Mathematica 11.3 Integration Test Results

Test results for the 664 problems in "1.2.3.2 (d x)^m (a+b x^n+c x^(2 n))^p.m"

Problem 61: Result more than twice size of optimal antiderivative.

$$\int x^2 \left(a^2+2 a b x^3+b^2 x^6\right)^{5/2} \, dx$$

Optimal (type 2, 36 leaves, 2 steps):

$$\frac{\left(a+b x^3\right) \left(a^2+2 a b x^3+b^2 x^6\right)^{5/2}}{18 b}$$

Result (type 2, 82 leaves):

$$\frac{1}{18 \left(a+b x^3\right)} x^3 \sqrt{\left(a+b x^3\right)^2} \left(6 a^5+15 a^4 b x^3+20 a^3 b^2 x^6+15 a^2 b^3 x^9+6 a b^4 x^{12}+b^5 x^{15}\right)$$

Problem 132: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int \left(a^2+2 a b x^3+b^2 x^6\right)^p \, dx$$

Optimal (type 5, 53 leaves, 3 steps):

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

Result (type 6, 204 leaves):

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

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

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

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

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

$$\frac{b\,\text{ArcTanh}\left[\frac{b+2\,c\,x^3}{\sqrt{b^2-4\,a\,c}}\right]}{3\,a\,\sqrt{b^2-4\,a\,c}}+\frac{\text{Log}[x]}{a}-\frac{\text{Log}\left[a+b\,x^3+c\,x^6\right]}{6\,a}$$

Result (type 7, 66 leaves):

$$\frac{\text{Log}[x]}{a}-\frac{\text{RootSum}\left[a+b\,\sharp1^3+c\,\sharp1^6\,\&,\,\frac{b\,\text{Log}[x-\sharp1]+c\,\text{Log}[x-\sharp1]\,\sharp1^3}{b+2\,c\,\sharp1^3}\,\&\right]}{3\,a}$$

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

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

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

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

Result (type 7, 92 leaves):

$$-\frac{1}{3\,a\,x^3}-\frac{b\,\text{Log}[x]}{a^2}+\frac{\text{RootSum}\left[a+b\,\sharp1^3+c\,\sharp1^6\,\&,\,\frac{b^2\,\text{Log}[x-\sharp1]-a\,c\,\text{Log}[x-\sharp1]+b\,c\,\text{Log}[x-\sharp1]\,\sharp1^3}{b+2\,c\,\sharp1^3}\,\&\right]}{3\,a^2}$$

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

$$\int\frac{x^7}{a+b\,x^3+c\,x^6}\,dx$$

Optimal (type 3, 636 leaves, 14 steps):

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

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

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

$$\left(\left(b-\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\text{Log}\left[\left(b-\sqrt{b^2-4ac}\right)^{2/3}-2^{1/3}c^{1/3}\left(b-\sqrt{b^2-4ac}\right)^{1/3}x+2^{2/3}c^{2/3}x^2\right]\right)\Big/\left(6\times 2^{2/3}c^{5/3}\left(b-\sqrt{b^2-4ac}\right)^{1/3}\right)-$$

$$\left(\left(b+\frac{b^2-2ac}{\sqrt{b^2-4ac}}\right)\text{Log}\left[\left(b+\sqrt{b^2-4ac}\right)^{2/3}-2^{1/3}c^{1/3}\left(b+\sqrt{b^2-4ac}\right)^{1/3}x+2^{2/3}c^{2/3}x^2\right]\right)\Big/\left(6\times 2^{2/3}c^{5/3}\left(b+\sqrt{b^2-4ac}\right)^{1/3}\right)$$

Result (type 7, 70 leaves):

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

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

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

Optimal (type 3, 631 leaves, 14 steps):

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

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

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

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

Result (type 7, 70 leaves):

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

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

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

Optimal (type 3, 558 leaves, 13 steps):

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

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

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

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

$$\left(6\times 2^{2/3} c^{2/3} \sqrt{b^2-4 a c}\right)+$$

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

$$\left(6\times 2^{2/3} c^{2/3} \sqrt{b^2-4 a c}\right)$$

Result (type 7, 44 leaves):

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

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

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

Optimal (type 3, 558 leaves, 13 steps):

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

Result (type 7, 42 leaves):

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

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

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

Optimal (type 3, 558 leaves, 13 steps):

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

Result (type 7, 43 leaves):

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

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

$$\int \frac{1}{a+b\,x^3+c\,x^6}\,dx$$

Optimal (type 3, 558 leaves, 13 steps):

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

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

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

Result (type 7, 45 leaves):

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

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

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

Optimal (type 3, 610 leaves, 14 steps):

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

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

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

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

Result (type 7, 71 leaves):

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

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

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

Optimal (type 3, 612 leaves, 14 steps):

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

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

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

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

Result (type 7, 75 leaves):

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

Problem 154: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 10 leaves, 4 steps):

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

Result (type 3, 21 leaves):

$$\frac{1}{6}\,\text{Log}\left[1+x^3\right]-\frac{1}{6}\,\text{Log}\left[3+x^3\right]$$

Problem 170: Result is not expressed in closed-form.

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

Optimal (type 3, 412 leaves, 14 steps):

$$x+\frac{\left(i-\sqrt{3}\right)\text{ArcTan}\left[\frac{1+\frac{2x}{\left(\frac{1}{2}\left(1-i\sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3\times 2^{1/3}\left(1-i\sqrt{3}\right)^{2/3}}-\frac{\left(i+\sqrt{3}\right)\text{ArcTan}\left[\frac{1+\frac{2x}{\left(\frac{1}{2}\left(1+i\sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3\times 2^{1/3}\left(1+i\sqrt{3}\right)^{2/3}}+$$
$$\frac{\left(3-i\sqrt{3}\right)\text{Log}\left[\left(1-i\sqrt{3}\right)^{1/3}-2^{1/3}x\right]}{9\times 2^{1/3}\left(1-i\sqrt{3}\right)^{2/3}}+\frac{\left(3+i\sqrt{3}\right)\text{Log}\left[\left(1+i\sqrt{3}\right)^{1/3}-2^{1/3}x\right]}{9\times 2^{1/3}\left(1+i\sqrt{3}\right)^{2/3}}-$$
$$\frac{\left(3-i\sqrt{3}\right)\text{Log}\left[\left(1-i\sqrt{3}\right)^{2/3}+\left(2\left(1-i\sqrt{3}\right)\right)^{1/3}x+2^{2/3}x^2\right]}{18\times 2^{1/3}\left(1-i\sqrt{3}\right)^{2/3}}-$$
$$\frac{\left(3+i\sqrt{3}\right)\text{Log}\left[\left(1+i\sqrt{3}\right)^{2/3}+\left(2\left(1+i\sqrt{3}\right)\right)^{1/3}x+2^{2/3}x^2\right]}{18\times 2^{1/3}\left(1+i\sqrt{3}\right)^{2/3}}$$

Result (type 7, 59 leaves):

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

Problem 172: Result is not expressed in closed-form.

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

Optimal (type 3, 411 leaves, 13 steps):

$$\frac{\left(i+\sqrt{3}\right)\text{ArcTan}\left[\frac{1+\frac{2x}{\left(\frac{1}{2}\left(1-i\sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3\times 2^{2/3}\left(1-i\sqrt{3}\right)^{1/3}}-\frac{\left(i-\sqrt{3}\right)\text{ArcTan}\left[\frac{1+\frac{2x}{\left(\frac{1}{2}\left(1+i\sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3\times 2^{2/3}\left(1+i\sqrt{3}\right)^{1/3}}+$$
$$\frac{\left(3+i\sqrt{3}\right)\text{Log}\left[\left(1-i\sqrt{3}\right)^{1/3}-2^{1/3}x\right]}{9\times 2^{2/3}\left(1-i\sqrt{3}\right)^{1/3}}+\frac{\left(3-i\sqrt{3}\right)\text{Log}\left[\left(1+i\sqrt{3}\right)^{1/3}-2^{1/3}x\right]}{9\times 2^{2/3}\left(1+i\sqrt{3}\right)^{1/3}}-$$
$$\frac{\left(3+i\sqrt{3}\right)\text{Log}\left[\left(1-i\sqrt{3}\right)^{2/3}+\left(2\left(1-i\sqrt{3}\right)\right)^{1/3}x+2^{2/3}x^2\right]}{18\times 2^{2/3}\left(1-i\sqrt{3}\right)^{1/3}}-$$
$$\frac{\left(3-i\sqrt{3}\right)\text{Log}\left[\left(1+i\sqrt{3}\right)^{2/3}+\left(2\left(1+i\sqrt{3}\right)\right)^{1/3}x+2^{2/3}x^2\right]}{18\times 2^{2/3}\left(1+i\sqrt{3}\right)^{1/3}}$$

Result (type 7, 41 leaves):

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

Problem 173: Result is not expressed in closed-form.

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

Optimal (type 3, 411 leaves, 13 steps):

$$-\frac{\left(i+\sqrt{3}\right)\text{ArcTan}\left[\frac{1+\frac{2x}{\left(\frac{1}{2}\left(1-i\sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3\times 2^{1/3}\left(1-i\sqrt{3}\right)^{2/3}}+\frac{\left(i-\sqrt{3}\right)\text{ArcTan}\left[\frac{1+\frac{2x}{\left(\frac{1}{2}\left(1+i\sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3\times 2^{1/3}\left(1+i\sqrt{3}\right)^{2/3}}+\frac{\left(3+i\sqrt{3}\right)\text{Log}\left[\left(1-i\sqrt{3}\right)^{1/3}-2^{1/3}x\right]}{9\times 2^{1/3}\left(1-i\sqrt{3}\right)^{2/3}}+\frac{\left(3-i\sqrt{3}\right)\text{Log}\left[\left(1+i\sqrt{3}\right)^{1/3}-2^{1/3}x\right]}{9\times 2^{1/3}\left(1+i\sqrt{3}\right)^{2/3}}-\frac{\left(3+i\sqrt{3}\right)\text{Log}\left[\left(1-i\sqrt{3}\right)^{2/3}+\left(2\left(1-i\sqrt{3}\right)\right)^{1/3}x+2^{2/3}x^2\right]}{18\times 2^{1/3}\left(1-i\sqrt{3}\right)^{2/3}}-\frac{\left(3-i\sqrt{3}\right)\text{Log}\left[\left(1+i\sqrt{3}\right)^{2/3}+\left(2\left(1+i\sqrt{3}\right)\right)^{1/3}x+2^{2/3}x^2\right]}{18\times 2^{1/3}\left(1+i\sqrt{3}\right)^{2/3}}$$

Result (type 7, 39 leaves):

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

Problem 175: Result is not expressed in closed-form.

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

Optimal (type 3, 375 leaves, 13 steps):

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

Result (type 7, 40 leaves):

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

Problem 176: Result is not expressed in closed-form.

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

Optimal (type 3, 186 leaves, 13 steps):

$$-\frac{1}{3}(-1)^{13/18}\text{ArcTan}\left[\frac{1+2(-1)^{1/9}x}{\sqrt{3}}\right]+\frac{1}{3}(-1)^{5/18}\text{ArcTan}\left[\frac{1-2(-1)^{8/9}x}{\sqrt{3}}\right]-\frac{(-1)^{5/18}\left(\text{Log}[2]+3\,\text{Log}\left[(-1)^{1/9}-x\right]\right)}{9\sqrt{3}}+\frac{(-1)^{13/18}\,\text{Log}\left[-2^{1/3}\left((-1)^{8/9}+x\right)\right]}{3\sqrt{3}}-\frac{(-1)^{13/18}\,\text{Log}\left[-2^{2/3}\left((-1)^{7/9}+\left((-1)^{8/9}-x\right)x\right)\right]}{6\sqrt{3}}+\frac{(-1)^{5/18}\,\text{Log}\left[2^{2/3}\left((-1)^{2/9}+x\left((-1)^{1/9}+x\right)\right)\right]}{6\sqrt{3}}$$

Result (type 7, 42 leaves):

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

Problem 177: Result is not expressed in closed-form.

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

Optimal (type 3, 41 leaves, 7 steps):

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

Result (type 7, 55 leaves):

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

Problem 178: Result is not expressed in closed-form.

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

Optimal (type 3, 416 leaves, 14 steps):

$$-\frac{1}{x}+\frac{\left(\mathrm{i}-\sqrt{3}\right)\mathrm{ArcTan}\left[\frac{1+\frac{2x}{\left(\frac{1}{2}\left(1-\mathrm{i}\sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3\times 2^{2/3}\left(1-\mathrm{i}\sqrt{3}\right)^{1/3}}-\frac{\left(\mathrm{i}+\sqrt{3}\right)\mathrm{ArcTan}\left[\frac{1+\frac{2x}{\left(\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3\times 2^{2/3}\left(1+\mathrm{i}\sqrt{3}\right)^{1/3}}-$$
$$\frac{\left(3-\mathrm{i}\sqrt{3}\right)\mathrm{Log}\left[\left(1-\mathrm{i}\sqrt{3}\right)^{1/3}-2^{1/3}x\right]}{9\times 2^{2/3}\left(1-\mathrm{i}\sqrt{3}\right)^{1/3}}-\frac{\left(3+\mathrm{i}\sqrt{3}\right)\mathrm{Log}\left[\left(1+\mathrm{i}\sqrt{3}\right)^{1/3}-2^{1/3}x\right]}{9\times 2^{2/3}\left(1+\mathrm{i}\sqrt{3}\right)^{1/3}}+$$
$$\frac{\left(3-\mathrm{i}\sqrt{3}\right)\mathrm{Log}\left[\left(1-\mathrm{i}\sqrt{3}\right)^{2/3}+\left(2\left(1-\mathrm{i}\sqrt{3}\right)\right)^{1/3}x+2^{2/3}x^2\right]}{18\times 2^{2/3}\left(1-\mathrm{i}\sqrt{3}\right)^{1/3}}+$$
$$\frac{\left(3+\mathrm{i}\sqrt{3}\right)\mathrm{Log}\left[\left(1+\mathrm{i}\sqrt{3}\right)^{2/3}+\left(2\left(1+\mathrm{i}\sqrt{3}\right)\right)^{1/3}x+2^{2/3}x^2\right]}{18\times 2^{2/3}\left(1+\mathrm{i}\sqrt{3}\right)^{1/3}}$$

Result (type 7, 61 leaves):

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

Problem 179: Result is not expressed in closed-form.

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

Optimal (type 3, 418 leaves, 14 steps):

$$-\frac{1}{2x^2}-\frac{\left(\mathrm{i}-\sqrt{3}\right)\mathrm{ArcTan}\left[\frac{1+\frac{2x}{\left(\frac{1}{2}\left(1-\mathrm{i}\sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3\times 2^{1/3}\left(1-\mathrm{i}\sqrt{3}\right)^{2/3}}+\frac{\left(\mathrm{i}+\sqrt{3}\right)\mathrm{ArcTan}\left[\frac{1+\frac{2x}{\left(\frac{1}{2}\left(1+\mathrm{i}\sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3\times 2^{1/3}\left(1+\mathrm{i}\sqrt{3}\right)^{2/3}}-$$
$$\frac{\left(3-\mathrm{i}\sqrt{3}\right)\mathrm{Log}\left[\left(1-\mathrm{i}\sqrt{3}\right)^{1/3}-2^{1/3}x\right]}{9\times 2^{1/3}\left(1-\mathrm{i}\sqrt{3}\right)^{2/3}}-\frac{\left(3+\mathrm{i}\sqrt{3}\right)\mathrm{Log}\left[\left(1+\mathrm{i}\sqrt{3}\right)^{1/3}-2^{1/3}x\right]}{9\times 2^{1/3}\left(1+\mathrm{i}\sqrt{3}\right)^{2/3}}+$$
$$\frac{\left(3-\mathrm{i}\sqrt{3}\right)\mathrm{Log}\left[\left(1-\mathrm{i}\sqrt{3}\right)^{2/3}+\left(2\left(1-\mathrm{i}\sqrt{3}\right)\right)^{1/3}x+2^{2/3}x^2\right]}{18\times 2^{1/3}\left(1-\mathrm{i}\sqrt{3}\right)^{2/3}}+$$
$$\frac{\left(3+\mathrm{i}\sqrt{3}\right)\mathrm{Log}\left[\left(1+\mathrm{i}\sqrt{3}\right)^{2/3}+\left(2\left(1+\mathrm{i}\sqrt{3}\right)\right)^{1/3}x+2^{2/3}x^2\right]}{18\times 2^{1/3}\left(1+\mathrm{i}\sqrt{3}\right)^{2/3}}$$

Result (type 7, 65 leaves):

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

Problem 180: Result is not expressed in closed-form.

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

Optimal (type 3, 48 leaves, 8 steps):

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

Result (type 7, 51 leaves):

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

Problem 181: Result is not expressed in closed-form.

$$\int \frac{1}{x^5\left(1-x^3+x^6\right)}\,dx$$

Optimal (type 3, 423 leaves, 16 steps):

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

Result (type 7, 54 leaves):

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

Problem 182: Result is not expressed in closed-form.

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

Optimal (type 3, 381 leaves, 13 steps):

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

Result (type 7, 38 leaves):

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

Problem 184: Result is not expressed in closed-form.

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

Optimal (type 3, 399 leaves, 13 steps):

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

Result (type 7, 37 leaves):

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

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

$$\int x^3\sqrt{a+b\,x^3+c\,x^6}\,dx$$

Optimal (type 6, 140 leaves, 2 steps):

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

Result (type 6, 1043 leaves):

$$\frac{1}{448 c^2 \left(a+b x^3+c x^6\right)^{3/2}} \Bigg(8 c \left(3 b x+8 c x^4\right) \left(a+b x^3+c x^6\right)^2+\Bigg(96 a^2 b x \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right) \text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\Bigg) \Big/ \Bigg(-16 a \text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+3 x^3 \Bigg(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{3}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{4}{3},\frac{3}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\Bigg)\Bigg)+\Bigg(336 a^2 c x^4 \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right) \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\Bigg) \Big/ \Bigg(28 a \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]-3 x^3 \Bigg(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{7}{3},\frac{1}{2},\frac{3}{2},\frac{10}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{7}{3},\frac{3}{2},\frac{1}{2},\frac{10}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\Bigg)\Bigg)+\Bigg(105 a b^2 x^4 \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right) \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\Bigg) \Big/ \Bigg(-28 a \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+3 x^3 \Bigg(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{7}{3},\frac{1}{2},\frac{3}{2},\frac{10}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{7}{3},\frac{3}{2},\frac{1}{2},\frac{10}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\Bigg)\Bigg)$$

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

$$\int x \sqrt{a + b x^3 + c x^6} \, dx$$

Optimal (type 6, 140 leaves, 2 steps):

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

Result (type 6, 701 leaves):

$$\frac{1}{25 \left(a + b x^3 + c x^6\right)^{3/2}} x^2 \left(5 \left(a + b x^3 + c x^6\right)^2 + \left(75 a^2 \left(b - \sqrt{b^2 - 4 a c} + 2 c x^3\right) \left(b + \sqrt{b^2 - 4 a c} + 2 c x^3\right) \text{AppellF1}\left[\frac{2}{3}, \frac{1}{2}, \frac{1}{2}, \frac{5}{3}, -\frac{2 c x^3}{b + \sqrt{b^2 - 4 a c}}, \frac{2 c x^3}{-b + \sqrt{b^2 - 4 a c}}\right]\right) \Big/ \left(40 a c \, \text{AppellF1}\left[\frac{2}{3}, \frac{1}{2}, \frac{1}{2}, \frac{5}{3}, -\frac{2 c x^3}{b + \sqrt{b^2 - 4 a c}}, \frac{2 c x^3}{-b + \sqrt{b^2 - 4 a c}}\right] - 6 c x^3 \left(\left(b + \sqrt{b^2 - 4 a c}\right) \text{AppellF1}\left[\frac{5}{3}, \frac{1}{2}, \frac{3}{2}, \frac{8}{3}, -\frac{2 c x^3}{b + \sqrt{b^2 - 4 a c}}, \frac{2 c x^3}{-b + \sqrt{b^2 - 4 a c}}\right] + \left(b - \sqrt{b^2 - 4 a c}\right) \text{AppellF1}\left[\frac{5}{3}, \frac{3}{2}, \frac{1}{2}, \frac{8}{3}, -\frac{2 c x^3}{b + \sqrt{b^2 - 4 a c}}, \frac{2 c x^3}{-b + \sqrt{b^2 - 4 a c}}\right]\right)\right) + \left(12 a b x^3 \left(b - \sqrt{b^2 - 4 a c} + 2 c x^3\right) \left(b + \sqrt{b^2 - 4 a c} + 2 c x^3\right) \text{AppellF1}\left[\frac{5}{3}, \frac{1}{2}, \frac{1}{2}, \frac{8}{3}, -\frac{2 c x^3}{b + \sqrt{b^2 - 4 a c}}, \frac{2 c x^3}{-b + \sqrt{b^2 - 4 a c}}\right]\right) \Big/ \left(c \left(32 a \, \text{AppellF1}\left[\frac{5}{3}, \frac{1}{2}, \frac{1}{2}, \frac{8}{3}, -\frac{2 c x^3}{b + \sqrt{b^2 - 4 a c}}, \frac{2 c x^3}{-b + \sqrt{b^2 - 4 a c}}\right] - 3 x^3 \left(\left(b + \sqrt{b^2 - 4 a c}\right) \text{AppellF1}\left[\frac{8}{3}, \frac{1}{2}, \frac{3}{2}, \frac{11}{3}, -\frac{2 c x^3}{b + \sqrt{b^2 - 4 a c}}, \frac{2 c x^3}{-b + \sqrt{b^2 - 4 a c}}\right] + \left(b - \sqrt{b^2 - 4 a c}\right) \text{AppellF1}\left[\frac{8}{3}, \frac{3}{2}, \frac{1}{2}, \frac{11}{3}, -\frac{2 c x^3}{b + \sqrt{b^2 - 4 a c}}, \frac{2 c x^3}{-b + \sqrt{b^2 - 4 a c}}\right]\right)\right)\right)\right)$$

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

$$\int \sqrt{a + b x^3 + c x^6} \, dx$$

Optimal (type 6, 135 leaves, 2 steps):

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

Result (type 6, 702 leaves):

$$\frac{1}{8\left(a+b x^3+c x^6\right)^{3/2}} x\left(2\left(a+b x^3+c x^6\right)^2+\left(24 a^2\left(b-\sqrt{b^2-4 a c}+2 c x^3\right)\left(b+\sqrt{b^2-4 a c}+2 c x^3\right)\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/\left(c\left(16 a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]-3 x^3\left(\left(b+\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{3}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)+\left(21 a b x^3\left(b-\sqrt{b^2-4 a c}+2 c x^3\right)\left(b+\sqrt{b^2-4 a c}+2 c x^3\right)\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/\left(4 c\left(28 a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]-3 x^3\left(\left(b+\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},\frac{3}{2},\frac{10}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},\frac{1}{2},\frac{10}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)\right)$$

