(3\,c^{3/4}\,\left(7\,b^4-66\,a\,b^2\,c+280\,a^2\,c^2+b\,\left(7\,b^2-52\,a\,c\right)\,\sqrt{b^2-4\,a\,c}\right)\,\text{ArcTan}\left[\frac{2^{1/4}\,c^{1/4}\,\sqrt{x}}{\left(-b+\sqrt{b^2-4\,a\,c}\right)^{1/4}}\right]\right)\Big/$$

$$\left(32\times 2^{1/4}\,a^2\,\left(b^2-4\,a\,c\right)^{5/2}\,\left(-b+\sqrt{b^2-4\,a\,c}\right)^{3/4}\right)+$$

$$\left(3\,c^{3/4}\,\left(7\,b^4-66\,a\,b^2\,c+280\,a^2\,c^2-b\,\left(7\,b^2-52\,a\,c\right)\,\sqrt{b^2-4\,a\,c}\right)\,\text{ArcTanh}\left[\frac{2^{1/4}\,c^{1/4}\,\sqrt{x}}{\left(-b-\sqrt{b^2-4\,a\,c}\right)^{1/4}}\right]\right)\Big/$$

$$\left(32\times 2^{1/4}\,a^2\,\left(b^2-4\,a\,c\right)^{5/2}\,\left(-b-\sqrt{b^2-4\,a\,c}\right)^{3/4}\right)-$$

$$\left(3\,c^{3/4}\,\left(7\,b^4-66\,a\,b^2\,c+280\,a^2\,c^2+b\,\left(7\,b^2-52\,a\,c\right)\,\sqrt{b^2-4\,a\,c}\right)\,\text{ArcTanh}\left[\frac{2^{1/4}\,c^{1/4}\,\sqrt{x}}{\left(-b+\sqrt{b^2-4\,a\,c}\right)^{1/4}}\right]\right)\Big/$$

$$\left(32\times 2^{1/4}\,a^2\,\left(b^2-4\,a\,c\right)^{5/2}\,\left(-b+\sqrt{b^2-4\,a\,c}\right)^{3/4}\right)$$

Result (type 7, 258 leaves):

$$\frac{1}{64\,a^2\,\left(b^2-4\,a\,c\right)^2}\left(-\frac{16\,a\,\left(-b^2+4\,a\,c\right)\,\sqrt{x}\,\left(b^2-2\,a\,c+b\,c\,x^2\right)}{\left(a+b\,x^2+c\,x^4\right)^2}+\right.$$

$$\frac{4\,\sqrt{x}\,\left(7\,b^4-55\,a\,b^2\,c+60\,a^2\,c^2+7\,b^3\,c\,x^2-52\,a\,b\,c^2\,x^2\right)}{a+b\,x^2+c\,x^4}+$$

$$3\,\text{RootSum}\left[a+b\,\#1^4+c\,\#1^8\,\&,\,\frac{1}{b\,\#1^3+2\,c\,\#1^7}\left(7\,b^4\,\text{Log}\left[\sqrt{x}-\#1\right]-59\,a\,b^2\,c\,\text{Log}\left[\sqrt{x}-\#1\right]+\right.\right.$$

$$\left.\left.\left.140\,a^2\,c^2\,\text{Log}\left[\sqrt{x}-\#1\right]+7\,b^3\,c\,\text{Log}\left[\sqrt{x}-\#1\right]\,\#1^4-52\,a\,b\,c^2\,\text{Log}\left[\sqrt{x}-\#1\right]\,\#1^4\right)\,\&\right]\right)$$

Problem 1089: Result more than twice size of optimal antiderivative.

$$\int(d\,x)^{3/2}\,\sqrt{a+b\,x^2+c\,x^4}\,dx$$

Optimal (type 6, 147 leaves, 2 steps):

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

Result (type 6, 1048 leaves):

$$\frac{1}{225\,c^2\,(a+b\,x^2+c\,x^4)^{3/2}}\,d\sqrt{d\,x}\,\Bigg(10\,c\,(2\,b+5\,c\,x^2)\,(a+b\,x^2+c\,x^4)^2-\Bigg(25\,a^2\,b\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},\frac{1}{2},\frac{5}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg/$$
$$\Bigg(5\,a\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},\frac{1}{2},\frac{5}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-x^2\Bigg(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{3}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)+$$
$$\Bigg(90\,a^2\,c\,x^2\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg/$$
$$\Bigg(9\,a\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-x^2\Bigg(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},\frac{3}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},\frac{1}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)+$$
$$\Bigg(27\,a\,b^2\,x^2\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg/$$
$$\Bigg(-9\,a\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+x^2\Bigg(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},\frac{3}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},\frac{1}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)\Bigg)$$

