Mathematica 11.3 Integration Test Results

on the problems in the test-suite directory "1 Algebraic functions\1.2 Trinomial products\1.2.3 General"

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):

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

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):

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

Result (type 6, 204 leaves):

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

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

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):

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

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):

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

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):

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

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

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

Result (type 7, 70 leaves):

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

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):

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

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

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

Result (type 7, 70 leaves):

$$\frac{x}{c}-\frac{\text{RootSum}\left[a+b\,\sharp1^3+c\,\sharp1^6\,\&,\,\frac{a\,\text{Log}[x-\sharp1]+b\,\text{Log}[x-\sharp1]\,\sharp1^3}{b\,\sharp1^2+2\,c\,\sharp1^5}\,\&\right]}{3\,c}$$

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):

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

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

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

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

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):

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

Result (type 7, 42 leaves):

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

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):

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

Result (type 7, 43 leaves):

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

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):

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

Result (type 7, 45 leaves):

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

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):

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

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):

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

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

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

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

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):

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

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):

$$\frac{1}{448\,c^2\,\left(a+b\,x^3+c\,x^6\right)^{3/2}}\left(8\,c\,\left(3\,b\,x+8\,c\,x^4\right)\,\left(a+b\,x^3+c\,x^6\right)^2+\right.$$

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

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

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

$$\left(336\,a^2\,c\,x^4\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

$$\left(105\,a\,b^2\,x^4\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

Problem 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):

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

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):

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

Problem 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):

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

Result (type 6, 1746 leaves):

$$\frac{1}{232960 c^3 \left(a + b x^3 + c x^6\right)^{3/2}} x \left(8 c \left(a + b x^3 + c x^6\right)^2 \left(-297 b^3 + 216 b^2 c x^3 + 320 c^2 x^3 \left(16 a + 7 c x^6\right) + 4 b c \left(459 a + 812 c x^6\right)\right) + \left(9504 a^2 b^3 \left(b - \sqrt{b^2 - 4 a c} + 2 c x^3\right) \left(b + \sqrt{b^2 - 4 a c} + 2 c x^3\right) \text{AppellF1}\left[\frac{1}{3}, \frac{1}{2}, \frac{1}{2}, \frac{4}{3}, -\frac{2 c x^3}{b + \sqrt{b^2 - 4 a c}}, \frac{2 c x^3}{-b + \sqrt{b^2 - 4 a c}}\right]\right) \Big/ \left(16 a \text{AppellF1}\left[\frac{1}{3}, \frac{1}{2}, \frac{1}{2}, \frac{4}{3}, -\frac{2 c x^3}{b + \sqrt{b^2 - 4 a c}}, \frac{2 c x^3}{-b + \sqrt{b^2 - 4 a c}}\right] - 3 x^3 \left(\left(b + \sqrt{b^2 - 4 a c}\right) \text{AppellF1}\left[\frac{4}{3}, \frac{1}{2}, \frac{3}{2}, \frac{7}{3}, -\frac{2 c x^3}{b + \sqrt{b^2 - 4 a c}}, \frac{2 c x^3}{-b + \sqrt{b^2 - 4 a c}}\right] + \left(b - \sqrt{b^2 - 4 a c}\right) \text{AppellF1}\left[\frac{4}{3}, \frac{3}{2}, \frac{1}{2}, \frac{7}{3}, -\frac{2 c x^3}{b + \sqrt{b^2 - 4 a c}}, \frac{2 c x^3}{-b + \sqrt{b^2 - 4 a c}}\right]\right)\right) -$$

$$
\begin{aligned}
&\left(58752\, a^3 b c \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]\right)\Big/\\
&\quad\left(16\, a\, \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]-3x^3\left(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{3}{2},\frac{7}{3},\right.\right.\right.\\
&\qquad\left.-\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},\frac{3}{2},\frac{1}{2},\frac{7}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg)+\\
&\left(10395\, a b^4 x^3 \left(b-\sqrt{b^2-4ac}+2cx^3\right)\left(b+\sqrt{b^2-4ac}+2cx^3\right) \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/\\
&\quad\left(28\, a\, \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]-\right.\\
&\qquad 3x^3\left(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},\frac{3}{2},\frac{10}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]+\right.\\
&\qquad\left.\left.\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},\frac{1}{2},\frac{10}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]\right)\right)+\\
&\left(120960\, a^3 c^2 x^3 \left(b-\sqrt{b^2-4ac}+2cx^3\right)\left(b+\sqrt{b^2-4ac}+2cx^3\right) \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/\\
&\quad\left(28\, a\, \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]-\right.\\
&\qquad 3x^3\left(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},\frac{3}{2},\frac{10}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]+\right.\\
&\qquad\left.\left.\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},\frac{1}{2},\frac{10}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]\right)\right)+\\
&\left(76356\, a^2 b^2 c x^3 \left(b-\sqrt{b^2-4ac}+2cx^3\right)\left(b+\sqrt{b^2-4ac}+2cx^3\right) \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/\\
&\quad\left(-28\, a\, \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]+\right.\\
&\qquad 3x^3\left(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{7}{3},\frac{1}{2},\frac{3}{2},\frac{10}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]+\right.\\
&\qquad\left.\left.\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\left[\frac{7}{3},\frac{3}{2},\frac{1}{2},\frac{10}{3},-\frac{2cx^3}{b+\sqrt{b^2-4ac}},\frac{2cx^3}{-b+\sqrt{b^2-4ac}}\right]\right)\right)\Bigg)
\end{aligned}
$$

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):

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

Result (type 6, 1391 leaves):

$$\frac{1}{8800\,c^2\,\left(a+b\,x^3+c\,x^6\right)^{3/2}}\,x^2\,\Bigg(5\,c\,\left(a+b\,x^3+c\,x^6\right)^2\,\left(27\,b^2+250\,b\,c\,x^3+32\,c\,\left(14\,a+5\,c\,x^6\right)\right)-$$

$$\left(675\,a^2\,b^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

$$\left(10\,800\,a^3\,c\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

$$\left(5616\,a^2\,b\,c\,x^3\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

$$\left(756\,a\,b^3\,x^3\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

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

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

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

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

Result (type 6, 1389 leaves):

$$\frac{1}{8960\, c^2 \left(a + b x^3 + c x^6\right)^{3/2}} x \Bigg(8 c \left(a + b x^3 + c x^6\right)^2 \left(27 b^2 + 184 b c x^3 + 28 c \left(13 a + 4 c x^6\right)\right) -$$

$$\left(864 a^2 b^2 \left(b - \sqrt{b^2 - 4 a c} + 2 c x^3\right) \left(b + \sqrt{b^2 - 4 a c} + 2 c x^3\right) \text{AppellF1}\left[\frac{1}{3}, \frac{1}{2}, \frac{1}{2}, \frac{4}{3}, -\frac{2 c x^3}{b + \sqrt{b^2 - 4 a c}}, \frac{2 c x^3}{-b + \sqrt{b^2 - 4 a c}}\right]\right) \Big/$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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):

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

Result (type 6, 1058 leaves):

$$\frac{1}{100 \left(a+b x^3+c x^6\right)^{3/2}} \left(\frac{5 \left(a+b x^3+c x^6\right)^2 \left(-80 a+19 b x^3+10 c x^6\right)}{4 x}+\right.$$
$$\left(2025 a^2 b x^2 \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right) \mathrm{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$
$$\left(4 c \left(20 a\, \mathrm{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]-3 x^3 \left(\left(b+\sqrt{b^2-4 a c}\right) \mathrm{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{3}{2},\frac{8}{3},\right.\right.\right.\right.$$
$$\left.\left.\left.\left.-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right) \mathrm{AppellF1}\left[\frac{5}{3},\frac{3}{2},\frac{1}{2},\frac{8}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)+$$
$$\left(540 a^2 x^5 \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right) \mathrm{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$
$$\left(32 a\, \mathrm{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]-\right.$$
$$3 x^3 \left(\left(b+\sqrt{b^2-4 a c}\right) \mathrm{AppellF1}\left[\frac{8}{3},\frac{1}{2},\frac{3}{2},\frac{11}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+\right.$$
$$\left.\left.\left(b-\sqrt{b^2-4 a c}\right) \mathrm{AppellF1}\left[\frac{8}{3},\frac{3}{2},\frac{1}{2},\frac{11}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)+$$
$$\left(27 a b^2 x^5 \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right) \mathrm{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$
$$\left(c \left(32 a\, \mathrm{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]-3 x^3 \left(\left(b+\sqrt{b^2-4 a c}\right) \mathrm{AppellF1}\left[\frac{8}{3},\frac{1}{2},\frac{3}{2},\frac{11}{3},\right.\right.\right.\right.$$
$$\left.\left.\left.\left.\left.-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right) \mathrm{AppellF1}\left[\frac{8}{3},\frac{3}{2},\frac{1}{2},\frac{11}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)\right)$$

Problem 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):

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

Result (type 6, 1054 leaves):

$$\frac{1}{112 \left(a+b x^3+c x^6\right)^{3/2}} \left(\frac{2 \left(a+b x^3+c x^6\right)^2 \left(-28 a+17 b x^3+8 c x^6\right)}{x^2}+\right.$$

$$\left(648 a^2 b x \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right) \text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$

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

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

$$\left(378 a^2 x^4 \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right) \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$

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

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

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

$$\left(189 a b^2 x^4 \left(b-\sqrt{b^2-4 a c}+2 c x^3\right) \left(b+\sqrt{b^2-4 a c}+2 c x^3\right) \text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2 c x^3}{b+\sqrt{b^2-4 a c}},\frac{2 c x^3}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$

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

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

Problem 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):

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

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):

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

Result (type 6, 380 leaves):

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

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):

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

Result (type 6, 378 leaves):

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

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):

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

Result (type 6, 705 leaves):

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

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

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

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

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

Result (type 6, 705 leaves):

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

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):

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

Result (type 6, 711 leaves):

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

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

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

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

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

Result (type 6, 1054 leaves):

$$\frac{1}{30\,a\,\left(-b^2+4\,a\,c\right)\,\left(a+b\,x^3+c\,x^6\right)^{3/2}}\,x^2\,\left(-20\,\left(b^2-2\,a\,c+b\,c\,x^3\right)\,\left(a+b\,x^3+c\,x^6\right)+\right.$$

$$\left(100\,a^2\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\text{AppellF1}\left[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

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

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

$$\left(64\,a\,b\,x^3\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\,\text{AppellF1}\left[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

Problem 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):

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

Result (type 6, 1056 leaves):

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

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

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

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

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

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

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

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

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

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

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):

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

Result (type 6, 1599 leaves):

$$\frac{1}{15\,\left(a+b\,x^3+c\,x^6\right)^{3/2}}\left(\frac{10\,x^2\,\left(b^3-3\,a\,b\,c+b^2\,c\,x^3-2\,a\,c^2\,x^3\right)\,\left(a+b\,x^3+c\,x^6\right)}{a^2\,\left(-b^2+4\,a\,c\right)}-\frac{15\,\left(a+b\,x^3+c\,x^6\right)^2}{a^2\,x}+\right.$$

$$\Big(125\, b^3 x^2 \big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\big)\big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\big)\,\text{AppellF1}\Big[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

$$\Big(\big(b^2-4\,a\,c\big)\big(-b+\sqrt{b^2-4\,a\,c}\big)\big(b+\sqrt{b^2-4\,a\,c}\big)\Big(-20\,a\,\text{AppellF1}\Big[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\Big]+$$

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

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

$$\Big(300\,a\,b\,c\,x^2 \big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\big)\big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\big)\,\text{AppellF1}\Big[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

$$\Big(\big(b^2-4\,a\,c\big)\big(-b+\sqrt{b^2-4\,a\,c}\big)\big(b+\sqrt{b^2-4\,a\,c}\big)\Big(-20\,a\,\text{AppellF1}\Big[\frac{2}{3},\frac{1}{2},\frac{1}{2},\frac{5}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\Big]+$$

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

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

$$\Big(320\,b^2\,c\,x^5 \big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\big)\big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\big)\,\text{AppellF1}\Big[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

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

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

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

$$\Big(1024\,a\,c^2\,x^5 \big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\big)\big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\big)\,\text{AppellF1}\Big[\frac{5}{3},\frac{1}{2},\frac{1}{2},\frac{8}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

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

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

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

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):

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

Result (type 6, 1593 leaves):

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

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

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

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

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

$$\left(288\,a\,b\,c\,x\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\text{AppellF1}\left[\frac{1}{3},\frac{1}{2},\frac{1}{2},\frac{4}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

$$\left(49\,b^2\,c\,x^4\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

$$\left(140\,a\,c^2\,x^4\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^3\right)\text{AppellF1}\left[\frac{4}{3},\frac{1}{2},\frac{1}{2},\frac{7}{3},-\frac{2\,c\,x^3}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^3}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

Problem 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):

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

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):

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

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):

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

Result (type 6, 1083 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

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):

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

Result (type 6, 424 leaves):

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

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):

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

Result (type 6, 426 leaves):

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

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):

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

Result (type 6, 426 leaves):

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

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):

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

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):

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

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

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

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

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

Result (type 6, 439 leaves):

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

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):

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

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

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

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

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

Result (type 6, 487 leaves):

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

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):

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

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):

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

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):

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

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):

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

Result (type 6, 510 leaves):

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

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

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

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):

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

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):

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

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):

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

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

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

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

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

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

$$\int \frac{x^m}{a+bx^4+cx^8}\,dx$$

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

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

Result (type 7, 82 leaves):

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

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

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

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

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

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):

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

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

Result (type 7, 70 leaves):

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

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):

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

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

Result (type 7, 70 leaves):

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

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):

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

Result (type 7, 44 leaves):

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

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):

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

Result (type 7, 42 leaves):

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

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):

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

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

Result (type 7, 43 leaves):

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

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):

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

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

Result (type 7, 45 leaves):

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

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):

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

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):

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

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):

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

Problem 335: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 3, 100 leaves):

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

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

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

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 3, 141 leaves):

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

Problem 337: Result unnecessarily involves imaginary or complex numbers.

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

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):

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

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):

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

Result (type 3, 139 leaves):

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

Problem 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):

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

Result (type 3, 148 leaves):

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

Problem 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):

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

Result (type 3, 171 leaves):

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

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):

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

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):

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

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):

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

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):

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

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):

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

Result (type 7, 65 leaves):

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

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):

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

Result (type 7, 54 leaves):

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

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):

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

Result (type 7, 54 leaves):

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

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

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

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

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

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.

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

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

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

Result (type 7, 65 leaves):

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

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

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

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

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

Result (type 7, 73 leaves):

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

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

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

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

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

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.

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

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):

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

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):

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

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):

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

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

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

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.

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

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.

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

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

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

Result (type 7, 65 leaves):

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

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

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

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

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

Result (type 7, 575 leaves):

$$\frac{1}{4\,m}$$

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

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

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

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

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

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

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):

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

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

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

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):

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

Result (type 7, 208 leaves):

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

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):

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

Result (type 7, 197 leaves):

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

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):

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

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

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

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):

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

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

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.