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

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

Optimal (type 6, 138 leaves, 2 steps):

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

Result (type 6, 702 leaves):

$$\frac{1}{5\,x\,\left(a+b\,x^3+c\,x^6\right)^{3/2}}\left(-5\,\left(a+b\,x^3+c\,x^6\right)^2+\left(75\,a\,b\,x^3\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\right.\right.$$
$$\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg/$$
$$\left(4\,c\,\left(20\,a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.\right.$$
$$3\,x^3\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{3}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)+$$
$$\left(24\,a\,x^6\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\right.\right.$$
$$\left.\left.\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Bigg/$$
$$\left(32\,a\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$
$$3\,x^3\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{8}{3},\frac{1}{2},\frac{3}{2},\frac{11}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{8}{3},\frac{3}{2},\frac{1}{2},\frac{11}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)$$

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

$$\int\frac{\sqrt{a+b\,x^3+c\,x^6}}{x^3}\,dx$$

Optimal (type 6, 140 leaves, 2 steps):

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

Result (type 6, 702 leaves):

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

$$\Bigg(-\left(a+b x^3+c x^6\right)^2+\Bigg(6 a b x^3 \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right)$$

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

$$\Bigg(c \Bigg(16 a \,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]-$$

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

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

$$\Bigg(21 a x^6 \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right) \text{AppellF1}\Bigg[\frac{4}{3},\frac{1}{2},$$

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

$$\Bigg(4 \Bigg(28 a \,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]-$$

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

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

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

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

Optimal (type 6, 141 leaves, 2 steps):

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

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

Result (type 6, 1746 leaves):

$$\frac{1}{232960 c^3 \left(a+b x^3+c x^6\right)^{3/2}}$$

$$\times \Bigg(8 c \left(a+b x^3+c x^6\right)^2 \left(-297 b^3+216 b^2 c x^3+320 c^2 x^3 \left(16 a+7 c x^6\right)+4 b c \left(459 a+812 c x^6\right)\right)+$$

$$\Bigg(9504 a^2 b^3 \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right)$$

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

$$\Bigg(16\,a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$

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

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

$$\Bigg(58\,752\,a^3\,b\,c\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)$$

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

$$\Bigg(16\,a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$

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

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

$$\Bigg(10\,395\,a\,b^4\,x^3\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)$$

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

$$\Bigg(28\,a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$

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

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

$$\Bigg(120\,960\,a^3\,c^2\,x^3\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)$$

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

$$\Bigg(28\,a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$

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

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

$$\Bigg(76\,356\,a^2\,b^2\,c\,x^3\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)$$

$$\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg/$$
$$\left(-28\,a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$3\,x^3\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},\frac{3}{2},\frac{10}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},\frac{1}{2},\frac{10}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\Bigg)\Bigg)$$

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

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

Optimal (type 6, 141 leaves, 2 steps):

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

Result (type 6, 1391 leaves):

$$\frac{1}{8800\,c^2\left(a+b\,x^3+c\,x^6\right)^{3/2}}$$
$$x^2\left(5\,c\left(a+b\,x^3+c\,x^6\right)^2\left(27\,b^2+250\,b\,c\,x^3+32\,c\left(14\,a+5\,c\,x^6\right)\right)-\left(675\,a^2\,b^2\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\right.\right.$$
$$\left.\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Bigg/$$
$$\left(20\,a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$
$$3\,x^3\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{3}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)+$$
$$\left(10\,800\,a^3\,c\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\right.$$
$$\left.\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Bigg/$$
$$\left(20\,a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$
$$3\,x^3\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{3}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$

$$\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},\frac{1}{2},\frac{8}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg)+$$

$$\Bigg(5616a^2bcx^3\left(b-\sqrt{b^2-4ac}+2cx^3\right)\left(b+\sqrt{b^2-4ac}+2cx^3\right)$$

$$\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg/$$

$$\Bigg(32a\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]-$$

$$3x^3\Bigg(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{8}{3},\frac{1}{2},\frac{3}{2},\frac{11}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]+$$

$$\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{8}{3},\frac{3}{2},\frac{1}{2},\frac{11}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg)+$$

$$\Bigg(756ab^3x^3\left(b-\sqrt{b^2-4ac}+2cx^3\right)\left(b+\sqrt{b^2-4ac}+2cx^3\right)$$

$$\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg/$$

$$\Bigg(-32a\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]+$$

$$3x^3\Bigg(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{8}{3},\frac{1}{2},\frac{3}{2},\frac{11}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]+$$

$$\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{8}{3},\frac{3}{2},\frac{1}{2},\frac{11}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg)\Bigg)$$

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

$$\int\left(a+bx^3+cx^6\right)^{3/2}\,dx$$

Optimal (type 6, 136 leaves, 2 steps):

$$\left(ax\sqrt{a+bx^3+cx^6}\;\text{AppellF1}\left[\frac{1}{3},-\frac{3}{2},-\frac{3}{2},\frac{4}{3},-\frac{2cx^3}{b-\sqrt{b^2-4ac}},-\frac{2cx^3}{b+\sqrt{b^2-4ac}}\right]\right)\Bigg/$$

$$\left(\sqrt{1+\frac{2cx^3}{b-\sqrt{b^2-4ac}}}\;\sqrt{1+\frac{2cx^3}{b+\sqrt{b^2-4ac}}}\right)$$

Result (type 6, 1389 leaves):

$$\frac{1}{8960c^2\left(a+bx^3+cx^6\right)^{3/2}}$$

$$x\Bigg(8c\left(a+bx^3+cx^6\right)^2\left(27b^2+184bcx^3+28c\left(13a+4cx^6\right)\right)-\Bigg(864a^2b^2\left(b-\sqrt{b^2-4ac}+2cx^3\right)$$

$$\left(b+\sqrt{b^2-4ac}+2cx^3\right)\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg/$$

$$\left(16\,a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$
$$3\,x^3\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{3}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)+$$
$$\left(24192\,a^3\,c\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\right.$$
$$\left.\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(16\,a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$
$$3\,x^3\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{3}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)+$$
$$\left(8316\,a^2\,b\,c\,x^3\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\right.$$
$$\left.\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(28\,a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$
$$3\,x^3\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},\frac{3}{2},\frac{10}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},\frac{1}{2},\frac{10}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)+$$
$$\left(945\,a\,b^3\,x^3\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\right.$$
$$\left.\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(-28\,a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$3\,x^3\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},\frac{3}{2},\frac{10}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},\frac{1}{2},\frac{10}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)$$

Problem 217: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 139 leaves, 2 steps):

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

Result (type 6, 1058 leaves):

$$
\begin{aligned}
&\frac{1}{100\left(a+b x^3+c x^6\right)^{3/2}}\Bigg(\frac{5\left(a+b x^3+c x^6\right)^2\left(-80 a+19 b x^3+10 c x^6\right)}{4 x}+\Bigg(2025 a^2 b x^2\left(b-\sqrt{b^2-4 a c}+2 c x^3\right)\\
&\quad\left(b+\sqrt{b^2-4 a c}+2 c x^3\right)\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\Bigg)\Bigg/\\
&\quad\Bigg(4 c\Bigg(20 a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]-\\
&\quad 3 x^3\Bigg(\left(b+\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{3}{2},\frac{8}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+\\
&\quad\left(b-\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},\frac{1}{2},\frac{8}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\Bigg)\Bigg)\Bigg)+\\
&\quad\Bigg(540 a^2 x^5\left(b-\sqrt{b^2-4 a c}+2 c x^3\right)\left(b+\sqrt{b^2-4 a c}+2 c x^3\right)\\
&\quad\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\Bigg)\Bigg/\\
&\quad\Bigg(32 a\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]-\\
&\quad 3 x^3\Bigg(\left(b+\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{8}{3},\frac{1}{2},\frac{3}{2},\frac{11}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+\\
&\quad\left(b-\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{8}{3},\frac{3}{2},\frac{1}{2},\frac{11}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\Bigg)\Bigg)+\\
&\quad\Bigg(27 a b^2 x^5\left(b-\sqrt{b^2-4 a c}+2 c x^3\right)\left(b+\sqrt{b^2-4 a c}+2 c x^3\right)\\
&\quad\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\Bigg)\Bigg/\\
&\quad\Bigg(c\Bigg(32 a\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]-\\
&\quad 3 x^3\Bigg(\left(b+\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{8}{3},\frac{1}{2},\frac{3}{2},\frac{11}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+\\
&\quad\left(b-\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{8}{3},\frac{3}{2},\frac{1}{2},\frac{11}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\Bigg)\Bigg)\Bigg)\Bigg)
\end{aligned}
$$

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

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

Optimal (type 6, 141 leaves, 2 steps):

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

Result (type 6, 1054 leaves):

$$\frac{1}{112\left(a+b x^3+c x^6\right)^{3/2}}\left(\frac{2\left(a+b x^3+c x^6\right)^2\left(-28 a+17 b x^3+8 c x^6\right)}{x^2}+\left(648 a^2 b x\left(b-\sqrt{b^2-4 a c}+2 c x^3\right)\left(b+\sqrt{b^2-4 a c}+2 c x^3\right)\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/\left(c\left(16 a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]-3 x^3\left(\left(b+\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{3}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)+\left(378 a^2 x^4\left(b-\sqrt{b^2-4 a c}+2 c x^3\right)\left(b+\sqrt{b^2-4 a c}+2 c x^3\right)\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/\left(28 a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]-3 x^3\left(\left(b+\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},\frac{3}{2},\frac{10}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},\frac{1}{2},\frac{10}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)+\left(189 a b^2 x^4\left(b-\sqrt{b^2-4 a c}+2 c x^3\right)\left(b+\sqrt{b^2-4 a c}+2 c x^3\right)\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/\left(4 c\left(28 a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]-3 x^3\left(\left(b+\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},\frac{3}{2},\frac{10}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},\frac{1}{2},\frac{10}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)$$

Problem 229: Result more than twice size of optimal antiderivative.

$$\int \frac{x^3}{\sqrt{a+b x^3+c x^6}} \, dx$$

Optimal (type 6, 140 leaves, 2 steps):

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

Result (type 6, 380 leaves):

$$\left(7 a^2 x^4 \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right) \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/ \left(\left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) \left(a+b x^3+c x^6\right)^{3/2} \left(28 a \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]-3 x^3 \left(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{7}{3},\frac{1}{2},\frac{3}{2},\frac{10}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{7}{3},\frac{3}{2},\frac{1}{2},\frac{10}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)$$

Problem 230: Result more than twice size of optimal antiderivative.

$$\int \frac{x}{\sqrt{a+b x^3+c x^6}} \, dx$$

Optimal (type 6, 140 leaves, 2 steps):

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

Result (type 6, 380 leaves):

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

Problem 231: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\sqrt{a+b\,x^3+c\,x^6}}\,dx$$

Optimal (type 6, 135 leaves, 2 steps):

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

Result (type 6, 378 leaves):

$$\left(16\,a^2\,x\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(\left(b-\sqrt{b^2-4\,a\,c}\right)\,\left(b+\sqrt{b^2-4\,a\,c}\right)\,\left(a+b\,x^3+c\,x^6\right)^{3/2}\,\left(16\,a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-3\,x^3\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{3}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)$$

Problem 232: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 138 leaves, 2 steps):

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

Result (type 6, 705 leaves):

$$\frac{1}{5 a x \left(a+b x^3+c x^6\right)^{3/2}} \left(-5 \left(a+b x^3+c x^6\right)^2 + \left(25 a b x^3 \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right) \text{AppellF1}\left[\frac{2}{3}, \frac{1}{2}, \frac{1}{2}, \frac{5}{3}, -\frac{2 c x^3}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/ \left(4 c \left(20 a \text{AppellF1}\left[\frac{2}{3}, \frac{1}{2}, \frac{1}{2}, \frac{5}{3}, -\frac{2 c x^3}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right] - 3 x^3 \left(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{5}{3}, \frac{1}{2}, \frac{3}{2}, \frac{8}{3}, -\frac{2 c x^3}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right] + \left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{5}{3}, \frac{3}{2}, \frac{1}{2}, \frac{8}{3}, -\frac{2 c x^3}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right) + \left(16 a x^6 \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right) \text{AppellF1}\left[\frac{5}{3}, \frac{1}{2}, \frac{1}{2}, \frac{8}{3}, -\frac{2 c x^3}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/ \left(32 a \text{AppellF1}\left[\frac{5}{3}, \frac{1}{2}, \frac{1}{2}, \frac{8}{3}, -\frac{2 c x^3}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right] - 3 x^3 \left(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{8}{3}, \frac{1}{2}, \frac{3}{2}, \frac{11}{3}, -\frac{2 c x^3}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right] + \left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{8}{3}, \frac{3}{2}, \frac{1}{2}, \frac{11}{3}, -\frac{2 c x^3}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)$$

Problem 233: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{x^3 \sqrt{a+b x^3+c x^6}} \, dx$$

Optimal (type 6, 140 leaves, 2 steps):

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

Result (type 6, 705 leaves):

$$\frac{1}{2\,a\,x^2\,\left(a+b\,x^3+c\,x^6\right)^{3/2}}\left(-\left(a+b\,x^3+c\,x^6\right)^2-\left(2\,a\,b\,x^3\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\right.\right.$$
$$\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\Big)\Big/$$
$$\left(c\,\left(16\,a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.\right.$$
$$3\,x^3\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{3}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)+$$
$$\left(7\,a\,x^6\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\right.\right.$$
$$\left.\left.\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(4\,\left(28\,a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.\right.$$
$$3\,x^3\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},\frac{3}{2},\frac{10}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},\frac{1}{2},\frac{10}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)\right)$$

Problem 243: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 143 leaves, 2 steps):

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

Result (type 6, 711 leaves):

$$\frac{1}{3 \left(b^2-4 a c\right) \left(a+b x^3+c x^6\right)^{3/2}} 2 x \left(-\left(b+2 c x^3\right) \left(a+b x^3+c x^6\right)+\left(4 a b \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right) \text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/\left(c \left(16 a \text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]-3 x^3 \left(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{3}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{4}{3},\frac{3}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)+\left(7 a x^3 \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right) \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/\left(56 a \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]-6 x^3 \left(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{7}{3},\frac{1}{2},\frac{3}{2},\frac{10}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{7}{3},\frac{3}{2},\frac{1}{2},\frac{10}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)$$

Problem 244: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 143 leaves, 2 steps):

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

Result (type 6, 1054 leaves):

$$\frac{1}{30\,a\,\left(-b^2+4\,a\,c\right)\,\left(a+b\,x^3+c\,x^6\right)^{3/2}}x^2\left(-20\,\left(b^2-2\,a\,c+b\,c\,x^3\right)\,\left(a+b\,x^3+c\,x^6\right)+\left(100\,a^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Bigg/\left(20\,a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-3\,x^3\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{3}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-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^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Bigg/\left(c\left(20\,a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-3\,x^3\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{3}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)+\left(64\,a\,b\,x^3\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Bigg/\left(32\,a\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-3\,x^3\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{8}{3},\frac{1}{2},\frac{3}{2},\frac{11}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{8}{3},\frac{3}{2},\frac{1}{2},\frac{11}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)$$

Problem 245: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 138 leaves, 2 steps):

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

Result (type 6, 1056 leaves):

$$\frac{1}{3\,a\,\left(-b^2+4\,a\,c\right)\,\left(a+b\,x^3+c\,x^6\right)^{3/2}} 2\left(-x\,\left(b^2-2\,a\,c+b\,c\,x^3\right)\,\left(a+b\,x^3+c\,x^6\right)+\left(16\,a^2\,x\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(16\,a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-3\,x^3\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{3}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)-\left(2\,a\,b^2\,x\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(c\left(16\,a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-3\,x^3\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{3}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{4}{3},\frac{3}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)+\left(7\,a\,b\,x^4\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(4\left(28\,a\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]-3\,x^3\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},\frac{3}{2},\frac{10}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},\frac{1}{2},\frac{10}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)\right)$$

Problem 246: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 141 leaves, 2 steps):

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

Result (type 6, 1599 leaves):

$$\frac{1}{15\,\left(a+b\,x^3+c\,x^6\right)^{3/2}}\left(\frac{10\,x^2\,\left(b^3-3\,a\,b\,c+b^2\,c\,x^3-2\,a\,c^2\,x^3\right)\,\left(a+b\,x^3+c\,x^6\right)}{a^2\,\left(-b^2+4\,a\,c\right)}-\frac{15\,\left(a+b\,x^3+c\,x^6\right)^2}{a^2\,x}+\right.$$
$$\left(125\,b^3\,x^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\right.\right.$$
$$\left.\left.\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(\left(b^2-4\,a\,c\right)\,\left(-b+\sqrt{b^2-4\,a\,c}\right)\right.$$
$$\left(b+\sqrt{b^2-4\,a\,c}\right)\,\left(-20\,a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$3\,x^3\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{3}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)-$$
$$\left(300\,a\,b\,c\,x^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\right.$$
$$\left.\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(\left(b^2-4\,a\,c\right)\,\left(-b+\sqrt{b^2-4\,a\,c}\right)\,\left(b+\sqrt{b^2-4\,a\,c}\right)\right.$$
$$\left(-20\,a\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$3\,x^3\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{3}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{5}{3},\frac{3}{2},\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)+$$
$$\left(320\,b^2\,c\,x^5\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\right.$$
$$\left.\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(\left(b^2-4\,a\,c\right)\,\left(-b+\sqrt{b^2-4\,a\,c}\right)\,\left(b+\sqrt{b^2-4\,a\,c}\right)\right.$$
$$\left(-32\,a\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$

$$3\,x^3\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{8}{3},\frac{1}{2},\frac{3}{2},\frac{11}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$

$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{8}{3},\frac{3}{2},\frac{1}{2},\frac{11}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)-$$

$$\left(1024\,a\,c^2\,x^5\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\right.$$

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

$$\left(\left(b^2-4\,a\,c\right)\left(-b+\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)\right.$$

$$\left(-32\,a\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$

$$3\,x^3\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{8}{3},\frac{1}{2},\frac{3}{2},\frac{11}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$

$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{8}{3},\frac{3}{2},\frac{1}{2},\frac{11}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)\right)$$

Problem 247: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 143 leaves, 2 steps):

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

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

Result (type 6, 1593 leaves):

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

$$\left(56\,b^3\,x\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\right.\right.$$

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

$$\left(b+\sqrt{b^2-4\,a\,c}\right)\left(-16\,a\,\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$

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

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

$$\Bigg(288 a b c x \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right)$$

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

$$\Bigg(\left(b^2-4 a c\right) \left(-b+\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right)$$

$$\Bigg(-16 a \text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+$$

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

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

$$\Bigg(49 b^2 c x^4 \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right)$$

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

$$\Bigg(\left(b^2-4 a c\right) \left(-b+\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right)$$

$$\Bigg(-28 a \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+$$

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

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

$$\Bigg(140 a c^2 x^4 \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right)$$

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

$$\Bigg(\left(b^2-4 a c\right) \left(-b+\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right)$$

$$\Bigg(-28 a \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+$$

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

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

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

$$\int \frac{(d\,x)^m}{a+b\,x^3+c\,x^6}\,dx$$

Optimal (type 5, 173 leaves, 3 steps):

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

Result (type 7, 84 leaves):

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

Problem 251: Result unnecessarily involves higher level functions.

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

Optimal (type 5, 315 leaves, 4 steps):

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

Result (type 6, 376 leaves):

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

Problem 252: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 158 leaves, 2 steps):

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

Result (type 6, 1083 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

$$3 x^3\left(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{10+m}{3},-\frac{1}{2},\frac{1}{2},\frac{13+m}{3},\right.\right.$$

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

$$\left.\left.\left.\left.\text{AppellF1}\left[\frac{10+m}{3},\frac{1}{2},-\frac{1}{2},\frac{13+m}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)\right)$$

Problem 253: Result more than twice size of optimal antiderivative.

$$\int (d x)^m \sqrt{a+b x^3+c x^6}\, dx$$

Optimal (type 6, 157 leaves, 2 steps):

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

Result (type 6, 424 leaves) :

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

Problem 254: Result more than twice size of optimal antiderivative.

$$\int \frac{(d x)^m}{\sqrt{a+b x^3+c x^6}}\, dx$$

Optimal (type 6, 157 leaves, 2 steps) :

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

Result (type 6, 426 leaves) :

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

Problem 255: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 160 leaves, 2 steps):

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

Result (type 6, 426 leaves):

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

Problem 256: Result more than twice size of optimal antiderivative.

$$\int (d\,x)^m \left(a+b\,x^3+c\,x^6\right)^p\,dx$$

Optimal (type 6, 155 leaves, 2 steps):

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

Result (type 6, 501 leaves):

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

Problem 257: Result unnecessarily involves higher level functions.

$$\int x^8\left(a+b\,x^3+c\,x^6\right)^p\,dx$$

Optimal (type 5, 224 leaves, 4 steps):

$$-\frac{b\,(2+p)\,\left(a+b\,x^3+c\,x^6\right)^{1+p}}{6\,c^2\,(1+p)\,(3+2\,p)}+\frac{x^3\,\left(a+b\,x^3+c\,x^6\right)^{1+p}}{3\,c\,(3+2\,p)}+\left(2^p\,\left(2\,a\,c-b^2\,(2+p)\right)\left(-\frac{b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3}{\sqrt{b^2-4\,a\,c}}\right)^{-1-p}\left(a+b\,x^3+c\,x^6\right)^{1+p}\,\text{Hypergeometric2F1}\left[-p,\,1+p,\,2+p,\,\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3}{2\,\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(3\,c^2\,\sqrt{b^2-4\,a\,c}\,(1+p)\,(3+2\,p)\right)$$

Result (type 6, 395 leaves):

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

Problem 258: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int x^5\,\left(a+b\,x^3+c\,x^6\right)^p\,dx$$

Optimal (type 5, 161 leaves, 3 steps):

$$\frac{\left(a+b\,x^3+c\,x^6\right)^{1+p}}{6\,c\,(1+p)}+\left(2^p\,b\left(-\frac{b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3}{\sqrt{b^2-4\,a\,c}}\right)^{-1-p}\left(a+b\,x^3+c\,x^6\right)^{1+p}\,\text{Hypergeometric2F1}\left[-p,\,1+p,\,2+p,\,\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3}{2\,\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(3\,c\,\sqrt{b^2-4\,a\,c}\,(1+p)\right)$$

Result (type 6, 439 leaves):

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

Problem 260: Result more than twice size of optimal antiderivative.

$$\int x^4\,\left(a+b\,x^3+c\,x^6\right)^p\,dx$$

Optimal (type 6, 138 leaves, 2 steps):