Problem 1090: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 147 leaves, 2 steps):

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

Result (type 6, 706 leaves):

$$\frac{1}{147\,\left(a+b\,x^2+c\,x^4\right)^{3/2}}\,2\,x\,\sqrt{d\,x}\,\left(21\,\left(a+b\,x^2+c\,x^4\right)^2+\left(49\,a^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\right.\right.$$
$$\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\bigg)\bigg/$$
$$\left(c\,\left(7\,a\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.\right.$$
$$x^2\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{3}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)+$$
$$\left(33\,a\,b\,x^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\right.\right.$$
$$\left.\left.\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\bigg/$$
$$\left(22\,a\,c\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$
$$2\,c\,x^2\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},\frac{3}{2},\frac{15}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},\frac{1}{2},\frac{15}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)$$

Problem 1091: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 145 leaves, 2 steps):

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

Result (type 6, 709 leaves) :

$$\frac{1}{25\sqrt{d\,x}\,\left(a+b\,x^2+c\,x^4\right)^{3/2}}\,2\,x\,\Bigg(5\,\left(a+b\,x^2+c\,x^4\right)^2+\Bigg(25\,a^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},\frac{1}{2},\frac{5}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Big/\Bigg(c\,\Bigg(5\,a\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},\frac{1}{2},\frac{5}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-x^2\,\Bigg(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{3}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)\Bigg)+\Bigg(9\,a\,b\,x^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Big/\Bigg(2\,c\,\Bigg(9\,a\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-x^2\,\Bigg(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},\frac{3}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},\frac{1}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)\Bigg)\Bigg)$$

Problem 1092: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{a+b\,x^2+c\,x^4}}{(d\,x)^{3/2}}\,dx$$

Optimal (type 6, 145 leaves, 2 steps) :

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

Result (type 6, 707 leaves):

$$\frac{1}{21\,(d x)^{3/2}\,(a+b x^2+c x^4)^{3/2}}\,2 x\left(-21\,(a+b x^2+c x^4)^2+\left(49 a b x^2\left(b-\sqrt{b^2-4 a c}+2 c x^2\right)\left(b+\sqrt{b^2-4 a c}+2 c x^2\right)\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/\left(2 c\left(7 a\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]-x^2\left(\left(b+\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{3}{2},\frac{11}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},\frac{1}{2},\frac{11}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)+\left(33 a x^4\left(b-\sqrt{b^2-4 a c}+2 c x^2\right)\left(b+\sqrt{b^2-4 a c}+2 c x^2\right)\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{1}{2},\frac{11}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/\left(11 a\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{1}{2},\frac{11}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]-x^2\left(\left(b+\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},\frac{3}{2},\frac{15}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},\frac{1}{2},\frac{15}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)$$

Problem 1093: Result more than twice size of optimal antiderivative.

$$\int (d x)^{3/2}\,(a+b x^2+c x^4)^{3/2}\,dx$$

Optimal (type 6, 148 leaves, 2 steps):

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

Result (type 6, 1751 leaves) :

$$\frac{1}{16575\,c^3\,\left(a+b\,x^2+c\,x^4\right)^{3/2}}$$

$$2\,d\,\sqrt{d\,x}\,\Bigg(5\,c\,\left(a+b\,x^2+c\,x^4\right)^2\,\left(-28\,b^3+20\,b^2\,c\,x^2+65\,c^2\,x^2\,\left(7\,a+3\,c\,x^4\right)+b\,c\,\left(176\,a+285\,c\,x^4\right)\right)+$$

$$\Bigg(175\,a^2\,b^3\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)$$

$$\text{AppellF1}\Big[\frac{1}{4},\,\frac{1}{2},\,\frac{1}{2},\,\frac{5}{4},\,-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Bigg)\Big/$$

$$\Bigg(5\,a\,\text{AppellF1}\Big[\frac{1}{4},\,\frac{1}{2},\,\frac{1}{2},\,\frac{5}{4},\,-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\Big]-$$

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

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

$$\Bigg(1100\,a^3\,b\,c\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)$$

$$\text{AppellF1}\Big[\frac{1}{4},\,\frac{1}{2},\,\frac{1}{2},\,\frac{5}{4},\,-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Bigg)\Big/$$

$$\Bigg(5\,a\,\text{AppellF1}\Big[\frac{1}{4},\,\frac{1}{2},\,\frac{1}{2},\,\frac{5}{4},\,-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\Big]-$$