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

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

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

Result (type 7, 60 leaves):

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

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

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

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

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

Result (type 7, 60 leaves):

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

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

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

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

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

Result (type 7, 70 leaves):

$$-\frac{9\,b\,x^{-4\,n/3}\left(b-4\,c\,x^n\right)+4\,c^2\,\text{RootSum}\left[c+b\,\sharp1^3\,\&,\,\frac{n\,\text{Log}[x]+3\,\text{Log}\left[x^{-n/3}-\sharp1\right]}{\sharp1^2}\,\&\right]}{12\,b^3\,n}$$

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):

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

Result (type 7, 70 leaves):

$$-\frac{16\,b\,x^{-5\,n/4}\left(b-5\,c\,x^n\right)+5\,c^2\,\text{RootSum}\left[c+b\,\sharp1^4\,\&,\,\frac{n\,\text{Log}[x]+4\,\text{Log}\left[x^{-n/4}-\sharp1\right]}{\sharp1^3}\,\&\right]}{20\,b^3\,n}$$

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):

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

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):

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

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):

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

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):

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

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

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

Result (type 7, 62 leaves):

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

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):

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

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):

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

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):

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

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

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

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

Result (type 7, 107 leaves):

$$-\frac{9\,x^{-n/3}-\mathrm{RootSum}\left[c+b\,\sharp 1^3+a\,\sharp 1^6\,\&,\ \frac{c\,n\,\mathrm{Log}[x]+3\,c\,\mathrm{Log}\left[x^{-n/3}-\sharp 1\right]+b\,n\,\mathrm{Log}[x]\,\sharp 1^3+3\,b\,\mathrm{Log}\left[x^{-n/3}-\sharp 1\right]\sharp 1^3}{b\,\sharp 1^2+2\,a\,\sharp 1^5}\,\&\right]}{3\,a\,n}$$

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):

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

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

Result (type 7, 105 leaves):

$$\frac{-16\,x^{-n/4}+\text{RootSum}\left[c+b\,\#1^4+a\,\#1^8\,\&,\ \frac{c\,n\,\text{Log}[x]+4\,c\,\text{Log}\left[x^{-n/4}-\#1\right]+b\,n\,\text{Log}[x]\,\#1^4+4\,b\,\text{Log}\left[x^{-n/4}-\#1\right]\,\#1^4}{b\,\#1^3+2\,a\,\#1^7}\,\&\right]}{4\,a\,n}$$

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):

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

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

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):

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

Result (type 6, 820 leaves) :

$$
\begin{aligned}
&\frac{1}{\left(a+x^n\,(b+c\,x^n)\right)^{3/2}}\,x^4\,\Bigg(\frac{\left(a+x^n\,(b+c\,x^n)\right)^2}{4+n}+\\
&\quad\Big(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)\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]\Big)\Big/\\
&\quad\Big(\Big(\left(-b+\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)(4+n)^2\,\Big(\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]-\\
&\qquad\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]-\\
&\qquad 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]\Big)\Big)+\\
&\quad\Big(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},\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]\Big)\Big/\\
&\quad\Big(4\,c\,\Big(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\,\Big(\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.\\
&\qquad\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{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]\Big)\Big)\Big)\Bigg)
\end{aligned}
$$

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) :

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

Result (type 6, 825 leaves) :

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

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):

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

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) :

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

Result (type 6, 786 leaves) :

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

Problem 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):

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

Result (type 6, 821 leaves):

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

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):

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

Result (type 6, 816 leaves):

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

Problem 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):

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

Result (type 6, 3165 leaves):

$$\sqrt{a+b x^n+c x^{2 n}}\left(\frac{\left(64 a c+96 a c n+3 b^2 n^2+32 a c n^2\right) x^4}{8 c(2+n)(4+n)(4+3 n)}+\frac{b(8+7 n) x^{4+n}}{4(2+n)(4+3 n)}+\frac{c x^{4+2 n}}{4+3 n}\right)-\left(48 a^3 b n^2 x^{4+n}\left(b-\sqrt{b^2-4 a c}+2 c x^n\right)\left(b+\sqrt{b^2-4 a c}+2 c x^n\right)\text{AppellF1}\left[\frac{4+n}{n},\frac{1}{2},\frac{1}{2},2+\frac{4}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$

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

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

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

$$\left(12\,a^2\,b^3\,n^2\,x^{4+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\left[\frac{4+n}{n},\,\frac{1}{2},\,\frac{1}{2},\,2+\frac{4}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

$$\left(18\,a^3\,b\,n^3\,x^{4+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\left[\frac{4+n}{n},\,\frac{1}{2},\,\frac{1}{2},\,2+\frac{4}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Problem 576: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 149 leaves, 2 steps):

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

Result (type 6, 3165 leaves):

$$\sqrt{a+b\,x^n+c\,x^{2\,n}}\left(\frac{\left(36\,a\,c+72\,a\,c\,n+3\,b^2\,n^2+32\,a\,c\,n^2\right)x^3}{12\,c\,(1+n)\,(3+n)\,(3+2\,n)}+\frac{b\,(6+7\,n)\,x^{3+n}}{6\,(1+n)\,(3+2\,n)}+\frac{c\,x^{3+2\,n}}{3\,(1+n)}\right)-$$

$$\left(12\,a^3\,b\,n^2\,x^{3+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\left[\frac{3+n}{n},\frac{1}{2},\frac{1}{2},2+\frac{3}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Problem 577: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 149 leaves, 2 steps):

$$\frac{ax^2\sqrt{a+bx^n+cx^{2n}}\,\text{AppellF1}\left[\frac{2}{n},-\frac{3}{2},-\frac{3}{2},\frac{2+n}{n},-\frac{2cx^n}{b-\sqrt{b^2-4ac}},-\frac{2cx^n}{b+\sqrt{b^2-4ac}}\right]}{2\sqrt{1+\frac{2cx^n}{b-\sqrt{b^2-4ac}}}\sqrt{1+\frac{2cx^n}{b+\sqrt{b^2-4ac}}}}$$

Result (type 6, 3165 leaves):

$$\sqrt{a+b\,x^n+c\,x^{2\,n}}\,\left(\frac{\left(16\,a\,c+48\,a\,c\,n+3\,b^2\,n^2+32\,a\,c\,n^2\right)\,x^2}{8\,c\,(1+n)\,(2+n)\,(2+3\,n)}+\frac{b\,(4+7\,n)\,x^{2+n}}{4\,(1+n)\,(2+3\,n)}+\frac{c\,x^{2+2\,n}}{2+3\,n}\right)-$$

$$\left(24\,a^3\,b\,n^2\,x^{2+n}\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\text{AppellF1}\left[\frac{2+n}{n},\frac{1}{2},\frac{1}{2},2+\frac{2}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

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

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

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

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

$$\left(18\,a^3\,b\,n^3\,x^{2+n}\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\text{AppellF1}\left[\frac{2+n}{n},\frac{1}{2},\frac{1}{2},2+\frac{2}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

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

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

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

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

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

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

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

Problem 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):

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

Result (type 6, 3058 leaves):

$$\sqrt{a+b\,x^n+c\,x^{2\,n}}\;\left(\frac{\left(4\,a\,c+24\,a\,c\,n+3\,b^2\,n^2+32\,a\,c\,n^2\right)\,x}{4\,c\,(1+n)\,(1+2\,n)\,(1+3\,n)}+\frac{b\,(2+7\,n)\,x^{1+n}}{2\,(1+2\,n)\,(1+3\,n)}+\frac{c\,x^{1+2\,n}}{1+3\,n}\right)-$$

$$\Bigg(12\,a^3\,b\,n^2\,x^{1+n}\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\text{AppellF1}\Big[1+\frac{1}{n},\,\frac{1}{2},\,\frac{1}{2},\,2+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Bigg)\Bigg/$$

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

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

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

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

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

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

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

$$\Bigg(18\,a^3\,b\,n^3\,x^{1+n}\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\text{AppellF1}\Big[1+\frac{1}{n},\,\frac{1}{2},\,\frac{1}{2},\,2+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Bigg)\Bigg/$$

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

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

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

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

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

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

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

$$\Big(12 a^4 n^2 x \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\Big[\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 1+\frac{1}{n},\ -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\ \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big]\Big)\Big/$$

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

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

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

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

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

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

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

$$\Big(24 a^4 n^3 x \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\Big[\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 1+\frac{1}{n},\ -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\ \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big]\Big)\Big/$$

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

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

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

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):

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

Result (type 6, 3181 leaves):

$$\sqrt{a+b\,x^n+c\,x^{2n}}\left(\frac{4\,a\,c-24\,a\,c\,n+3\,b^2\,n^2+32\,a\,c\,n^2}{4\,c\,(-1+n)\,(-1+2\,n)\,(-1+3\,n)\,x}+\frac{b\,(-2+7\,n)\,x^{-1+n}}{2\,(-1+2\,n)\,(-1+3\,n)}+\frac{c\,x^{-1+2\,n}}{-1+3\,n}\right)+$$

$$\left(12\,a^3\,b\,n^2\,x^{-1+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\left[\frac{-1+n}{n},\frac{1}{2},\frac{1}{2},2-\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

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

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

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

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

$$\left(18\,a^3\,b\,n^3\,x^{-1+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\left[\frac{-1+n}{n},\frac{1}{2},\frac{1}{2},2-\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

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

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

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

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

$$\left(12\,a^4\,n^2\,\left(-b+\sqrt{b^2-4\,a\,c}-2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\text{AppellF1}\left[-\frac{1}{n},\frac{1}{2},\frac{1}{2},\frac{-1+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

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

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

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

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

$$\left(24\,a^4\,n^3\,\left(-b+\sqrt{b^2-4\,a\,c}-2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\text{AppellF1}\left[-\frac{1}{n},\frac{1}{2},\frac{1}{2},\frac{-1+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

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):

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

Result (type 6, 3165 leaves):

$$\sqrt{a+b x^n+c x^{2 n}} \left(\frac{16 a c-48 a c n+3 b^2 n^2+32 a c n^2}{8 c (-2+n) (-1+n) (-2+3 n) x^2}+\frac{b (-4+7 n) x^{-2+n}}{4 (-1+n) (-2+3 n)}+\frac{c x^{-2+2 n}}{-2+3 n}\right)+$$

$$\left(24 a^3 b n^2 x^{-2+n} \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{-2+n}{n},\frac{1}{2},\frac{1}{2},2-\frac{2}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$

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

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

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

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

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

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

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

$$\left(18 a^3 b n^3 x^{-2+n} \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{-2+n}{n},\frac{1}{2},\frac{1}{2},2-\frac{2}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$

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

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

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

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

$$\Big(2\,c\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,(-2+n)^2\,(-2+3\,n)\,\Big(a+x^n\,\big(b+c\,x^n\big)\Big)^{3/2}$$

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

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

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

$$\Big(\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,(-1+n)\,(-2+3\,n)\,x^2\,\Big(a+x^n\,\big(b+c\,x^n\big)\Big)^{3/2}$$

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

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

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

$$\Big(2\,c\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,(-1+n)\,(-2+3\,n)\,x^2\,\Big(a+x^n\,\big(b+c\,x^n\big)\Big)^{3/2}$$

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

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

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

$$\Big(\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,(-1+n)\,(-2+3\,n)\,x^2\,\Big(a+x^n\,\big(b+c\,x^n\big)\Big)^{3/2}$$

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

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

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):

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

Result (type 6, 415 leaves):

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

Problem 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):

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

Result (type 6, 417 leaves):

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

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):

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

Result (type 6, 415 leaves):

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

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):

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

Result (type 6, 400 leaves) :

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

Problem 587: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{x^2\sqrt{a+bx^n+cx^{2n}}}\,dx$$

Optimal (type 6, 149 leaves, 2 steps) :

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

Result (type 6, 415 leaves) :

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

Problem 588: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 151 leaves, 2 steps):

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

Result (type 6, 415 leaves):

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

Problem 589: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 151 leaves, 2 steps):

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

Result (type 6, 1947 leaves):

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

$$x^4 \left(-\frac{2 \left(b^2-2 a c+b c x^n\right) \left(a+x^n \left(b+c x^n\right)\right)}{n} + \left(64 a^2 b c (2+n) x^n \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right)\right.\right.$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Problem 590: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 151 leaves, 2 steps):

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

Result (type 6, 1952 leaves):

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

$$2x^3\Bigg(-\frac{3\left(b^2-2ac+bcx^n\right)\left(a+x^n\left(b+cx^n\right)\right)}{n}+\Bigg(36a^2bc(3+2n)x^n\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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):

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

Result (type 6, 1947 leaves):

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

$$2 x^2 \Big(-\frac{\left(b^2-2 a c+b c x^n\right) \left(a+x^n \left(b+c x^n\right)\right)}{n} + \Big(16 a^2 b c (1+n) x^n \Big(b-\sqrt{b^2-4 a c}+2 c x^n\Big) \Big(b+\sqrt{b^2-4 a c}+2 c x^n\Big)$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Problem 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):

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

Result (type 6, 1876 leaves):

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

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

Problem 594: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 152 leaves, 2 steps):

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

Result (type 6, 2225 leaves):

$$\frac{2\left(-b^2+2ac-bcx^n\right)}{a\left(-b^2+4ac\right)n\,x\sqrt{a+b\,x^n+c\,x^{2n}}}+\left(8abc(-1+2n)\,x^{-1+n}\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\left[\frac{-1+n}{n},\frac{1}{2},\frac{1}{2},2-\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/\left(\left(-b^2+4ac\right)\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(-1+n)\,n\left(a+x^n\left(b+cx^n\right)\right)^{3/2}\left(\left(b+\sqrt{b^2-4ac}\right)n\,x^n\,\text{AppellF1}\left[2-\frac{1}{n},\frac{1}{2},\frac{3}{2},3-\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-\left(-b+\sqrt{b^2-4ac}\right)n\,x^n\,\text{AppellF1}\left[2-\frac{1}{n},\frac{3}{2},\frac{1}{2},3-\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+4a(1-2n)\,\text{AppellF1}\left[\frac{-1+n}{n},\frac{1}{2},\frac{1}{2},2-\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right)+\left(4ab^2(-1+n)\left(-b+\sqrt{b^2-4ac}-2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\left[-\frac{1}{n},\frac{1}{2},\frac{1}{2},\frac{-1+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$

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

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

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

$$\left(16a^2c(-1+n)\left(-b+\sqrt{b^2-4ac}-2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\left[-\frac{1}{n},\frac{1}{2},\frac{1}{2},\frac{-1+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$

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

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

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

$$\left(8ab^2(-1+n)\left(-b+\sqrt{b^2-4ac}-2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\left[-\frac{1}{n},\frac{1}{2},\frac{1}{2},\frac{-1+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$

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

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

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

$$\left(16a^2c(-1+n)\left(-b+\sqrt{b^2-4ac}-2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\left[-\frac{1}{n},\frac{1}{2},\frac{1}{2},\frac{-1+n}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$

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

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

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

Problem 595: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 154 leaves, 2 steps):

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

Result (type 6, 2221 leaves):

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

$$\left(32\,a\,b\,c\,(-1+n)\,x^{-2+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\left[\frac{-2+n}{n},\frac{1}{2},\frac{1}{2},2-\frac{2}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

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

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

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

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

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

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

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

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

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

Problem 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):

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

Result (type 5, 3515 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\int \frac{(dx)^m}{\left(a+bx^n+cx^{2n}\right)^3}\,dx$$

Optimal (type 5, 615 leaves, 6 steps) :

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

$$\left((d\,x)^{1+m}\left(4\,a^2\,c^2\,(1+m-4\,n)-5\,a\,b^2\,c\,(1+m-3\,n)+b^4\,(1+m-2\,n)-b\,c\left(2\,a\,c\,(2+2\,m-7\,n)-b^2\,(1+m-2\,n)\right)x^n\right)\right)\Big/$$
$$\left(2\,a^2\left(b^2-4\,a\,c\right)^2 d\,n^2\left(a+b\,x^n+c\,x^{2\,n}\right)\right)-$$

$$\Bigg(c\left(b\sqrt{b^2-4\,a\,c}\,\left(2\,a\,c\,(2+2\,m-7\,n)-b^2\,(1+m-2\,n)\right)(1+m-n)-b^4\left(1+m^2+m\,(2-3\,n)-3\,n+2\,n^2\right)+6\,a\,b^2\,c\left(1+m^2+m\,(2-4\,n)-4\,n+3\,n^2\right)-\right.$$
$$\left.8\,a^2\,c^2\left(1+m^2+m\,(2-6\,n)-6\,n+8\,n^2\right)\right)(d\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Big/$$
$$\left(2\,a^2\left(b^2-4\,a\,c\right)^{5/2}\left(b-\sqrt{b^2-4\,a\,c}\right)d\,(1+m)\,n^2\right)-\Bigg(c\left(b\sqrt{b^2-4\,a\,c}\,\left(2\,a\,c\,(2+2\,m-7\,n)-b^2\,(1+m-2\,n)\right)(1+m-n)+\right.$$
$$\left.b^4\left(1+m^2+m\,(2-3\,n)-3\,n+2\,n^2\right)-6\,a\,b^2\,c\left(1+m^2+m\,(2-4\,n)-4\,n+3\,n^2\right)+8\,a^2\,c^2\left(1+m^2+m\,(2-6\,n)-6\,n+8\,n^2\right)\right)$$
$$(d\,x)^{1+m}\,\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Big/\left(2\,a^2\left(b^2-4\,a\,c\right)^{5/2}\left(b+\sqrt{b^2-4\,a\,c}\right)d\,(1+m)\,n^2\right)$$

Result (type 5, 12 289 leaves) :

$$\frac{1}{1+m}\left(-\frac{b^4}{a^3\left(-b^2+4\,a\,c\right)^2}+\frac{8\,b^2\,c}{a^2\left(-b^2+4\,a\,c\right)^2}-\frac{16\,c^2}{a\left(-b^2+4\,a\,c\right)^2}-\frac{b^4\,m}{a^3\left(-b^2+4\,a\,c\right)^2 n^2}+\frac{5\,b^2\,c\,m}{a^2\left(-b^2+4\,a\,c\right)^2 n^2}-\frac{2\,c^2\,(1+m)^2}{a\left(-b^2+4\,a\,c\right)^2 n^2}+\right.$$
$$\left.\frac{b^4\left(-1-m^2\right)}{2\,a^3\left(-b^2+4\,a\,c\right)^2 n^2}+\frac{5\,b^2\,c\left(1+m^2\right)}{2\,a^2\left(-b^2+4\,a\,c\right)^2 n^2}+\frac{3\,b^4\,(1+m)}{2\,a^3\left(-b^2+4\,a\,c\right)^2 n}-\frac{21\,b^2\,c\,(1+m)}{2\,a^2\left(-b^2+4\,a\,c\right)^2 n}+\frac{12\,c^2\,(1+m)}{a\left(-b^2+4\,a\,c\right)^2 n}\right)x\,(d\,x)^m+$$
$$\left(\left(b^4-5\,a\,b^2\,c+4\,a^2\,c^2+2\,b^4\,m-10\,a\,b^2\,c\,m+8\,a^2\,c^2\,m+b^4\,m^2-5\,a\,b^2\,c\,m^2+4\,a^2\,c^2\,m^2-3\,b^4\,n+21\,a\,b^2\,c\,n-24\,a^2\,c^2\,n-3\,b^4\,m\,n+21\,a\,b^2\,c\,m\,n-\right.\right.$$
$$\left.\left.24\,a^2\,c^2\,m\,n+2\,b^4\,n^2-16\,a\,b^2\,c\,n^2+32\,a^2\,c^2\,n^2\right)x\,(d\,x)^m\right)\Big/\left(2\,a^3\left(-b^2+4\,a\,c\right)^2(1+m)\,n^2\right)+\frac{x\,(d\,x)^m\left(-b^2+2\,a\,c-b\,c\,x^n\right)}{2\,a\left(-b^2+4\,a\,c\right)n\left(a+b\,x^n+c\,x^{2\,n}\right)^2}+$$
$$\left(x^{-m}\,(d\,x)^m\left(-b^4\,x^{1+m}+5\,a\,b^2\,c\,x^{1+m}-4\,a^2\,c^2\,x^{1+m}-b^4\,m\,x^{1+m}+5\,a\,b^2\,c\,m\,x^{1+m}-4\,a^2\,c^2\,m\,x^{1+m}+2\,b^4\,n\,x^{1+m}-15\,a\,b^2\,c\,n\,x^{1+m}+16\,a^2\,c^2\,n\,x^{1+m}-\right.\right.$$
$$\left.\left.b^3\,c\,x^{1+m+n}+4\,a\,b\,c^2\,x^{1+m+n}-b^3\,c\,m\,x^{1+m+n}+4\,a\,b\,c^2\,m\,x^{1+m+n}+2\,b^3\,c\,n\,x^{1+m+n}-14\,a\,b\,c^2\,n\,x^{1+m+n}\right)\right)\Big/\left(2\,a^2\left(-b^2+4\,a\,c\right)^2 n^2\left(a+b\,x^n+c\,x^{2\,n}\right)\right)+$$