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

Result (type 6, 411 leaves):

$$\left(4\,\left(b+\sqrt{b^2-4\,a\,c}\right)\,x^5\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\left(-2\,a+\left(-b+\sqrt{b^2-4\,a\,c}\right)\,x^3\right)^2\, \left(a+b\,x^3+c\,x^6\right)^{-1+p}\,\text{AppellF1}\left[\frac{5}{3},\,-p,\,-p,\,\frac{8}{3},\,-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right) \Big/ \left(5\,\left(-b+\sqrt{b^2-4\,a\,c}\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\, \left(-16\,a\,\text{AppellF1}\left[\frac{5}{3},\,-p,\,-p,\,\frac{8}{3},\,-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]+ 3\,p\,x^3\,\left(\left(-b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{8}{3},\,1-p,\,-p,\,\frac{11}{3},\,-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]- \left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{8}{3},\,-p,\,1-p,\,\frac{11}{3},\,-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)$$

Problem 261: Result more than twice size of optimal antiderivative.

$$\int x^3 \left(a+b x^3+c x^6\right)^p dx$$

Optimal (type 6, 138 leaves, 2 steps):

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

Result (type 6, 456 leaves):

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

Problem 262: Result more than twice size of optimal antiderivative.

$$\int x \left(a+b x^3+c x^6\right)^p dx$$

Optimal (type 6, 138 leaves, 2 steps):

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

Result (type 6, 454 leaves):

$$\left(5\times 2^{-2-p}\, c\left(b+\sqrt{b^2-4ac}\right)\left(\frac{b-\sqrt{b^2-4ac}}{2c}+x^3\right)^{-p}\left(\frac{b-\sqrt{b^2-4ac}+2cx^3}{c}\right)^{1+p}\left(-2ax+\left(-b+\sqrt{b^2-4ac}\right)x^4\right)^2\left(a+bx^3+cx^6\right)^{-1+p}\text{AppellF1}\left[\frac{2}{3},-p,-p,\frac{5}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/\left(\left(-b+\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}+2cx^3\right)\left(-10a\,\text{AppellF1}\left[\frac{2}{3},-p,-p,\frac{5}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]+3px^3\left(\left(-b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{5}{3},1-p,-p,\frac{8}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]-\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{5}{3},-p,1-p,\frac{8}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]\right)\right)\right)$$

Problem 263: Result more than twice size of optimal antiderivative.

$$\int \left(a+bx^3+cx^6\right)^p\, dx$$

Optimal (type 6, 133 leaves, 2 steps):

$$x\left(1+\frac{2cx^3}{b-\sqrt{b^2-4ac}}\right)^{-p}\left(1+\frac{2cx^3}{b+\sqrt{b^2-4ac}}\right)^{-p}\left(a+bx^3+cx^6\right)^p\,\text{AppellF1}\left[\frac{1}{3},-p,-p,\frac{4}{3},-\frac{2cx^3}{b-\sqrt{b^2-4ac}},-\frac{2cx^3}{b+\sqrt{b^2-4ac}}\right]$$

Result (type 6, 487 leaves):

$$\left(2^{1-2p}\left(b+\sqrt{b^2-4ac}\right)x\left(\frac{b-\sqrt{b^2-4ac}}{2c}+x^3\right)^{-p}\left(\frac{b+\sqrt{b^2-4ac}}{2c}+x^3\right)^{-p}\left(\frac{b-\sqrt{b^2-4ac}+2cx^3}{c}\right)^{1+p}\left(\frac{b+\sqrt{b^2-4ac}+2cx^3}{c}\right)^{-1+p}\left(-2a+\left(-b+\sqrt{b^2-4ac}\right)x^3\right)^2\left(a+bx^3+cx^6\right)^{-1+p}\text{AppellF1}\left[\frac{1}{3},-p,-p,\frac{4}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/\left(\left(-b+\sqrt{b^2-4ac}\right)\left(-8a\,\text{AppellF1}\left[\frac{1}{3},-p,-p,\frac{4}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]+3px^3\left(\left(-b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{4}{3},1-p,-p,\frac{7}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]-\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{4}{3},-p,1-p,\frac{7}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]\right)\right)\right)$$

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

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

Optimal (type 6, 157 leaves, 3 steps):

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

Result (type 6, 500 leaves):

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

Problem 265: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 136 leaves, 2 steps):

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

Result (type 6, 408 leaves):

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

Problem 266: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 138 leaves, 2 steps):

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

Result (type 6, 474 leaves):

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

Problem 267: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 164 leaves, 3 steps):

$$-\frac{1}{3\,(1-2p)\,x^3}4^p\left(\frac{b-\sqrt{b^2-4ac}+2cx^3}{cx^3}\right)^{-p}\left(\frac{b+\sqrt{b^2-4ac}+2cx^3}{cx^3}\right)^{-p}\left(a+bx^3+cx^6\right)^p \text{AppellF1}\left[1-2p,-p,-p,2\,(1-p),-\frac{b-\sqrt{b^2-4ac}}{2cx^3},-\frac{b+\sqrt{b^2-4ac}}{2cx^3}\right]$$

Result (type 6, 510 leaves):

$$\left((-1+p)\left(4+\frac{2\left(b-\sqrt{b^2-4ac}\right)}{cx^3}\right)^{-p}\left(\frac{b-\sqrt{b^2-4ac}}{2c}+x^3\right)^{-p}\left(-b+\sqrt{b^2-4ac}-2cx^3\right)\left(\frac{b-\sqrt{b^2-4ac}+2cx^3}{c}\right)^p\left(\frac{b-\sqrt{b^2-4ac}+2cx^3}{cx^3}\right)^p\left(b+\sqrt{b^2-4ac}+2cx^3\right)\left(a+bx^3+cx^6\right)^{-1+p}\text{AppellF1}\left[1-2p,-p,-p,2-2p,-\frac{b+\sqrt{b^2-4ac}}{2cx^3},\frac{-b+\sqrt{b^2-4ac}}{2cx^3}\right]\right)\Big/\left(3\,(-1+2p)\left(-4c\,(-1+p)\,x^3\,\text{AppellF1}\left[1-2p,-p,-p,2-2p,-\frac{b+\sqrt{b^2-4ac}}{2cx^3},\frac{-b+\sqrt{b^2-4ac}}{2cx^3}\right]+\left(b+\sqrt{b^2-4ac}\right)p\,\text{AppellF1}\left[2-2p,1-p,-p,3-2p,-\frac{b+\sqrt{b^2-4ac}}{2cx^3},\frac{-b+\sqrt{b^2-4ac}}{2cx^3}\right]+\left(b-\sqrt{b^2-4ac}\right)p\,\text{AppellF1}\left[2-2p,-p,1-p,3-2p,-\frac{b+\sqrt{b^2-4ac}}{2cx^3},\frac{-b+\sqrt{b^2-4ac}}{2cx^3}\right]\right)\right)$$

Problem 268: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x^3+c x^6\right)^p}{x^5}\,dx$$

Optimal (type 6, 138 leaves, 2 steps):

$$-\frac{1}{4x^4}\left(1+\frac{2cx^3}{b-\sqrt{b^2-4ac}}\right)^{-p}\left(1+\frac{2cx^3}{b+\sqrt{b^2-4ac}}\right)^{-p}\left(a+bx^3+cx^6\right)^p \text{AppellF1}\left[-\frac{4}{3},-p,-p,-\frac{1}{3},-\frac{2cx^3}{b-\sqrt{b^2-4ac}},-\frac{2cx^3}{b+\sqrt{b^2-4ac}}\right]$$

Result (type 6, 455 leaves):

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

Problem 269: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 138 leaves, 2 steps):

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

Result (type 6, 411 leaves):

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

Problem 270: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b x^3+c x^6\right)^p}{x^7} \, dx$$

Optimal (type 6, 168 leaves, 3 steps):

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

Result (type 6, 507 leaves):

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

Problem 309: Result is not expressed in closed-form.

$$\int \frac{x^m}{a+b x^4+c x^8} \, dx$$

Optimal (type 5, 163 leaves, 3 steps):

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

Result (type 7, 82 leaves):

$$\frac{x^m \,\text{RootSum}\left[a+b\, \#1^4+c\, \#1^8\,\&,\, \frac{\text{Hypergeometric2F1}\left[-m,-m,1-m,-\frac{\#1}{x-\#1}\right]\left(\frac{x}{x-\#1}\right)^{-m}}{b\, \#1^3+2\, c\, \#1^7}\,\&\right]}{4\, m}$$

Problem 316: Result is not expressed in closed-form.

$$\int \frac{1}{x\left(a+b\, x^4+c\, x^8\right)}\, dx$$

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

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

Result (type 7, 66 leaves):

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

Problem 317: Result is not expressed in closed-form.

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

Optimal (type 3, 184 leaves, 5 steps):

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

Result (type 7, 75 leaves):

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

Problem 318: Result is not expressed in closed-form.

$$\int \frac{1}{x^5\left(a+b\, x^4+c\, x^8\right)}\, dx$$

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

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

Result (type 7, 92 leaves):

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

Problem 319: Result is not expressed in closed-form.

$$\int\frac{x^{10}}{a+b\,x^4+c\,x^8}\,dx$$

Optimal (type 3, 381 leaves, 8 steps):

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

Result (type 7, 70 leaves):

$$\frac{4\,x^3-3\,\text{RootSum}\left[a+b\,\#1^4+c\,\#1^8\,\&,\ \frac{a\,\text{Log}[x-\#1]+b\,\text{Log}[x-\#1]\,\#1^4}{b\,\#1+2\,c\,\#1^5}\,\&\right]}{12\,c}$$

Problem 320: Result is not expressed in closed-form.

$$\int\frac{x^{8}}{a+b\,x^4+c\,x^8}\,dx$$

Optimal (type 3, 376 leaves, 8 steps):

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

Result (type 7, 70 leaves):

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

Problem 321: Result is not expressed in closed-form.

$$\int \frac{x^6}{a+b\,x^4+c\,x^8}\,dx$$

Optimal (type 3, 325 leaves, 7 steps):

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

Result (type 7, 44 leaves):

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

Problem 322: Result is not expressed in closed-form.

$$\int \frac{x^4}{a+b\,x^4+c\,x^8}\,dx$$

Optimal (type 3, 325 leaves, 7 steps):

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

Result (type 7, 42 leaves):

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

Problem 323: Result is not expressed in closed-form.

$$\int \frac{x^2}{a+b\,x^4+c\,x^8}\,dx$$

Optimal (type 3, 315 leaves, 7 steps):

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

Result (type 7, 43 leaves):

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

Problem 324: Result is not expressed in closed-form.

$$\int \frac{1}{a+b\,x^4+c\,x^8}\,dx$$

Optimal (type 3, 315 leaves, 7 steps):

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

Result (type 7, 45 leaves):

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

Problem 325: Result is not expressed in closed-form.

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

Optimal (type 3, 363 leaves, 8 steps):

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

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

Result (type 7, 71 leaves):

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

Problem 326: Result is not expressed in closed-form.

$$\int\frac{1}{x^4\left(a+b x^4+c x^8\right)}\,dx$$

Optimal (type 3, 365 leaves, 8 steps):

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

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

Result (type 7, 75 leaves):

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

Problem 327: Result is not expressed in closed-form.

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

Optimal (type 5, 127 leaves, 3 steps):

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

Result (type 7, 488 leaves):

$$\frac{1}{4\,m} x^m \left(-\frac{1}{\sqrt{3}} i \left(\left(\frac{x}{-(-1)^{1/3}+x}\right)^{-m} \text{Hypergeometric2F1}\left[-m,\,-m,\,1-m,\,\frac{(-1)^{1/3}}{(-1)^{1/3}-x}\right] + \left(\frac{x}{-(-1)^{2/3}+x}\right)^{-m} \text{Hypergeometric2F1}\left[-m,\,-m,\,1-m,\,\frac{(-1)^{2/3}}{(-1)^{2/3}-x}\right] - \left(\frac{x}{(-1)^{1/3}+x}\right)^{-m} \text{Hypergeometric2F1}\left[-m,\,-m,\,1-m,\,\frac{(-1)^{1/3}}{(-1)^{1/3}+x}\right] - \left(\frac{x}{(-1)^{2/3}+x}\right)^{-m} \text{Hypergeometric2F1}\left[-m,\,-m,\,1-m,\,\frac{(-1)^{2/3}}{(-1)^{2/3}+x}\right]\right) + \text{RootSum}\left[1-\#1^2+\#1^4\,\&,\,\frac{\text{Hypergeometric2F1}\left[-m,\,-m,\,1-m,\,-\frac{\#1}{x-\#1}\right]\left(\frac{x}{x-\#1}\right)^{-m}}{-\#1+2\,\#1^3}\,\&\right] - \frac{1}{2+3\,m+m^2}\text{RootSum}\left[1-\#1^2+\#1^4\,\&,\,\frac{1}{-\#1+2\,\#1^3}\left(m\,x^2+m^2\,x^2+2\,m\,x\,\#1+m^2\,x\,\#1+2\,\text{Hypergeometric2F1}\left[-m,\,-m,\,1-m,\,-\frac{\#1}{x-\#1}\right]\left(\frac{x}{x-\#1}\right)^{-m}\#1^2+3\,m\,\text{Hypergeometric2F1}\left[-m,\,-m,\,1-m,\,-\frac{\#1}{x-\#1}\right]\left(\frac{x}{x-\#1}\right)^{-m}\#1^2+m^2\,\text{Hypergeometric2F1}\left[-m,\,-m,\,1-m,\,-\frac{\#1}{x-\#1}\right]\left(\frac{x}{x-\#1}\right)^{-m}\#1^2+m\left(\frac{x}{\#1}\right)^{-m}\#1^2\right)\&\right]\right)$$

Problem 329: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^9}{1+x^4+x^8}\,dx$$

Optimal (type 3, 54 leaves, 7 steps):

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

Result (type 3, 98 leaves):

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

Problem 331: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 75 leaves, 10 steps):

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

Result (type 3, 94 leaves):

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

Problem 333: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 75 leaves, 10 steps):

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

Result (type 3, 79 leaves):

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

Problem 334: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 39 leaves, 7 steps):

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

Result (type 3, 138 leaves):

$$\frac{1}{24}\left(2\sqrt{3}\,\text{ArcTan}\left[\frac{-1+2x}{\sqrt{3}}\right]-2\sqrt{3}\,\text{ArcTan}\left[\frac{1+2x}{\sqrt{3}}\right]+24\,\text{Log}[x]-\sqrt{3}\left(-i+\sqrt{3}\right)\text{Log}\left[-\frac{1}{2}-\frac{i\sqrt{3}}{2}+x^2\right]-\sqrt{3}\left(i+\sqrt{3}\right)\text{Log}\left[\frac{1}{2}i\left(i+\sqrt{3}\right)+x^2\right]-3\,\text{Log}\left[1-x+x^2\right]-3\,\text{Log}\left[1+x+x^2\right]\right)$$

Problem 335: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 54 leaves, 7 steps):

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

Result (type 3, 100 leaves):

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

Problem 336: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{1}{x^5\,(1+x^4+x^8)}\,dx$$

Optimal (type 3, 48 leaves, 8 steps):

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

Result (type 3, 141 leaves):

$$\frac{1}{24}\left(-\frac{6}{x^4}+2\,\sqrt{3}\,\text{ArcTan}\left[\frac{-1+2\,x}{\sqrt{3}}\right]-\right.$$
$$2\,\sqrt{3}\,\text{ArcTan}\left[\frac{1+2\,x}{\sqrt{3}}\right]-24\,\text{Log}[x]+\sqrt{3}\,\left(i+\sqrt{3}\right)\,\text{Log}\left[-\frac{1}{2}-\frac{i\,\sqrt{3}}{2}+x^2\right]+$$
$$\left.\sqrt{3}\,\left(-i+\sqrt{3}\right)\,\text{Log}\left[\frac{1}{2}\,i\,\left(i+\sqrt{3}\right)+x^2\right]+3\,\text{Log}\left[1-x+x^2\right]+3\,\text{Log}\left[1+x+x^2\right]\right)$$

Problem 337: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{1}{x^7\,(1+x^4+x^8)}\,dx$$

Optimal (type 3, 89 leaves, 13 steps):

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

Result (type 3, 142 leaves):

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

Problem 338: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 141 leaves, 20 steps):

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

Result (type 3, 139 leaves):

$$-\frac{i\,\text{ArcTan}\left[\frac{1}{2}\left(1-i\sqrt{3}\right)x\right]}{\sqrt{-6+6i\sqrt{3}}}+\frac{i\,\text{ArcTan}\left[\frac{1}{2}\left(1+i\sqrt{3}\right)x\right]}{\sqrt{-6-6i\sqrt{3}}}+\frac{1}{24}\left(24x-2\sqrt{3}\,\text{ArcTan}\left[\frac{-1+2x}{\sqrt{3}}\right]-2\sqrt{3}\,\text{ArcTan}\left[\frac{1+2x}{\sqrt{3}}\right]+3\,\text{Log}\left[1-x+x^2\right]-3\,\text{Log}\left[1+x+x^2\right]\right)$$

Problem 340: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 140 leaves, 19 steps):

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

Result (type 3, 135 leaves):

$$\frac{1}{24}\left(-2\,i\sqrt{-6+6\,i\sqrt{3}}\;\text{ArcTan}\left[\frac{1}{2}\left(1-i\sqrt{3}\right)x\right]+2\,i\sqrt{-6-6\,i\sqrt{3}}\;\text{ArcTan}\left[\frac{1}{2}\left(1+i\sqrt{3}\right)x\right]-2\sqrt{3}\;\text{ArcTan}\left[\frac{-1+2x}{\sqrt{3}}\right]-2\sqrt{3}\;\text{ArcTan}\left[\frac{1+2x}{\sqrt{3}}\right]-3\,\text{Log}\left[1-x+x^2\right]+3\,\text{Log}\left[1+x+x^2\right]\right)$$

Problem 341: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 140 leaves, 19 steps):

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

Result (type 3, 135 leaves):

$$\frac{1}{48}\left(4\,i\sqrt{-6-6\,i\sqrt{3}}\;\text{ArcTan}\left[\frac{1}{2}\left(1-i\sqrt{3}\right)x\right]-4\,i\sqrt{-6+6\,i\sqrt{3}}\;\text{ArcTan}\left[\frac{1}{2}\left(1+i\sqrt{3}\right)x\right]-4\sqrt{3}\;\text{ArcTan}\left[\frac{-1+2x}{\sqrt{3}}\right]-4\sqrt{3}\;\text{ArcTan}\left[\frac{1+2x}{\sqrt{3}}\right]+6\,\text{Log}\left[1-x+x^2\right]-6\,\text{Log}\left[1+x+x^2\right]\right)$$

Problem 343: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 145 leaves, 20 steps):

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

Result (type 3, 140 leaves):

$$\frac{1}{24}\left(-\frac{24}{x}+2\,i\sqrt{-6+6\,i\sqrt{3}}\;\text{ArcTan}\left[\frac{1}{2}\left(1-i\sqrt{3}\right)x\right]-2\,i\sqrt{-6-6\,i\sqrt{3}}\;\text{ArcTan}\left[\frac{1}{2}\left(1+i\sqrt{3}\right)x\right]-2\sqrt{3}\;\text{ArcTan}\left[\frac{-1+2x}{\sqrt{3}}\right]-2\sqrt{3}\;\text{ArcTan}\left[\frac{1+2x}{\sqrt{3}}\right]-3\,\text{Log}\left[1-x+x^2\right]+3\,\text{Log}\left[1+x+x^2\right]\right)$$

Problem 344: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 147 leaves, 20 steps):

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

Result (type 3, 148 leaves):

$$\frac{1}{24} \left(-\frac{8}{x^3}-\frac{4 i \text{ArcTan}\left[\frac{1}{2} \left(1-i \sqrt{3}\right) x\right]}{\sqrt{\frac{1}{6} i \left(i+\sqrt{3}\right)}}+\frac{4 i \text{ArcTan}\left[\frac{1}{2} \left(1+i \sqrt{3}\right) x\right]}{\sqrt{-\frac{1}{6} i \left(-i+\sqrt{3}\right)}}-2 \sqrt{3} \text{ArcTan}\left[\frac{-1+2 x}{\sqrt{3}}\right]-2 \sqrt{3} \text{ArcTan}\left[\frac{1+2 x}{\sqrt{3}}\right]+3 \text{Log}\left[1-x+x^2\right]-3 \text{Log}\left[1+x+x^2\right]\right)$$

Problem 346: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 154 leaves, 22 steps):

$$-\frac{1}{7 x^7}+\frac{1}{3 x^3}+\frac{\text{ArcTan}\left[\frac{1-2 x}{\sqrt{3}}\right]}{4 \sqrt{3}}-\frac{1}{4} \text{ArcTan}\left[\sqrt{3}-2 x\right]-\frac{\text{ArcTan}\left[\frac{1+2 x}{\sqrt{3}}\right]}{4 \sqrt{3}}+\frac{1}{4} \text{ArcTan}\left[\sqrt{3}+2 x\right]-\frac{1}{8} \text{Log}\left[1-x+x^2\right]+\frac{1}{8} \text{Log}\left[1+x+x^2\right]+\frac{\text{Log}\left[1-\sqrt{3} x+x^2\right]}{8 \sqrt{3}}-\frac{\text{Log}\left[1+\sqrt{3} x+x^2\right]}{8 \sqrt{3}}$$

Result (type 3, 171 leaves):

$$-\frac{1}{7 x^7}+\frac{1}{3 x^3}+\frac{\left(i+\sqrt{3}\right) \text{ArcTan}\left[\frac{1}{2} \left(1-i \sqrt{3}\right) x\right]}{2 \sqrt{-6+6 i \sqrt{3}}}+\frac{\left(-i+\sqrt{3}\right) \text{ArcTan}\left[\frac{1}{2} \left(1+i \sqrt{3}\right) x\right]}{2 \sqrt{-6-6 i \sqrt{3}}}-\frac{\text{ArcTan}\left[\frac{-1+2 x}{\sqrt{3}}\right]}{4 \sqrt{3}}-\frac{\text{ArcTan}\left[\frac{1+2 x}{\sqrt{3}}\right]}{4 \sqrt{3}}-\frac{1}{8} \text{Log}\left[1-x+x^2\right]+\frac{1}{8} \text{Log}\left[1+x+x^2\right]$$

Problem 347: Result is not expressed in closed-form.

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

Optimal (type 5, 127 leaves, 3 steps):

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

Result (type 7, 79 leaves):

$$\frac{x^m\,\text{RootSum}\left[1-\#1^4+\#1^8\,\&,\,\frac{\text{Hypergeometric2F1}\left[-m,-m,1-m,-\frac{\#1}{x-\#1}\right]\left(\frac{x}{x-\#1}\right)^{-m}}{-\#1^3+2\,\#1^7}\,\&\right]}{4\,m}$$

Problem 351: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 82 leaves, 10 steps):

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

Result (type 3, 98 leaves):

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

Problem 353: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 82 leaves, 10 steps):

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

Result (type 3, 83 leaves):

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

Problem 354: Result is not expressed in closed-form.