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

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

$$\Bigg(189\,a\,b^4\,x^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)$$

$$\text{AppellF1}\Big[\frac{5}{4},\,\frac{1}{2},\,\frac{1}{2},\,\frac{9}{4},\,-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Bigg)\Big/$$

$$\Bigg(9\,a\,\text{AppellF1}\Big[\frac{5}{4},\,\frac{1}{2},\,\frac{1}{2},\,\frac{9}{4},\,-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\Big]-$$

$$x^2\,\Bigg(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\Big[\frac{9}{4},\,\frac{1}{2},\,\frac{3}{2},\,\frac{13}{4},\,-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\Big]+$$

$$\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\Big[\frac{9}{4},\,\frac{3}{2},\,\frac{1}{2},\,\frac{13}{4},\,-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Bigg)\Bigg)+$$

$$\Bigg(2340\,a^3\,c^2\,x^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)$$

$$\text{AppellF1}\Big[\frac{5}{4},\,\frac{1}{2},\,\frac{1}{2},\,\frac{9}{4},\,-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Bigg)\Big/$$

$$\left(9\,a\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-x^2\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},\frac{3}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},\frac{1}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)+$$

$$\left(1413\,a^2\,b^2\,c\,x^2\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

$$\left(-9\,a\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+x^2\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},\frac{3}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},\frac{1}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)$$

Problem 1094: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 148 leaves, 2 steps):

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

Result (type 6, 1395 leaves):

$$\frac{1}{8085\,c^2\left(a+b\,x^2+c\,x^4\right)^{3/2}}2\,x\sqrt{d\,x}\left(7\,c\left(a+b\,x^2+c\,x^4\right)^2\left(12\,b^2+119\,b\,c\,x^2+11\,c\left(19\,a+7\,c\,x^4\right)\right)-\left(147\,a^2\,b^2\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\right.$$

$$\left(7\,a\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-x^2\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{3}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)+$$

$$\left(2156\, a^3\, c \left(b-\sqrt{b^2-4\, a\, c}+2\, c\, x^2\right) \left(b+\sqrt{b^2-4\, a\, c}+2\, c\, x^2\right) \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2\, c\, x^2}{b+\sqrt{b^2-4\, a\, c}},\frac{2\, c\, x^2}{-b+\sqrt{b^2-4\, a\, c}}\right]\right) \Big/ \left(7\, a\, \text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2\, c\, x^2}{b+\sqrt{b^2-4\, a\, c}},\frac{2\, c\, x^2}{-b+\sqrt{b^2-4\, a\, c}}\right] - x^2 \left(\left(b+\sqrt{b^2-4\, a\, c}\right) \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{3}{2},\frac{11}{4},-\frac{2\, c\, x^2}{b+\sqrt{b^2-4\, a\, c}},\frac{2\, c\, x^2}{-b+\sqrt{b^2-4\, a\, c}}\right] + \left(b-\sqrt{b^2-4\, a\, c}\right) \text{AppellF1}\left[\frac{7}{4},\frac{3}{2},\frac{1}{2},\frac{11}{4},-\frac{2\, c\, x^2}{b+\sqrt{b^2-4\, a\, c}},\frac{2\, c\, x^2}{-b+\sqrt{b^2-4\, a\, c}}\right]\right)\right) +$$

$$\left(1188\, a^2\, b\, c\, x^2 \left(b-\sqrt{b^2-4\, a\, c}+2\, c\, x^2\right) \left(b+\sqrt{b^2-4\, a\, c}+2\, c\, x^2\right) \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{1}{2},\frac{11}{4},-\frac{2\, c\, x^2}{b+\sqrt{b^2-4\, a\, c}},\frac{2\, c\, x^2}{-b+\sqrt{b^2-4\, a\, c}}\right]\right) \Big/ \left(11\, a\, \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{1}{2},\frac{11}{4},-\frac{2\, c\, x^2}{b+\sqrt{b^2-4\, a\, c}},\frac{2\, c\, x^2}{-b+\sqrt{b^2-4\, a\, c}}\right] - x^2 \left(\left(b+\sqrt{b^2-4\, a\, c}\right) \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},\frac{3}{2},\frac{15}{4},-\frac{2\, c\, x^2}{b+\sqrt{b^2-4\, a\, c}},\frac{2\, c\, x^2}{-b+\sqrt{b^2-4\, a\, c}}\right] + \left(b-\sqrt{b^2-4\, a\, c}\right) \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},\frac{1}{2},\frac{15}{4},-\frac{2\, c\, x^2}{b+\sqrt{b^2-4\, a\, c}},\frac{2\, c\, x^2}{-b+\sqrt{b^2-4\, a\, c}}\right]\right)\right) +$$