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

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

$$7 b c^2 x^{1+n} (d x)^m \left(x^n\right)^{\frac{1+m}{n}-\frac{1+m+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}} \text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.$$

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

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

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

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

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

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

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

$$\frac{1}{a\left(-b^2+4ac\right)^2(1+m)n^2}4bc^2mx^{1+n}(dx)^m(x^n)^{\frac{1+m}{n}-\frac{1+m+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

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

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

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

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

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

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

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

$$\frac{1}{a\,(-b^2+4\,a\,c)^2\,(1+m)\,n}9\,b\,c^2\,x^{1+n}\,(d\,x)^m\,(x^n)^{\frac{1+m}{n}-\frac{1+m+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},\,-\frac{1+m}{n},\,1-\frac{1+m}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

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

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

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

$$\frac{1}{a\left(-b^2+4ac\right)^2(1+m)\,n}9bc^2mx^{1+n}(dx)^m\left(x^n\right)^{\frac{1+m}{n}-\frac{1+m+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

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

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

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

$$\frac{1}{a\left(-b^2+4\,a\,c\right)^2\,(1+m)}8\,b^2\,c\,x\,(d\,x)^m\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},\,-\frac{1+m}{n},\,1-\frac{1+m}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

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

$$\frac{1}{\left(-b^2+4\,a\,c\right)^2\,(1+m)}16\,c^2\,x\,(d\,x)^m\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},\,-\frac{1+m}{n},\,1-\frac{1+m}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\frac{1}{2\,a\left(-b^2+4\,a\,c\right)^2(1+m)\,n}21\,b^2\,c\,x\,(d\,x)^m\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

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

$$\frac{1}{\left(-b^2+4ac\right)^2(1+m)\,n}12\,c^2\,x\,(d\,x)^m\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},\,-\frac{1+m}{n},\,1-\frac{1+m}{n},\,-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

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

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

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

$$\frac{1}{2\,a\,\left(-b^2+4\,a\,c\right)^2\,(1+m)\,n}21\,b^2\,c\,m\,x\,(d\,x)^m\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

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

$$\frac{1}{\left(-b^2+4\,a\,c\right)^2\,(1+m)\,n}12\,c^2\,m\,x\,(d\,x)^m\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

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

Problem 602: Result more than twice size of optimal antiderivative.

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

Optimal (type 6, 161 leaves, 2 steps):

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

Result (type 6, 5259 leaves):

$$x^{-m}\,(d\,x)^m\,\sqrt{a+b\,x^n+c\,x^{2\,n}}\,\left(\frac{\left(4\,a\,c+8\,a\,c\,m+4\,a\,c\,m^2+24\,a\,c\,n+24\,a\,c\,m\,n+3\,b^2\,n^2+32\,a\,c\,n^2\right)\,x^{1+m}}{4\,c\,(1+m+n)\,(1+m+2\,n)\,(1+m+3\,n)}+\frac{b\,(2+2\,m+7\,n)\,x^{1+m+n}}{2\,(1+m+2\,n)\,(1+m+3\,n)}+\frac{c\,x^{1+m+2\,n}}{1+m+3\,n}\right)+$$

$$\left(12\,a^4\,n^2\,x\,(d\,x)^m\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\text{AppellF1}\left[\frac{1+m}{n},\frac{1}{2},\frac{1}{2},\frac{1+m+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

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

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

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

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

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

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

$$\left(12\,a^4\,m\,n^2\,x\,(d\,x)^m\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\text{AppellF1}\left[\frac{1+m}{n},\frac{1}{2},\frac{1}{2},\frac{1+m+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

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

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

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

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

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

$$\Big(c \Big(b-\sqrt{b^2-4 a c}\Big) \Big(b+\sqrt{b^2-4 a c}\Big) (1+m) (1+m+2 n) (1+m+3 n) \big(a+x^n (b+c x^n)\big)^{3/2}$$

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

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

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

$$\Big(24 a^4 n^3 x (d x)^m \Big(b-\sqrt{b^2-4 a c}+2 c x^n\Big) \Big(b+\sqrt{b^2-4 a c}+2 c x^n\Big) \text{AppellF1}\Big[\frac{1+m}{n}, \frac{1}{2}, \frac{1}{2}, \frac{1+m+n}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big]\Big) \Big/$$

$$\Big(\Big(b-\sqrt{b^2-4 a c}\Big) \Big(b+\sqrt{b^2-4 a c}\Big) (1+m) (1+m+2 n) (1+m+3 n) \big(a+x^n (b+c x^n)\big)^{3/2}$$

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

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

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

$$\Big(12 a^3 b n^2 x^{1+n} (d x)^m \Big(b-\sqrt{b^2-4 a c}+2 c x^n\Big) \Big(b+\sqrt{b^2-4 a c}+2 c x^n\Big) \text{AppellF1}\Big[\frac{1+m+n}{n}, \frac{1}{2}, \frac{1}{2}, \frac{1+m+2 n}{n},$$

$$-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\Big]\Big) \Big/ \Big(\Big(b-\sqrt{b^2-4 a c}\Big) \Big(b+\sqrt{b^2-4 a c}\Big) (1+m+n)^2 (1+m+3 n)$$

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

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

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

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

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

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

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

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

$$\Bigg(12 a^3 b m n^2 x^{1+n} (d x)^m \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{1+m+n}{n},\frac{1}{2},\frac{1}{2},\frac{1+m+2 n}{n},\right.$$

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

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

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

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

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

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

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

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

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

$$\Bigg(18 a^3 b n^3 x^{1+n} (d x)^m \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{1+m+n}{n},\frac{1}{2},\frac{1}{2},\frac{1+m+2 n}{n},\right.$$

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

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

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):

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

Result (type 6, 930 leaves):

$$\frac{x\,(d\,x)^m\sqrt{a+b\,x^n+c\,x^{2\,n}}}{1+m+n}+$$

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

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

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

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

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

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

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

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

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

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

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):

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

Result (type 6, 440 leaves):

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

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):

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

Result (type 6, 3743 leaves):

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

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

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

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

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

$$\Big(8\,a\,b^2\,(1+m+n)\,x\,(d\,x)^m\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\Big[\frac{1+m}{n},\frac{1}{2},\frac{1}{2},\frac{1+m+n}{n},$$

$$-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

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

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

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

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

$$\Big(16\,a^2\,c\,(1+m+n)\,x\,(d\,x)^m\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\Big[\frac{1+m}{n},\frac{1}{2},\frac{1}{2},\frac{1+m+n}{n},$$

$$-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

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

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

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

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

$$\Big(8\,a\,b^2\,m\,(1+m+n)\,x\,(d\,x)^m\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\Big[\frac{1+m}{n},\frac{1}{2},\frac{1}{2},\frac{1+m+n}{n},$$

$$-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\,]\,\Big)\Big/$$

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

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

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

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

$$\Big(16\,a^2\,c\,m\,\left(1+m+n\right)\,x\,\left(d\,x\right)^m\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\text{AppellF1}\Big[\frac{1+m}{n},\ \frac{1}{2},\ \frac{1}{2},$$

$$\frac{1+m+n}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

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

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

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

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

$$\Big(8\,a\,b\,c\,\left(1+m+2\,n\right)\,x^{1+n}\,\left(d\,x\right)^m\,\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\,\text{AppellF1}\Big[\frac{1+m+n}{n},\ \frac{1}{2},\ \frac{1}{2},$$

$$\frac{1+m+2\,n}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

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

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

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

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

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

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):

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

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):

$$\frac{a (d+e x)^4}{4 e}+\frac{b (d+e x)^6}{6 e}+\frac{c (d+e x)^8}{8 e}$$

Result (type 1, 150 leaves):

$$d^3 \left(a+b d^2+c d^4\right) x+\frac{1}{2} d^2 \left(3 a+5 b d^2+7 c d^4\right) e x^2+\frac{1}{3} d \left(3 a+10 b d^2+21 c d^4\right) e^2 x^3+\frac{1}{4} \left(a+10 b d^2+35 c d^4\right) e^3 x^4+d \left(b+7 c d^2\right) e^4 x^5+\frac{1}{6} \left(b+21 c d^2\right) e^5 x^6+c d e^6 x^7+\frac{1}{8} c e^7 x^8$$

Problem 608: Result more than twice size of optimal antiderivative.

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

Optimal (type 1, 89 leaves, 4 steps):

$$\frac{a^2 (d+e x)^4}{4 e}+\frac{a b (d+e x)^6}{3 e}+\frac{\left(b^2+2 a c\right) (d+e x)^8}{8 e}+\frac{b c (d+e x)^{10}}{5 e}+\frac{c^2 (d+e x)^{12}}{12 e}$$

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):

$$\begin{aligned}
&d^3 \left(a+b d^2+c d^4\right)^3 x+\frac{3}{2} d^2 \left(a+b d^2+c d^4\right)^2 \left(a+3 b d^2+5 c d^4\right) e x^2+\\
&d \left(a^3+10 a^2 b d^2+21 a b^2 d^4+21 a^2 c d^4+12 b^3 d^6+72 a b c d^6+55 b^2 c d^8+55 a c^2 d^8+78 b c^2 d^{10}+35 c^3 d^{12}\right) e^2 x^3+\\
&\frac{1}{4} \left(a^3+30 a^2 b d^2+105 a b^2 d^4+105 a^2 c d^4+84 b^3 d^6+504 a b c d^6+495 b^2 c d^8+495 a c^2 d^8+858 b c^2 d^{10}+455 c^3 d^{12}\right) e^3 x^4+\\
&\frac{3}{5} d \left(5 a^2 b+35 a b^2 d^2+35 a^2 c d^2+42 b^3 d^4+252 a b c d^4+330 b^2 c d^6+330 a c^2 d^6+715 b c^2 d^8+455 c^3 d^{10}\right) e^4 x^5+\\
&\frac{1}{2} \left(a^2 b+21 a b^2 d^2+21 a^2 c d^2+42 b^3 d^4+252 a b c d^4+462 b^2 c d^6+462 a c^2 d^6+1287 b c^2 d^8+1001 c^3 d^{10}\right) e^5 x^6+\\
&\frac{1}{7} d \left(21 a b^2+21 a^2 c+84 b^3 d^2+504 a b c d^2+1386 b^2 c d^4+1386 a c^2 d^4+5148 b c^2 d^6+5005 c^3 d^8\right) e^6 x^7+\\
&\frac{3}{8} \left(a b^2+a^2 c+12 b^3 d^2+72 a b c d^2+330 b^2 c d^4+330 a c^2 d^4+1716 b c^2 d^6+2145 c^3 d^8\right) e^7 x^8+\\
&d \left(b^3+6 a b c+55 b^2 c d^2+55 a c^2 d^2+429 b c^2 d^4+715 c^3 d^6\right) e^8 x^9+\\
&\frac{1}{10} \left(b^3+6 a b c+165 b^2 c d^2+165 a c^2 d^2+2145 b c^2 d^4+5005 c^3 d^6\right) e^9 x^{10}+3 c d \left(b^2+a c+26 b c d^2+91 c^2 d^4\right) e^{10} x^{11}+\\
&\frac{1}{4} c \left(b^2+a c+78 b c d^2+455 c^2 d^4\right) e^{11} x^{12}+c^2 d \left(3 b+35 c d^2\right) e^{12} x^{13}+\frac{3}{14} c^2 \left(b+35 c d^2\right) e^{13} x^{14}+c^3 d e^{14} x^{15}+\frac{1}{16} c^3 e^{15} x^{16}
\end{aligned}$$

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):

$$\begin{aligned}
&f^3 \left(d^3 \left(a+b d^2+c d^4\right) x+\frac{1}{2} d^2 \left(3 a+5 b d^2+7 c d^4\right) e x^2+\frac{1}{3} d \left(3 a+10 b d^2+21 c d^4\right) e^2 x^3+\right.\\
&\left.\frac{1}{4} \left(a+10 b d^2+35 c d^4\right) e^3 x^4+d \left(b+7 c d^2\right) e^4 x^5+\frac{1}{6} \left(b+21 c d^2\right) e^5 x^6+c d e^6 x^7+\frac{1}{8} c e^7 x^8\right)
\end{aligned}$$

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):

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

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):

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

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

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):

$$17\,451\,466\,816\,x+443\,569\,828\,128\,x^2+7\,299\,544\,818\,384\,x^3+87\,406\,679\,578\,680\,x^4+\frac{4\,057\,390\,785\,756\,924\,x^5}{5}+6\,077\,684\,727\,888\,102\,x^6+$$
$$37\,727\,143\,432\,895\,007\,x^7+197\,897\,276\,851\,452\,864\,x^8+889\,942\,562\,270\,387\,136\,x^9+\frac{17\,344\,958\,593\,049\,772\,048\,x^{10}}{5}+$$
$$11\,821\,487\,501\,620\,716\,192\,x^{11}+35\,454\,069\,480\,572\,048\,124\,x^{12}+94\,069\,263\,918\,929\,616\,324\,x^{13}+221\,699\,757\,548\,270\,194\,389\,x^{14}+$$
$$465\,517\,091\,041\,681\,015\,296\,x^{15}+872\,775\,774\,067\,455\,498\,528\,x^{16}+1\,463\,104\,032\,160\,519\,033\,200\,x^{17}+2\,194\,577\,166\,014\,752\,240\,080\,x^{18}+$$
$$2\,945\,285\,062\,308\,448\,290\,360\,x^{19}+3\,534\,290\,697\,929\,473\,864\,098\,x^{20}+\frac{26\,506\,949\,038\,858\,918\,036\,881\,x^{21}}{7}+3\,614\,565\,944\,605\,222\,108\,800\,x^{22}+$$
$$3\,064\,515\,076\,512\,846\,852\,480\,x^{23}+2\,298\,383\,223\,254\,096\,766\,840\,x^{24}+\frac{7\,584\,660\,010\,542\,711\,771\,792\,x^{25}}{5}+875\,152\,864\,622\,814\,086\,340\,x^{26}+$$
$$437\,576\,396\,725\,285\,446\,564\,x^{27}+\frac{2\,625\,458\,326\,972\,530\,284\,475\,x^{28}}{14}+67\,899\,784\,121\,041\,365\,504\,x^{29}+\frac{101\,849\,676\,181\,562\,048\,256\,x^{30}}{5}+$$
$$4\,928\,210\,137\,817\,518\,464\,x^{31}+924\,039\,400\,840\,784\,712\,x^{32}+126\,005\,372\,841\,925\,188\,x^{33}+11\,118\,121\,133\,111\,046\,x^{34}+\frac{16\,677\,181\,699\,666\,569\,x^{35}}{35}$$

Test results for the 96 problems in "1.2.3.3 (d+e x^n)^q (a+b x^n+c x^(2 n))^p.m"

Problem 5: Result is not expressed in closed-form.

$$\int\frac{d+e\,x^4}{d^2+b\,x^4+e^2\,x^8}\,dx$$

Optimal (type 3, 791 leaves, 19 steps):

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{2\sqrt{d}\,\sqrt{e}-\sqrt{-b+2\,d\,e}}-2\sqrt{e}\,x}{\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{-b+2\,d\,e}}}\right]}{4\sqrt{d}\,\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{-b+2\,d\,e}}}-\frac{\text{ArcTan}\left[\frac{\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{-b+2\,d\,e}}-2\sqrt{e}\,x}{\sqrt{2\sqrt{d}\,\sqrt{e}-\sqrt{-b+2\,d\,e}}}\right]}{4\sqrt{d}\,\sqrt{2\sqrt{d}\,\sqrt{e}-\sqrt{-b+2\,d\,e}}}+\frac{\text{ArcTan}\left[\frac{\sqrt{2\sqrt{d}\,\sqrt{e}-\sqrt{-b+2\,d\,e}}+2\sqrt{e}\,x}{\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{-b+2\,d\,e}}}\right]}{4\sqrt{d}\,\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{-b+2\,d\,e}}}+$$
$$\frac{\text{ArcTan}\left[\frac{\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{-b+2\,d\,e}}+2\sqrt{e}\,x}{\sqrt{2\sqrt{d}\,\sqrt{e}-\sqrt{-b+2\,d\,e}}}\right]}{4\sqrt{d}\,\sqrt{2\sqrt{d}\,\sqrt{e}-\sqrt{-b+2\,d\,e}}}-\frac{\text{Log}\left[\sqrt{d}-\sqrt{2\sqrt{d}\,\sqrt{e}-\sqrt{-b+2\,d\,e}}\;x+\sqrt{e}\,x^2\right]}{8\sqrt{d}\,\sqrt{2\sqrt{d}\,\sqrt{e}-\sqrt{-b+2\,d\,e}}}+\frac{\text{Log}\left[\sqrt{d}+\sqrt{2\sqrt{d}\,\sqrt{e}-\sqrt{-b+2\,d\,e}}\;x+\sqrt{e}\,x^2\right]}{8\sqrt{d}\,\sqrt{2\sqrt{d}\,\sqrt{e}-\sqrt{-b+2\,d\,e}}}-$$
$$\frac{\text{Log}\left[\sqrt{d}-\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{-b+2\,d\,e}}\;x+\sqrt{e}\,x^2\right]}{8\sqrt{d}\,\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{-b+2\,d\,e}}}+\frac{\text{Log}\left[\sqrt{d}+\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{-b+2\,d\,e}}\;x+\sqrt{e}\,x^2\right]}{8\sqrt{d}\,\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{-b+2\,d\,e}}}$$

Result (type 7, 67 leaves):

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

Problem 6: Result is not expressed in closed-form.

$$\int \frac{d+e\,x^4}{d^2+f\,x^4+e^2\,x^8}\,dx$$

Optimal (type 3, 791 leaves, 19 steps):

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{2\sqrt{d}\,\sqrt{e}-\sqrt{2\,d\,e-f}}-2\sqrt{e}\,x}{\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{2\,d\,e-f}}}\right]}{4\sqrt{d}\,\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{2\,d\,e-f}}}-\frac{\text{ArcTan}\left[\frac{\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{2\,d\,e-f}}-2\sqrt{e}\,x}{\sqrt{2\sqrt{d}\,\sqrt{e}-\sqrt{2\,d\,e-f}}}\right]}{4\sqrt{d}\,\sqrt{2\sqrt{d}\,\sqrt{e}-\sqrt{2\,d\,e-f}}}+\frac{\text{ArcTan}\left[\frac{\sqrt{2\sqrt{d}\,\sqrt{e}-\sqrt{2\,d\,e-f}}+2\sqrt{e}\,x}{\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{2\,d\,e-f}}}\right]}{4\sqrt{d}\,\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{2\,d\,e-f}}}+$$

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

$$\frac{\text{Log}\left[\sqrt{d}-\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{2\,d\,e-f}}\,x+\sqrt{e}\,x^2\right]}{8\sqrt{d}\,\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{2\,d\,e-f}}}+\frac{\text{Log}\left[\sqrt{d}+\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{2\,d\,e-f}}\,x+\sqrt{e}\,x^2\right]}{8\sqrt{d}\,\sqrt{2\sqrt{d}\,\sqrt{e}+\sqrt{2\,d\,e-f}}}$$

Result (type 7, 67 leaves):

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

Problem 7: Result is not expressed in closed-form.