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

Optimal (type 3, 41 leaves, 7 steps):

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

Result (type 7, 55 leaves):

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

Problem 356: Result is not expressed in closed-form.

$$\int \frac{1}{x^5\left(1-x^4+x^8\right)}\,dx$$

Optimal (type 3, 48 leaves, 8 steps):

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

Result (type 7, 51 leaves):

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

Problem 357: Result is not expressed in closed-form.

$$\int \frac{1}{x^7\left(1-x^4+x^8\right)}\,dx$$

Optimal (type 3, 96 leaves, 13 steps):

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

Result (type 7, 56 leaves):

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

Problem 358: Result is not expressed in closed-form.

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

Optimal (type 3, 356 leaves, 20 steps):

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

Result (type 7, 59 leaves):

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

Problem 359: Result is not expressed in closed-form.

$$\int \frac{x^6}{1-x^4+x^8}\,dx$$

Optimal (type 3, 275 leaves, 19 steps):

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

Result (type 7, 41 leaves):

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

Problem 360: Result is not expressed in closed-form.

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

Optimal (type 3, 347 leaves, 19 steps):

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

Result (type 7, 39 leaves):

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

Problem 361: Result is not expressed in closed-form.

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

Optimal (type 3, 355 leaves, 19 steps):

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

Result (type 7, 40 leaves):

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

Problem 362: Result is not expressed in closed-form.

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

Optimal (type 3, 275 leaves, 19 steps):

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

Result (type 7, 42 leaves):

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

Problem 363: Result is not expressed in closed-form.

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

Optimal (type 3, 360 leaves, 22 steps):

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

Result (type 7, 61 leaves):

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

Problem 364: Result is not expressed in closed-form.

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

Optimal (type 3, 370 leaves, 20 steps):

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

Result (type 7, 65 leaves):

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

Problem 365: Result is not expressed in closed-form.

$$\int\frac{1}{x^6\left(1-x^4+x^8\right)}\,dx$$

Optimal (type 3, 287 leaves, 22 steps):

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

Result (type 7, 54 leaves):

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

Problem 366: Result is not expressed in closed-form.

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

Optimal (type 3, 377 leaves, 22 steps):

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

Result (type 7, 54 leaves):

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

Problem 367: Result is not expressed in closed-form.

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

Optimal (type 5, 117 leaves, 3 steps):

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

Result (type 7, 79 leaves):

$$\frac{x^m\,\text{RootSum}\left[1+3\,\#1^4+\#1^8\,\&,\frac{\text{Hypergeometric2F1}\left[-m,-m,1-m,-\frac{\#1}{x-\#1}\right]\left(\frac{x}{x-\#1}\right)^{-m}}{3\,\#1^3+2\,\#1^7}\,\&\right]}{4\,m}$$

Problem 375: Result is not expressed in closed-form.

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

Optimal (type 3, 89 leaves, 5 steps):

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

Result (type 7, 65 leaves):

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

Problem 377: Result is not expressed in closed-form.

$$\int \frac{1}{x^7\left(1+3x^4+x^8\right)}\,dx$$

Optimal (type 3, 97 leaves, 6 steps):

$$-\frac{1}{6x^6}+\frac{3}{2x^2}-\frac{1}{2}\sqrt{\frac{1}{10}\left(123-55\sqrt{5}\right)}\,\text{ArcTan}\left[\sqrt{\frac{2}{3+\sqrt{5}}}\,x^2\right]+\frac{1}{2}\sqrt{\frac{1}{10}\left(123+55\sqrt{5}\right)}\,\text{ArcTan}\left[\sqrt{\frac{1}{2}\left(3+\sqrt{5}\right)}\,x^2\right]$$

Result (type 7, 73 leaves):

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

Problem 378: Result is not expressed in closed-form.

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

Optimal (type 3, 460 leaves, 20 steps):

$$x-\frac{\left(123-55\sqrt{5}\right)^{1/4}\,\text{ArcTan}\left[1-\frac{2^{3/4}\,x}{\left(3-\sqrt{5}\right)^{1/4}}\right]}{2\times 2^{3/4}\sqrt{5}}+\frac{\left(123-55\sqrt{5}\right)^{1/4}\,\text{ArcTan}\left[1+\frac{2^{3/4}\,x}{\left(3-\sqrt{5}\right)^{1/4}}\right]}{2\times 2^{3/4}\sqrt{5}}+\frac{\left(123+55\sqrt{5}\right)^{1/4}\,\text{ArcTan}\left[1-\frac{2^{3/4}\,x}{\left(3+\sqrt{5}\right)^{1/4}}\right]}{2\times 2^{3/4}\sqrt{5}}-\frac{\left(123+55\sqrt{5}\right)^{1/4}\,\text{ArcTan}\left[1+\frac{2^{3/4}\,x}{\left(3+\sqrt{5}\right)^{1/4}}\right]}{2\times 2^{3/4}\sqrt{5}}-\frac{\left(123-55\sqrt{5}\right)^{1/4}\,\text{Log}\left[\sqrt{2\left(3-\sqrt{5}\right)}-2\left(2\left(3-\sqrt{5}\right)\right)^{1/4}x+2x^2\right]}{4\times 2^{3/4}\sqrt{5}}+\frac{\left(123-55\sqrt{5}\right)^{1/4}\,\text{Log}\left[\sqrt{2\left(3-\sqrt{5}\right)}+2\left(2\left(3-\sqrt{5}\right)\right)^{1/4}x+2x^2\right]}{4\times 2^{3/4}\sqrt{5}}+\frac{\left(123+55\sqrt{5}\right)^{1/4}\,\text{Log}\left[\sqrt{2\left(3+\sqrt{5}\right)}-2\left(2\left(3+\sqrt{5}\right)\right)^{1/4}x+2x^2\right]}{4\times 2^{3/4}\sqrt{5}}-\frac{\left(123+55\sqrt{5}\right)^{1/4}\,\text{Log}\left[\sqrt{2\left(3+\sqrt{5}\right)}+2\left(2\left(3+\sqrt{5}\right)\right)^{1/4}x+2x^2\right]}{4\times 2^{3/4}\sqrt{5}}$$

Result (type 7, 58 leaves):

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

Problem 379: Result is not expressed in closed-form.

$$\int \frac{x^6}{1+3x^4+x^8}\,dx$$

Optimal (type 3, 431 leaves, 19 steps):

$$\frac{\left(9-4\sqrt{5}\right)^{1/4}\text{ArcTan}\left[1-\frac{2^{3/4}x}{\left(3-\sqrt{5}\right)^{1/4}}\right]}{2\sqrt{10}}-\frac{\left(9-4\sqrt{5}\right)^{1/4}\text{ArcTan}\left[1+\frac{2^{3/4}x}{\left(3-\sqrt{5}\right)^{1/4}}\right]}{2\sqrt{10}}-$$

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

$$\frac{\left(9-4\sqrt{5}\right)^{1/4}\text{Log}\left[\sqrt{2\left(3-\sqrt{5}\right)}-2\left(2\left(3-\sqrt{5}\right)\right)^{1/4}x+2x^2\right]}{4\sqrt{10}}+$$

$$\frac{\left(9-4\sqrt{5}\right)^{1/4}\text{Log}\left[\sqrt{2\left(3-\sqrt{5}\right)}+2\left(2\left(3-\sqrt{5}\right)\right)^{1/4}x+2x^2\right]}{4\sqrt{10}}+$$

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

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

Result (type 7, 41 leaves):

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

Problem 380: Result is not expressed in closed-form.

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

Optimal (type 3, 451 leaves, 19 steps):

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

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

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

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

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

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

Result (type 7, 39 leaves):

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

Problem 381: Result is not expressed in closed-form.

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

Optimal (type 3, 427 leaves, 19 steps):

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

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

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

Result (type 7, 40 leaves):

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

Problem 382: Result is not expressed in closed-form.

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

Optimal (type 3, 414 leaves, 19 steps):

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

Result (type 7, 42 leaves):

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

Problem 383: Result is not expressed in closed-form.

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

Optimal (type 3, 416 leaves, 20 steps):

$$-\frac{1}{x}+\frac{\left(3+\sqrt{5}\right)^{5/4}\text{ArcTan}\left[1-\frac{2^{3/4}x}{\left(3-\sqrt{5}\right)^{1/4}}\right]}{4\times 2^{3/4}\sqrt{5}}-\frac{\left(3+\sqrt{5}\right)^{5/4}\text{ArcTan}\left[1+\frac{2^{3/4}x}{\left(3-\sqrt{5}\right)^{1/4}}\right]}{4\times 2^{3/4}\sqrt{5}}-\frac{1}{20}\left(6150-2750\sqrt{5}\right)^{1/4}\text{ArcTan}\left[1-\frac{2^{3/4}x}{\left(3+\sqrt{5}\right)^{1/4}}\right]+$$
$$\frac{1}{20}\left(6150-2750\sqrt{5}\right)^{1/4}\text{ArcTan}\left[1+\frac{2^{3/4}x}{\left(3+\sqrt{5}\right)^{1/4}}\right]-$$
$$\frac{\left(3+\sqrt{5}\right)^{5/4}\text{Log}\left[\sqrt{2\left(3-\sqrt{5}\right)}-2\left(2\left(3-\sqrt{5}\right)\right)^{1/4}x+2x^2\right]}{8\times 2^{3/4}\sqrt{5}}+$$
$$\frac{\left(3+\sqrt{5}\right)^{5/4}\text{Log}\left[\sqrt{2\left(3-\sqrt{5}\right)}+2\left(2\left(3-\sqrt{5}\right)\right)^{1/4}x+2x^2\right]}{8\times 2^{3/4}\sqrt{5}}+$$
$$\frac{1}{40}\left(6150-2750\sqrt{5}\right)^{1/4}\text{Log}\left[\sqrt{2\left(3+\sqrt{5}\right)}-2\left(2\left(3+\sqrt{5}\right)\right)^{1/4}x+2x^2\right]-$$
$$\frac{1}{40}\left(6150-2750\sqrt{5}\right)^{1/4}\text{Log}\left[\sqrt{2\left(3+\sqrt{5}\right)}+2\left(2\left(3+\sqrt{5}\right)\right)^{1/4}x+2x^2\right]$$

Result (type 7, 61 leaves):

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

Problem 384: Result is not expressed in closed-form.

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

Optimal (type 3, 466 leaves, 20 steps):

$$-\frac{1}{3x^3}+\frac{\left(843+377\sqrt{5}\right)^{1/4}\text{ArcTan}\left[1-\frac{2^{3/4}x}{\left(3-\sqrt{5}\right)^{1/4}}\right]}{2\times 2^{3/4}\sqrt{5}}-\frac{\left(843+377\sqrt{5}\right)^{1/4}\text{ArcTan}\left[1+\frac{2^{3/4}x}{\left(3-\sqrt{5}\right)^{1/4}}\right]}{2\times 2^{3/4}\sqrt{5}}-$$

$$\frac{\left(843-377\sqrt{5}\right)^{1/4}\text{ArcTan}\left[1-\frac{2^{3/4}x}{\left(3+\sqrt{5}\right)^{1/4}}\right]}{2\times 2^{3/4}\sqrt{5}}+\frac{\left(843-377\sqrt{5}\right)^{1/4}\text{ArcTan}\left[1+\frac{2^{3/4}x}{\left(3+\sqrt{5}\right)^{1/4}}\right]}{2\times 2^{3/4}\sqrt{5}}+$$

$$\frac{\left(843+377\sqrt{5}\right)^{1/4}\text{Log}\left[\sqrt{2\left(3-\sqrt{5}\right)}-2\left(2\left(3-\sqrt{5}\right)\right)^{1/4}x+2x^2\right]}{4\times 2^{3/4}\sqrt{5}}-$$

$$\frac{\left(843+377\sqrt{5}\right)^{1/4}\text{Log}\left[\sqrt{2\left(3-\sqrt{5}\right)}+2\left(2\left(3-\sqrt{5}\right)\right)^{1/4}x+2x^2\right]}{4\times 2^{3/4}\sqrt{5}}-$$

$$\frac{\left(843-377\sqrt{5}\right)^{1/4}\text{Log}\left[\sqrt{2\left(3+\sqrt{5}\right)}-2\left(2\left(3+\sqrt{5}\right)\right)^{1/4}x+2x^2\right]}{4\times 2^{3/4}\sqrt{5}}+$$

$$\frac{\left(843-377\sqrt{5}\right)^{1/4}\text{Log}\left[\sqrt{2\left(3+\sqrt{5}\right)}+2\left(2\left(3+\sqrt{5}\right)\right)^{1/4}x+2x^2\right]}{4\times 2^{3/4}\sqrt{5}}$$

Result (type 7, 65 leaves):

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

Problem 385: Result is not expressed in closed-form.

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

Optimal (type 5, 117 leaves, 3 steps):

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

Result (type 7, 575 leaves):

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

$$\left(\text{RootSum}\left[-1-\#1^2+\#1^4\,\&,\ \frac{1}{-\#1+2\,\#1^3}\left(m\,x^2+m^2\,x^2+2\,m\,x\,\#1+m^2\,x\,\#1+2\,\text{Hypergeometric2F1}\left[\right.\right.\right.\right.$$

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

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

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

$$\frac{\text{Hypergeometric2F1}\left[-m,\,-m,\,1-m,\,-\frac{\#1}{x-\#1}\right]\left(\frac{x}{x-\#1}\right)^{-m}}{\#1+2\,\#1^3}\,\&\Big]-\text{RootSum}\Big[-1+\#1^2+\#1^4\,\&,$$

$$\frac{1}{\#1+2\,\#1^3}\Big(m\,x^2+m^2\,x^2+2\,m\,x\,\#1+m^2\,x\,\#1+2\,\text{Hypergeometric2F1}\Big[-m,\,-m,\,1-m,\,-\frac{\#1}{x-\#1}\Big]$$

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

$$\left.\left.m^2\,\text{Hypergeometric2F1}\Big[-m,\,-m,\,1-m,\,-\frac{\#1}{x-\#1}\Big]\left(\frac{x}{x-\#1}\right)^{-m}\#1^2+m\left(\frac{x}{\#1}\right)^{-m}\#1^2\Big)\,\&\Big]\right)\right)$$

Problem 409: Result is not expressed in closed-form.

$$\int \frac{1}{x\left(1+x^5+x^{10}\right)}\,dx$$

Optimal (type 3, 39 leaves, 7 steps):

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

Result (type 7, 197 leaves):

$$\frac{\text{ArcTan}\left[\frac{1+2\,x}{\sqrt{3}}\right]}{5\,\sqrt{3}}+\text{Log}[x]-\frac{1}{10}\,\text{Log}\left[1+x+x^2\right]-\frac{1}{5}\,\text{RootSum}\Big[1-\#1+\#1^3-\#1^4+\#1^5-\#1^7+\#1^8\,\&,$$

$$\left(-\text{Log}[x-\#1]\,\#1+2\,\text{Log}[x-\#1]\,\#1^2-\text{Log}[x-\#1]\,\#1^3+3\,\text{Log}[x-\#1]\,\#1^4-\text{Log}[x-\#1]\,\#1^5-\right.$$

$$\left.3\,\text{Log}[x-\#1]\,\#1^6+4\,\text{Log}[x-\#1]\,\#1^7\right)\Big/\left(-1+3\,\#1^2-4\,\#1^3+5\,\#1^4-7\,\#1^6+8\,\#1^7\right)\,\&\Big]$$

Problem 410: Result is not expressed in closed-form.

$$\int \frac{1}{x^6\left(1+x^5+x^{10}\right)}\,dx$$

Optimal (type 3, 48 leaves, 8 steps):

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

Result (type 7, 208 leaves):

$$\frac{1}{30} \left(-\frac{6}{x^5}+2 \sqrt{3} \text{ArcTan}\left[\frac{1+2 x}{\sqrt{3}}\right]-30 \text{Log}[x]+3 \text{Log}\left[1+x+x^2\right]+6 \text{RootSum}\left[1-\#1+\#1^3-\#1^4+\#1^5-\#1^7+\#1^8 \&, \left(-\text{Log}[x-\#1]+\text{Log}[x-\#1] \#1+\text{Log}[x-\#1] \#1^2-3 \text{Log}[x-\#1] \#1^3+2 \text{Log}[x-\#1] \#1^4+\text{Log}[x-\#1] \#1^5-4 \text{Log}[x-\#1] \#1^6+4 \text{Log}[x-\#1] \#1^7\right) \Big/ \left(-1+3 \#1^2-4 \#1^3+5 \#1^4-7 \#1^6+8 \#1^7\right) \&\right]\right)$$

Problem 411: Result is not expressed in closed-form.

$$\int \frac{1}{x+x^6+x^{11}} \, dx$$

Optimal (type 3, 39 leaves, 8 steps):

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

Result (type 7, 197 leaves):

$$\frac{\text{ArcTan}\left[\frac{1+2 x}{\sqrt{3}}\right]}{5 \sqrt{3}}+\text{Log}[x]-\frac{1}{10} \text{Log}\left[1+x+x^2\right]-\frac{1}{5} \text{RootSum}\left[1-\#1+\#1^3-\#1^4+\#1^5-\#1^7+\#1^8 \&, \left(-\text{Log}[x-\#1] \#1+2 \text{Log}[x-\#1] \#1^2-\text{Log}[x-\#1] \#1^3+3 \text{Log}[x-\#1] \#1^4-\text{Log}[x-\#1] \#1^5-3 \text{Log}[x-\#1] \#1^6+4 \text{Log}[x-\#1] \#1^7\right) \Big/ \left(-1+3 \#1^2-4 \#1^3+5 \#1^4-7 \#1^6+8 \#1^7\right) \&\right]$$

Problem 457: Result is not expressed in closed-form.

$$\int \frac{1}{c+\frac{a}{x^6}+\frac{b}{x^3}} \, dx$$

Optimal (type 3, 631 leaves, 15 steps):

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

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

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

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

Result (type 7, 70 leaves):

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

Problem 458: Result is not expressed in closed-form.

$$\int\frac{1}{c+\frac{a}{x^8}+\frac{b}{x^4}}\,dx$$

Optimal (type 3, 376 leaves, 9 steps):

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

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

Result (type 7, 70 leaves):

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

Problem 500: Result is not expressed in closed-form.

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

Optimal (type 3, 236 leaves, 12 steps):

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

Result (type 7, 60 leaves):

$$\frac{-16\,b\,x^{-3\,n/4}+3\,c\,\text{RootSum}\left[c+b\,\#1^4\,\&,\ \frac{n\,\text{Log}[x]+4\,\text{Log}\left[x^{-n/4}-\#1\right]}{\#1}\,\&\right]}{12\,b^2\,n}$$

Problem 501: Result is not expressed in closed-form.

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

Optimal (type 3, 160 leaves, 9 steps):

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

Result (type 7, 60 leaves):

$$\frac{-9\,b\,x^{-2\,n/3}+2\,c\,\text{RootSum}\left[c+b\,\#1^3\,\&,\ \frac{n\,\text{Log}[x]+3\,\text{Log}\left[x^{-n/3}-\#1\right]}{\#1}\,\&\right]}{6\,b^2\,n}$$

Problem 504: Result is not expressed in closed-form.

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

Optimal (type 3, 176 leaves, 11 steps):

$$-\frac{3 x^{-4 n/3}}{4 b n}+\frac{3 c x^{-n/3}}{b^2 n}+\frac{\sqrt{3}\, c^{4/3} \operatorname{ArcTan}\left[\frac{c^{1/3}-2 b^{1/3} x^{-n/3}}{\sqrt{3}\, c^{1/3}}\right]}{b^{7/3} n}-\frac{c^{4/3} \operatorname{Log}\left[c^{1/3}+b^{1/3} x^{-n/3}\right]}{b^{7/3} n}+\frac{c^{4/3} \operatorname{Log}\left[c^{2/3}+b^{2/3} x^{-2 n/3}-b^{1/3} c^{1/3} x^{-n/3}\right]}{2 b^{7/3} n}$$

Result (type 7, 70 leaves):

$$-\frac{1}{12 b^3 n}\left(9 b x^{-4 n/3}\left(b-4 c x^n\right)+4 c^2 \operatorname{RootSum}\left[c+b \#1^3 \&, \frac{n \operatorname{Log}[x]+3 \operatorname{Log}\left[x^{-n/3}-\#1\right]}{\#1^2} \&\right]\right)$$

Problem 505: Result is not expressed in closed-form.

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

Optimal (type 3, 252 leaves, 14 steps):

$$-\frac{4 x^{-5 n/4}}{5 b n}+\frac{4 c x^{-n/4}}{b^2 n}+\frac{\sqrt{2}\, c^{5/4} \operatorname{ArcTan}\left[1-\frac{\sqrt{2}\, b^{1/4} x^{-n/4}}{c^{1/4}}\right]}{b^{9/4} n}-\frac{\sqrt{2}\, c^{5/4} \operatorname{ArcTan}\left[1+\frac{\sqrt{2}\, b^{1/4} x^{-n/4}}{c^{1/4}}\right]}{b^{9/4} n}+\frac{c^{5/4} \operatorname{Log}\left[\sqrt{c}+\sqrt{b}\, x^{-n/2}-\sqrt{2}\, b^{1/4} c^{1/4} x^{-n/4}\right]}{\sqrt{2}\, b^{9/4} n}-\frac{c^{5/4} \operatorname{Log}\left[\sqrt{c}+\sqrt{b}\, x^{-n/2}+\sqrt{2}\, b^{1/4} c^{1/4} x^{-n/4}\right]}{\sqrt{2}\, b^{9/4} n}$$

Result (type 7, 70 leaves):

$$-\frac{1}{20 b^3 n}\left(16 b x^{-5 n/4}\left(b-5 c x^n\right)+5 c^2 \operatorname{RootSum}\left[c+b \#1^4 \&, \frac{n \operatorname{Log}[x]+4 \operatorname{Log}\left[x^{-n/4}-\#1\right]}{\#1^3} \&\right]\right)$$

Problem 543: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 52 leaves, 2 steps):

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

Result (type 3, 121 leaves):

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

Problem 546: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 59 leaves):

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

Problem 547: Result unnecessarily involves higher level functions.

$$\int (d x)^{-1-2 n (1+p)}\left(a^2+2 a b x^n+b^2 x^{2 n}\right)^p \, dx$$

Optimal (type 3, 117 leaves, 3 steps):

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

Result (type 5, 75 leaves):

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

Problem 556: Result is not expressed in closed-form.

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

Optimal (type 3, 353 leaves, 8 steps):

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

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

Result (type 7, 62 leaves):

$$\frac{\text{RootSum}\left[a+b \#1^4+c \#1^8\&,\frac{-n \text{Log}[x]+4 \text{Log}\left[x^{n/4}-\#1\right]}{b \#1^3+2 c \#1^7}\&\right]}{4 n}$$

Problem 557: Result is not expressed in closed-form.