$$\left(165\, a\, b^3\, x^2 \left(b-\sqrt{b^2-4\, a\, c}+2\, c\, x^2\right) \left(b+\sqrt{b^2-4\, a\, c}+2\, c\, x^2\right) \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{1}{2},\frac{11}{4},-\frac{2\, c\, x^2}{b+\sqrt{b^2-4\, a\, c}},\frac{2\, c\, x^2}{-b+\sqrt{b^2-4\, a\, c}}\right]\right) \Big/ \left(-11\, a\, \text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{1}{2},\frac{11}{4},-\frac{2\, c\, x^2}{b+\sqrt{b^2-4\, a\, c}},\frac{2\, c\, x^2}{-b+\sqrt{b^2-4\, a\, c}}\right] + x^2 \left(\left(b+\sqrt{b^2-4\, a\, c}\right) \text{AppellF1}\left[\frac{11}{4},\frac{1}{2},\frac{3}{2},\frac{15}{4},-\frac{2\, c\, x^2}{b+\sqrt{b^2-4\, a\, c}},\frac{2\, c\, x^2}{-b+\sqrt{b^2-4\, a\, c}}\right] + \left(b-\sqrt{b^2-4\, a\, c}\right) \text{AppellF1}\left[\frac{11}{4},\frac{3}{2},\frac{1}{2},\frac{15}{4},-\frac{2\, c\, x^2}{b+\sqrt{b^2-4\, a\, c}},\frac{2\, c\, x^2}{-b+\sqrt{b^2-4\, a\, c}}\right]\right)\right)\Bigg)\Bigg)$$

Problem 1095: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 146 leaves, 2 steps):

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

Result (type 6, 1395 leaves):

$$\frac{1}{975\,c^2\,\sqrt{d\,x}\,\left(a+b\,x^2+c\,x^4\right)^{3/2}}$$

$$2\,x\,\Bigg(5\,c\,\left(a+b\,x^2+c\,x^4\right)^2\,\left(4\,b^2+25\,b\,c\,x^2+3\,c\,\left(17\,a+5\,c\,x^4\right)\right)-\Bigg(25\,a^2\,b^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)$$
$$\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},\frac{1}{2},\frac{5}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Big/$$
$$\Bigg(5\,a\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},\frac{1}{2},\frac{5}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$
$$x^2\,\Bigg(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{3}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+$$
$$\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)+$$
$$\Bigg(900\,a^3\,c\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)$$
$$\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},\frac{1}{2},\frac{5}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Big/$$
$$\Bigg(5\,a\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},\frac{1}{2},\frac{5}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$
$$x^2\,\Bigg(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{3}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+$$
$$\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)+$$
$$\Bigg(252\,a^2\,b\,c\,x^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)$$
$$\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Big/$$
$$\Bigg(9\,a\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$
$$x^2\,\Bigg(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},\frac{3}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+$$
$$\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},\frac{1}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)+$$

$$\left(27\,a\,b^3\,x^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\right.$$
$$\left.\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Bigg/$$
$$\left(-9\,a\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$x^2\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},\frac{3}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},\frac{1}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)$$

Problem 1096: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 146 leaves, 2 steps):

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

Result (type 6, 1059 leaves):

$$\frac{1}{539\,(d\,x)^{3/2}\,\left(a+b\,x^2+c\,x^4\right)^{3/2}}$$

$$2\,x\,\Bigg(7\,\left(a+b\,x^2+c\,x^4\right)^2\,\left(-77\,a+13\,b\,x^2+7\,c\,x^4\right)+\left(784\,a^2\,b\,x^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\right.$$

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

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

$$x^2\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{3}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$

$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)+$$

$$\left(924\,a^2\,x^4\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\right.\right.$$

$$\left.\left.\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

$$\left(11\,a\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$

$$x^2\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},\frac{3}{2},\frac{15}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$

$$\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},\frac{1}{2},\frac{15}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)+$$

$$\left(33\,a\,b^2\,x^4\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\right.$$

$$\left.\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

$$\left(c\,\left(11\,a\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.\right.$$

$$x^2\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},\frac{3}{2},\frac{15}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$

$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},\frac{1}{2},\frac{15}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)\Bigg)$$

Problem 1097: Result more than twice size of optimal antiderivative.