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

Optimal (type 3, 349 leaves, 7 steps):

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

$$\frac{\sqrt{e}\,\text{ArcTanh}\left[\frac{\sqrt{2}\,\sqrt{e}\,x}{\sqrt{\sqrt{b-2\,d\,e}-\sqrt{b+2\,d\,e}}}\right]}{\sqrt{2}\,\sqrt{b-2\,d\,e}\,\sqrt{\sqrt{b-2\,d\,e}-\sqrt{b+2\,d\,e}}}-\frac{\sqrt{e}\,\text{ArcTanh}\left[\frac{\sqrt{2}\,\sqrt{e}\,x}{\sqrt{\sqrt{b-2\,d\,e}+\sqrt{b+2\,d\,e}}}\right]}{\sqrt{2}\,\sqrt{b-2\,d\,e}\,\sqrt{\sqrt{b-2\,d\,e}+\sqrt{b+2\,d\,e}}}$$

Result (type 7, 69 leaves):

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

Problem 8: Result is not expressed in closed-form.

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

Optimal (type 3, 751 leaves, 19 steps):

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{2\sqrt{d}\sqrt{e}-\sqrt{2de+f}}-2\sqrt{e}\,x}{\sqrt{2\sqrt{d}\sqrt{e}+\sqrt{2de+f}}}\right]}{4\sqrt{d}\sqrt{2\sqrt{d}\sqrt{e}+\sqrt{2de+f}}}-\frac{\text{ArcTan}\left[\frac{\sqrt{2\sqrt{d}\sqrt{e}+\sqrt{2de+f}}-2\sqrt{e}\,x}{\sqrt{2\sqrt{d}\sqrt{e}-\sqrt{2de+f}}}\right]}{4\sqrt{d}\sqrt{2\sqrt{d}\sqrt{e}-\sqrt{2de+f}}}+\frac{\text{ArcTan}\left[\frac{\sqrt{2\sqrt{d}\sqrt{e}-\sqrt{2de+f}}+2\sqrt{e}\,x}{\sqrt{2\sqrt{d}\sqrt{e}+\sqrt{2de+f}}}\right]}{4\sqrt{d}\sqrt{2\sqrt{d}\sqrt{e}+\sqrt{2de+f}}}+$$
$$\frac{\text{ArcTan}\left[\frac{\sqrt{2\sqrt{d}\sqrt{e}+\sqrt{2de+f}}+2\sqrt{e}\,x}{\sqrt{2\sqrt{d}\sqrt{e}-\sqrt{2de+f}}}\right]}{4\sqrt{d}\sqrt{2\sqrt{d}\sqrt{e}-\sqrt{2de+f}}}-\frac{\text{Log}\left[\sqrt{d}-\sqrt{2\sqrt{d}\sqrt{e}-\sqrt{2de+f}}\,x+\sqrt{e}\,x^2\right]}{8\sqrt{d}\sqrt{2\sqrt{d}\sqrt{e}-\sqrt{2de+f}}}+\frac{\text{Log}\left[\sqrt{d}+\sqrt{2\sqrt{d}\sqrt{e}-\sqrt{2de+f}}\,x+\sqrt{e}\,x^2\right]}{8\sqrt{d}\sqrt{2\sqrt{d}\sqrt{e}-\sqrt{2de+f}}}-$$
$$\frac{\text{Log}\left[\sqrt{d}-\sqrt{2\sqrt{d}\sqrt{e}+\sqrt{2de+f}}\,x+\sqrt{e}\,x^2\right]}{8\sqrt{d}\sqrt{2\sqrt{d}\sqrt{e}+\sqrt{2de+f}}}+\frac{\text{Log}\left[\sqrt{d}+\sqrt{2\sqrt{d}\sqrt{e}+\sqrt{2de+f}}\,x+\sqrt{e}\,x^2\right]}{8\sqrt{d}\sqrt{2\sqrt{d}\sqrt{e}+\sqrt{2de+f}}}$$

Result (type 7, 69 leaves):

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

Problem 9: Result is not expressed in closed-form.

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

Optimal (type 3, 411 leaves, 19 steps):

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

Result (type 7, 55 leaves):

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

Problem 10: Result is not expressed in closed-form.

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

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

$$-\frac{\left(3+\sqrt{5}\right)^{1/4}\text{ArcTan}\left[1-\frac{2^{3/4}x}{\left(3-\sqrt{5}\right)^{1/4}}\right]}{2\times2^{3/4}\sqrt{5}}+\frac{\left(3+\sqrt{5}\right)^{1/4}\text{ArcTan}\left[1+\frac{2^{3/4}x}{\left(3-\sqrt{5}\right)^{1/4}}\right]}{2\times2^{3/4}\sqrt{5}}-\frac{\left(3-\sqrt{5}\right)^{1/4}\text{ArcTan}\left[1-\frac{2^{3/4}x}{\left(3+\sqrt{5}\right)^{1/4}}\right]}{2\times2^{3/4}\sqrt{5}}+\frac{\left(3-\sqrt{5}\right)^{1/4}\text{ArcTan}\left[1+\frac{2^{3/4}x}{\left(3+\sqrt{5}\right)^{1/4}}\right]}{2\times2^{3/4}\sqrt{5}}-\frac{\left(3+\sqrt{5}\right)^{1/4}\text{Log}\left[\sqrt{2\left(3-\sqrt{5}\right)}-2\left(2\left(3-\sqrt{5}\right)\right)^{1/4}x+2x^2\right]}{4\times2^{3/4}\sqrt{5}}+\frac{\left(3+\sqrt{5}\right)^{1/4}\text{Log}\left[\sqrt{2\left(3-\sqrt{5}\right)}+2\left(2\left(3-\sqrt{5}\right)\right)^{1/4}x+2x^2\right]}{4\times2^{3/4}\sqrt{5}}-\frac{\left(3-\sqrt{5}\right)^{1/4}\text{Log}\left[\sqrt{2\left(3+\sqrt{5}\right)}-2\left(2\left(3+\sqrt{5}\right)\right)^{1/4}x+2x^2\right]}{4\times2^{3/4}\sqrt{5}}+\frac{\left(3-\sqrt{5}\right)^{1/4}\text{Log}\left[\sqrt{2\left(3+\sqrt{5}\right)}+2\left(2\left(3+\sqrt{5}\right)\right)^{1/4}x+2x^2\right]}{4\times2^{3/4}\sqrt{5}}$$

Result (type 7, 55 leaves):

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

Problem 12: Result unnecessarily involves imaginary or complex numbers.

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

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):

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

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

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

Optimal (type 3, 331 leaves, 19 steps):

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

Result (type 7, 55 leaves):

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

Problem 17: Result is not expressed in closed-form.

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

Optimal (type 3, 157 leaves, 7 steps):

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

Result (type 7, 53 leaves):

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

Problem 18: Result is not expressed in closed-form.

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

Optimal (type 3, 171 leaves, 7 steps):

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

Result (type 7, 55 leaves):

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

Problem 20: Result is not expressed in closed-form.

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

Optimal (type 3, 511 leaves, 19 steps):

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

Result (type 7, 57 leaves):

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

Problem 21: Result is not expressed in closed-form.

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

Optimal (type 3, 411 leaves, 19 steps) :

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

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

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

Result (type 7, 57 leaves) :

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

Problem 23: Result unnecessarily involves imaginary or complex numbers.

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

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

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

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

Result (type 3, 129 leaves) :

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

Problem 25: Result is not expressed in closed-form.

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

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

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

Result (type 7, 57 leaves):

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

Problem 28: Result is not expressed in closed-form.

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

Optimal (type 3, 165 leaves, 7 steps):

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

Result (type 7, 55 leaves):

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

Problem 29: Result is not expressed in closed-form.

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

Optimal (type 3, 169 leaves, 7 steps):

$$\frac{\text{ArcTan}\left[\sqrt{\frac{2}{-\sqrt{3}+\sqrt{7}}}\;x\right]}{\sqrt{14\left(-\sqrt{3}+\sqrt{7}\right)}}+\frac{\text{ArcTan}\left[\sqrt{\frac{2}{\sqrt{3}+\sqrt{7}}}\;x\right]}{\sqrt{14\left(\sqrt{3}+\sqrt{7}\right)}}+\frac{\text{ArcTanh}\left[\sqrt{\frac{2}{-\sqrt{3}+\sqrt{7}}}\;x\right]}{\sqrt{14\left(-\sqrt{3}+\sqrt{7}\right)}}+\frac{\text{ArcTanh}\left[\sqrt{\frac{2}{\sqrt{3}+\sqrt{7}}}\;x\right]}{\sqrt{14\left(\sqrt{3}+\sqrt{7}\right)}}$$

Result (type 7, 57 leaves):

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

Problem 31: Result is not expressed in closed-form.

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

Optimal (type 3, 135 leaves, 9 steps):

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

Result (type 7, 71 leaves):

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

Problem 32: Result is not expressed in closed-form.

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

Optimal (type 3, 164 leaves, 9 steps):

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

Result (type 7, 72 leaves):

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

Problem 33: Result is not expressed in closed-form.

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

Optimal (type 3, 180 leaves, 9 steps):

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

Result (type 7, 89 leaves):

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

Problem 39: Result is not expressed in closed-form.

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

Optimal (type 3, 716 leaves, 15 steps):

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

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

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

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

Result (type 7, 88 leaves):

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

Problem 41: Result is not expressed in closed-form.

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

Optimal (type 3, 433 leaves, 9 steps):

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

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

Result (type 7, 88 leaves):

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

Problem 58: Unable to integrate problem.

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

Optimal (type 6, 171 leaves, 6 steps):

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

Result (type 8, 25 leaves):

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

Problem 63: Unable to integrate problem.

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

Optimal (type 6, 167 leaves, 6 steps):

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

Result (type 8, 23 leaves):

$$\int\frac{\left(a+c\,x^{2\,n}\right)^p}{d+e\,x^n}\,dx$$

Problem 64: Unable to integrate problem.

$$\int\frac{\left(a+c\,x^{2\,n}\right)^p}{\left(d+e\,x^n\right)^2}\,dx$$

Optimal (type 6, 261 leaves, 8 steps):

$$\frac{e^2 x^{1+2n} \left(a+c x^{2n}\right)^p \left(1+\frac{c x^{2n}}{a}\right)^{-p} \text{AppellF1}\left[\frac{1}{2}\left(2+\frac{1}{n}\right),-p,2,\frac{1}{2}\left(4+\frac{1}{n}\right),-\frac{c x^{2n}}{a},\frac{e^2 x^{2n}}{d^2}\right]}{d^4 (1+2n)}+\frac{x \left(a+c x^{2n}\right)^p \left(1+\frac{c x^{2n}}{a}\right)^{-p} \text{AppellF1}\left[\frac{1}{2n},-p,2,\frac{1}{2}\left(2+\frac{1}{n}\right),-\frac{c x^{2n}}{a},\frac{e^2 x^{2n}}{d^2}\right]}{d^2}-\frac{2 e x^{1+n} \left(a+c x^{2n}\right)^p \left(1+\frac{c x^{2n}}{a}\right)^{-p} \text{AppellF1}\left[\frac{1+n}{2n},-p,2,\frac{1}{2}\left(3+\frac{1}{n}\right),-\frac{c x^{2n}}{a},\frac{e^2 x^{2n}}{d^2}\right]}{d^3 (1+n)}$$

Result (type 8, 23 leaves):

$$\int \frac{\left(a+c x^{2n}\right)^p}{\left(d+e x^n\right)^2} \, dx$$

Problem 65: Unable to integrate problem.

$$\int \frac{\left(a+c x^{2n}\right)^p}{\left(d+e x^n\right)^3} \, dx$$

Optimal (type 6, 357 leaves, 10 steps):

$$\frac{3 e^2 x^{1+2n} \left(a+c x^{2n}\right)^p \left(1+\frac{c x^{2n}}{a}\right)^{-p} \text{AppellF1}\left[\frac{1}{2}\left(2+\frac{1}{n}\right),-p,3,\frac{1}{2}\left(4+\frac{1}{n}\right),-\frac{c x^{2n}}{a},\frac{e^2 x^{2n}}{d^2}\right]}{d^5 (1+2n)}-\frac{e^3 x^{1+3n} \left(a+c x^{2n}\right)^p \left(1+\frac{c x^{2n}}{a}\right)^{-p} \text{AppellF1}\left[\frac{1}{2}\left(3+\frac{1}{n}\right),-p,3,\frac{1}{2}\left(5+\frac{1}{n}\right),-\frac{c x^{2n}}{a},\frac{e^2 x^{2n}}{d^2}\right]}{d^6 (1+3n)}+\frac{x \left(a+c x^{2n}\right)^p \left(1+\frac{c x^{2n}}{a}\right)^{-p} \text{AppellF1}\left[\frac{1}{2n},-p,3,\frac{1}{2}\left(2+\frac{1}{n}\right),-\frac{c x^{2n}}{a},\frac{e^2 x^{2n}}{d^2}\right]}{d^3}-\frac{3 e x^{1+n} \left(a+c x^{2n}\right)^p \left(1+\frac{c x^{2n}}{a}\right)^{-p} \text{AppellF1}\left[\frac{1+n}{2n},-p,3,\frac{1}{2}\left(3+\frac{1}{n}\right),-\frac{c x^{2n}}{a},\frac{e^2 x^{2n}}{d^2}\right]}{d^4 (1+n)}$$

Result (type 8, 23 leaves):

$$\int \frac{\left(a+c x^{2n}\right)^p}{\left(d+e x^n\right)^3} \, dx$$

Problem 73: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(d+e\,x^n\right)^2\,\left(a+b\,x^n+c\,x^{2\,n}\right)}\,dx$$

Optimal (type 5, 368 leaves, 7 steps):

$$-\left(\left(c\left(2\,c^2\,d^2+b\left(b+\sqrt{b^2-4\,a\,c}\right)e^2-2\,c\,e\left(b\,d+\sqrt{b^2-4\,a\,c}\,d+a\,e\right)\right)x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(\left(b^2-4\,a\,c-b\sqrt{b^2-4\,a\,c}\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\right)\right)-\left(c\left(2\,c^2\,d^2+b\left(b-\sqrt{b^2-4\,a\,c}\right)e^2-2\,c\,e\left(b\,d-\sqrt{b^2-4\,a\,c}\,d+a\,e\right)\right)x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(\left(b^2-4\,a\,c+b\sqrt{b^2-4\,a\,c}\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\right)+\frac{e^2\left(2\,c\,d-b\,e\right)x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{e\,x^n}{d}\right]}{d\left(c\,d^2-b\,d\,e+a\,e^2\right)^2}+\frac{e^2\,x\,\text{Hypergeometric2F1}\left[2,\frac{1}{n},1+\frac{1}{n},-\frac{e\,x^n}{d}\right]}{d^2\left(c\,d^2-b\,d\,e+a\,e^2\right)}$$