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

Optimal (type 3, 610 leaves, 14 steps):

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

Result (type 7, 62 leaves):

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

Problem 558: Result is not expressed in closed-form.

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

Optimal (type 3, 169 leaves, 4 steps):

$$\frac{2\sqrt{2}\,\sqrt{c}\, \operatorname{ArcTan}\left[\frac{\sqrt{2}\,\sqrt{c}\, x^{n/2}}{\sqrt{b-\sqrt{b^2-4 a c}}}\right]}{\sqrt{b^2-4 a c}\,\sqrt{b-\sqrt{b^2-4 a c}}\, n}-\frac{2\sqrt{2}\,\sqrt{c}\, \operatorname{ArcTan}\left[\frac{\sqrt{2}\,\sqrt{c}\, x^{n/2}}{\sqrt{b+\sqrt{b^2-4 a c}}}\right]}{\sqrt{b^2-4 a c}\,\sqrt{b+\sqrt{b^2-4 a c}}\, n}$$

Result (type 7, 60 leaves):

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

Problem 559: Result is not expressed in closed-form.

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

Optimal (type 3, 205 leaves, 6 steps):

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

Result (type 7, 105 leaves):

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

Problem 560: Result is not expressed in closed-form.

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

Optimal (type 3, 699 leaves, 16 steps):

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

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

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

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

Result (type 7, 107 leaves):

$$-\frac{1}{3\,a\,n}\left(9\,x^{-n/3}-\text{RootSum}\left[c+b\,\#1^3+a\,\#1^6\,\&,\right.\right.$$
$$\left.\left.\frac{1}{b\,\#1^2+2\,a\,\#1^5}\left(c\,n\,\text{Log}[x]+3\,c\,\text{Log}\left[x^{-n/3}-\#1\right]+b\,n\,\text{Log}[x]\,\#1^3+3\,b\,\text{Log}\left[x^{-n/3}-\#1\right]\#1^3\right)\&\right]\right)$$

Problem 561: Result is not expressed in closed-form.

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

Optimal (type 3, 414 leaves, 10 steps):

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

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

Result (type 7, 105 leaves):

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

Problem 564: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 124 leaves, 3 steps):

$$-\frac{2\,c\,x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{b^2-4\,a\,c-b\sqrt{b^2-4\,a\,c}}-\frac{2\,c\,x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{b^2-4\,a\,c+b\sqrt{b^2-4\,a\,c}}$$

Result (type 5, 261 leaves):

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

Problem 568: Result more than twice size of optimal antiderivative.

$$\int x^3\sqrt{a+b\,x^n+c\,x^{2\,n}}\,dx$$

Optimal (type 6, 148 leaves, 2 steps):

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

Result (type 6, 820 leaves):

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

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

$$\left(\left(-b+\sqrt{b^2-4 a c}\right)\left(b+\sqrt{b^2-4 a c}\right)(4+n)^2\left(\left(b+\sqrt{b^2-4 a c}\right) n x^n\right.\right.$$

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

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

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

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

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

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

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

$$\left.-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right)$$

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

Problem 569: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 148 leaves, 2 steps):

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

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

Result (type 6, 825 leaves):

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

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

$$\left(\left(-b+\sqrt{b^2-4 a c}\right)\left(b+\sqrt{b^2-4 a c}\right)(3+n)^2\left(\left(b+\sqrt{b^2-4 a c}\right) n x^n\right.\right.$$

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

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

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

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

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

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

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

$$\left.-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right)$$

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

Problem 570: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 148 leaves, 2 steps):

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

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

Result (type 6, 816 leaves):

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

Problem 571: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 139 leaves, 2 steps):

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

Result (type 6, 786 leaves):

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

Problem 573: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 149 leaves, 2 steps):

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

Result (type 6, 821 leaves):

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

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

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

Optimal (type 6, 151 leaves, 2 steps):

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

Result (type 6, 816 leaves):

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

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

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

Optimal (type 6, 149 leaves, 2 steps):

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

Result (type 6, 3165 leaves):

$$\sqrt{a+b x^n+c x^{2 n}}\left(\frac{\left(64 a c+96 a c n+3 b^2 n^2+32 a c n^2\right) x^4}{8 c\left(2+n\right)\left(4+n\right)\left(4+3 n\right)}+\frac{b\left(8+7 n\right) x^{4+n}}{4\left(2+n\right)\left(4+3 n\right)}+\frac{c x^{4+2 n}}{4+3 n}\right)-$$
$$\left(48 a^3 b n^2 x^{4+n}\left(b-\sqrt{b^2-4 a c}+2 c x^n\right)\left(b+\sqrt{b^2-4 a c}+2 c x^n\right)\right.$$

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

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

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

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

$$8\,a\,(2+n)\,\text{AppellF1}\left[\frac{4+n}{n},\frac{1}{2},\frac{1}{2},2+\frac{4}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)+$$

$$\Bigg(12\,a^2\,b^3\,n^2\,x^{4+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)$$

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

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

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

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

$$8\,a\,(2+n)\,\text{AppellF1}\left[\frac{4+n}{n},\frac{1}{2},\frac{1}{2},2+\frac{4}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)-$$

$$\Bigg(18\,a^3\,b\,n^3\,x^{4+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)$$

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

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

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

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

$$8\,a\,(2+n)\,\text{AppellF1}\left[\frac{4+n}{n},\frac{1}{2},\frac{1}{2},2+\frac{4}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)+$$

$$\Bigg(3\,a^2\,b^3\,n^3\,x^{4+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)$$

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

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

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

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

$$\left.\left.8a(2+n)\text{AppellF1}\left[\frac{4+n}{n},\frac{1}{2},\frac{1}{2},2+\frac{4}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right)-$$

$$\left(6a^4n^2x^4\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\right.$$

$$\left.\text{AppellF1}\left[\frac{4}{n},\frac{1}{2},\frac{1}{2},\frac{4+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$

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

$$\left(-4a(4+n)\text{AppellF1}\left[\frac{4}{n},\frac{1}{2},\frac{1}{2},\frac{4+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+\right.$$

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

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

$$\left(3a^3b^2n^2x^4\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\right.$$

$$\left.\text{AppellF1}\left[\frac{4}{n},\frac{1}{2},\frac{1}{2},\frac{4+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$

$$\left(2c\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(2+n)(4+3n)\left(a+x^n\left(b+cx^n\right)\right)^{3/2}\right.$$

$$\left(-4a(4+n)\text{AppellF1}\left[\frac{4}{n},\frac{1}{2},\frac{1}{2},\frac{4+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+\right.$$

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

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

$$\left(3a^4n^3x^4\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\right.$$

$$\left.\text{AppellF1}\left[\frac{4}{n},\frac{1}{2},\frac{1}{2},\frac{4+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$

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

$$\left(-4a(4+n)\text{AppellF1}\left[\frac{4}{n},\frac{1}{2},\frac{1}{2},\frac{4+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+\right.$$

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

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

Problem 576: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 149 leaves, 2 steps):

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

Result (type 6, 3165 leaves):

$$\sqrt{a+b x^n+c x^{2n}}\left(\frac{\left(36ac+72acn+3b^2n^2+32acn^2\right)x^3}{12c(1+n)(3+n)(3+2n)}+\frac{b(6+7n)x^{3+n}}{6(1+n)(3+2n)}+\frac{c x^{3+2n}}{3(1+n)}\right)-$$

$$\left(12a^3bn^2x^{3+n}\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\right.$$
$$\left.\text{AppellF1}\left[\frac{3+n}{n},\frac{1}{2},\frac{1}{2},2+\frac{3}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$
$$\left(\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(1+n)(3+n)^2\left(a+x^n\left(b+cx^n\right)\right)^{3/2}\right.$$
$$\left(\left(b+\sqrt{b^2-4ac}\right)n x^n \text{AppellF1}\left[2+\frac{3}{n},\frac{1}{2},\frac{3}{2},3+\frac{3}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-\right.$$
$$\left(-b+\sqrt{b^2-4ac}\right)n x^n \text{AppellF1}\left[2+\frac{3}{n},\frac{3}{2},\frac{1}{2},3+\frac{3}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-$$
$$\left.\left.4a(3+2n)\text{AppellF1}\left[\frac{3+n}{n},\frac{1}{2},\frac{1}{2},2+\frac{3}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right)+$$

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

$$\Big(6\, a^3\, b\, n^3\, x^{3+n} \left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right) \left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)$$

$$\quad \text{AppellF1}\Big[\frac{3+n}{n},\ \frac{1}{2},\ \frac{1}{2},\ 2+\frac{3}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

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

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

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

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

$$\Big(a^2\, b^3\, n^3\, x^{3+n} \left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right) \left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)$$

$$\quad \text{AppellF1}\Big[\frac{3+n}{n},\ \frac{1}{2},\ \frac{1}{2},\ 2+\frac{3}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

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

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

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

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

$$\Big(4\, a^4\, n^2\, x^3 \left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right) \left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)$$

$$\quad \text{AppellF1}\Big[\frac{3}{n},\ \frac{1}{2},\ \frac{1}{2},\ \frac{3+n}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

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

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

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

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

$$\Big(a^3\, b^2\, n^2\, x^3 \left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right) \left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)$$

$$\quad \text{AppellF1}\Big[\frac{3}{n},\ \frac{1}{2},\ \frac{1}{2},\ \frac{3+n}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

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

$$\left(8a^4n^3x^3\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\left[\frac{3}{n},\frac{1}{2},\frac{1}{2},\frac{3+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$

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

Problem 577: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 149 leaves, 2 steps):

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

Result (type 6, 3165 leaves):

$$\sqrt{a+bx^n+cx^{2n}}\left(\frac{\left(16ac+48acn+3b^2n^2+32acn^2\right)x^2}{8c(1+n)(2+n)(2+3n)}+\frac{b(4+7n)x^{2+n}}{4(1+n)(2+3n)}+\frac{cx^{2+2n}}{2+3n}\right)-$$

$$\left(24a^3bn^2x^{2+n}\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\left[\frac{2+n}{n},\frac{1}{2},\frac{1}{2},2+\frac{2}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$

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

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

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

$$\left.8a(1+n)\, \text{AppellF1}\left[\frac{2+n}{n}, \frac{1}{2}, \frac{1}{2}, 2+\frac{2}{n}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}, \frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\bigg) +$$

$$\bigg(6a^2b^3n^2x^{2+n}\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)$$

$$\text{AppellF1}\left[\frac{2+n}{n}, \frac{1}{2}, \frac{1}{2}, 2+\frac{2}{n}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}, \frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\bigg) \Big/$$

$$\bigg(c\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(2+n)^2(2+3n)\left(a+x^n\left(b+cx^n\right)\right)^{3/2}$$

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

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

$$\left.8a(1+n)\, \text{AppellF1}\left[\frac{2+n}{n}, \frac{1}{2}, \frac{1}{2}, 2+\frac{2}{n}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}, \frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\bigg) -$$

$$\bigg(18a^3b\,n^3x^{2+n}\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)$$

$$\text{AppellF1}\left[\frac{2+n}{n}, \frac{1}{2}, \frac{1}{2}, 2+\frac{2}{n}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}, \frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\bigg) \Big/$$

$$\bigg(\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(2+n)^2(2+3n)\left(a+x^n\left(b+cx^n\right)\right)^{3/2}$$

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

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

$$\left.8a(1+n)\, \text{AppellF1}\left[\frac{2+n}{n}, \frac{1}{2}, \frac{1}{2}, 2+\frac{2}{n}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}, \frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\bigg) +$$

$$\bigg(3a^2b^3n^3x^{2+n}\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)$$

$$\text{AppellF1}\left[\frac{2+n}{n}, \frac{1}{2}, \frac{1}{2}, 2+\frac{2}{n}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}, \frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\bigg) \Big/$$

$$\bigg(2c\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(2+n)^2(2+3n)\left(a+x^n\left(b+cx^n\right)\right)^{3/2}$$

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

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

$$8\,a\,(1+n)\,\text{AppellF1}\left[\frac{2+n}{n},\frac{1}{2},\frac{1}{2},2+\frac{2}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)-$$

$$\left(6\,a^4\,n^2\,x^2\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\right.$$

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

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

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

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

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

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

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

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

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

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

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

$$\left(6\,a^4\,n^3\,x^2\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\right.$$

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

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

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

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

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

Problem 578: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 140 leaves, 2 steps):

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

Result (type 6, 3058 leaves):

$$\sqrt{a+b\,x^n+c\,x^{2\,n}}\left(\frac{\left(4\,a\,c+24\,a\,c\,n+3\,b^2\,n^2+32\,a\,c\,n^2\right)x}{4\,c\,(1+n)\,(1+2\,n)\,(1+3\,n)}+\frac{b\,(2+7\,n)\,x^{1+n}}{2\,(1+2\,n)\,(1+3\,n)}+\frac{c\,x^{1+2\,n}}{1+3\,n}\right)-$$
$$\left(12\,a^3\,b\,n^2\,x^{1+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\right.$$
$$\left.\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Bigg/$$
$$\left(\left(b-\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)(1+n)^2\,(1+3\,n)\,\left(a+x^n\,(b+c\,x^n)\right)^{3/2}\right.$$
$$\left(-4\,(a+2\,a\,n)\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$n\,x^n\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)+$$
$$\left(3\,a^2\,b^3\,n^2\,x^{1+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\right.$$
$$\left.\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Bigg/$$
$$\left(c\left(b-\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)(1+n)^2\,(1+3\,n)\,\left(a+x^n\,(b+c\,x^n)\right)^{3/2}\right.$$
$$\left(-4\,(a+2\,a\,n)\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$n\,x^n\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)-$$
$$\left(18\,a^3\,b\,n^3\,x^{1+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\right.$$
$$\left.\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Bigg/$$

$$\left(\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(1+n)^2(1+3n)\left(a+x^n\left(b+c x^n\right)\right)^{3/2}\right.$$
$$\left(-4(a+2an)\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+\right.$$
$$n x^n\left(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+\right.$$
$$\left.\left.\left.\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right)\right)+$$
$$\left(3a^2b^3n^3x^{1+n}\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\right.$$
$$\left.\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$
$$\left(2c\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(1+n)^2(1+3n)\left(a+x^n\left(b+cx^n\right)\right)^{3/2}\right.$$
$$\left(-4(a+2an)\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+\right.$$
$$n x^n\left(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+\right.$$
$$\left.\left.\left.\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right)\right)-$$
$$\left(12a^4n^2x\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\right.$$
$$\left.\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$
$$\left(\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(1+2n)(1+3n)\left(a+x^n\left(b+cx^n\right)\right)^{3/2}\right.$$
$$\left(\left(b+\sqrt{b^2-4ac}\right)n x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-\right.$$
$$\left(-b+\sqrt{b^2-4ac}\right)n x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-$$
$$\left.\left.4a(1+n)\,\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right)+$$
$$\left(3a^3b^2n^2x\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\right.$$
$$\left.\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$
$$\left(c\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(1+2n)(1+3n)\left(a+x^n\left(b+cx^n\right)\right)^{3/2}\right.$$
$$\left(\left(b+\sqrt{b^2-4ac}\right)n x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-\right.$$

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

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

$$\Bigg(24 a^4 n^3 x \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right)$$

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

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

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

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

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

Problem 580: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 150 leaves, 2 steps):

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

Result (type 6, 3181 leaves):

$$\sqrt{a+b x^n+c x^{2 n}} \left(\frac{4 a c-24 a c n+3 b^2 n^2+32 a c n^2}{4 c (-1+n) (-1+2 n) (-1+3 n) x}+\frac{b (-2+7 n) x^{-1+n}}{2 (-1+2 n) (-1+3 n)}+\frac{c x^{-1+2 n}}{-1+3 n}\right)+$$

$$\Bigg(12 a^3 b n^2 x^{-1+n} \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right)$$

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

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

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

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

$$4\,a\,(1-2\,n)\,\text{AppellF1}\Big[\frac{-1+n}{n},\,\frac{1}{2},\,\frac{1}{2},\,2-\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big)-$$

$$\Big(3\,a^2\,b^3\,n^2\,x^{-1+n}\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)$$

$$\text{AppellF1}\Big[\frac{-1+n}{n},\,\frac{1}{2},\,\frac{1}{2},\,2-\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

$$\Big(c\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,(-1+n)^2\,(-1+3\,n)\,\big(a+x^n\,(b+c\,x^n)\big)^{3/2}$$

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

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

$$4\,a\,(1-2\,n)\,\text{AppellF1}\Big[\frac{-1+n}{n},\,\frac{1}{2},\,\frac{1}{2},\,2-\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big)-$$

$$\Big(18\,a^3\,b\,n^3\,x^{-1+n}\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)$$

$$\text{AppellF1}\Big[\frac{-1+n}{n},\,\frac{1}{2},\,\frac{1}{2},\,2-\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

$$\Big(\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,(-1+n)^2\,(-1+3\,n)\,\big(a+x^n\,(b+c\,x^n)\big)^{3/2}$$

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

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

$$4\,a\,(1-2\,n)\,\text{AppellF1}\Big[\frac{-1+n}{n},\,\frac{1}{2},\,\frac{1}{2},\,2-\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big)+$$

$$\Big(3\,a^2\,b^3\,n^3\,x^{-1+n}\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)$$

$$\text{AppellF1}\Big[\frac{-1+n}{n},\,\frac{1}{2},\,\frac{1}{2},\,2-\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

$$\Big(2\,c\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,(-1+n)^2\,(-1+3\,n)\,\big(a+x^n\,(b+c\,x^n)\big)^{3/2}$$

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

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

$$4\,a\,(1-2\,n)\,\text{AppellF1}\Big[\frac{-1+n}{n},\,\frac{1}{2},\,\frac{1}{2},\,2-\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big)+$$

$$\left(12\,a^4\,n^2\,\left(-b+\sqrt{b^2-4\,a\,c}\,-2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}\,+2\,c\,x^n\right)\right.$$
$$\left.\text{AppellF1}\left[-\frac{1}{n},\,\frac{1}{2},\,\frac{1}{2},\,\frac{-1+n}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(\left(b-\sqrt{b^2-4\,a\,c}\right)\,\left(b+\sqrt{b^2-4\,a\,c}\right)\,\left(-1+2\,n\right)\,\left(-1+3\,n\right)\,x\,\left(a+x^n\,\left(b+c\,x^n\right)\right)^{3/2}\right.$$
$$\left(-4\,a\,\left(-1+n\right)\,\text{AppellF1}\left[-\frac{1}{n},\,\frac{1}{2},\,\frac{1}{2},\,\frac{-1+n}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$n\,x^n\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{-1+n}{n},\,\frac{1}{2},\,\frac{3}{2},\,2-\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{-1+n}{n},\,\frac{3}{2},\,\frac{1}{2},\right.$$
$$\left.\left.\left.\left.2-\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)-$$
$$\left(3\,a^3\,b^2\,n^2\,\left(-b+\sqrt{b^2-4\,a\,c}\,-2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}\,+2\,c\,x^n\right)\right.$$
$$\left.\text{AppellF1}\left[-\frac{1}{n},\,\frac{1}{2},\,\frac{1}{2},\,\frac{-1+n}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(c\,\left(b-\sqrt{b^2-4\,a\,c}\right)\,\left(b+\sqrt{b^2-4\,a\,c}\right)\,\left(-1+2\,n\right)\,\left(-1+3\,n\right)\,x\,\left(a+x^n\,\left(b+c\,x^n\right)\right)^{3/2}\right.$$
$$\left(-4\,a\,\left(-1+n\right)\,\text{AppellF1}\left[-\frac{1}{n},\,\frac{1}{2},\,\frac{1}{2},\,\frac{-1+n}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$n\,x^n\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{-1+n}{n},\,\frac{1}{2},\,\frac{3}{2},\,2-\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{-1+n}{n},\,\frac{3}{2},\,\frac{1}{2},\right.$$
$$\left.\left.\left.\left.2-\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)-$$
$$\left(24\,a^4\,n^3\,\left(-b+\sqrt{b^2-4\,a\,c}\,-2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}\,+2\,c\,x^n\right)\,\text{AppellF1}\left[-\frac{1}{n},\,\frac{1}{2},\right.\right.$$
$$\left.\left.\frac{1}{2},\,\frac{-1+n}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(\left(b-\sqrt{b^2-4\,a\,c}\right)\,\left(b+\sqrt{b^2-4\,a\,c}\right)\,\left(-1+2\,n\right)\,\left(-1+3\,n\right)\,x\,\left(a+x^n\,\left(b+c\,x^n\right)\right)^{3/2}\right.$$
$$\left(-4\,a\,\left(-1+n\right)\,\text{AppellF1}\left[-\frac{1}{n},\,\frac{1}{2},\,\frac{1}{2},\,\frac{-1+n}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$n\,x^n\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{-1+n}{n},\,\frac{1}{2},\,\frac{3}{2},\,2-\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left.\left.\left.\left.\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{-1+n}{n},\,\frac{3}{2},\,\frac{1}{2},\,2-\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)\right)$$

Problem 581: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 152 leaves, 2 steps):

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

Result (type 6, 3165 leaves):

$$\sqrt{a+b x^n+c x^{2 n}}\left(\frac{16 a c-48 a c n+3 b^2 n^2+32 a c n^2}{8 c (-2+n)(-1+n)(-2+3 n) x^2}+\frac{b(-4+7 n) x^{-2+n}}{4(-1+n)(-2+3 n)}+\frac{c x^{-2+2 n}}{-2+3 n}\right)+$$

$$\left(24 a^3 b n^2 x^{-2+n}\left(b-\sqrt{b^2-4 a c}+2 c x^n\right)\left(b+\sqrt{b^2-4 a c}+2 c x^n\right)\right.$$
$$\left.\text{AppellF1}\left[\frac{-2+n}{n},\frac{1}{2},\frac{1}{2},2-\frac{2}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$
$$\left(\left(b-\sqrt{b^2-4 a c}\right)\left(b+\sqrt{b^2-4 a c}\right)(-2+n)^2(-2+3 n)\left(a+x^n\left(b+c x^n\right)\right)^{3/2}\right.$$
$$\left(\left(b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[2-\frac{2}{n},\frac{1}{2},\frac{3}{2},3-\frac{2}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-\right.$$
$$\left(-b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[2-\frac{2}{n},\frac{3}{2},\frac{1}{2},3-\frac{2}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-$$
$$\left.\left.8 a(-1+n) \text{AppellF1}\left[\frac{-2+n}{n},\frac{1}{2},\frac{1}{2},2-\frac{2}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)-$$

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

$$\left(18 a^3 b n^3 x^{-2+n}\left(b-\sqrt{b^2-4 a c}+2 c x^n\right)\left(b+\sqrt{b^2-4 a c}+2 c x^n\right)\right.$$

$$\text{AppellF1}\left[\frac{-2+n}{n},\frac{1}{2},\frac{1}{2},2-\frac{2}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg/$$

$$\Bigg(\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(-2+n)^2(-2+3n)\left(a+x^n\left(b+cx^n\right)\right)^{3/2}$$