$$\int\frac{(d\,x)^{3/2}}{\sqrt{a+b\,x^2+c\,x^4}}\,dx$$

Optimal (type 6, 147 leaves, 2 steps):

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

Result (type 6, 386 leaves):

$$-\left(\left(18\,a^2\,x\,(d\,x)^{3/2}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(5\left(b-\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)\left(a+b\,x^2+c\,x^4\right)^{3/2}\left(-9\,a\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+x^2\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},\frac{3}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},\frac{1}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)\right)$$

Problem 1098: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 147 leaves, 2 steps):

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

Result (type 6, 386 leaves):

$$-\left(\left(14\,a^2\,x\,\sqrt{d\,x}\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(3\,\left(b-\sqrt{b^2-4\,a\,c}\right)\,\left(b+\sqrt{b^2-4\,a\,c}\right)\,\left(a+b\,x^2+c\,x^4\right)^{3/2}\left(-7\,a\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+x^2\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{3}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)\right)$$

Problem 1099: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 145 leaves, 2 steps):

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

Result (type 6, 384 leaves):

$$-\left(\left(10\,a^2\,x\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},\frac{1}{2},\frac{5}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(\left(b-\sqrt{b^2-4\,a\,c}\right)\,\left(b+\sqrt{b^2-4\,a\,c}\right)\,\sqrt{d\,x}\,\left(a+b\,x^2+c\,x^4\right)^{3/2}\left(-5\,a\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},\frac{1}{2},\frac{5}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+x^2\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{3}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)\right)$$

Problem 1100: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 145 leaves, 2 steps):

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

Result (type 6, 710 leaves):

$$\frac{1}{21\,a\,(d\,x)^{3/2}\,\left(a+b\,x^2+c\,x^4\right)^{3/2}}$$
$$2\,x\left(-21\,\left(a+b\,x^2+c\,x^4\right)^2+\left(49\,a\,b\,x^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\right.\right.$$
$$\left.\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(4\,c\,\left(7\,a\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.\right.$$
$$x^2\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{3}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)+$$
$$\left(99\,a\,x^4\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\right.\right.$$
$$\left.\left.\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(44\,a\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$
$$4\,x^2\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},\frac{3}{2},\frac{15}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},\frac{1}{2},\frac{15}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)$$

Problem 1101: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 150 leaves, 2 steps):

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

Result (type 6, 720 leaves):

$$\frac{1}{5\,(b^2-4\,a\,c)\,(a+b\,x^2+c\,x^4)^{3/2}}\,d\,\sqrt{d\,x}\,\Bigg(-5\,(b+2\,c\,x^2)\,(a+b\,x^2+c\,x^4)+\Bigg(25\,a\,b\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},\frac{1}{2},\frac{5}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Big/$$
$$\Bigg(4\,c\,\Bigg(5\,a\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},\frac{1}{2},\frac{5}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$
$$x^2\,\Bigg(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{3}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+$$
$$\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)\Bigg)+$$
$$\Bigg(9\,a\,x^2\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Big/$$
$$\Bigg(18\,a\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$
$$2\,x^2\,\Bigg(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},\frac{3}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+$$
$$\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},\frac{1}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)\Bigg)$$

Problem 1102: Result more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{d\,x}}{(a+b\,x^2+c\,x^4)^{3/2}}\,dx$$

Optimal (type 6, 150 leaves, 2 steps):

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

Result (type 6, 1058 leaves):

$$\frac{1}{84\,a\,\left(-b^2+4\,a\,c\right)\,\left(a+b\,x^2+c\,x^4\right)^{3/2}}\,x\,\sqrt{d\,x}\,\Bigg(-84\,\left(b^2-2\,a\,c+b\,c\,x^2\right)\,\left(a+b\,x^2+c\,x^4\right)+\Bigg(196\,a^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)$$
$$\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Big/$$
$$\Bigg(14\,a\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$
$$2\,x^2\,\Bigg(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{3}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+$$
$$\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)+$$
$$\Bigg(49\,a\,b^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)$$
$$\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Big/$$
$$\Bigg(c\,\Bigg(7\,a\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$
$$x^2\,\Bigg(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{3}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+$$
$$\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)\Bigg)-$$
$$\Bigg(99\,a\,b\,x^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\text{AppellF1}\Big[\frac{7}{4},\frac{1}{2},$$
$$\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Bigg)\Big/$$
$$\Bigg(-11\,a\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+$$
$$x^2\,\Bigg(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},\frac{3}{2},\frac{15}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+$$
$$\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},\frac{1}{2},\frac{15}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)\Bigg)$$