Result (type 5, 2302 leaves):

$$\frac{\left(a\,e^2-c\,d^2\,n+b\,d\,e\,n-a\,e^2\,n\right)x}{a\,d^2\left(c\,d^2-b\,d\,e+a\,e^2\right)n}+\frac{\left(-a\,e^2+c\,d^2\,n-b\,d\,e\,n+a\,e^2\,n\right)x}{a\,d^2\left(c\,d^2-b\,d\,e+a\,e^2\right)n}+\frac{e^2\,x}{d\left(c\,d^2-b\,d\,e+a\,e^2\right)n\left(d+e\,x^n\right)}+\frac{e^2\left(-c\,d^2+b\,d\,e-a\,e^2+3\,c\,d^2\,n-2\,b\,d\,e\,n+a\,e^2\,n\right)x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{e\,x^n}{d}\right]}{d^2\left(c\,d^2-b\,d\,e+a\,e^2\right)^2 n}-\frac{1}{\left(c\,d^2-b\,d\,e+a\,e^2\right)^2}$$

$$2\,c^2\,d\,e\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+\frac{1}{\left(c\,d^2-b\,d\,e+a\,e^2\right)^2}$$

$$b\,c\,e^2\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)-$$

$$\frac{1}{\left(c\,d^2-b\,d\,e+a\,e^2\right)^2}c^2\,d^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)+$$

$$\frac{1}{\left(c\,d^2-b\,d\,e+a\,e^2\right)^2}2\,b\,c\,d\,e\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{\left(c\,d^2-b\,d\,e+a\,e^2\right)^2}b^2\,e^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{\left(c\,d^2-b\,d\,e+a\,e^2\right)^2}a\,c\,e^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)$$

Problem 74: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{(d+e x^n)^3 \left(a+b x^n+c x^{2 n}\right)} \, dx$$

Optimal (type 5, 552 leaves, 8 steps):

$$-\left(\left(c \left(2 c^3 d^3-b^2 \left(b+\sqrt{b^2-4 a c}\right) e^3-3 c^2 d e \left(b d+\sqrt{b^2-4 a c}\, d+2 a e\right)+c e^2 \left(3 b^2 d+a \sqrt{b^2-4 a c}\, e+3 b \left(\sqrt{b^2-4 a c}\, d+a e\right)\right)\right) x\, \text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}\right]\right)\Big/\left(\left(b^2-4 a c-b \sqrt{b^2-4 a c}\right) \left(c d^2-b d e+a e^2\right)^3\right)\right)-\left(c \left(2 c^3 d^3-b^2 \left(b-\sqrt{b^2-4 a c}\right) e^3-3 c^2 d e \left(b d-\sqrt{b^2-4 a c}\, d+2 a e\right)+c e^2 \left(3 b^2 d-3 b \sqrt{b^2-4 a c}\, d+3 a b e-a \sqrt{b^2-4 a c}\, e\right)\right) x\, \text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]\right)\Big/\left(\left(b^2-4 a c+b \sqrt{b^2-4 a c}\right) \left(c d^2-b d e+a e^2\right)^3\right)+\frac{e^2 \left(3 c^2 d^2+b^2 e^2-c e (3 b d+a e)\right) x\, \text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{e x^n}{d}\right]}{d \left(c d^2-b d e+a e^2\right)^3}+\frac{e^2 (2 c d-b e) x\, \text{Hypergeometric2F1}\left[2,\frac{1}{n},1+\frac{1}{n},-\frac{e x^n}{d}\right]}{d^2 \left(c d^2-b d e+a e^2\right)^2}+\frac{e^2 x\, \text{Hypergeometric2F1}\left[3,\frac{1}{n},1+\frac{1}{n},-\frac{e x^n}{d}\right]}{d^3 \left(c d^2-b d e+a e^2\right)}$$

Result (type 5, 4111 leaves):

$$\left(\left(-a c d^2 e^2+a b d e^3-a^2 e^4+7 a c d^2 e^2 n-5 a b d e^3 n+3 a^2 e^4 n-2 c^2 d^4 n^2+4 b c d^3 e n^2-2 b^2 d^2 e^2 n^2-4 a c d^2 e^2 n^2+4 a b d e^3 n^2-2 a^2 e^4 n^2\right) x\right)\Big/\left(2 a d^3 \left(c d^2-b d e+a e^2\right)^2 n^2\right)+\left(\left(a c d^2 e^2-a b d e^3+a^2 e^4-7 a c d^2 e^2 n+5 a b d e^3 n-3 a^2 e^4 n+2 c^2 d^4 n^2-4 b c d^3 e n^2+2 b^2 d^2 e^2 n^2+4 a c d^2 e^2 n^2-4 a b d e^3 n^2+2 a^2 e^4 n^2\right) x\right)\Big/\left(2 a d^3 \left(c d^2-b d e+a e^2\right)^2 n^2\right)+\frac{e^2 x}{2 d \left(c d^2-b d e+a e^2\right) n \left(d+e x^n\right)^2}+\frac{\left(-c d^2 e^2+b d e^3-a e^4+6 c d^2 e^2 n-4 b d e^3 n+2 a e^4 n\right) x}{2 d^2 \left(c d^2-b d e+a e^2\right)^2 n^2 \left(d+e x^n\right)}+\left(\left(c^2 d^4 e^2-2 b c d^3 e^3+b^2 d^2 e^4+2 a c d^2 e^4-2 a b d e^5+a^2 e^6-7 c^2 d^4 e^2 n+12 b c d^3 e^3 n-5 b^2 d^2 e^4 n-10 a c d^2 e^4 n+8 a b d e^5 n-3 a^2 e^6 n+12 c^2 d^4 e^2 n^2-16 b c d^3 e^3 n^2+6 b^2 d^2 e^4 n^2+6 a c d^2 e^4 n^2-6 a b d e^5 n^2+2 a^2 e^6 n^2\right) x\, \text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{e x^n}{d}\right]\right)\Big/\left(2 d^3 \left(c d^2-b d e+a e^2\right)^3 n^2\right)-\frac{1}{\left(c d^2-b d e+a e^2\right)^3}$$

$$3 c^3 d^2 e\, x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n}, -\frac{1}{n}, \frac{-1+n}{n}, -\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}} + \right.$$

$$\left. \frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n}, -\frac{1}{n}, \frac{-1+n}{n}, -\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}} \right) + \frac{1}{\left(c d^2 - b d e + a e^2\right)^3}$$

$$3 b c^2 d e^2 x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n}, -\frac{1}{n}, \frac{-1+n}{n}, -\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}} + \right.$$

$$\left. \frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n}, -\frac{1}{n}, \frac{-1+n}{n}, -\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}} \right) - \frac{1}{\left(c d^2 - b d e + a e^2\right)^3}$$

$$b^2 c e^3 x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n}, -\frac{1}{n}, \frac{-1+n}{n}, -\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}} + \right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)+\frac{1}{\left(c d^2-b d e+a e^2\right)^3}$$

$$a c^2 e^3 x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)-$$

$$\frac{1}{\left(c d^2-b d e+a e^2\right)^3}c^3 d^3 x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)+$$

$$\frac{1}{\left(c\,d^2-b\,d\,e+a\,e^2\right)^3}3\,b\,c^2\,d^2\,e\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{\left(c\,d^2-b\,d\,e+a\,e^2\right)^3}3\,b^2\,c\,d\,e^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)+$$

$$\frac{1}{\left(c\,d^2-b\,d\,e+a\,e^2\right)^3}3\,a\,c^2\,d\,e^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{\left(c\,d^2-b\,d\,e+a\,e^2\right)^3}b^3e^3x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{\left(c\,d^2-b\,d\,e+a\,e^2\right)^3}2\,a\,b\,c\,e^3x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)$$

Problem 75: Result more than twice size of optimal antiderivative.

$$\int \frac{(d+e x^n)^3}{(a+b x^n+c x^{2n})^2}\, dx$$

Optimal (type 5, 750 leaves, 9 steps):

$$\left(x\left(b^2 c d^3-2 a c d\left(c d^2-3 a e^2\right)-a b e\left(3 c d^2+a e^2\right)-\left(a b^2 e^3+2 a c e\left(3 c d^2-a e^2\right)-b c d\left(c d^2+3 a e^2\right)\right) x^n\right)\right)\Big/\left(a c\left(b^2-4 a c\right) n\left(a+b x^n+c x^{2n}\right)\right)+\frac{e^2\left(e+\frac{6 c d-3 b e}{\sqrt{b^2-4 a c}}\right) x \,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}\right]}{c\left(b-\sqrt{b^2-4 a c}\right)}+$$
$$\left(\left(\left(a b^2 e^3+2 a c e\left(3 c d^2-a e^2\right)-b c d\left(c d^2+3 a e^2\right)\right)(1-n)+\frac{1}{\sqrt{b^2-4 a c}}\right.\right.$$
$$\left.\left(b^2 c d\left(3 a e^2(1-3 n)-c d^2(1-n)\right)-a b^3 e^3(1-3 n)+4 a c^2 d\left(c d^2-3 a e^2\right)(1-2 n)+2 a b c e\left(a e^2(2-5 n)+3 c d^2 n\right)\right)\right)$$
$$\left.x \,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}\right]\right)\Big/\left(a c\left(b^2-4 a c\right)\left(b-\sqrt{b^2-4 a c}\right) n\right)+$$
$$\frac{e^2\left(e-\frac{3(2 c d-b e)}{\sqrt{b^2-4 a c}}\right) x \,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]}{c\left(b+\sqrt{b^2-4 a c}\right)}+\left(\left(\left(a b^2 e^3+2 a c e\left(3 c d^2-a e^2\right)-b c d\left(c d^2+3 a e^2\right)\right)(1-n)-\right.\right.$$
$$\left.\frac{1}{\sqrt{b^2-4 a c}}\left(b^2 c d\left(3 a e^2(1-3 n)-c d^2(1-n)\right)-a b^3 e^3(1-3 n)+4 a c^2 d\left(c d^2-3 a e^2\right)(1-2 n)+2 a b c e\left(a e^2(2-5 n)+3 c d^2 n\right)\right)\right)$$
$$\left.x \,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]\right)\Big/\left(a c\left(b^2-4 a c\right)\left(b+\sqrt{b^2-4 a c}\right) n\right)$$

Result (type 5, 5537 leaves):

$$\frac{\left(-b^2 c d^3+2 a c^2 d^3+3 a b c d^2 e-6 a^2 c d e^2+a^2 b e^3+b^2 c d^3 n-4 a c^2 d^3 n\right) x}{a^2 c\left(-b^2+4 a c\right) n}+$$
$$\frac{\left(b^2 c d^3-2 a c^2 d^3-3 a b c d^2 e+6 a^2 c d e^2-a^2 b e^3-b^2 c d^3 n+4 a c^2 d^3 n\right) x}{a^2 c\left(-b^2+4 a c\right) n}-$$
$$\left(x\left(b^2 c d^3-2 a c^2 d^3-3 a b c d^2 e+6 a^2 c d e^2-a^2 b e^3+b c^2 d^3 x^n-6 a c^2 d^2 e x^n+3 a b c d e^2 x^n-a b^2 e^3 x^n+2 a^2 c e^3 x^n\right)\right)\Big/$$
$$\left(a c\left(-b^2+4 a c\right) n\left(a+b x^n+c x^{2n}\right)\right)-\frac{1}{a\left(-b^2+4 a c\right)}$$

$$b\,c\,d^3\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{-b^2+4\,a\,c}6\,c\,d^2\,e\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)-$$

$$\frac{1}{-b^2+4\,a\,c}3\,b\,d\,e^2\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\ \text{Hypergeometric2F1}\left[-\frac{1}{n},\ -\frac{1}{n},\ \frac{-1+n}{n},\ -\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{-b^2+4ac}2\,a\,e^3\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\ \text{Hypergeometric2F1}\left[-\frac{1}{n},\ -\frac{1}{n},\ \frac{-1+n}{n},\ -\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\ \text{Hypergeometric2F1}\left[-\frac{1}{n},\ -\frac{1}{n},\ \frac{-1+n}{n},\ -\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{a\left(-b^2+4ac\right)n}b\,c\,d^3\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\ \text{Hypergeometric2F1}\left[-\frac{1}{n},\ -\frac{1}{n},\ \frac{-1+n}{n},\ -\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\ \text{Hypergeometric2F1}\left[-\frac{1}{n},\ -\frac{1}{n},\ \frac{-1+n}{n},\ -\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)-\frac{1}{\left(-b^2+4ac\right)n}$$

$$6\,c\,d^2\,e\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)\,n}3\,b\,d\,e^2\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)\,n}2\,a\,e^3\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)-$$

$$\frac{1}{c\left(-b^2+4ac\right)n}b^2e^3x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{a\left(-b^2+4ac\right)}b^2d^3x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{-b^2+4\,a\,c}4\,c\,d^3\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{a\left(-b^2+4\,a\,c\right)n}b^2\,d^3\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)+$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)n}2\,c\,d^3\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{\left(-b^2+4ac\right)n}3bd^2ex\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{\left(-b^2+4ac\right)n}6ade^2x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{c\left(-b^2+4 a c\right) n} a b e^3 x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)$$

Problem 76: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(d+e x^n\right)^2}{\left(a+b x^n+c x^{2 n}\right)^2} \, dx$$

Optimal (type 5, 543 leaves, 9 steps):

$$\frac{x\left(b^2 d^2-2 a b d e-2 a\left(c d^2-a e^2\right)+\left(b c d^2-4 a c d e+a b e^2\right) x^n\right)}{a\left(b^2-4 a c\right) n\left(a+b x^n+c x^{2 n}\right)}-\frac{2 e^2 x \text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}\right]}{b^2-4 a c-b \sqrt{b^2-4 a c}}-$$

$$\left(\left(\left(b c d^2-4 a c d e+a b e^2\right)(1-n)-\frac{b^2\left(a e^2(1-3 n)-c d^2(1-n)\right)+4 a c\left(c d^2-a e^2\right)(1-2 n)+4 a b c d e n}{\sqrt{b^2-4 a c}}\right)\right.$$

$$\left.x \text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}\right]\right)\Big/$$

$$\left(a\left(b^2-4 a c\right)\left(b-\sqrt{b^2-4 a c}\right) n\right)-\frac{2 e^2 x \text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]}{b^2-4 a c+b \sqrt{b^2-4 a c}}-$$

$$\left(\left(\left(b c d^2-4 a c d e+a b e^2\right)(1-n)+\frac{b^2\left(a e^2(1-3 n)-c d^2(1-n)\right)+4 a c\left(c d^2-a e^2\right)(1-2 n)+4 a b c d e n}{\sqrt{b^2-4 a c}}\right)\right.$$

$$\left.x \text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]\right)\Big/\left(a\left(b^2-4 a c\right)\left(b+\sqrt{b^2-4 a c}\right) n\right)$$

Result (type 5, 4177 leaves):

$$\frac{\left(-b^2 d^2+2 a c d^2+2 a b d e-2 a^2 e^2+b^2 d^2 n-4 a c d^2 n\right) x}{a^2 \left(-b^2+4 a c\right) n}+\frac{\left(b^2 d^2-2 a c d^2-2 a b d e+2 a^2 e^2-b^2 d^2 n+4 a c d^2 n\right) x}{a^2 \left(-b^2+4 a c\right) n}-$$

$$\frac{x \left(b^2 d^2-2 a c d^2-2 a b d e+2 a^2 e^2+b c d^2 x^n-4 a c d e x^n+a b e^2 x^n\right)}{a \left(-b^2+4 a c\right) n \left(a+b x^n+c x^{2 n}\right)}-\frac{1}{a \left(-b^2+4 a c\right)}$$

$$b c d^2 x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)+$$

$$\frac{1}{-b^2+4 a c} 4 c d e x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)-$$

$$\frac{1}{-b^2+4\,a\,c}b\,e^2\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{a\left(-b^2+4\,a\,c\right)\,n}b\,c\,d^2\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)-$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)\,n}4\,c\,d\,e\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)+$$

$$\frac{1}{\left(-b^2+4 a c\right) n} b e^2 x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)+$$

$$\frac{1}{a\left(-b^2+4 a c\right)} b^2 d^2 x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)-$$

$$\frac{1}{-b^2+4\,a\,c}4\,c\,d^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{a\left(-b^2+4\,a\,c\right)n}b^2\,d^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)+$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)n}2\,c\,d^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\Bigg)+$$

$$\frac{1}{\left(-b^2+4ac\right)n}2bdex\Bigg(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+$$

$$\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\Bigg)-$$

$$\frac{1}{\left(-b^2+4ac\right)n}2ae^2x\Bigg(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+$$

$$\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\Bigg)$$

Problem 77: Result more than twice size of optimal antiderivative.

$$\int \frac{d+e\,x^n}{\left(a+b\,x^n+c\,x^{2\,n}\right)^2}\,dx$$

Optimal (type 5, 362 leaves, 4 steps):

$$\frac{x\,\left(b^2\,d-2\,a\,c\,d-a\,b\,e+c\,\left(b\,d-2\,a\,e\right)\,x^n\right)}{a\,\left(b^2-4\,a\,c\right)\,n\,\left(a+b\,x^n+c\,x^{2\,n}\right)}-\left(c\,\left(2\,a\,\left(2\,c\,d\,\left(1-2\,n\right)+\sqrt{b^2-4\,a\,c}\;e\,\left(1-n\right)\right)-b^2\,\left(d-d\,n\right)-b\,\left(\sqrt{b^2-4\,a\,c}\;d\,\left(1-n\right)-2\,a\,e\,n\right)\right)\right.$$
$$\left.x\,\text{Hypergeometric2F1}\left[1,\,\frac{1}{n},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(a\,\left(b^2-4\,a\,c\right)\,\left(b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)\,n\right)-$$
$$\left(c\,\left(2\,a\,\left(c\,d\,\left(2-4\,n\right)-\sqrt{b^2-4\,a\,c}\;e\,\left(1-n\right)\right)-b^2\,d\,\left(1-n\right)+b\,\left(\sqrt{b^2-4\,a\,c}\;d\,\left(1-n\right)+2\,a\,e\,n\right)\right)\,x\right.$$
$$\left.\text{Hypergeometric2F1}\left[1,\,\frac{1}{n},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(a\,\left(b^2-4\,a\,c\right)\,\left(b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)\,n\right)$$