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

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

$$8a(-1+n)\,\text{AppellF1}\left[\frac{-2+n}{n},\frac{1}{2},\frac{1}{2},2-\frac{2}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg)+$$

$$\Bigg(3a^2b^3n^3x^{-2+n}\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)$$

$$\text{AppellF1}\left[\frac{-2+n}{n},\frac{1}{2},\frac{1}{2},2-\frac{2}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg/$$

$$\Bigg(2c\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(-2+n)^2(-2+3n)\left(a+x^n\left(b+cx^n\right)\right)^{3/2}$$

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

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

$$8a(-1+n)\,\text{AppellF1}\left[\frac{-2+n}{n},\frac{1}{2},\frac{1}{2},2-\frac{2}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg)+$$

$$\Bigg(6a^4n^2\left(-b+\sqrt{b^2-4ac}-2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)$$

$$\text{AppellF1}\left[-\frac{2}{n},\frac{1}{2},\frac{1}{2},\frac{-2+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg/$$

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

$$\Bigg(-4a(-2+n)\,\text{AppellF1}\left[-\frac{2}{n},\frac{1}{2},\frac{1}{2},\frac{-2+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+$$

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

$$\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{-2+n}{n},\frac{3}{2},\frac{1}{2},\right.$$

$$\left.2-\frac{2}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg)\Bigg)-$$

$$\Bigg(3a^3b^2n^2\left(-b+\sqrt{b^2-4ac}-2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)$$

$$\text{AppellF1}\left[-\frac{2}{n},\frac{1}{2},\frac{1}{2},\frac{-2+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg/$$

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

Problem 582: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 148 leaves, 2 steps):

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

Result (type 6, 415 leaves):

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

Problem 583: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 148 leaves, 2 steps):

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

Result (type 6, 417 leaves):

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

Problem 584: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 148 leaves, 2 steps):

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

Result (type 6, 415 leaves):

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

Problem 585: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 139 leaves, 2 steps):

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

Result (type 6, 400 leaves):

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

Problem 587: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 149 leaves, 2 steps):

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

Result (type 6, 415 leaves):

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

Problem 588: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 151 leaves, 2 steps):

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

Result (type 6, 415 leaves):

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

Problem 589: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 151 leaves, 2 steps):

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

Result (type 6, 1947 leaves):

$$\frac{1}{a \left(-b^2+4 a c\right) \left(a+x^n \left(b+c x^n\right)\right)^{3/2}} x^4 \left(-\frac{2 \left(b^2-2 a c+b c x^n\right) \left(a+x^n \left(b+c x^n\right)\right)}{n}+\left(64 a^2 b c (2+n) x^n \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{4+n}{n},\frac{1}{2},\frac{1}{2},2+\frac{4}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/\left(\left(-b+\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) n (4+n) \left(\left(b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[2+\frac{4}{n},\frac{1}{2},\frac{3}{2},3+\frac{4}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-\left(-b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[2+\frac{4}{n},\frac{3}{2},\frac{1}{2},3+\frac{4}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-\right.\right.$$

$$8\,a\,(2+n)\,\text{AppellF1}\left[\frac{4+n}{n},\frac{1}{2},\frac{1}{2},2+\frac{4}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)+$$

$$\Bigg(a^2\,(4+n)\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)$$

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

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

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

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

$$\Bigg(a\,b^2\,(4+n)\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)$$

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

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

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

$$-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Bigg]+\left(b-\sqrt{b^2-4\,a\,c}\right)$$

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

$$\Bigg(4\,a^2\,(4+n)\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)$$

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

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

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

$$-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Bigg]+\left(b-\sqrt{b^2-4\,a\,c}\right)$$

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

$$\Bigg(2\,a\,b^2\,(4+n)\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)$$

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

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

Problem 590: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 151 leaves, 2 steps):

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

Result (type 6, 2229 leaves):

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

$$\left(24\,a\,b\,c\,(3+2\,n)\,x^{3+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\left[\frac{3+n}{n},\frac{1}{2},\frac{1}{2},2+\frac{3}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

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

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

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

$$\left(16 a^2 c(3+n) x^3\left(b-\sqrt{b^2-4 a c}+2 c x^n\right)\left(b+\sqrt{b^2-4 a c}+2 c x^n\right)\right.$$

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

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

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

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

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

$$\left(8 a b^2(3+n) x^3\left(b-\sqrt{b^2-4 a c}+2 c x^n\right)\left(b+\sqrt{b^2-4 a c}+2 c x^n\right)\right.$$

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

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

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

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

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

$$\left(16 a^2 c(3+n) x^3\left(b-\sqrt{b^2-4 a c}+2 c x^n\right)\left(b+\sqrt{b^2-4 a c}+2 c x^n\right)\right.$$

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

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

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

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

Problem 591: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 151 leaves, 2 steps):

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

Result (type 6, 1947 leaves):

$$\frac{1}{a\left(-b^2+4 a c\right)\left(a+x^n\left(b+c x^n\right)\right)^{3/2}} 2 x^2 \left(-\frac{\left(b^2-2 a c+b c x^n\right)\left(a+x^n\left(b+c x^n\right)\right)}{n}+\right.$$
$$\left(16 a^2 b c (1+n) x^n \left(b-\sqrt{b^2-4 a c}+2 c x^n\right)\left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{2+n}{n}, \frac{1}{2}, \frac{1}{2}, 2+\frac{2}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$
$$\left(\left(-b+\sqrt{b^2-4 a c}\right)\left(b+\sqrt{b^2-4 a c}\right) n (2+n) \left(\left(b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[2+\frac{2}{n}, \frac{1}{2}, \frac{3}{2}, 3+\frac{2}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-\left(-b+\sqrt{b^2-4 a c}\right)\right.\right.$$
$$n x^n \text{AppellF1}\left[2+\frac{2}{n}, \frac{3}{2}, \frac{1}{2}, 3+\frac{2}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-$$
$$\left.\left.8 a (1+n) \text{AppellF1}\left[\frac{2+n}{n}, \frac{1}{2}, \frac{1}{2}, 2+\frac{2}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)+$$
$$\left(a^2 (2+n) \left(b-\sqrt{b^2-4 a c}+2 c x^n\right)\left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{2}{n}, \frac{1}{2}, \frac{1}{2}, \frac{2+n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$
$$\left(4 a (2+n) \text{AppellF1}\left[\frac{2}{n}, \frac{1}{2}, \frac{1}{2}, \frac{2+n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-\right.$$
$$n x^n \left(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{2+n}{n}, \frac{1}{2}, \frac{3}{2}, 2+\frac{2}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+\right.$$

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

$$\Bigg(a b^2(2+n)\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)$$

$$\text{AppellF1}\left[\frac{2}{n},\frac{1}{2},\frac{1}{2},\frac{2+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg/$$

$$\Bigg(4c\Bigg(4a(2+n)\text{AppellF1}\left[\frac{2}{n},\frac{1}{2},\frac{1}{2},\frac{2+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-$$

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

$$-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Bigg]+\left(b-\sqrt{b^2-4ac}\right)$$

$$\text{AppellF1}\left[\frac{2+n}{n},\frac{3}{2},\frac{1}{2},2+\frac{2}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg)\Bigg)-$$

$$\Bigg(2a^2(2+n)\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)$$

$$\text{AppellF1}\left[\frac{2}{n},\frac{1}{2},\frac{1}{2},\frac{2+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg/$$

$$\Bigg(n\Bigg(4a(2+n)\text{AppellF1}\left[\frac{2}{n},\frac{1}{2},\frac{1}{2},\frac{2+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-$$

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

$$-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Bigg]+\left(b-\sqrt{b^2-4ac}\right)$$

$$\text{AppellF1}\left[\frac{2+n}{n},\frac{3}{2},\frac{1}{2},2+\frac{2}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg)\Bigg)+$$

$$\Bigg(a b^2(2+n)\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)$$

$$\text{AppellF1}\left[\frac{2}{n},\frac{1}{2},\frac{1}{2},\frac{2+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg/$$

$$\Bigg(c\,n\Bigg(4a(2+n)\text{AppellF1}\left[\frac{2}{n},\frac{1}{2},\frac{1}{2},\frac{2+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-$$

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

$$-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Bigg]+\left(b-\sqrt{b^2-4ac}\right)$$

$$\text{AppellF1}\left[\frac{2+n}{n},\frac{3}{2},\frac{1}{2},2+\frac{2}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg)\Bigg)\Bigg)$$

Problem 592: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 142 leaves, 2 steps):

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

Result (type 6, 1876 leaves):

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

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

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

$$\left.\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-\left(-b+\sqrt{b^2-4 a c}\right) n x^n$$

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

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

$$\Bigg(2 a^2 (1+n) \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right)$$

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

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

$$\left(-b+\sqrt{b^2-4 a c}\right) n x^n$$

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

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

$$\Bigg(a b^2 (1+n) \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right)$$

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

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

$$\left.\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-\left(-b+\sqrt{b^2-4 a c}\right) n x^n$$

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

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

Problem 594: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 152 leaves, 2 steps):

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

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

Result (type 6, 2225 leaves):

$$\frac{2\left(-b^2+2\,a\,c-b\,c\,x^n\right)}{a\left(-b^2+4\,a\,c\right)n\,x\,\sqrt{a+b\,x^n+c\,x^{2\,n}}}+$$

$$\left(8\,a\,b\,c\,(-1+2\,n)\,x^{-1+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\right.$$

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

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

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

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

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

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

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

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

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

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

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

$$\left.\left.\left.\left.2-\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)-$$

$$\left(16\,a^2\,c\,(-1+n)\left(-b+\sqrt{b^2-4\,a\,c}-2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\right.$$

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

$$\Big(\big(-b^2+4ac\big)\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)x\,\big(a+x^n\,(b+c\,x^n)\big)^{3/2}$$

$$\Big(-4a\,(-1+n)\,\text{AppellF1}\Big[-\frac{1}{n},\frac{1}{2},\frac{1}{2},\frac{-1+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]+$$

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

$$\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\Big[\frac{-1+n}{n},\frac{3}{2},\frac{1}{2},$$

$$2-\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]\Big)\Big)\Big)+$$

$$\Big(8ab^2\,(-1+n)\left(-b+\sqrt{b^2-4ac}-2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)$$

$$\text{AppellF1}\Big[-\frac{1}{n},\frac{1}{2},\frac{1}{2},\frac{-1+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]\Big)\Big/$$

$$\Big(\big(-b^2+4ac\big)\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)n\,x\,\big(a+x^n\,(b+c\,x^n)\big)^{3/2}$$

$$\Big(-4a\,(-1+n)\,\text{AppellF1}\Big[-\frac{1}{n},\frac{1}{2},\frac{1}{2},\frac{-1+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]+$$

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

$$\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\Big[\frac{-1+n}{n},\frac{3}{2},\frac{1}{2},$$

$$2-\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]\Big)\Big)\Big)-$$

$$\Big(16a^2c\,(-1+n)\left(-b+\sqrt{b^2-4ac}-2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)$$

$$\text{AppellF1}\Big[-\frac{1}{n},\frac{1}{2},\frac{1}{2},\frac{-1+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]\Big)\Big/$$

$$\Big(\big(-b^2+4ac\big)\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)n\,x\,\big(a+x^n\,(b+c\,x^n)\big)^{3/2}$$

$$\Big(-4a\,(-1+n)\,\text{AppellF1}\Big[-\frac{1}{n},\frac{1}{2},\frac{1}{2},\frac{-1+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]+$$

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

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

Problem 595: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 154 leaves, 2 steps):

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

Result (type 6, 2221 leaves):

$$\frac{2\,\left(-b^2+2\,a\,c-b\,c\,x^n\right)}{a\,\left(-b^2+4\,a\,c\right)\,n\,x^2\,\sqrt{a+b\,x^n+c\,x^{2\,n}}}+$$

$$\left(32\,a\,b\,c\,(-1+n)\,x^{-2+n}\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\right.$$
$$\left.\text{AppellF1}\left[\frac{-2+n}{n},\frac{1}{2},\frac{1}{2},2-\frac{2}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(\left(-b^2+4\,a\,c\right)\,\left(b-\sqrt{b^2-4\,a\,c}\right)\,\left(b+\sqrt{b^2-4\,a\,c}\right)\,(-2+n)\,n\,\left(a+x^n\,\left(b+c\,x^n\right)\right)^{3/2}\right.$$
$$\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,n\,x^n\,\text{AppellF1}\left[2-\frac{2}{n},\frac{1}{2},\frac{3}{2},3-\frac{2}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$
$$\left(-b+\sqrt{b^2-4\,a\,c}\right)\,n\,x^n\,\text{AppellF1}\left[2-\frac{2}{n},\frac{3}{2},\frac{1}{2},3-\frac{2}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$
$$\left.\left.8\,a\,(-1+n)\,\text{AppellF1}\left[\frac{-2+n}{n},\frac{1}{2},\frac{1}{2},2-\frac{2}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)+$$
$$\left(2\,a\,b^2\,(-2+n)\,\left(-b+\sqrt{b^2-4\,a\,c}-2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\right.$$
$$\left.\text{AppellF1}\left[-\frac{2}{n},\frac{1}{2},\frac{1}{2},\frac{-2+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(\left(-b^2+4\,a\,c\right)\,\left(b-\sqrt{b^2-4\,a\,c}\right)\,\left(b+\sqrt{b^2-4\,a\,c}\right)\,x^2\,\left(a+x^n\,\left(b+c\,x^n\right)\right)^{3/2}\right.$$
$$\left(-4\,a\,(-2+n)\,\text{AppellF1}\left[-\frac{2}{n},\frac{1}{2},\frac{1}{2},\frac{-2+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$n\,x^n\,\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{-2+n}{n},\frac{1}{2},\frac{3}{2},2-\frac{2}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$\left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}\left[\frac{-2+n}{n},\frac{3}{2},\frac{1}{2},\right.$$
$$\left.\left.\left.\left.2-\frac{2}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)-$$
$$\left(8\,a^2\,c\,(-2+n)\,\left(-b+\sqrt{b^2-4\,a\,c}-2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\right.$$
$$\left.\text{AppellF1}\left[-\frac{2}{n},\frac{1}{2},\frac{1}{2},\frac{-2+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

$$\left(\left(-b^2+4ac\right)\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)x^2\left(a+x^n\left(b+cx^n\right)\right)^{3/2}\right.$$
$$\left(-4a(-2+n)\,\text{AppellF1}\left[-\frac{2}{n},\frac{1}{2},\frac{1}{2},\frac{-2+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+\right.$$
$$nx^n\left(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{-2+n}{n},\frac{1}{2},\frac{3}{2},2-\frac{2}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+\right.$$
$$\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{-2+n}{n},\frac{3}{2},\frac{1}{2},\right.$$
$$\left.\left.\left.\left.2-\frac{2}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right)\right)+$$
$$\left(8ab^2(-2+n)\left(-b+\sqrt{b^2-4ac}-2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\right.$$
$$\left.\text{AppellF1}\left[-\frac{2}{n},\frac{1}{2},\frac{1}{2},\frac{-2+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$
$$\left(\left(-b^2+4ac\right)\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)nx^2\left(a+x^n\left(b+cx^n\right)\right)^{3/2}\right.$$
$$\left(-4a(-2+n)\,\text{AppellF1}\left[-\frac{2}{n},\frac{1}{2},\frac{1}{2},\frac{-2+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+\right.$$
$$nx^n\left(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{-2+n}{n},\frac{1}{2},\frac{3}{2},2-\frac{2}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+\right.$$
$$\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{-2+n}{n},\frac{3}{2},\frac{1}{2},\right.$$
$$\left.\left.\left.\left.2-\frac{2}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right)\right)-$$
$$\left(16a^2c(-2+n)\left(-b+\sqrt{b^2-4ac}-2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\right.$$
$$\left.\text{AppellF1}\left[-\frac{2}{n},\frac{1}{2},\frac{1}{2},\frac{-2+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$
$$\left(\left(-b^2+4ac\right)\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)nx^2\left(a+x^n\left(b+cx^n\right)\right)^{3/2}\right.$$
$$\left(-4a(-2+n)\,\text{AppellF1}\left[-\frac{2}{n},\frac{1}{2},\frac{1}{2},\frac{-2+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+\right.$$
$$nx^n\left(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{-2+n}{n},\frac{1}{2},\frac{3}{2},2-\frac{2}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+\right.$$
$$\left.\left.\left.\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{-2+n}{n},\frac{3}{2},\frac{1}{2},2-\frac{2}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right)\right)$$

Problem 600: Result more than twice size of optimal antiderivative.

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

Optimal (type 5, 328 leaves, 5 steps):

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

Result (type 5, 3515 leaves):

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

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

$$1-\frac{1+m}{n},\ -\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]+\frac{1}{\sqrt{b^2-4ac}}\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},\ -\frac{1+m}{n},\ 1-\frac{1+m}{n},\ -\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg)\Big/$$

$$\left(a\left(-b^2+4ac\right)(1+m)\,n\right)+\Bigg(b\,c\,m\,x^{1+n}\,(d\,x)^m\,\left(x^n\right)^{\frac{1+m}{n}-\frac{1+m+n}{n}}\Bigg(-\frac{1}{\sqrt{b^2-4ac}}\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

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

$$\frac{1}{\sqrt{b^2-4ac}}\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},\ -\frac{1+m}{n},$$

$$1-\frac{1+m}{n},\ -\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg)\Big/\left(a\left(-b^2+4ac\right)(1+m)\,n\right)+$$

$$\Bigg(b^2\,x\,(d\,x)^m\Bigg(\Bigg(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},\ -\frac{1+m}{n},\ 1-\frac{1+m}{n},$$

$$-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Big/\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+$$

$$\Bigg(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},\ -\frac{1+m}{n},\ 1-\frac{1+m}{n},$$

$$-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(a\left(-b^2+4ac\right)(1+m)\right)-\Bigg(4cx(dx)^m\Bigg(\Bigg(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+\Bigg(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/\left(\left(-b^2+4ac\right)(1+m)\right)-$$

$$\Bigg(b^2x(dx)^m\Bigg(\Bigg(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},$$

$$-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+$$

$$\Bigg(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},$$

$$-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Bigg]\Bigg)\Bigg/\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(a\left(-b^2+4ac\right)(1+m)\,n\right)+\left(2cx\,(dx)^m\left(\left(\left(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)\right)^{-\frac{1}{n}-\frac{m}{n}}\right.\right.\right.$$

$$\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+\left(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/\left(\left(-b^2+4ac\right)(1+m)\,n\right)-$$

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

$$-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Bigg]\Bigg)\Bigg/\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+$$

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

$$- \frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\Big]\Bigg)\Bigg) \Bigg/ \left(\frac{b\,\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}\right)\Bigg)\Bigg) \Bigg/$$

$$\left(a\,\left(-b^2+4\,a\,c\right)\,(1+m)\,n\right)+\Bigg(2\,c\,m\,x\,(d\,x)^m\,\Bigg(\Bigg(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

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

$$\left(\frac{b\,\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}\right)+\Bigg(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

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

$$\left(\frac{b\,\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}\right)\Bigg)\Bigg) \Bigg/ \left(\left(-b^2+4\,a\,c\right)\,(1+m)\,n\right)$$

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

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

Optimal (type 5, 615 leaves, 6 steps):

$$\frac{(d\,x)^{1+m}\left(b^2-2\,a\,c+b\,c\,x^n\right)}{2\,a\left(b^2-4\,a\,c\right)d\,n\left(a+b\,x^n+c\,x^{2\,n}\right)^2}-\left((d\,x)^{1+m}\left(4\,a^2\,c^2\,(1+m-4\,n)-5\,a\,b^2\,c\,(1+m-3\,n)+b^4\,(1+m-2\,n)-b\,c\left(2\,a\,c\,(2+2\,m-7\,n)-b^2\,(1+m-2\,n)\right)x^n\right)\right)\Big/\left(2\,a^2\left(b^2-4\,a\,c\right)^2 d\,n^2\left(a+b\,x^n+c\,x^{2\,n}\right)\right)-$$

$$\left(c\left(b\sqrt{b^2-4\,a\,c}\,\left(2\,a\,c\,(2+2\,m-7\,n)-b^2\,(1+m-2\,n)\right)(1+m-n)-b^4\left(1+m^2+m\,(2-3\,n)-3\,n+2\,n^2\right)+6\,a\,b^2\,c\left(1+m^2+m\,(2-4\,n)-4\,n+3\,n^2\right)-8\,a^2\,c^2\left(1+m^2+m\,(2-6\,n)-6\,n+8\,n^2\right)\right)(d\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(2\,a^2\left(b^2-4\,a\,c\right)^{5/2}\left(b-\sqrt{b^2-4\,a\,c}\right)d\,(1+m)\,n^2\right)-$$

$$\left(c\left(b\sqrt{b^2-4\,a\,c}\,\left(2\,a\,c\,(2+2\,m-7\,n)-b^2\,(1+m-2\,n)\right)(1+m-n)+b^4\left(1+m^2+m\,(2-3\,n)-3\,n+2\,n^2\right)-6\,a\,b^2\,c\left(1+m^2+m\,(2-4\,n)-4\,n+3\,n^2\right)+8\,a^2\,c^2\left(1+m^2+m\,(2-6\,n)-6\,n+8\,n^2\right)\right)(d\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(2\,a^2\left(b^2-4\,a\,c\right)^{5/2}\left(b+\sqrt{b^2-4\,a\,c}\right)d\,(1+m)\,n^2\right)$$