Problem 1103: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 148 leaves, 2 steps):

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

Result (type 6, 1058 leaves):

$$\frac{1}{20\,a\,\left(-b^2+4\,a\,c\right)\,\sqrt{d\,x}\,\left(a+b\,x^2+c\,x^4\right)^{3/2}}$$
$$x\left(-20\,\left(b^2-2\,a\,c+b\,c\,x^2\right)\,\left(a+b\,x^2+c\,x^4\right)+\left(300\,a^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\right.\right.$$
$$\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},\frac{1}{2},\frac{5}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg/$$
$$\left(10\,a\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},\frac{1}{2},\frac{5}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$
$$2\,x^2\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{3}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)-$$
$$\left(25\,a\,b^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\right.$$
$$\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},\frac{1}{2},\frac{5}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg/$$
$$\left(c\,\left(5\,a\,\text{AppellF1}\left[\frac{1}{4},\frac{1}{2},\frac{1}{2},\frac{5}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.\right.$$
$$x^2\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{3}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{5}{4},\frac{3}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)-$$
$$\left(9\,a\,b\,x^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\right.\right.$$
$$\left.\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg/$$
$$\left(-9\,a\,\text{AppellF1}\left[\frac{5}{4},\frac{1}{2},\frac{1}{2},\frac{9}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$x^2\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{9}{4},\frac{1}{2},\frac{3}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{9}{4},\frac{3}{2},\frac{1}{2},\frac{13}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)$$

Problem 1104: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 148 leaves, 2 steps):

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

Result (type 6, 1600 leaves):

$$\frac{1}{7\,(d x)^{3/2}\,(a+b x^2+c x^4)^{3/2}}\times\left(\frac{7 x^2\,(b^3-3 a b c+b^2 c x^2-2 a c^2 x^2)\,(a+b x^2+c x^4)}{a^2\,(-b^2+4 a c)}-\frac{14\,(a+b x^2+c x^4)^2}{a^2}+\right.$$

$$\left(49 b^3 x^2\left(b-\sqrt{b^2-4 a c}+2 c x^2\right)\left(b+\sqrt{b^2-4 a c}+2 c x^2\right)\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/\left((b^2-4 a c)\left(-b+\sqrt{b^2-4 a c}\right)\left(b+\sqrt{b^2-4 a c}\right)\left(-7 a\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]+x^2\left(\left(b+\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{3}{2},\frac{11}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},\frac{1}{2},\frac{11}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)-$$

$$\left(147 a b c x^2\left(b-\sqrt{b^2-4 a c}+2 c x^2\right)\left(b+\sqrt{b^2-4 a c}+2 c x^2\right)\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/\left((b^2-4 a c)\left(-b+\sqrt{b^2-4 a c}\right)\left(b+\sqrt{b^2-4 a c}\right)\left(-7 a\,\text{AppellF1}\left[\frac{3}{4},\frac{1}{2},\frac{1}{2},\frac{7}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]+x^2\left(\left(b+\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{3}{2},\frac{11}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{7}{4},\frac{3}{2},\frac{1}{2},\frac{11}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)+$$

$$\left(99 b^2 c x^4\left(b-\sqrt{b^2-4 a c}+2 c x^2\right)\left(b+\sqrt{b^2-4 a c}+2 c x^2\right)\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{1}{2},\frac{11}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/\left((b^2-4 a c)\left(-b+\sqrt{b^2-4 a c}\right)\left(b+\sqrt{b^2-4 a c}\right)\left(-11 a\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{1}{2},\frac{11}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]+x^2\left(\left(b+\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},\frac{3}{2},\frac{15}{4},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}},\frac{2 c x^2}{-b+\sqrt{b^2-4 a c}}\right]+\right.\right.\right.$$

$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},\frac{1}{2},\frac{15}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)-$$

$$\left(330\,a\,c^2\,x^4\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^2\right)\right.$$

$$\left.\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

$$\left(\left(b^2-4\,a\,c\right)\left(-b+\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)\right.$$

$$\left(-11\,a\,\text{AppellF1}\left[\frac{7}{4},\frac{1}{2},\frac{1}{2},\frac{11}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$

$$x^2\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{11}{4},\frac{1}{2},\frac{3}{2},\frac{15}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$

$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{11}{4},\frac{3}{2},\frac{1}{2},\frac{15}{4},-\frac{2\,c\,x^2}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^2}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)$$

Problem 1108: Result is not expressed in closed-form.