Result (type 5, 3152 leaves):

$$\frac{\left(-b^2\,d+2\,a\,c\,d+a\,b\,e+b^2\,d\,n-4\,a\,c\,d\,n\right)\,x}{a^2\,\left(-b^2+4\,a\,c\right)\,n}+\frac{\left(b^2\,d-2\,a\,c\,d-a\,b\,e-b^2\,d\,n+4\,a\,c\,d\,n\right)\,x}{a^2\,\left(-b^2+4\,a\,c\right)\,n}+\frac{x\,\left(-b^2\,d+2\,a\,c\,d+a\,b\,e-b\,c\,d\,x^n+2\,a\,c\,e\,x^n\right)}{a\,\left(-b^2+4\,a\,c\right)\,n\,\left(a+b\,x^n+c\,x^{2\,n}\right)}-$$

$$\frac{1}{a\,\left(-b^2+4\,a\,c\right)}b\,c\,d\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{-b^2+4\,a\,c}2\,c\,e\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\Bigg)+$$

$$\frac{1}{a\left(-b^2+4ac\right)n}b\,c\,d\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\Bigg(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+$$

$$\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\Bigg)-$$

$$\frac{1}{\left(-b^2+4ac\right)n}2\,c\,e\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\Bigg(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+$$

$$\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\Bigg)+$$

$$\frac{1}{a\left(-b^2+4ac\right)}b^2\,d\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{-b^2+4ac}4\,c\,d\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{a\left(-b^2+4ac\right)n}b^2\,d\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{\left(-b^2+4ac\right)n}2cdx\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{\left(-b^2+4ac\right)n}bex\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)$$

Problem 78: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{(d+e x^n)\,(a+b x^n+c x^{2n})^2}\,dx$$

Optimal (type 5, 726 leaves, 10 steps):

$$\frac{x\,(b^2 c d-2 a c^2 d-b^3 e+3 a b c e+c\,(b c d-b^2 e+2 a c e)\,x^n)}{a\,(b^2-4 a c)\,(c d^2-b d e+a e^2)\,n\,(a+b x^n+c x^{2n})}-\frac{c e^2\,\left(2 c d-\left(b+\sqrt{b^2-4 a c}\right) e\right) x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}\right]}{\left(b^2-4 a c-b\sqrt{b^2-4 a c}\right)(c d^2-b d e+a e^2)^2}-$$
$$\left(c\left(\frac{2 a b c e\,(2-3 n)-4 a c^2 d\,(1-2 n)+b^2 c d\,(1-n)-b^3 e\,(1-n)}{\sqrt{b^2-4 a c}}+(b c d-b^2 e+2 a c e)\,(1-n)\right) x\right.$$
$$\left.\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}\right]\right)\Big/\left(a\,(b^2-4 a c)\left(b-\sqrt{b^2-4 a c}\right)(c d^2-b d e+a e^2)\,n\right)-$$
$$\frac{c e^2\left(2 c d-\left(b-\sqrt{b^2-4 a c}\right) e\right) x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]}{\left(b^2-4 a c+b\sqrt{b^2-4 a c}\right)(c d^2-b d e+a e^2)^2}+$$
$$\left(c\left(b c\left(2 a e\,(2-3 n)-\sqrt{b^2-4 a c}\;d\,(1-n)\right)-2 a c\left(2 c d\,(1-2 n)+\sqrt{b^2-4 a c}\;e\,(1-n)\right)-b^3 e\,(1-n)+b^2\left(c d+\sqrt{b^2-4 a c}\;e\right)(1-n)\right)\right.$$
$$\left.x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$
$$\left(a\,(b^2-4 a c)\left(b^2-4 a c+b\sqrt{b^2-4 a c}\right)(c d^2-b d e+a e^2)\,n\right)+\frac{e^4 x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{e x^n}{d}\right]}{d\,(c d^2-b d e+a e^2)^2}$$

Result (type 5, 11 767 leaves):

$$\left((-b^2 c d^2+2 a c^2 d^2+b^3 d e-3 a b c d e+b^2 c d^2 n-4 a c^2 d^2 n-b^3 d e n+4 a b c d e n+a b^2 e^2 n-4 a^2 c e^2 n)\,x\right)\Big/$$
$$\left(a^2\,(-b^2+4 a c)\,d\,(c d^2-b d e+a e^2)\,n\right)+$$
$$\left((b^2 c d^2-2 a c^2 d^2-b^3 d e+3 a b c d e-b^2 c d^2 n+4 a c^2 d^2 n+b^3 d e n-4 a b c d e n-a b^2 e^2 n+4 a^2 c e^2 n)\,x\right)\Big/$$
$$\left(a^2\,(-b^2+4 a c)\,d\,(c d^2-b d e+a e^2)\,n\right)-\frac{x\,(b^2 c d-2 a c^2 d-b^3 e+3 a b c e+b c^2 d x^n-b^2 c e x^n+2 a c^2 e x^n)}{a\,(-b^2+4 a c)\,(c d^2-b d e+a e^2)\,n\,(a+b x^n+c x^{2n})}+$$
$$\frac{e^4 x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{e x^n}{d}\right]}{d\,(c d^2-b d e+a e^2)^2}-\left(b c^3 d^3 x^{1+n}\,(x^n)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)\right) \Big/ \left(a \left(-b^2+4 a c\right) \left(c d^2-b d e+a e^2\right)^2\right)+$$

$$\left(2 b^2 c^2 d^2 e\, x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)\right) \Big/ \left(a \left(-b^2+4 a c\right) \left(c d^2-b d e+a e^2\right)^2\right)-$$

$$\left(2 c^3 d^2 e\, x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)\right) \Big/ \left(\left(-b^2+4 a c\right) \left(c d^2-b d e+a e^2\right)^2\right)-$$

$$\left(b^3\,c\,d\,e^2\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)\right)\Big/\left(a\,\left(-b^2+4\,a\,c\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\right)+$$

$$\left(b\,c^2\,d\,e^2\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)\right)\Big/\left(\left(-b^2+4\,a\,c\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\right)+$$

$$\left(2\,b^2\,c\,e^3\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)\right)\Big/\left(\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^2\right)-$$

$$\left(6ac^2e^3x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)\right)\Big/\left(\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^2\right)+$$

$$\left(bc^3d^3x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)\right)\Big/\left(a\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^2n\right)-$$

$$\left(2\, b^2 c^2 d^2 e\, x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\, -\frac{1}{n},\, \frac{-1+n}{n},\, -\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\, +\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\, -\frac{1}{n},\, \frac{-1+n}{n},\, -\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)\right) \Big/ \left(a \left(-b^2+4 a c\right) \left(c d^2-b d e+a e^2\right)^2 n\right)\, +$$

$$\left(2\, c^3 d^2 e\, x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\, -\frac{1}{n},\, \frac{-1+n}{n},\, -\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\, +\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\, -\frac{1}{n},\, \frac{-1+n}{n},\, -\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)\right) \Big/ \left(\left(-b^2+4 a c\right) \left(c d^2-b d e+a e^2\right)^2 n\right)\, +$$

$$\left(b^3 c\, d\, e^2 x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\, -\frac{1}{n},\, \frac{-1+n}{n},\, -\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\, +\right.\right.$$

$$\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\ -\frac{1}{n},\ \frac{-1+n}{n},\ -\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\Bigg)\Bigg) \Big/ \Big(a\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^2 n\Big) -$$

$$\Bigg(b c^2 d e^2 x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \Bigg(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\ -\frac{1}{n},\ \frac{-1+n}{n},\ -\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}} +$$

$$\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\ -\frac{1}{n},\ \frac{-1+n}{n},\ -\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\Bigg)\Bigg) \Big/ \Big(\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^2 n\Big) -$$

$$\Bigg(b^2 c e^3 x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \Bigg(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\ -\frac{1}{n},\ \frac{-1+n}{n},\ -\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}} +$$

$$\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\ -\frac{1}{n},\ \frac{-1+n}{n},\ -\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\Bigg)\Bigg) \Big/ \Big(\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^2 n\Big) +$$

$$\left(2\,a\,c^2\,e^3\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)\right)\Big/\left(\left(-b^2+4\,a\,c\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\,n\right)+$$

$$\left(b^2\,c^2\,d^3\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)\right)\Big/\left(a\,\left(-b^2+4\,a\,c\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\right)-$$

$$\left(4\,c^3\,d^3\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)\right)\Big/\left(\left(-b^2+4ac\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\right)-$$

$$\left(2\,b^3\,c\,d^2\,e\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)\right)\Big/\left(a\left(-b^2+4ac\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\right)+$$

$$\left(8\,b\,c^2\,d^2\,e\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)\right)\Big/\left(\left(-b^2+4ac\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\right)+$$

$$\left(b^4 d e^2 x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)\right) \Big/ \left(a \left(-b^2+4 a c\right) \left(c d^2-b d e+a e^2\right)^2\right)-$$

$$\left(2 b^2 c d e^2 x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)\right) \Big/ \left(\left(-b^2+4 a c\right) \left(c d^2-b d e+a e^2\right)^2\right)-$$

$$\left(8 a c^2 d e^2 x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)\right)\Big/\left(\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^2\right)-$$

$$\left(2b^3e^3x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)\right)\Big/\left(\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^2\right)+$$

$$\left(8abce^3x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)\right)\Big/\left(\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^2\right)-$$

$$\left(b^2 c^2 d^3 x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)\right) \Big/ \left(a \left(-b^2+4 a c\right) \left(c d^2-b d e+a e^2\right)^2 n\right)+$$

$$\left(2 c^3 d^3 x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)\right) \Big/ \left(\left(-b^2+4 a c\right) \left(c d^2-b d e+a e^2\right)^2 n\right)+$$

$$\left(2 b^3 c d^2 e x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\left(\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}\right)^2}\right)\right)\Big/\left(a\left(-b^2+4\,a\,c\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^2 n\right)-$$

$$\left(5\,b\,c^2\,d^2\,e\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\left(\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}\right)^2}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\left(\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}\right)^2}\right)\right)\Big/\left(\left(-b^2+4\,a\,c\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^2 n\right)-$$

$$\left(b^4\,d\,e^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\left(\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}\right)^2}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\left(\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}\right)^2}\right)\right)\Big/\left(a\left(-b^2+4\,a\,c\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^2 n\right)+$$

$$\left(2\,b^2\,c\,d\,e^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)\right)\Big/\left(\left(-b^2+4\,a\,c\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\,n\right)+$$

$$\left(2\,a\,c^2\,d\,e^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)\right)\Big/\left(\left(-b^2+4\,a\,c\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\,n\right)+$$

$$\left(b^3\,e^3\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\Bigg)\Bigg)\Big/\left(\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^2 n\right)-$$

$$\Bigg(3abce^3x\Bigg(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+$$

$$\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\Bigg)\Bigg)\Big/\left(\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^2 n\right)$$

Problem 79: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{\left(d+e\,x^n\right)^2\left(a+b\,x^n+c\,x^{2n}\right)^2}\,dx$$

Optimal (type 5, 1129 leaves, 11 steps):

$$-\left(\left(x\left(2b^3cde-6abc^2de-b^4e^2-b^2c\left(cd^2-4ae^2\right)+2ac^2\left(cd^2-ae^2\right)+c\left(2b^2cde-4ac^2de-b^3e^2-bc\left(cd^2-3ae^2\right)\right)x^n\right)\right)\Big/\left(a\left(b^2-4ac\right)\left(cd^2-bde+ae^2\right)^2n\left(a+bx^n+cx^{2n}\right)\right)\right)-$$

$$\left(2ce^2\left(3c^2d^2+b\left(b+\sqrt{b^2-4ac}\right)e^2-ce\left(3bd+2\sqrt{b^2-4ac}\,d+ae\right)\right)x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2cx^n}{b-\sqrt{b^2-4ac}}\right]\right)\Big/$$

$$\left(\left(b^2-4ac-b\sqrt{b^2-4ac}\right)\left(cd^2-bde+ae^2\right)^3\right)+$$

$$\frac{1}{a\left(b^2-4ac\right)\left(b^2-4ac-b\sqrt{b^2-4ac}\right)\left(cd^2-bde+ae^2\right)^2n}c\left(4ac^2\left(e\left(ae\left(1-2n\right)+\sqrt{b^2-4ac}\,d\left(1-n\right)\right)-cd^2\left(1-2n\right)\right)-\right.$$

$$b^2c\left(e\left(ae\left(5-7n\right)+2\sqrt{b^2-4ac}\,d\left(1-n\right)\right)-cd^2\left(1-n\right)\right)+bc\left(cd\left(4ae\left(2-3n\right)+\sqrt{b^2-4ac}\,d\left(1-n\right)\right)-3a\sqrt{b^2-4ac}\,e^2\left(1-n\right)\right)+$$

$$\left.b^4e^2\left(1-n\right)-b^3e\left(2cd-\sqrt{b^2-4ac}\,e\right)\left(1-n\right)\right)x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2cx^n}{b-\sqrt{b^2-4ac}}\right]-$$

$$\left(2ce^2\left(3c^2d^2+b\left(b-\sqrt{b^2-4ac}\right)e^2-ce\left(3bd-2\sqrt{b^2-4ac}\,d+ae\right)\right)x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}}\right]\right)\Big/$$

$$\left(\left(b^2-4ac+b\sqrt{b^2-4ac}\right)\left(cd^2-bde+ae^2\right)^3\right)+$$

$$\frac{1}{a\left(b^2-4ac\right)\left(b^2-4ac+b\sqrt{b^2-4ac}\right)\left(cd^2-bde+ae^2\right)^2n}c\left(4ac^2\left(e\left(ae\left(1-2n\right)-\sqrt{b^2-4ac}\,d\left(1-n\right)\right)-cd^2\left(1-2n\right)\right)-\right.$$

$$b^2c\left(e\left(ae\left(5-7n\right)-2\sqrt{b^2-4ac}\,d\left(1-n\right)\right)-cd^2\left(1-n\right)\right)+bc\left(cd\left(4ae\left(2-3n\right)-\sqrt{b^2-4ac}\,d\left(1-n\right)\right)+3a\sqrt{b^2-4ac}\,e^2\left(1-n\right)\right)+$$

$$\left.b^4e^2\left(1-n\right)-b^3e\left(2cd+\sqrt{b^2-4ac}\,e\right)\left(1-n\right)\right)x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}}\right]+$$

$$\frac{2e^4\left(2cd-be\right)x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{ex^n}{d}\right]}{d\left(cd^2-bde+ae^2\right)^3}+\frac{e^4x\,\text{Hypergeometric2F1}\left[2,\frac{1}{n},1+\frac{1}{n},-\frac{ex^n}{d}\right]}{d^2\left(cd^2-bde+ae^2\right)^2}$$