Result (type 5, 12 289 leaves) :

$$\frac{1}{1+m}\left(-\frac{b^4}{a^3\left(-b^2+4\,a\,c\right)^2}+\frac{8\,b^2\,c}{a^2\left(-b^2+4\,a\,c\right)^2}-\frac{16\,c^2}{a\left(-b^2+4\,a\,c\right)^2}-\frac{b^4\,m}{a^3\left(-b^2+4\,a\,c\right)^2 n^2}+\frac{5\,b^2\,c\,m}{a^2\left(-b^2+4\,a\,c\right)^2 n^2}-\frac{2\,c^2\,(1+m)^2}{a\left(-b^2+4\,a\,c\right)^2 n^2}+\frac{b^4\left(-1-m^2\right)}{2\,a^3\left(-b^2+4\,a\,c\right)^2 n^2}+\frac{5\,b^2\,c\left(1+m^2\right)}{2\,a^2\left(-b^2+4\,a\,c\right)^2 n^2}+\frac{3\,b^4\,(1+m)}{2\,a^3\left(-b^2+4\,a\,c\right)^2 n}-\frac{21\,b^2\,c\,(1+m)}{2\,a^2\left(-b^2+4\,a\,c\right)^2 n}+\frac{12\,c^2\,(1+m)}{a\left(-b^2+4\,a\,c\right)^2 n}\right)x\,(d\,x)^m+$$

$$\left(\left(b^4-5\,a\,b^2\,c+4\,a^2\,c^2+2\,b^4\,m-10\,a\,b^2\,c\,m+8\,a^2\,c^2\,m+b^4\,m^2-5\,a\,b^2\,c\,m^2+4\,a^2\,c^2\,m^2-3\,b^4\,n+21\,a\,b^2\,c\,n-24\,a^2\,c^2\,n-3\,b^4\,m\,n+21\,a\,b^2\,c\,m\,n-24\,a^2\,c^2\,m\,n+2\,b^4\,n^2-16\,a\,b^2\,c\,n^2+32\,a^2\,c^2\,n^2\right)x\,(d\,x)^m\right)\Big/\left(2\,a^3\left(-b^2+4\,a\,c\right)^2(1+m)\,n^2\right)+\frac{x\,(d\,x)^m\left(-b^2+2\,a\,c-b\,c\,x^n\right)}{2\,a\left(-b^2+4\,a\,c\right)n\left(a+b\,x^n+c\,x^{2\,n}\right)^2}+$$

$$\left(x^{-m}\,(d\,x)^m\left(-b^4\,x^{1+m}+5\,a\,b^2\,c\,x^{1+m}-4\,a^2\,c^2\,x^{1+m}-b^4\,m\,x^{1+m}+5\,a\,b^2\,c\,m\,x^{1+m}-4\,a^2\,c^2\,m\,x^{1+m}+2\,b^4\,n\,x^{1+m}-15\,a\,b^2\,c\,n\,x^{1+m}+16\,a^2\,c^2\,n\,x^{1+m}-b^3\,c\,x^{1+m+n}+4\,a\,b\,c^2\,x^{1+m+n}-b^3\,c\,m\,x^{1+m+n}+4\,a\,b\,c^2\,m\,x^{1+m+n}+2\,b^3\,c\,n\,x^{1+m+n}-14\,a\,b\,c^2\,n\,x^{1+m+n}\right)\right)\Big/\left(2\,a^2\left(-b^2+4\,a\,c\right)^2 n^2\left(a+b\,x^n+c\,x^{2\,n}\right)\right)+$$

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

$$\left.-\frac{1+m}{n},\, 1-\frac{1+m}{n},\, -\frac{-b-\sqrt{b^2-4\, a\, c}}{2\, c \left(-\frac{-b-\sqrt{b^2-4\, a\, c}}{2\, c}+x^n\right)}\right] + \frac{1}{\sqrt{b^2-4\, a\, c}} \left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\, a\, c}}{2\, c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

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

$$\left(a^2 \left(-b^2+4\, a\, c\right)^2 \left(1+m\right)\right) - \left(7\, b\, c^2\, x^{1+n} \left(d\, x\right)^m \left(x^n\right)^{\frac{1+m}{n}-\frac{1+m+n}{n}}\right.$$

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

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

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

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

$$-\frac{1+m}{n},\, -\frac{1+m}{n},\, 1-\frac{1+m}{n},\, -\frac{-b-\sqrt{b^2-4\, a\, c}}{2\, c \left(-\frac{-b-\sqrt{b^2-4\, a\, c}}{2\, c}+x^n\right)}\Big] + \frac{1}{\sqrt{b^2-4\, a\, c}} \left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\, a\, c}}{2\, c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

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

$$\left(2a^2\left(-b^2+4ac\right)^2(1+m)\,n^2\right)-\left(2\,b\,c^2\,x^{1+n}\,(d\,x)^m\,\left(x^n\right)^{\frac{1+m}{n}-\frac{1+m+n}{n}}\right.$$

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

$$\left.1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]+\frac{1}{\sqrt{b^2-4ac}}\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

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

$$\left(a\left(-b^2+4ac\right)^2(1+m)\,n^2\right)+\left(b^3\,c\,m\,x^{1+n}\,(d\,x)^m\,\left(x^n\right)^{\frac{1+m}{n}-\frac{1+m+n}{n}}\right.$$

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

$$\left.1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]+\frac{1}{\sqrt{b^2-4ac}}\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

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

$$\left(a^2\left(-b^2+4ac\right)^2(1+m)\,n^2\right)-\left(4bc^2 m\,x^{1+n}(d\,x)^m\left(x^n\right)^{\frac{1+m}{n}-\frac{1+m+n}{n}}\right.$$

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

$$\left.1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]+\frac{1}{\sqrt{b^2-4ac}}\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

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

$$\left(a\left(-b^2+4ac\right)^2(1+m)\,n^2\right)+\left(b^3 c\,m^2 x^{1+n}(d\,x)^m\left(x^n\right)^{\frac{1+m}{n}-\frac{1+m+n}{n}}\right.$$

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

$$\left.1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]+\frac{1}{\sqrt{b^2-4ac}}\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

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

$$\left(2a^2\left(-b^2+4ac\right)^2(1+m)\,n^2\right)-\left(2bc^2 m^2 x^{1+n}(d\,x)^m\left(x^n\right)^{\frac{1+m}{n}-\frac{1+m+n}{n}}\right.$$

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

$$\left.1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]+\frac{1}{\sqrt{b^2-4\,a\,c}}\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

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

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

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

$$\left.1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]+\frac{1}{\sqrt{b^2-4\,a\,c}}\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

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

$$\left(2\,a^2\left(-b^2+4\,a\,c\right)^2\left(1+m\right)n\right)+\left(9\,b\,c^2\,x^{1+n}\left(d\,x\right)^m\left(x^n\right)^{\frac{1+m}{n}-\frac{1+m+n}{n}}\right.$$

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

$$1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]+\frac{1}{\sqrt{b^2-4ac}}\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg)\Bigg/$$

$$\left(a\left(-b^2+4ac\right)^2(1+m)\,n\right)-\Bigg(3b^3cm\,x^{1+n}(d\,x)^m\left(x^n\right)^{\frac{1+m}{n}-\frac{1+m+n}{n}}$$

$$\Bigg(-\frac{1}{\sqrt{b^2-4ac}}\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},$$

$$1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]+\frac{1}{\sqrt{b^2-4ac}}\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg)\Bigg/$$

$$\left(2a^2\left(-b^2+4ac\right)^2(1+m)\,n\right)+\Bigg(9bc^2m\,x^{1+n}(d\,x)^m\left(x^n\right)^{\frac{1+m}{n}-\frac{1+m+n}{n}}$$

$$\Bigg(-\frac{1}{\sqrt{b^2-4ac}}\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},$$

$$1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]+\frac{1}{\sqrt{b^2-4ac}}\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]\Bigg)\Bigg)\Bigg/$$

$$\left(a\left(-b^2+4ac\right)^2(1+m)\,n\right)-\left(b^4 x\,(d x)^m\left(\left(\left(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\right.\right.\right.\right.$$

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

$$\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+\left(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\right.$$

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

$$\left.\left.\left.\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\right)\right)\right)\Bigg/\left(a^2\left(-b^2+4ac\right)^2(1+m)\right)+$$

$$\left(8b^2 c\,x\,(d x)^m\left(\left(\left(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},\right.\right.\right.\right.\right.$$

$$\left.\left.-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]\right)\Bigg/\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+$$

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

$$-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Bigg]\Bigg)\Bigg/\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(a\left(-b^2+4ac\right)^2(1+m)\right)-\Bigg(16c^2x(dx)^m\Bigg(\Bigg(\left(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\right.$$

$$\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+\Bigg(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/\left(\left(-b^2+4ac\right)^2(1+m)\right)-$$

$$\Bigg(b^4x(dx)^m\Bigg(\Bigg(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Bigg[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},$$

$$-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Bigg]\Bigg)\Bigg/\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+$$

$$\Bigg(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Bigg[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},$$

$$-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(2a^2\left(-b^2+4ac\right)^2(1+m)\,n^2\right)+\Bigg(5b^2c\,x\,(d\,x)^m\Bigg(\Bigg(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+\Bigg(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/\left(2a\left(-b^2+4ac\right)^2(1+m)\,n^2\right)-$$

$$\Bigg(2c^2x\,(d\,x)^m\Bigg(\Bigg(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},$$

$$-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+$$

$$\Bigg(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},$$

$$- \frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\Big]\Bigg) \Bigg/ \left(\frac{b\left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}\right)\Bigg)\Bigg) \Bigg/$$

$$\left(\left(-b^2+4 a c\right)^2 (1+m) n^2\right) - \Bigg(b^4 m x (d x)^m \Bigg(\Bigg(\left(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)\right)^{-\frac{1}{n}-\frac{m}{n}}$$

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

$$\left(\frac{b\left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}\right) + \Bigg(\left(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)\right)^{-\frac{1}{n}-\frac{m}{n}}$$

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

$$\left(\frac{b\left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}\right)\Bigg)\Bigg) \Bigg/ \left(a^2 \left(-b^2+4 a c\right)^2 (1+m) n^2\right) +$$

$$\Bigg(5 b^2 c m x (d x)^m \Bigg(\Bigg(\left(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)\right)^{-\frac{1}{n}-\frac{m}{n}} \text{Hypergeometric2F1}\Big[-\frac{1+m}{n}, -\frac{1+m}{n}, 1-\frac{1+m}{n},$$

$$-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\Big]\Bigg) \Bigg/ \left(\frac{b\left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}\right) +$$

$$\Bigg(\left(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)\right)^{-\frac{1}{n}-\frac{m}{n}} \text{Hypergeometric2F1}\Big[-\frac{1+m}{n}, -\frac{1+m}{n}, 1-\frac{1+m}{n},$$

$$-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(a\left(-b^2+4ac\right)^2(1+m)\,n^2\right)-\Bigg(4c^2mx\,(dx)^m\Bigg(\Bigg(\Bigg(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+\Bigg(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/\left(\left(-b^2+4ac\right)^2(1+m)\,n^2\right)-$$

$$\Bigg(b^4m^2x\,(dx)^m\Bigg(\Bigg(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},$$

$$-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+$$

$$\Bigg(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},$$

$$-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(2a^2\left(-b^2+4ac\right)^2(1+m)\,n^2\right)+\Bigg(5b^2cm^2x\,(dx)^m\Bigg(\Bigg(\left(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\right.$$

$$\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+\left(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\right.$$

$$\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/\left(2a\left(-b^2+4ac\right)^2(1+m)\,n^2\right)-$$

$$\Bigg(2c^2m^2x\,(dx)^m\Bigg(\Bigg(\left(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\right.\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},$$

$$-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+$$

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

$$-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(\left(-b^2+4ac\right)^2(1+m)\,n^2\right)+\Bigg(3b^4x\,(dx)^m\Bigg(\Bigg(\left(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+\Bigg(\left(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/\left(2a^2\left(-b^2+4ac\right)^2(1+m)\,n\right)-$$

$$\Bigg(21b^2c\,x\,(dx)^m\Bigg(\Bigg(\left(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},$$

$$-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+$$

$$\Bigg(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)\Bigg)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},$$

$$-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(2a\left(-b^2+4ac\right)^2(1+m)\,n\right)+\Bigg(12c^2x\,(dx)^m\Bigg(\Bigg(\Bigg(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+\Bigg(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg)\Bigg/\left(\left(-b^2+4ac\right)^2(1+m)\,n\right)+$$

$$\Bigg(3b^4m\,x\,(dx)^m\Bigg(\Bigg(\Bigg(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},$$

$$-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+$$

$$\Bigg(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},$$

$$-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Bigg]\Bigg)\Bigg/\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(2a^2\left(-b^2+4ac\right)^2(1+m)\,n\right)-\Bigg(21\,b^2\,c\,m\,x\,(d\,x)^m\Bigg(\Bigg(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+\Bigg(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/\left(2a\left(-b^2+4ac\right)^2(1+m)\,n\right)+$$

$$\Bigg(12\,c^2\,m\,x\,(d\,x)^m\Bigg(\Bigg(1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\Big[-\frac{1+m}{n},$$

$$-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\Big]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}\right)+\Bigg(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}$$

$$\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]\Bigg)\Bigg/$$

$$\left(\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}\right)\Bigg)\Bigg)\Bigg/\left(\left(-b^2+4ac\right)^2(1+m)\,n\right)$$

Problem 602: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 161 leaves, 2 steps):

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

$$\left(d\,(1+m)\sqrt{1+\frac{2cx^n}{b-\sqrt{b^2-4ac}}}\sqrt{1+\frac{2cx^n}{b+\sqrt{b^2-4ac}}}\right)$$

Result (type 6, 5259 leaves):

$$x^{-m}(d\,x)^m\sqrt{a+b\,x^n+c\,x^{2n}}\left(\frac{\left(4ac+8acm+4acm^2+24acn+24acmn+3b^2n^2+32acn^2\right)x^{1+m}}{4c\,(1+m+n)\,(1+m+2n)\,(1+m+3n)}+\right.$$

$$\left.\frac{b\,(2+2m+7n)\,x^{1+m+n}}{2\,(1+m+2n)\,(1+m+3n)}+\frac{c\,x^{1+m+2n}}{1+m+3n}\right)+$$

$$\left(12a^4n^2x\,(d\,x)^m\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\right.$$

$$\left.\text{AppellF1}\left[\frac{1+m}{n},\frac{1}{2},\frac{1}{2},\frac{1+m+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Bigg/$$

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

$$\left(4a\,(1+m+n)\,\text{AppellF1}\left[\frac{1+m}{n},\frac{1}{2},\frac{1}{2},\frac{1+m+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-\right.$$

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

$$\left.-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+\left(b-\sqrt{b^2-4ac}\right)$$

$$\left.\left.\left.\text{AppellF1}\left[\frac{1+m+n}{n},\frac{3}{2},\frac{1}{2},\frac{1+m+2n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right)\right)-$$

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

$$\left(12 a^4 m n^2 x (d x)^m \left(b-\sqrt{b^2-4 a c}+2 c x^n\right)\left(b+\sqrt{b^2-4 a c}+2 c x^n\right)\right.$$
$$\left.\text{AppellF1}\left[\frac{1+m}{n},\frac{1}{2},\frac{1}{2},\frac{1+m+n}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$
$$\left(\left(b-\sqrt{b^2-4 a c}\right)\left(b+\sqrt{b^2-4 a c}\right)(1+m)(1+m+2 n)(1+m+3 n)\left(a+x^n\left(b+c x^n\right)\right)^{3/2}\right.$$
$$\left(4 a (1+m+n)\,\text{AppellF1}\left[\frac{1+m}{n},\frac{1}{2},\frac{1}{2},\frac{1+m+n}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-\right.$$
$$n x^n\left(\left(b+\sqrt{b^2-4 a c}\right)\text{AppellF1}\left[\frac{1+m+n}{n},\frac{1}{2},\frac{3}{2},\frac{1+m+2 n}{n},\right.\right.$$
$$\left.-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right)$$
$$\left.\left.\left.\left.\text{AppellF1}\left[\frac{1+m+n}{n},\frac{3}{2},\frac{1}{2},\frac{1+m+2 n}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)\right)-$$

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

$$\text{AppellF1}\left[\frac{1+m+n}{n},\frac{3}{2},\frac{1}{2},\frac{1+m+2n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg)\Bigg)+$$

$$\Bigg(24a^4n^3x\,(dx)^m\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)$$

$$\text{AppellF1}\left[\frac{1+m}{n},\frac{1}{2},\frac{1}{2},\frac{1+m+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Big/$$

$$\Bigg(\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(1+m)(1+m+2n)(1+m+3n)\left(a+x^n\left(b+cx^n\right)\right)^{3/2}$$

$$\Bigg(4a(1+m+n)\,\text{AppellF1}\left[\frac{1+m}{n},\frac{1}{2},\frac{1}{2},\frac{1+m+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-$$

$$nx^n\Bigg(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{1+m+n}{n},\frac{1}{2},\frac{3}{2},\frac{1+m+2n}{n},\right.$$

$$\left.-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+\left(b-\sqrt{b^2-4ac}\right)$$

$$\text{AppellF1}\left[\frac{1+m+n}{n},\frac{3}{2},\frac{1}{2},\frac{1+m+2n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg)\Bigg)+$$

$$\Bigg(12a^3b\,n^2x^{1+n}(dx)^m\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)$$

$$\text{AppellF1}\left[\frac{1+m+n}{n},\frac{1}{2},\frac{1}{2},\frac{1+m+2n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Big/$$

$$\Bigg(\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(1+m+n)^2(1+m+3n)\left(a+x^n\left(b+cx^n\right)\right)^{3/2}$$

$$\Bigg(4a(1+m+2n)\,\text{AppellF1}\left[\frac{1+m+n}{n},\frac{1}{2},\frac{1}{2},\frac{1+m+2n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-$$

$$nx^n\Bigg(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{1+m+2n}{n},\frac{1}{2},\frac{3}{2},\frac{1+m+3n}{n},\right.$$

$$\left.-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+\left(b-\sqrt{b^2-4ac}\right)$$

$$\text{AppellF1}\left[\frac{1+m+2n}{n},\frac{3}{2},\frac{1}{2},\frac{1+m+3n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg)\Bigg)-$$

$$\Bigg(3a^2b^3n^2x^{1+n}(dx)^m\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)$$

$$\text{AppellF1}\left[\frac{1+m+n}{n},\frac{1}{2},\frac{1}{2},\frac{1+m+2n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Big/$$

$$\Bigg(c\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(1+m+n)^2(1+m+3n)\left(a+x^n\left(b+cx^n\right)\right)^{3/2}$$

$$\Bigg(4a(1+m+2n)\,\text{AppellF1}\left[\frac{1+m+n}{n},\frac{1}{2},\frac{1}{2},\frac{1+m+2n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-$$

$$nx^n\Bigg(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{1+m+2n}{n},\frac{1}{2},\frac{3}{2},\frac{1+m+3n}{n},\right.$$

$$-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big] + \left(b-\sqrt{b^2-4 a c}\right)$$

$$\text{AppellF1}\Big[\frac{1+m+2 n}{n}, \frac{3}{2}, \frac{1}{2}, \frac{1+m+3 n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big]\Bigg)\Bigg)\Bigg) +$$

$$\Bigg(12 a^3 b m n^2 x^{1+n} (d x)^m \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right)$$

$$\text{AppellF1}\Big[\frac{1+m+n}{n}, \frac{1}{2}, \frac{1}{2}, \frac{1+m+2 n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big]\Bigg) \Big/$$

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

$$\Bigg(4 a (1+m+2 n) \text{AppellF1}\Big[\frac{1+m+n}{n}, \frac{1}{2}, \frac{1}{2}, \frac{1+m+2 n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big] -$$

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

$$-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big] + \left(b-\sqrt{b^2-4 a c}\right)$$

$$\text{AppellF1}\Big[\frac{1+m+2 n}{n}, \frac{3}{2}, \frac{1}{2}, \frac{1+m+3 n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big]\Bigg)\Bigg)\Bigg) -$$

$$\Bigg(3 a^2 b^3 m n^2 x^{1+n} (d x)^m \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right)$$

$$\text{AppellF1}\Big[\frac{1+m+n}{n}, \frac{1}{2}, \frac{1}{2}, \frac{1+m+2 n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big]\Bigg) \Big/$$

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

$$\Bigg(4 a (1+m+2 n) \text{AppellF1}\Big[\frac{1+m+n}{n}, \frac{1}{2}, \frac{1}{2}, \frac{1+m+2 n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big] -$$

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

$$-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big] + \left(b-\sqrt{b^2-4 a c}\right)$$

$$\text{AppellF1}\Big[\frac{1+m+2 n}{n}, \frac{3}{2}, \frac{1}{2}, \frac{1+m+3 n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big]\Bigg)\Bigg)\Bigg) +$$

$$\Bigg(18 a^3 b n^3 x^{1+n} (d x)^m \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right)$$

$$\text{AppellF1}\Big[\frac{1+m+n}{n}, \frac{1}{2}, \frac{1}{2}, \frac{1+m+2 n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big]\Bigg) \Big/$$

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

$$\Bigg(4 a (1+m+2 n) \text{AppellF1}\Big[\frac{1+m+n}{n}, \frac{1}{2}, \frac{1}{2}, \frac{1+m+2 n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big] -$$

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

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

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

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

Problem 603: Result more than twice size of optimal antiderivative.

$$\int (d x)^m \sqrt{a+b x^n+c x^{2 n}} \, dx$$

Optimal (type 6, 160 leaves, 2 steps):

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

Result (type 6, 930 leaves):

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

Problem 604: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 160 leaves, 2 steps):

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

Result (type 6, 440 leaves):

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

Problem 605: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 163 leaves, 2 steps):

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

Result (type 6, 3743 leaves):