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

Optimal (type 5, 173 leaves, 3 steps):

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

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

Result (type 7, 82 leaves):

$$\frac{1}{2\,m}(d\,x)^m\,\text{RootSum}\left[a+b\,\#1^2+c\,\#1^4\,\&,\frac{\text{Hypergeometric2F1}\left[-m,-m,1-m,-\frac{\#1}{x-\#1}\right]\left(\frac{x}{x-\#1}\right)^{-m}}{b\,\#1+2\,c\,\#1^3}\,\&\right]$$

Problem 1109: Result unnecessarily involves higher level functions.

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

Optimal (type 5, 315 leaves, 4 steps):

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

Result (type 6, 376 leaves):

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

Problem 1110: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 158 leaves, 2 steps):

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

Result (type 6, 1080 leaves):

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

Problem 1111: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 157 leaves, 2 steps):

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

Result (type 6, 423 leaves):

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

Problem 1112: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 157 leaves, 2 steps):

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

Result (type 6, 425 leaves):

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

Problem 1113: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 160 leaves, 2 steps):

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

Result (type 6, 426 leaves):

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

Problem 1114: Result more than twice size of optimal antiderivative.

$$\int (d\,x)^m \left(a+b\,x^2+c\,x^4\right)^p \, dx$$

Optimal (type 6, 155 leaves, 2 steps):

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

Result (type 6, 499 leaves):

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

Problem 1115: Result unnecessarily involves higher level functions.

$$\int x^7 \left(a+b\,x^2+c\,x^4\right)^p \, dx$$

Optimal (type 5, 257 leaves, 4 steps):

$$\frac{x^4\left(a+b x^2+c x^4\right)^{1+p}}{4 c\,(2+p)}+\left(\left(b^2(2+p)(3+p)-2 a c\,(3+2 p)-2 b c\,(1+p)(3+p)\,x^2\right)\left(a+b x^2+c x^4\right)^{1+p}\right)\Big/\left(8 c^3(1+p)(2+p)(3+2 p)\right)-\left(2^{-2+p} b\left(6 a c-b^2(3+p)\right)\left(-\frac{b-\sqrt{b^2-4 a c}+2 c x^2}{\sqrt{b^2-4 a c}}\right)^{-1-p}\left(a+b x^2+c x^4\right)^{1+p}\text{Hypergeometric2F1}\left[-p,1+p,2+p,\frac{b+\sqrt{b^2-4 a c}+2 c x^2}{2\sqrt{b^2-4 a c}}\right]\right)\Big/\left(c^3\sqrt{b^2-4 a c}\,(1+p)(3+2 p)\right)$$

Result (type 6, 440 leaves) :

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

Problem 1116: Result unnecessarily involves higher level functions.

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

Optimal (type 5, 223 leaves, 4 steps) :

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

Result (type 6, 395 leaves) :

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

Problem 1117: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int x^3\left(a+bx^2+cx^4\right)^p\,dx$$

Optimal (type 5, 160 leaves, 3 steps):

$$\frac{\left(a+bx^2+cx^4\right)^{1+p}}{4c\,(1+p)}+\left(2^{-1+p}b\left(-\frac{b-\sqrt{b^2-4ac}+2cx^2}{\sqrt{b^2-4ac}}\right)^{-1-p}\left(a+bx^2+cx^4\right)^{1+p}\right.$$
$$\left.\text{Hypergeometric2F1}\left[-p,1+p,2+p,\frac{b+\sqrt{b^2-4ac}+2cx^2}{2\sqrt{b^2-4ac}}\right]\right)\Big/\left(c\sqrt{b^2-4ac}\,(1+p)\right)$$

Result (type 6, 440 leaves):

$$\left(3\times2^{-3-p}c\left(b+\sqrt{b^2-4ac}\right)x^4\left(\frac{b-\sqrt{b^2-4ac}}{2c}+x^2\right)^{-p}\right.$$
$$\left(\frac{b-\sqrt{b^2-4ac}+2cx^2}{c}\right)^{1+p}\left(2a+\left(b-\sqrt{b^2-4ac}\right)x^2\right)^2\left(a+x^2\left(b+cx^2\right)\right)^{-1+p}$$
$$\left.\text{AppellF1}\left[2,-p,-p,3,-\frac{2cx^2}{b+\sqrt{b^2-4ac}},\frac{2cx^2}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/\left(\left(-b+\sqrt{b^2-4ac}\right)\right.$$
$$\left(b+\sqrt{b^2-4ac}+2cx^2\right)\left(-6a\,\text{AppellF1}\left[2,-p,-p,3,-\frac{2cx^2}{b+\sqrt{b^2-4ac}},\frac{2cx^2}{-b+\sqrt{b^2-4ac}}\right]+\right.$$
$$px^2\left(\left(-b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[3,1-p,-p,4,-\frac{2cx^2}{b+\sqrt{b^2-4ac}},\frac{2cx^2}{-b+\sqrt{b^2-4ac}}\right]-\right.$$
$$\left.\left.\left.\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[3,-p,1-p,4,-\frac{2cx^2}{b+\sqrt{b^2-4ac}},\frac{2cx^2}{-b+\sqrt{b^2-4ac}}\right]\right)\right)\right)$$