Result (type 5, 16 855 leaves) :

$$\left(\left(-b^2c^2d^4+2ac^3d^4+2b^3cd^3e-6abc^2d^3e-b^4d^2e^2+4ab^2cd^2e^2-\right.\right.$$
$$2a^2c^2d^2e^2-a^2b^2e^4+4a^3ce^4+b^2c^2d^4n-4ac^3d^4n-2b^3cd^3en+8abc^2d^3en+b^4d^2e^2n-2ab^2cd^2e^2n-$$
$$\left.\left.8a^2c^2d^2e^2n-2ab^3de^3n+8a^2bcde^3n+a^2b^2e^4n-4a^3ce^4n\right)x\right)\Big/\left(a^2\left(-b^2+4ac\right)d^2\left(cd^2-bde+ae^2\right)^2n\right)+$$
$$\left(\left(b^2c^2d^4-2ac^3d^4-2b^3cd^3e+6abc^2d^3e+b^4d^2e^2-4ab^2cd^2e^2+2a^2c^2d^2e^2+a^2b^2e^4-4a^3ce^4-b^2c^2d^4n+4ac^3d^4n+\right.\right.$$
$$\left.\left.2b^3cd^3en-8abc^2d^3en-b^4d^2e^2n+2ab^2cd^2e^2n+8a^2c^2d^2e^2n+2ab^3de^3n-8a^2bcde^3n-a^2b^2e^4n+4a^3ce^4n\right)x\right)\Big/$$
$$\left(a^2\left(-b^2+4ac\right)d^2\left(cd^2-bde+ae^2\right)^2n\right)+\frac{e^4x}{d\left(cd^2-bde+ae^2\right)^2n\left(d+ex^n\right)}+$$
$$\left(-b^2c^2d^2x+2ac^3d^2x+2b^3cdex-6abc^2dex-b^4e^2x+4ab^2ce^2x-2a^2c^2e^2x-bc^3d^2x^{1+n}+2b^2c^2dex^{1+n}-\right.$$
$$\left.4ac^3dex^{1+n}-b^3ce^2x^{1+n}+3abc^2e^2x^{1+n}\right)\Big/\left(a\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^2n\left(a+bx^n+cx^{2n}\right)\right)+$$

$$\frac{e^4 \left(-c\, d^2+b\, d\, e-a\, e^2+5\, c\, d^2\, n-3\, b\, d\, e\, n+a\, e^2\, n\right) x\, \text{Hypergeometric2F1}\left[1, \frac{1}{n}, 1+\frac{1}{n}, -\frac{e\, x^n}{d}\right]}{d^2 \left(c\, d^2-b\, d\, e+a\, e^2\right)^3 n} -$$

$$\left(b\, c^4\, d^4\, x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\, a\, c}}{2\, c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n}, -\frac{1}{n}, \frac{-1+n}{n}, -\frac{-b-\sqrt{b^2-4\, a\, c}}{2\, c \left(-\frac{-b-\sqrt{b^2-4\, a\, c}}{2\, c}+x^n\right)}\right]}{\sqrt{b^2-4\, a\, c}} +\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\, a\, c}}{2\, c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n}, -\frac{1}{n}, \frac{-1+n}{n}, -\frac{-b+\sqrt{b^2-4\, a\, c}}{2\, c \left(-\frac{-b+\sqrt{b^2-4\, a\, c}}{2\, c}+x^n\right)}\right]}{\sqrt{b^2-4\, a\, c}}\right)\right) \Big/ \left(a \left(-b^2+4\, a\, c\right) \left(c\, d^2-b\, d\, e+a\, e^2\right)^3\right) +$$

$$\left(3\, b^2\, c^3\, d^3\, e\, x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\, a\, c}}{2\, c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n}, -\frac{1}{n}, \frac{-1+n}{n}, -\frac{-b-\sqrt{b^2-4\, a\, c}}{2\, c \left(-\frac{-b-\sqrt{b^2-4\, a\, c}}{2\, c}+x^n\right)}\right]}{\sqrt{b^2-4\, a\, c}} +\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\, a\, c}}{2\, c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n}, -\frac{1}{n}, \frac{-1+n}{n}, -\frac{-b+\sqrt{b^2-4\, a\, c}}{2\, c \left(-\frac{-b+\sqrt{b^2-4\, a\, c}}{2\, c}+x^n\right)}\right]}{\sqrt{b^2-4\, a\, c}}\right)\right) \Big/ \left(a \left(-b^2+4\, a\, c\right) \left(c\, d^2-b\, d\, e+a\, e^2\right)^3\right) -$$

$$\left(4\, c^4\, d^3\, e\, x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\, a\, c}}{2\, c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n}, -\frac{1}{n}, \frac{-1+n}{n}, -\frac{-b-\sqrt{b^2-4\, a\, c}}{2\, c \left(-\frac{-b-\sqrt{b^2-4\, a\, c}}{2\, c}+x^n\right)}\right]}{\sqrt{b^2-4\, a\, c}} +\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)\right)\Big/\left(\left(-b^2+4ac\right)\left(c d^2-b d e+a e^2\right)^3\right)-$$

$$\left(3 b^3 c^2 d^2 e^2 x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)\right)\Big/\left(a\left(-b^2+4ac\right)\left(c d^2-b d e+a e^2\right)^3\right)+$$

$$\left(6 b c^3 d^2 e^2 x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)\right)\Big/\left(\left(-b^2+4ac\right)\left(c d^2-b d e+a e^2\right)^3\right)+$$

$$\left(b^4\,c\,d\,e^3\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)\right)\Big/\left(a\left(-b^2+4\,a\,c\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\right)+$$

$$\left(3\,b^2\,c^2\,d\,e^3\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)\right)\Big/\left(\left(-b^2+4\,a\,c\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\right)-$$

$$\left(20\,a\,c^3\,d\,e^3\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)\right)\Big/\left(\left(-b^2+4ac\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\right)-$$

$$\left(3\,b^3\,c\,e^4\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)\right)\Big/\left(\left(-b^2+4ac\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\right)+$$

$$\left(11\,a\,b\,c^2\,e^4\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)\right)\Big/\left(\left(-b^2+4ac\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\right)+$$

$$\left(b\,c^4\,d^4\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)\right)\Big/\left(a\,\left(-b^2+4\,a\,c\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\,n\right)-$$

$$\left(3\,b^2\,c^3\,d^3\,e\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)\right)\Big/\left(a\,\left(-b^2+4\,a\,c\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\,n\right)+$$

$$\left(4\,c^4\,d^3\,e\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)\right)\Bigg/\left(\left(-b^2+4ac\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3 n\right)+$$

$$\left(3\,b^3\,c^2\,d^2\,e^2\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)\right)\Bigg/\left(a\left(-b^2+4ac\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3 n\right)-$$

$$\left(6\,b\,c^3\,d^2\,e^2\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)\right)\Bigg/\left(\left(-b^2+4ac\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3 n\right)-$$

$$\left(b^4\,c\,d\,e^3\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)\right)\Big/\left(a\,\left(-b^2+4\,a\,c\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\,n\right)+$$

$$\left(b^2\,c^2\,d\,e^3\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)\right)\Big/\left(\left(-b^2+4\,a\,c\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\,n\right)+$$

$$\left(4\,a\,c^3\,d\,e^3\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)\right)\Big/\left(\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^3n\right)+$$

$$\left(b^3ce^4x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)\right)\Big/\left(\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^3n\right)-$$

$$\left(3abc^2e^4x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.\right.$$

$$\left.\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)\right)\Big/\left(\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^3n\right)+$$

$$\left(b^2 c^3 d^4 x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)\right) \Big/ \left(a \left(-b^2+4 a c\right) \left(c d^2-b d e+a e^2\right)^3\right)-$$

$$\left(4 c^4 d^4 x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)\right) \Big/ \left(\left(-b^2+4 a c\right) \left(c d^2-b d e+a e^2\right)^3\right)-$$

$$\left(3 b^3 c^2 d^3 e x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)\right)\Big/\left(a\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^3\right)+$$

$$\left(12bc^3d^3ex\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)\right)\Big/\left(\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^3\right)+$$

$$\left(3b^4cd^2e^2x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)\right)\Big/\left(a\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^3\right)-$$

$$\left(9\, b^2\, c^2\, d^2\, e^2\, x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)\right) \Big/ \left(\left(-b^2+4\,a\,c\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\right)-$$

$$\left(12\, a\, c^3\, d^2\, e^2\, x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)\right) \Big/ \left(\left(-b^2+4\,a\,c\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\right)-$$

$$\left(b^5\, d\, e^3\, x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)\right) \Big/ \left(a \left(-b^2+4 a c\right) \left(c d^2-b d e+a e^2\right)^3\right)-$$

$$\left(2 b^3 c d e^3 x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)\right) \Big/ \left(\left(-b^2+4 a c\right) \left(c d^2-b d e+a e^2\right)^3\right)+$$

$$\left(24 a b c^2 d e^3 x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)\right) \Big/ \left(\left(-b^2+4 a c\right) \left(c d^2-b d e+a e^2\right)^3\right)+$$

$$\left(3\,b^4\,e^4\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)\right)\Big/\left(\left(-b^2+4\,a\,c\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\right)-$$

$$\left(14\,a\,b^2\,c\,e^4\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)\right)\Big/\left(\left(-b^2+4\,a\,c\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\right)+$$

$$\left(8\,a^2\,c^2\,e^4\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)\right)\Big/\left(\left(-b^2+4\,a\,c\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3\right)-$$

$$\left(b^2\,c^3\,d^4\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)\right)\Big/\left(a\left(-b^2+4\,a\,c\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3 n\right)+$$

$$\left(2\,c^4\,d^4\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)\right)\Big/\left(\left(-b^2+4\,a\,c\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3 n\right)+$$

$$\left(3\,b^3\,c^2\,d^3\,e\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)\right)\Big/\left(a\left(-b^2+4\,a\,c\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3 n\right)-$$

$$\left(8\,b\,c^3\,d^3\,e\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)\right)\Big/\left(\left(-b^2+4\,a\,c\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3 n\right)-$$

$$\left(3\,b^4\,c\,d^2\,e^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\Bigg)\Bigg)\Big/\left(a\left(-b^2+4ac\right)\left(c d^2-b d e+a e^2\right)^3 n\right)+$$

$$\Bigg(9 b^2 c^2 d^2 e^2 x\Bigg(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+$$

$$\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\Bigg)\Bigg)\Big/\left(\left(-b^2+4ac\right)\left(c d^2-b d e+a e^2\right)^3 n\right)+$$

$$\Bigg(b^5 d e^3 x\Bigg(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+$$

$$\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\Bigg)\Bigg)\Big/\left(a\left(-b^2+4ac\right)\left(c d^2-b d e+a e^2\right)^3 n\right)-$$

$$\left(2\,b^3\,c\,d\,e^3\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)\right)\Big/\left(\left(-b^2+4\,a\,c\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3 n\right)-$$

$$\left(4\,a\,b\,c^2\,d\,e^3\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)\right)\Big/\left(\left(-b^2+4\,a\,c\right)\left(c\,d^2-b\,d\,e+a\,e^2\right)^3 n\right)-$$

$$\left(b^4\,e^4\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\left(\frac{-b+\sqrt{b^2-4ac}}{2c}\right)^2}\right)\right)\bigg/\left(\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^3 n\right)+$$

$$\left(4ab^2ce^4x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\left(\frac{-b-\sqrt{b^2-4ac}}{2c}\right)^2}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\left(\frac{-b+\sqrt{b^2-4ac}}{2c}\right)^2}\right)\right)\bigg/\left(\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^3 n\right)-$$

$$\left(2a^2c^2e^4x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\left(\frac{-b-\sqrt{b^2-4ac}}{2c}\right)^2}+\right.\right.$$

$$\left.\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\left(\frac{-b+\sqrt{b^2-4ac}}{2c}\right)^2}\right)\right)\bigg/\left(\left(-b^2+4ac\right)\left(cd^2-bde+ae^2\right)^3 n\right)$$

Problem 80: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(d+e\,x^n\right)^3}{\left(a+b\,x^n+c\,x^{2\,n}\right)^3}\,dx$$

Optimal (type 5, 1707 leaves, 11 steps) :

$$\left(x\left(b^2 c d^3-2 a c d\left(c d^2-3 a e^2\right)-a b e\left(3 c d^2+a e^2\right)-\left(a b^2 e^3+2 a c e\left(3 c d^2-a e^2\right)-b c d\left(c d^2+3 a e^2\right)\right) x^n\right)\right)\Big/$$
$$\left(2 a c\left(b^2-4 a c\right) n\left(a+b x^n+c x^{2 n}\right)^2\right)+\frac{e^2 x\left(3 b^2 c d-6 a c^2 d-b^3 e+a b c e+c\left(3 b c d-b^2 e-2 a c e\right) x^n\right)}{a c^2\left(b^2-4 a c\right) n\left(a+b x^n+c x^{2 n}\right)}-$$
$$\frac{1}{2 a^2 c^2\left(b^2-4 a c\right)^2 n^2\left(a+b x^n+c x^{2 n}\right)} x\left(a b^2 c^2 d\left(3 a e^2(1-9 n)-5 c d^2(1-3 n)\right)+4 a^2 c^3 d\left(c d^2-3 a e^2\right)(1-4 n)-2 a b^5 e^3 n+\right.$$
$$2 a^2 b c^2 e\left(3 c d^2(2-3 n)-5 a e^2 n\right)-3 a b^3 c e\left(c d^2-3 a e^2 n\right)+b^4 c d\left(c d^2(1-2 n)+6 a e^2 n\right)+c\left(4 a^2 c^2 e\left(3 c d^2-a e^2\right)(1-3 n)-\right.$$
$$\left.\left.2 a b^4 e^3 n-2 a b c^2 d\left(c d^2(2-7 n)+3 a e^2 n\right)+b^3 c d\left(c d^2(1-2 n)+6 a e^2 n\right)-a b^2 c e\left(3 c d^2-a e^2(1+2 n)\right)\right) x^n\right)+$$
$$\left(e^2\left(b c\left(2 a e(2-5 n)+3 \sqrt{b^2-4 a c}\, d(1-n)\right)-2 a c\left(6 c d(1-2 n)+\sqrt{b^2-4 a c}\, e(1-n)\right)-b^3 e(1-n)+b^2\left(3 c d-\sqrt{b^2-4 a c}\, e\right)(1-n)\right)\right.$$
$$\left.x \,\text{Hypergeometric2F1}\left[1, \frac{1}{n}, 1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}\right]\right)\Big/\left(a c\left(b^2-4 a c\right)\left(b^2-4 a c-b \sqrt{b^2-4 a c}\right) n\right)+$$
$$\frac{1}{2 a^2 c\left(b^2-4 a c\right)^2\left(b-\sqrt{b^2-4 a c}\right) n^2}\left((1-n)\left(4 a^2 c^2 e\left(3 c d^2-a e^2\right)(1-3 n)-2 a b^4 e^3 n-\right.\right.$$
$$\left.2 a b c^2 d\left(c d^2(2-7 n)+3 a e^2 n\right)+b^3 c d\left(c d^2(1-2 n)+6 a e^2 n\right)-a b^2 c e\left(3 c d^2-a e^2(1+2 n)\right)\right)-$$
$$\frac{1}{\sqrt{b^2-4 a c}}\left(2 a b^5 e^3(1-n) n-b^4 c d(1-n)\left(c d^2(1-2 n)+6 a e^2 n\right)-8 a^2 c^3 d\left(c d^2-3 a e^2\right)\left(1-6 n+8 n^2\right)+\right.$$
$$6 a b^2 c^2 d\left(c d^2\left(1-4 n+3 n^2\right)-a e^2\left(1-10 n+15 n^2\right)\right)-4 a^2 b c^2 e\left(3 c d^2\left(1-n-3 n^2\right)+a e^2\left(1-11 n+19 n^2\right)\right)+$$
$$\left.\left.a b^3 c e\left(3 c d^2(1-n)+a e^2\left(1-19 n+30 n^2\right)\right)\right)\right) x \,\text{Hypergeometric2F1}\left[1, \frac{1}{n}, 1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}\right]+$$
$$\left(e^2\left(b c\left(2 a e(2-5 n)-3 \sqrt{b^2-4 a c}\, d(1-n)\right)-2 a c\left(6 c d(1-2 n)-\sqrt{b^2-4 a c}\, e(1-n)\right)-b^3 e(1-n)+b^2\left(3 c d+\sqrt{b^2-4 a c}\, e\right)(1-n)\right)\right.$$
$$\left.x \,\text{Hypergeometric2F1}\left[1, \frac{1}{n}, 1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$
$$\left(a c\left(b^2-4 a c\right)\left(b^2-4 a c+b \sqrt{b^2-4 a c}\right) n\right)+\frac{1}{2 a^2 c\left(b^2-4 a c\right)^2\left(b+\sqrt{b^2-4 a c}\right) n^2}$$
$$\left((1-n)\left(4 a^2 c^2 e\left(3 c d^2-a e^2\right)(1-3 n)-2 a b^4 e^3 n-2 a b c^2 d\left(c d^2(2-7 n)+3 a e^2 n\right)+b^3 c d\left(c d^2(1-2 n)+6 a e^2 n\right)-\right.\right.$$
$$\left.a b^2 c e\left(3 c d^2-a e^2(1+2 n)\right)\right)+\frac{1}{\sqrt{b^2-4 a c}}\left(2 a b^5 e^3(1-n) n-b^4 c d(1-n)\left(c d^2(1-2 n)+6 a e^2 n\right)-8 a^2 c^3 d\left(c d^2-3 a e^2\right)\right.$$
$$\left(1-6 n+8 n^2\right)+6 a b^2 c^2 d\left(c d^2\left(1-4 n+3 n^2\right)-a e^2\left(1-10 n+15 n^2\right)\right)-4 a^2 b c^2 e\left(3 c d^2\left(1-n-3 n^2\right)+a e^2\left(1-11 n+19 n^2\right)\right)+$$
$$\left.\left.a b^3 c e\left(3 c d^2(1-n)+a e^2\left(1-19 n+30 n^2\right)\right)\right)\right) x \,\text{Hypergeometric2F1}\left[1, \frac{1}{n}, 1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]$$