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

$$-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]+\Big(b-\sqrt{b^2-4\,a\,c}\Big)$$

$$\text{AppellF1}\Big[\frac{1+m+n}{n},\ \frac{3}{2},\ \frac{1}{2},\ \frac{1+m+2\,n}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big)\Big)+$$

$$\Big(16\,a^2\,c\,(1+m+n)\,x\,(d\,x)^m\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)$$

$$\text{AppellF1}\Big[\frac{1+m}{n},\ \frac{1}{2},\ \frac{1}{2},\ \frac{1+m+n}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

$$\Big(\Big(-b^2+4\,a\,c\Big)\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,(1+m)\,\Big(a+x^n\,(b+c\,x^n)\Big)^{3/2}$$

$$\Big(4\,a\,(1+m+n)\,\text{AppellF1}\Big[\frac{1+m}{n},\ \frac{1}{2},\ \frac{1}{2},\ \frac{1+m+n}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-$$

$$n\,x^n\,\Big(\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,\text{AppellF1}\Big[\frac{1+m+n}{n},\ \frac{1}{2},\ \frac{3}{2},\ \frac{1+m+2\,n}{n},$$

$$-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]+\Big(b-\sqrt{b^2-4\,a\,c}\Big)$$

$$\text{AppellF1}\Big[\frac{1+m+n}{n},\ \frac{3}{2},\ \frac{1}{2},\ \frac{1+m+2\,n}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big)\Big)+$$

$$\Big(8\,a\,b^2\,(1+m+n)\,x\,(d\,x)^m\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)$$

$$\text{AppellF1}\Big[\frac{1+m}{n},\ \frac{1}{2},\ \frac{1}{2},\ \frac{1+m+n}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

$$\Big(\Big(-b^2+4\,a\,c\Big)\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,(1+m)\,n\,\Big(a+x^n\,(b+c\,x^n)\Big)^{3/2}$$

$$\Big(4\,a\,(1+m+n)\,\text{AppellF1}\Big[\frac{1+m}{n},\ \frac{1}{2},\ \frac{1}{2},\ \frac{1+m+n}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-$$

$$n\,x^n\,\Big(\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,\text{AppellF1}\Big[\frac{1+m+n}{n},\ \frac{1}{2},\ \frac{3}{2},\ \frac{1+m+2\,n}{n},$$

$$-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]+\Big(b-\sqrt{b^2-4\,a\,c}\Big)$$

$$\text{AppellF1}\Big[\frac{1+m+n}{n},\ \frac{3}{2},\ \frac{1}{2},\ \frac{1+m+2\,n}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big)\Big)-$$

$$\Big(16\,a^2\,c\,(1+m+n)\,x\,(d\,x)^m\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)$$

$$\text{AppellF1}\Big[\frac{1+m}{n},\ \frac{1}{2},\ \frac{1}{2},\ \frac{1+m+n}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

$$\Big(\Big(-b^2+4\,a\,c\Big)\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,(1+m)\,n\,\Big(a+x^n\,(b+c\,x^n)\Big)^{3/2}$$

$$\Big(4\,a\,(1+m+n)\,\text{AppellF1}\Big[\frac{1+m}{n},\ \frac{1}{2},\ \frac{1}{2},\ \frac{1+m+n}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-$$

$$n x^n \Big(\Big(b+\sqrt{b^2-4 a c}\Big) \text{AppellF1}\Big[\frac{1+m+n}{n}, \frac{1}{2}, \frac{3}{2}, \frac{1+m+2 n}{n},$$

$$-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big] + \Big(b-\sqrt{b^2-4 a c}\Big)$$

$$\text{AppellF1}\Big[\frac{1+m+n}{n}, \frac{3}{2}, \frac{1}{2}, \frac{1+m+2 n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big]\Big)\Big)\Big) +$$

$$\Big(8 a b^2 m (1+m+n) x (d x)^m \Big(b-\sqrt{b^2-4 a c}+2 c x^n\Big) \Big(b+\sqrt{b^2-4 a c}+2 c x^n\Big)$$

$$\text{AppellF1}\Big[\frac{1+m}{n}, \frac{1}{2}, \frac{1}{2}, \frac{1+m+n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big]\Big) \Big/$$

$$\Big(\Big(-b^2+4 a c\Big) \Big(b-\sqrt{b^2-4 a c}\Big) \Big(b+\sqrt{b^2-4 a c}\Big) (1+m) n \Big(a+x^n \big(b+c x^n\big)\Big)^{3/2}$$

$$\Big(4 a (1+m+n) \text{AppellF1}\Big[\frac{1+m}{n}, \frac{1}{2}, \frac{1}{2}, \frac{1+m+n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big] -$$

$$n x^n \Big(\Big(b+\sqrt{b^2-4 a c}\Big) \text{AppellF1}\Big[\frac{1+m+n}{n}, \frac{1}{2}, \frac{3}{2}, \frac{1+m+2 n}{n},$$

$$-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big] + \Big(b-\sqrt{b^2-4 a c}\Big)$$

$$\text{AppellF1}\Big[\frac{1+m+n}{n}, \frac{3}{2}, \frac{1}{2}, \frac{1+m+2 n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big]\Big)\Big)\Big) -$$

$$\Big(16 a^2 c m (1+m+n) x (d x)^m \Big(b-\sqrt{b^2-4 a c}+2 c x^n\Big) \Big(b+\sqrt{b^2-4 a c}+2 c x^n\Big)$$

$$\text{AppellF1}\Big[\frac{1+m}{n}, \frac{1}{2}, \frac{1}{2}, \frac{1+m+n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big]\Big) \Big/$$

$$\Big(\Big(-b^2+4 a c\Big) \Big(b-\sqrt{b^2-4 a c}\Big) \Big(b+\sqrt{b^2-4 a c}\Big) (1+m) n \Big(a+x^n \big(b+c x^n\big)\Big)^{3/2}$$

$$\Big(4 a (1+m+n) \text{AppellF1}\Big[\frac{1+m}{n}, \frac{1}{2}, \frac{1}{2}, \frac{1+m+n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big] -$$

$$n x^n \Big(\Big(b+\sqrt{b^2-4 a c}\Big) \text{AppellF1}\Big[\frac{1+m+n}{n}, \frac{1}{2}, \frac{3}{2}, \frac{1+m+2 n}{n},$$

$$-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big] + \Big(b-\sqrt{b^2-4 a c}\Big)$$

$$\text{AppellF1}\Big[\frac{1+m+n}{n}, \frac{3}{2}, \frac{1}{2}, \frac{1+m+2 n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big]\Big)\Big)\Big) +$$

$$\Big(8 a b c (1+m+2 n) x^{1+n} (d x)^m \Big(b-\sqrt{b^2-4 a c}+2 c x^n\Big) \Big(b+\sqrt{b^2-4 a c}+2 c x^n\Big)$$

$$\text{AppellF1}\Big[\frac{1+m+n}{n}, \frac{1}{2}, \frac{1}{2}, \frac{1+m+2 n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big]\Big) \Big/$$

$$\Big(\Big(-b^2+4 a c\Big) \Big(b-\sqrt{b^2-4 a c}\Big) \Big(b+\sqrt{b^2-4 a c}\Big) n (1+m+n) \Big(a+x^n \big(b+c x^n\big)\Big)^{3/2}$$

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

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

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

$$\left(8\,a\,b\,c\,m\,(1+m+2\,n)\,x^{1+n}\,(d\,x)^m\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\right.$$

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

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

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

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

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

Problem 606: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 158 leaves, 2 steps):

$$\frac{1}{d\,(1+m)}(d\,x)^{1+m}\left(1+\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right)^{-p}\left(1+\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right)^{-p}\left(a+b\,x^n+c\,x^{2\,n}\right)^p$$

$$\text{AppellF1}\left[\frac{1+m}{n},-p,-p,\frac{1+m+n}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]$$

Result (type 6, 534 leaves):

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

Problem 607: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 46 leaves, 3 steps):

$$\frac{a(d+e x)^4}{4e}+\frac{b(d+e x)^6}{6e}+\frac{c(d+e x)^8}{8e}$$

Result (type 1, 150 leaves):

$$d^3\left(a+bd^2+cd^4\right)x+\frac{1}{2}d^2\left(3a+5bd^2+7cd^4\right)e x^2+\frac{1}{3}d\left(3a+10bd^2+21cd^4\right)e^2x^3+$$
$$\frac{1}{4}\left(a+10bd^2+35cd^4\right)e^3x^4+d\left(b+7cd^2\right)e^4x^5+\frac{1}{6}\left(b+21cd^2\right)e^5x^6+c\,d\,e^6x^7+\frac{1}{8}c\,e^7x^8$$

Problem 608: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 89 leaves, 4 steps):

$$\frac{a^2(d+e x)^4}{4e}+\frac{ab(d+e x)^6}{3e}+\frac{\left(b^2+2ac\right)(d+e x)^8}{8e}+\frac{bc(d+e x)^{10}}{5e}+\frac{c^2(d+e x)^{12}}{12e}$$

Result (type 1, 401 leaves):

$$d^3\left(a+b d^2+c d^4\right)^2 x+\frac{1}{2} d^2\left(3 a^2+10 a b d^2+7 b^2 d^4+14 a c d^4+18 b c d^6+11 c^2 d^8\right) e x^2+$$
$$\frac{1}{3} d\left(3 a^2+20 a b d^2+21 b^2 d^4+42 a c d^4+72 b c d^6+55 c^2 d^8\right) e^2 x^3+$$
$$\frac{1}{4}\left(a^2+20 a b d^2+35 b^2 d^4+70 a c d^4+168 b c d^6+165 c^2 d^8\right) e^3 x^4+$$
$$\frac{1}{5} d\left(10 a b+35 b^2 d^2+70 a c d^2+252 b c d^4+330 c^2 d^6\right) e^4 x^5+$$
$$\frac{1}{6}\left(2 a b+21 b^2 d^2+42 a c d^2+252 b c d^4+462 c^2 d^6\right) e^5 x^6+$$
$$d\left(b^2+2 a c+24 b c d^2+66 c^2 d^4\right) e^6 x^7+\frac{1}{8}\left(b^2+2 a c+72 b c d^2+330 c^2 d^4\right) e^7 x^8+$$
$$\frac{1}{3} c d\left(6 b+55 c d^2\right) e^8 x^9+\frac{1}{10} c\left(2 b+55 c d^2\right) e^9 x^{10}+c^2 d e^{10} x^{11}+\frac{1}{12} c^2 e^{11} x^{12}$$

Problem 609: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 138 leaves, 4 steps):

$$\frac{a^3 (d+e x)^4}{4 e}+\frac{a^2 b (d+e x)^6}{2 e}+\frac{3 a\left(b^2+a c\right) (d+e x)^8}{8 e}+$$
$$\frac{b\left(b^2+6 a c\right) (d+e x)^{10}}{10 e}+\frac{c\left(b^2+a c\right) (d+e x)^{12}}{4 e}+\frac{3 b c^2 (d+e x)^{14}}{14 e}+\frac{c^3 (d+e x)^{16}}{16 e}$$

Result (type 1, 797 leaves):

$$d^3 \left(a+b d^2+c d^4\right)^3 x+\frac{3}{2} d^2 \left(a+b d^2+c d^4\right)^2 \left(a+3 b d^2+5 c d^4\right) e x^2+ d \left(a^3+10 a^2 b d^2+21 a b^2 d^4+21 a^2 c d^4+12 b^3 d^6+72 a b c d^6+55 b^2 c d^8+55 a c^2 d^8+78 b c^2 d^{10}+35 c^3 d^{12}\right) e^2 x^3+\frac{1}{4} \left(a^3+30 a^2 b d^2+105 a b^2 d^4+105 a^2 c d^4+84 b^3 d^6+504 a b c d^6+495 b^2 c d^8+495 a c^2 d^8+858 b c^2 d^{10}+455 c^3 d^{12}\right) e^3 x^4+\frac{3}{5} d \left(5 a^2 b+35 a b^2 d^2+35 a^2 c d^2+42 b^3 d^4+252 a b c d^4+330 b^2 c d^6+330 a c^2 d^6+715 b c^2 d^8+455 c^3 d^{10}\right) e^4 x^5+\frac{1}{2} \left(a^2 b+21 a b^2 d^2+21 a^2 c d^2+42 b^3 d^4+252 a b c d^4+462 b^2 c d^6+462 a c^2 d^6+1287 b c^2 d^8+1001 c^3 d^{10}\right) e^5 x^6+\frac{1}{7} d \left(21 a b^2+21 a^2 c+84 b^3 d^2+504 a b c d^2+1386 b^2 c d^4+1386 a c^2 d^4+5148 b c^2 d^6+5005 c^3 d^8\right) e^6 x^7+\frac{3}{8} \left(a b^2+a^2 c+12 b^3 d^2+72 a b c d^2+330 b^2 c d^4+330 a c^2 d^4+1716 b c^2 d^6+2145 c^3 d^8\right) e^7 x^8+ d \left(b^3+6 a b c+55 b^2 c d^2+55 a c^2 d^2+429 b c^2 d^4+715 c^3 d^6\right) e^8 x^9+\frac{1}{10} \left(b^3+6 a b c+165 b^2 c d^2+165 a c^2 d^2+2145 b c^2 d^4+5005 c^3 d^6\right) e^9 x^{10}+ 3 c d \left(b^2+a c+26 b c d^2+91 c^2 d^4\right) e^{10} x^{11}+\frac{1}{4} c \left(b^2+a c+78 b c d^2+455 c^2 d^4\right) e^{11} x^{12}+c^2 d \left(3 b+35 c d^2\right) e^{12} x^{13}+\frac{3}{14} c^2 \left(b+35 c d^2\right) e^{13} x^{14}+c^3 d e^{14} x^{15}+\frac{1}{16} c^3 e^{15} x^{16}$$

Problem 610: Result more than twice size of optimal antiderivative.

$$\int (d f+e f x)^3 \left(a+b (d+e x)^2+c (d+e x)^4\right) dx$$

Optimal (type 1, 55 leaves, 3 steps):

$$\frac{a f^3 (d+e x)^4}{4 e}+\frac{b f^3 (d+e x)^6}{6 e}+\frac{c f^3 (d+e x)^8}{8 e}$$

Result (type 1, 154 leaves):

$$f^3 \left(d^3 \left(a+b d^2+c d^4\right) x+\frac{1}{2} d^2 \left(3 a+5 b d^2+7 c d^4\right) e x^2+\frac{1}{3} d \left(3 a+10 b d^2+21 c d^4\right) e^2 x^3+\frac{1}{4} \left(a+10 b d^2+35 c d^4\right) e^3 x^4+d \left(b+7 c d^2\right) e^4 x^5+\frac{1}{6} \left(b+21 c d^2\right) e^5 x^6+c d e^6 x^7+\frac{1}{8} c e^7 x^8\right)$$

Problem 611: Result more than twice size of optimal antiderivative.

$$\int (d f+e f x)^3 \left(a+b (d+e x)^2+c (d+e x)^4\right)^2 dx$$

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

$$\frac{a^2 f^3 (d+e x)^4}{4 e}+\frac{a b f^3 (d+e x)^6}{3 e}+\frac{\left(b^2+2 a c\right) f^3 (d+e x)^8}{8 e}+\frac{b c f^3 (d+e x)^{10}}{5 e}+\frac{c^2 f^3 (d+e x)^{12}}{12 e}$$

Result (type 1, 405 leaves):

$$f^3 \left(d^3 \left(a+b d^2+c d^4\right)^2 x+\frac{1}{2} d^2 \left(3 a^2+10 a b d^2+7 b^2 d^4+14 a c d^4+18 b c d^6+11 c^2 d^8\right) e x^2+\frac{1}{3} d \left(3 a^2+20 a b d^2+21 b^2 d^4+42 a c d^4+72 b c d^6+55 c^2 d^8\right) e^2 x^3+\frac{1}{4} \left(a^2+20 a b d^2+35 b^2 d^4+70 a c d^4+168 b c d^6+165 c^2 d^8\right) e^3 x^4+\frac{1}{5} d \left(10 a b+35 b^2 d^2+70 a c d^2+252 b c d^4+330 c^2 d^6\right) e^4 x^5+\frac{1}{6} \left(2 a b+21 b^2 d^2+42 a c d^2+252 b c d^4+462 c^2 d^6\right) e^5 x^6+d \left(b^2+2 a c+24 b c d^2+66 c^2 d^4\right) e^6 x^7+\frac{1}{8} \left(b^2+2 a c+72 b c d^2+330 c^2 d^4\right) e^7 x^8+\frac{1}{3} c d \left(6 b+55 c d^2\right) e^8 x^9+\frac{1}{10} c \left(2 b+55 c d^2\right) e^9 x^{10}+c^2 d e^{10} x^{11}+\frac{1}{12} c^2 e^{11} x^{12}\right)$$

Problem 612: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 159 leaves, 4 steps):

$$\frac{a^3 f^3 (d+e x)^4}{4 e}+\frac{a^2 b f^3 (d+e x)^6}{2 e}+\frac{3 a \left(b^2+a c\right) f^3 (d+e x)^8}{8 e}+\frac{b \left(b^2+6 a c\right) f^3 (d+e x)^{10}}{10 e}+\frac{c \left(b^2+a c\right) f^3 (d+e x)^{12}}{4 e}+\frac{3 b c^2 f^3 (d+e x)^{14}}{14 e}+\frac{c^3 f^3 (d+e x)^{16}}{16 e}$$

Result (type 1, 801 leaves):

$$f^3 \left(d^3 \left(a+b d^2+c d^4\right)^3 x+\frac{3}{2} d^2 \left(a+b d^2+c d^4\right)^2 \left(a+3 b d^2+5 c d^4\right) e x^2+d \left(a^3+10 a^2 b d^2+21 a b^2 d^4+21 a^2 c d^4+12 b^3 d^6+72 a b c d^6+55 b^2 c d^8+55 a c^2 d^8+78 b c^2 d^{10}+35 c^3 d^{12}\right) e^2 x^3+\frac{1}{4} \left(a^3+30 a^2 b d^2+105 a b^2 d^4+105 a^2 c d^4+84 b^3 d^6+504 a b c d^6+495 b^2 c d^8+495 a c^2 d^8+858 b c^2 d^{10}+455 c^3 d^{12}\right) e^3 x^4+\frac{3}{5} d \left(5 a^2 b+35 a b^2 d^2+35 a^2 c d^2+42 b^3 d^4+252 a b c d^4+330 b^2 c d^6+330 a c^2 d^6+715 b c^2 d^8+455 c^3 d^{10}\right) e^4 x^5+\frac{1}{2} \left(a^2 b+21 a b^2 d^2+21 a^2 c d^2+42 b^3 d^4+252 a b c d^4+462 b^2 c d^6+462 a c^2 d^6+1287 b c^2 d^8+1001 c^3 d^{10}\right) e^5 x^6+\frac{1}{7} d \left(21 a b^2+21 a^2 c+84 b^3 d^2+504 a b c d^2+1386 b^2 c d^4+1386 a c^2 d^4+5148 b c^2 d^6+5005 c^3 d^8\right) e^6 x^7+\frac{3}{8} \left(a b^2+a^2 c+12 b^3 d^2+72 a b c d^2+330 b^2 c d^4+330 a c^2 d^4+1716 b c^2 d^6+2145 c^3 d^8\right) e^7 x^8+d \left(b^3+6 a b c+55 b^2 c d^2+55 a c^2 d^2+429 b c^2 d^4+715 c^3 d^6\right) e^8 x^9+\frac{1}{10} \left(b^3+6 a b c+165 b^2 c d^2+165 a c^2 d^2+2145 b c^2 d^4+5005 c^3 d^6\right) e^9 x^{10}+3 c d \left(b^2+a c+26 b c d^2+91 c^2 d^4\right) e^{10} x^{11}+\frac{1}{4} c \left(b^2+a c+78 b c d^2+455 c^2 d^4\right) e^{11} x^{12}+c^2 d \left(3 b+35 c d^2\right) e^{12} x^{13}+\frac{3}{14} c^2 \left(b+35 c d^2\right) e^{13} x^{14}+c^3 d e^{14} x^{15}+\frac{1}{16} c^3 e^{15} x^{16}\right)$$

Problem 661: Unable to integrate problem.

$$\int \frac{x}{\sqrt{a+b (d+e x)^3+c (d+e x)^6}}\,dx$$

Optimal (type 6, 340 leaves, 7 steps):

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

Result (type 8, 28 leaves):

$$\int \frac{x}{\sqrt{a+b\,(d+e\,x)^3+c\,(d+e\,x)^6}}\,dx$$

Problem 662: Unable to integrate problem.

$$\int \frac{x^2}{\sqrt{a+b\,(d+e\,x)^3+c\,(d+e\,x)^6}}\,dx$$

Optimal (type 6, 398 leaves, 10 steps):

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

Result (type 8, 30 leaves):

$$\int \frac{x^2}{\sqrt{a+b\,(d+e\,x)^3+c\,(d+e\,x)^6}}\,dx$$

Problem 664: Result more than twice size of optimal antiderivative.

$$\int (2+3\,x)^6\,\left(1+(2+3\,x)^7+(2+3\,x)^{14}\right)^2\,dx$$

Optimal (type 1, 56 leaves, 4 steps):

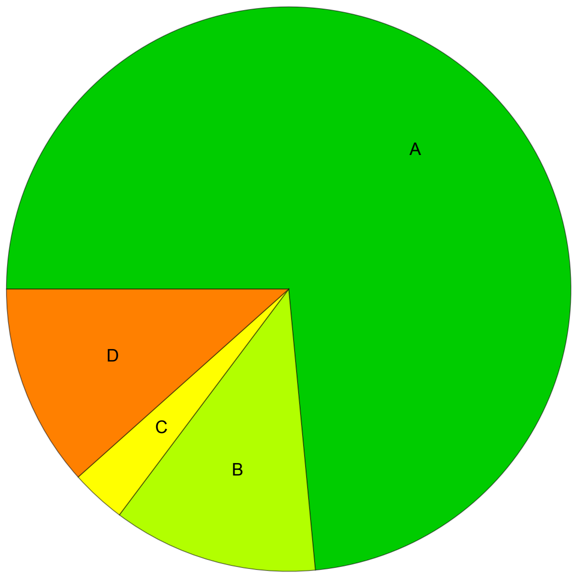
$$\frac{1}{21}\,(2+3\,x)^7+\frac{1}{21}\,(2+3\,x)^{14}+\frac{1}{21}\,(2+3\,x)^{21}+\frac{1}{42}\,(2+3\,x)^{28}+\frac{1}{105}\,(2+3\,x)^{35}$$

Result (type 1, 188 leaves):

$$17\,451\,466\,816\,x + 443\,569\,828\,128\,x^2 + 7\,299\,544\,818\,384\,x^3 + 87\,406\,679\,578\,680\,x^4 + \frac{4\,057\,390\,785\,756\,924\,x^5}{5} + 6\,077\,684\,727\,888\,102\,x^6 + 37\,727\,143\,432\,895\,007\,x^7 + 197\,897\,276\,851\,452\,864\,x^8 + 889\,942\,562\,270\,387\,136\,x^9 + \frac{17\,344\,958\,593\,049\,772\,048\,x^{10}}{5} + 11\,821\,487\,501\,620\,716\,192\,x^{11} + 35\,454\,069\,480\,572\,048\,124\,x^{12} + 94\,069\,263\,918\,929\,616\,324\,x^{13} + 221\,699\,757\,548\,270\,194\,389\,x^{14} + 465\,517\,091\,041\,681\,015\,296\,x^{15} + 872\,775\,774\,067\,455\,498\,528\,x^{16} + 1\,463\,104\,032\,160\,519\,033\,200\,x^{17} + 2\,194\,577\,166\,014\,752\,240\,080\,x^{18} + 2\,945\,285\,062\,308\,448\,290\,360\,x^{19} + 3\,534\,290\,697\,929\,473\,864\,098\,x^{20} + \frac{26\,506\,949\,038\,858\,918\,036\,881\,x^{21}}{7} + 3\,614\,565\,944\,605\,222\,108\,800\,x^{22} + 3\,064\,515\,076\,512\,846\,852\,480\,x^{23} + 2\,298\,383\,223\,254\,096\,766\,840\,x^{24} + \frac{7\,584\,660\,010\,542\,711\,771\,792\,x^{25}}{5} + 875\,152\,864\,622\,814\,086\,340\,x^{26} + 437\,576\,396\,725\,285\,446\,564\,x^{27} + \frac{2\,625\,458\,326\,972\,530\,284\,475\,x^{28}}{14} + 67\,899\,784\,121\,041\,365\,504\,x^{29} + \frac{101\,849\,676\,181\,562\,048\,256\,x^{30}}{5} + 4\,928\,210\,137\,817\,518\,464\,x^{31} + 924\,039\,400\,840\,784\,712\,x^{32} + 126\,005\,372\,841\,925\,188\,x^{33} + 11\,118\,121\,133\,111\,046\,x^{34} + \frac{16\,677\,181\,699\,666\,569\,x^{35}}{35}$$

Summary of Integration Test Results

664 integration problems



A - 488 optimal antiderivatives

B - 78 more than twice size of optimal antiderivatives

C - 21 unnecessarily complex antiderivatives

D - 77 unable to integrate problems

E - 0 integration timeouts