Problem 1119: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 152 leaves, 3 steps):

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

Result (type 6, 497 leaves):

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

Problem 1120: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 166 leaves, 3 steps):

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

Result (type 6, 516 leaves):

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

Problem 1121: Result more than twice size of optimal antiderivative.

$$\int\frac{\left(a+bx^2+cx^4\right)^p}{x^5}\,dx$$

Optimal (type 6, 164 leaves, 3 steps):

$$-\frac{1}{(1-p)\,x^4}4^{-1+p}\left(\frac{b-\sqrt{b^2-4ac}+2cx^2}{cx^2}\right)^{-p}\left(\frac{b+\sqrt{b^2-4ac}+2cx^2}{cx^2}\right)^{-p}\left(a+bx^2+cx^4\right)^p\,\text{AppellF1}\left[2(1-p),-p,-p,3-2p,-\frac{b-\sqrt{b^2-4ac}}{2cx^2},-\frac{b+\sqrt{b^2-4ac}}{2cx^2}\right]$$

Result (type 6, 504 leaves):

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

Problem 1122: Result more than twice size of optimal antiderivative.

$$\int x^4 \left(a+b x^2+c x^4\right)^p dx$$

Optimal (type 6, 138 leaves, 2 steps):

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

Result (type 6, 457 leaves):

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

Problem 1123: Result more than twice size of optimal antiderivative.

$$\int x^2 \left(a+b x^2+c x^4\right)^p dx$$

Optimal (type 6, 138 leaves, 2 steps):

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

Result (type 6, 457 leaves):

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

Problem 1124: Result more than twice size of optimal antiderivative.

$$\int\left(a+b\,x^2+c\,x^4\right)^p\,dx$$

Optimal (type 6, 133 leaves, 2 steps):

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

Result (type 6, 487 leaves):

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

Problem 1125: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 136 leaves, 2 steps):

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

Result (type 6, 472 leaves):

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

Problem 1126: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 138 leaves, 2 steps):

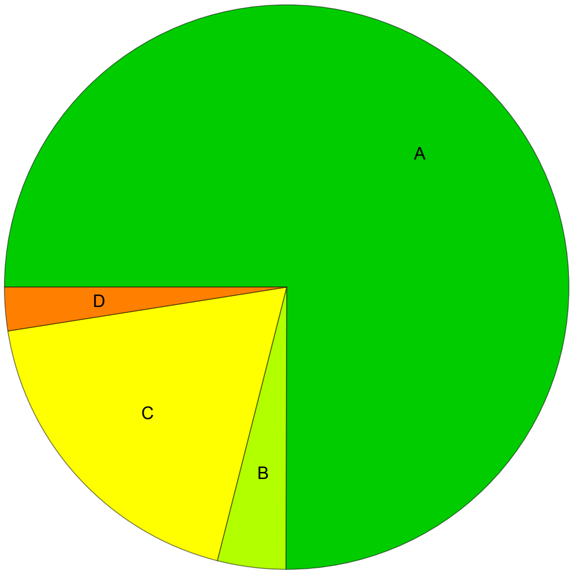
$$-\frac{1}{3 x^3}\left(1+\frac{2 c x^2}{b-\sqrt{b^2-4 a c}}\right)^{-p}\left(1+\frac{2 c x^2}{b+\sqrt{b^2-4 a c}}\right)^{-p}\left(a+b x^2+c x^4\right)^p \text{AppellF1}\left[-\frac{3}{2},-p,-p,-\frac{1}{2},-\frac{2 c x^2}{b-\sqrt{b^2-4 a c}},-\frac{2 c x^2}{b+\sqrt{b^2-4 a c}}\right]$$

Result (type 6, 456 leaves):

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

Summary of Integration Test Results

1126 integration problems



A - 845 optimal antiderivatives

B - 44 more than twice size of optimal antiderivatives

C - 209 unnecessarily complex antiderivatives

D - 28 unable to integrate problems

E - 0 integration timeouts