Result (type 5, 13 018 leaves) :

$$\frac{1}{2 a^3 \left(-b^2+4 a c\right)^2 n^2}\left(-b^4 d^3+5 a b^2 c d^3-4 a^2 c^2 d^3+3 a b^3 d^2 e-12 a^2 b c d^2 e-3 a^2 b^2 d e^2+12 a^3 c d e^2+3 b^4 d^3 n-21 a b^2 c d^3 n+24 a^2 c^2 d^3 n-3 a b^3 d^2 e n+30 a^2 b c d^2 e n-3 a^2 b^2 d e^2 n-24 a^3 c d e^2 n+6 a^3 b e^3 n-2 b^4 d^3 n^2+16 a b^2 c d^3 n^2-32 a^2 c^2 d^3 n^2\right) x+\frac{1}{2 a^3 \left(-b^2+4 a c\right)^2 n^2}\left(b^4 d^3-5 a b^2 c d^3+4 a^2 c^2 d^3-3 a b^3 d^2 e+12 a^2 b c d^2 e+3 a^2 b^2 d e^2-12 a^3 c d e^2-3 b^4 d^3 n+21 a b^2 c d^3 n-24 a^2 c^2 d^3 n+3 a b^3 d^2 e n-30 a^2 b c d^2 e n+3 a^2 b^2 d e^2 n+24 a^3 c d e^2 n-6 a^3 b e^3 n+2 b^4 d^3 n^2-16 a b^2 c d^3 n^2+32 a^2 c^2 d^3 n^2\right) x-\left(x \left(b^2 c d^3-2 a c^2 d^3-3 a b c d^2 e+6 a^2 c d e^2-a^2 b e^3+b c^2 d^3 x^n-6 a c^2 d^2 e x^n+3 a b c d e^2 x^n-a b^2 e^3 x^n+2 a^2 c e^3 x^n\right)\right) \Big/ \left(2 a c \left(-b^2+4 a c\right) n \left(a+b x^n+c x^{2 n}\right)^2\right)+\frac{1}{2 a^2 c \left(-b^2+4 a c\right)^2 n^2 \left(a+b x^n+c x^{2 n}\right)}\left(-b^4 c d^3 x+5 a b^2 c^2 d^3 x-4 a^2 c^3 d^3 x+3 a b^3 c d^2 e x-12 a^2 b c^2 d^2 e x-3 a^2 b^2 c d e^2 x+12 a^3 c^2 d e^2 x+2 b^4 c d^3 n x-15 a b^2 c^2 d^3 n x+16 a^2 c^3 d^3 n x+18 a^2 b c^2 d^2 e n x-9 a^2 b^2 c d e^2 n x+a^2 b^3 e^3 n x+2 a^3 b c e^3 n x-b^3 c^2 d^3 x^{1+n}+4 a b c^3 d^3 x^{1+n}+3 a b^2 c^2 d^2 e x^{1+n}-12 a^2 c^3 d^2 e x^{1+n}-a^2 b^2 c e^3 x^{1+n}+4 a^3 c^2 e^3 x^{1+n}+2 b^3 c^2 d^3 n x^{1+n}-14 a b c^3 d^3 n x^{1+n}+36 a^2 c^3 d^2 e n x^{1+n}-18 a^2 b c^2 d e^2 n x^{1+n}+2 a^2 b^2 c e^3 n x^{1+n}+4 a^3 c^2 e^3 n x^{1+n}\right)+$$

$$\frac{1}{a^2 \left(-b^2+4 a c\right)^2} b^3 c d^3 x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)-\frac{1}{a \left(-b^2+4 a c\right)^2}$$

$$7 b c^2 d^3 x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+\frac{1}{\left(-b^2+4ac\right)^2}$$

$$18c^2d^2e\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)-\frac{1}{\left(-b^2+4ac\right)^2}$$

$$9bcde^2x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{\left(-b^2+4 a c\right)^2} b^2 e^3 x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)+$$

$$\frac{1}{\left(-b^2+4 a c\right)^2} 2 a c e^3 x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)+\frac{1}{2 a^2 \left(-b^2+4 a c\right)^2 n^2}$$

$$b^3 c d^3 x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)-\frac{1}{a\left(-b^2+4ac\right)^2n^2}$$

$$2bc^2d^3x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)-\frac{1}{2a\left(-b^2+4ac\right)^2n^2}$$

$$3b^2cd^2ex^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+\frac{1}{\left(-b^2+4ac\right)^2n^2}$$

$$6\,c^2\,d^2\,e\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{2\,\left(-b^2+4\,a\,c\right)^2\,n^2}b^2\,e^3\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)-$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)^2\,n^2}2\,a\,c\,e^3\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)-\frac{1}{2a^2\left(-b^2+4ac\right)^2n}$$

$$3b^3cd^3x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+\frac{1}{a\left(-b^2+4ac\right)^2n}$$

$$9bc^2d^3x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+\frac{1}{2a\left(-b^2+4ac\right)^2n}$$

$$3\,b^2\,c\,d^2\,e\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)-\frac{1}{\left(-b^2+4\,a\,c\right)^2\,n}$$

$$24\,c^2\,d^2\,e\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+\frac{1}{\left(-b^2+4\,a\,c\right)^2\,n}$$

$$9\,b\,c\,d\,e^2\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n}, -\frac{1}{n}, \frac{-1+n}{n}, -\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right) -$$

$$\frac{1}{2 \left(-b^2+4 a c\right)^2 n} 3 b^2 e^3 x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n}, -\frac{1}{n}, \frac{-1+n}{n}, -\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}} +\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n}, -\frac{1}{n}, \frac{-1+n}{n}, -\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right) -$$

$$\frac{1}{a^2 \left(-b^2+4 a c\right)^2} b^4 d^3 x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n}, -\frac{1}{n}, \frac{-1+n}{n}, -\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}} +\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n}, -\frac{1}{n}, \frac{-1+n}{n}, -\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right) +$$

$$\frac{1}{a\left(-b^2+4ac\right)^2}8b^2cd^3x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{\left(-b^2+4ac\right)^2}16c^2d^3x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{2a^2\left(-b^2+4ac\right)^2n^2}b^4d^3x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{2a\left(-b^2+4ac\right)^2n^2}5b^2cd^3x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{\left(-b^2+4ac\right)^2n^2}2c^2d^3x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{2\,a\,\left(-b^2+4\,a\,c\right)^2\,n^2}3\,b^3\,d^2\,e\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)^2\,n^2}6\,b\,c\,d^2\,e\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{2\,\left(-b^2+4\,a\,c\right)^2\,n^2}3\,b^2\,d\,e^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)+$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)^2 n^2}6\,a\,c\,d\,e^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)+$$

$$\frac{1}{2\,a^2\left(-b^2+4\,a\,c\right)^2 n}3\,b^4\,d^3\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{2\,a\,\left(-b^2+4\,a\,c\right)^2\,n}21\,b^2\,c\,d^3\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)+$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)^2\,n}12\,c^2\,d^3\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{2\,a\,\left(-b^2+4\,a\,c\right)^2\,n}3\,b^3\,d^2\,e\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{\left(-b^2+4ac\right)^2 n}15\,b\,c\,d^2\,e\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{2\left(-b^2+4ac\right)^2 n}3\,b^2\,d\,e^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{\left(-b^2+4ac\right)^2 n} 12\, a\, c\, d\, e^2\, x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}} + \right.$$

$$\left. \frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}} \right) +$$

$$\frac{1}{\left(-b^2+4ac\right)^2 n} 3\, a\, b\, e^3\, x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}} + \right.$$

$$\left. \frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}} \right)$$

Problem 81: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(d+e\, x^n\right)^2}{\left(a+b\, x^n+c\, x^{2n}\right)^3}\, dx$$

Optimal (type 5, 1191 leaves, 11 steps):

$$\frac{x\left(b^2 d^2-2 a b d e-2 a\left(c d^2-a e^2\right)+\left(b c d^2-4 a c d e+a b e^2\right) x^n\right)}{2 a\left(b^2-4 a c\right) n\left(a+b x^n+c x^{2 n}\right)^2}+\frac{e^2 x\left(b^2-2 a c+b c x^n\right)}{a c\left(b^2-4 a c\right) n\left(a+b x^n+c x^{2 n}\right)}+$$
$$\Big(x\left(2 a b^3 c d e-a b^2 c\left(a e^2(1-9 n)-5 c d^2(1-3 n)\right)-4 a^2 c^2\left(c d^2-a e^2\right)(1-4 n)-4 a^2 b c^2 d e(2-3 n)-\right.$$
$$\left.b^4\left(c d^2(1-2 n)+2 a e^2 n\right)+c\left(2 a b^2 c d e-8 a^2 c^2 d e(1-3 n)+2 a b c\left(c d^2(2-7 n)+a e^2 n\right)-b^3\left(c d^2(1-2 n)+2 a e^2 n\right)\right) x^n\right)\Big) \Big/$$
$$\left(2 a^2 c\left(b^2-4 a c\right)^2 n^2\left(a+b x^n+c x^{2 n}\right)\right)-\frac{e^2\left(4 a c(1-2 n)-b^2(1-n)-b \sqrt{b^2-4 a c}(1-n)\right) x \,\text{Hypergeometric2F1}\left[1, \frac{1}{n}, 1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}\right]}{a\left(b^2-4 a c\right)\left(b^2-4 a c-b \sqrt{b^2-4 a c}\right) n}-$$
$$\Bigg(\Bigg(\left(1-n\right)\left(2 a b^2 c d e-8 a^2 c^2 d e(1-3 n)+2 a b c\left(c d^2(2-7 n)+a e^2 n\right)-b^3\left(c d^2(1-2 n)+2 a e^2 n\right)\right)+\frac{1}{\sqrt{b^2-4 a c}}$$
$$\Big(2 a b^3 c d e(1-n)-b^4(1-n)\left(c d^2(1-2 n)+2 a e^2 n\right)-8 a^2 b c^2 d e\left(1-n-3 n^2\right)-8 a^2 c^2\left(c d^2-a e^2\right)\left(1-6 n+8 n^2\right)+$$
$$2 a b^2 c\left(3 c d^2\left(1-4 n+3 n^2\right)-a e^2\left(1-10 n+15 n^2\right)\right)\Big)\Bigg) x \,\text{Hypergeometric2F1}\left[1, \frac{1}{n}, 1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}\right]\Bigg) \Big/$$
$$\left(2 a^2\left(b^2-4 a c\right)^2\left(b-\sqrt{b^2-4 a c}\right) n^2\right)-\frac{e^2\left(4 a c(1-2 n)-b^2(1-n)+b \sqrt{b^2-4 a c}(1-n)\right) x \,\text{Hypergeometric2F1}\left[1, \frac{1}{n}, 1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]}{a\left(b^2-4 a c\right)\left(b^2-4 a c+b \sqrt{b^2-4 a c}\right) n}-$$
$$\Bigg(\Bigg(\left(1-n\right)\left(2 a b^2 c d e-8 a^2 c^2 d e(1-3 n)+2 a b c\left(c d^2(2-7 n)+a e^2 n\right)-b^3\left(c d^2(1-2 n)+2 a e^2 n\right)\right)-$$
$$\frac{1}{\sqrt{b^2-4 a c}}\Big(2 a b^3 c d e(1-n)-b^4(1-n)\left(c d^2(1-2 n)+2 a e^2 n\right)-8 a^2 b c^2 d e\left(1-n-3 n^2\right)-$$
$$8 a^2 c^2\left(c d^2-a e^2\right)\left(1-6 n+8 n^2\right)+2 a b^2 c\left(3 c d^2\left(1-4 n+3 n^2\right)-a e^2\left(1-10 n+15 n^2\right)\right)\Big)\Bigg)$$
$$x \,\text{Hypergeometric2F1}\left[1, \frac{1}{n}, 1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]\Bigg) \Big/\left(2 a^2\left(b^2-4 a c\right)^2\left(b+\sqrt{b^2-4 a c}\right) n^2\right)$$

Result (type 5, 10 910 leaves) :

$$\frac{1}{2 a^3\left(-b^2+4 a c\right)^2 n^2}$$
$$\left(-b^4 d^2+5 a b^2 c d^2-4 a^2 c^2 d^2+2 a b^3 d e-8 a^2 b c d e-a^2 b^2 e^2+4 a^3 c e^2+3 b^4 d^2 n-21 a b^2 c d^2 n+24 a^2 c^2 d^2 n-2 a b^3 d e n+20 a^2 b c d e n-\right.$$
$$\left.a^2 b^2 e^2 n-8 a^3 c e^2 n-2 b^4 d^2 n^2+16 a b^2 c d^2 n^2-32 a^2 c^2 d^2 n^2\right) x+\frac{1}{2 a^3\left(-b^2+4 a c\right)^2 n^2}$$
$$\left(b^4 d^2-5 a b^2 c d^2+4 a^2 c^2 d^2-2 a b^3 d e+8 a^2 b c d e+a^2 b^2 e^2-4 a^3 c e^2-3 b^4 d^2 n+21 a b^2 c d^2 n-24 a^2 c^2 d^2 n+2 a b^3 d e n-20 a^2 b c d e n+\right.$$
$$\left.a^2 b^2 e^2 n+8 a^3 c e^2 n+2 b^4 d^2 n^2-16 a b^2 c d^2 n^2+32 a^2 c^2 d^2 n^2\right) x-\frac{x\left(b^2 d^2-2 a c d^2-2 a b d e+2 a^2 e^2+b c d^2 x^n-4 a c d e x^n+a b e^2 x^n\right)}{2 a\left(-b^2+4 a c\right) n\left(a+b x^n+c x^{2 n}\right)^2}+$$

$$\frac{1}{2 a^2 \left(-b^2+4 a c\right)^2 n^2 \left(a+b x^n+c x^{2 n}\right)} \left(-b^4 d^2 x+5 a b^2 c d^2 x-4 a^2 c^2 d^2 x+2 a b^3 d e x-8 a^2 b c d e x-a^2 b^2 e^2 x+4 a^3 c e^2 x+ 2 b^4 d^2 n x-15 a b^2 c d^2 n x+16 a^2 c^2 d^2 n x+12 a^2 b c d e n x-3 a^2 b^2 e^2 n x-b^3 c d^2 x^{1+n}+4 a b c^2 d^2 x^{1+n}+ 2 a b^2 c d e x^{1+n}-8 a^2 c^2 d e x^{1+n}+2 b^3 c d^2 n x^{1+n}-14 a b c^2 d^2 n x^{1+n}+24 a^2 c^2 d e n x^{1+n}-6 a^2 b c e^2 n x^{1+n}\right)+$$

$$\frac{1}{a^2 \left(-b^2+4 a c\right)^2} b^3 c d^2 x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)-\frac{1}{a \left(-b^2+4 a c\right)^2}$$

$$7 b c^2 d^2 x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)+\frac{1}{\left(-b^2+4 a c\right)^2}$$

$$12\,c^2\,d\,e\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)-$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)^2}3\,b\,c\,e^2\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+\frac{1}{2\,a^2\,\left(-b^2+4\,a\,c\right)^2\,n^2}$$

$$b^3\,c\,d^2\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)-\frac{1}{a\left(-b^2+4ac\right)^2n^2}$$

$$2bc^2d^2x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)-\frac{1}{a\left(-b^2+4ac\right)^2n^2}$$

$$b^2cdex^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)^2 n^2}4\,c^2\,d\,e\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)-\frac{1}{2\,a^2\left(-b^2+4\,a\,c\right)^2 n}$$

$$3\,b^3\,c\,d^2\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+\frac{1}{a\left(-b^2+4\,a\,c\right)^2 n}$$

$$9\,b\,c^2\,d^2\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)+$$

$$\frac{1}{a\left(-b^2+4 a c\right)^2 n} b^2 c\, d\, e\, x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)-\frac{1}{\left(-b^2+4 a c\right)^2 n}$$

$$16 c^2 d\, e\, x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)+$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)^2 n} 3\,b\,c\,e^2\,x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)-$$

$$\frac{1}{a^2\left(-b^2+4\,a\,c\right)^2} b^4\,d^2\,x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)+$$

$$\frac{1}{a\left(-b^2+4\,a\,c\right)^2} 8\,b^2\,c\,d^2\,x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)^2}16\,c^2\,d^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right.+$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{2\,a^2\left(-b^2+4\,a\,c\right)^2n^2}b^4\,d^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right.+$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)+$$

$$\frac{1}{2\,a\,\left(-b^2+4\,a\,c\right)^2\,n^2}5\,b^2\,c\,d^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)^2\,n^2}2\,c^2\,d^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)+$$

$$\frac{1}{a\,\left(-b^2+4\,a\,c\right)^2\,n^2}b^3\,d\,e\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{\left(-b^2+4ac\right)^2 n^2}4bcdex\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{2\left(-b^2+4ac\right)^2 n^2}b^2e^2x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{\left(-b^2+4ac\right)^2 n^2} 2ace^2 x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{2a^2\left(-b^2+4ac\right)^2 n} 3b^4 d^2 x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{2a\left(-b^2+4ac\right)^2 n} 21b^2 c d^2 x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\Bigg)+$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)^2 n}12\,c^2\,d^2\,x\Bigg(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+$$

$$\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\Bigg)-$$

$$\frac{1}{a\left(-b^2+4\,a\,c\right)^2 n}b^3\,d\,e\,x\Bigg(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+$$

$$\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\Bigg)+$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)^2 n}10\,b\,c\,d\,e\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{2\left(-b^2+4\,a\,c\right)^2 n}b^2\,e^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)^2 n}4\,a\,c\,e^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)$$

Problem 82: Result more than twice size of optimal antiderivative.

$$\int\frac{d+e\,x^n}{\left(a+b\,x^n+c\,x^{2n}\right)^3}\,dx$$

Optimal (type 5, 713 leaves, 5 steps):

$$\frac{x\left(b^2 d-2acd-abe+c\,(bd-2ae)\,x^n\right)}{2a\left(b^2-4ac\right)n\left(a+bx^n+cx^{2n}\right)^2}+\Big(x\left(ab^3e-4a^2c^2d\,(1-4n)+5ab^2cd\,(1-3n)-2a^2bce\,(2-3n)-\right.$$
$$\left.b^4d\,(1-2n)+c\left(ab^2e+2abcd\,(2-7n)-4a^2ce\,(1-3n)-b^3d\,(1-2n)\right)x^n\right)\Big)\Big/\left(2a^2\left(b^2-4ac\right)^2n^2\left(a+bx^n+cx^{2n}\right)\right)+$$
$$\Big(c\Big(ab^2\left(\sqrt{b^2-4ac}\;e+6cd\,(1-3n)\right)(1-n)+b^3\left(ae-\sqrt{b^2-4ac}\;d\,(1-2n)\right)(1-n)-b^4d\left(1-3n+2n^2\right)-$$
$$2abc\left(2ae\left(1-n-3n^2\right)-\sqrt{b^2-4ac}\;d\left(2-9n+7n^2\right)\right)-4a^2c\left(\sqrt{b^2-4ac}\;e\left(1-4n+3n^2\right)+2cd\left(1-6n+8n^2\right)\right)\Big)$$
$$x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2cx^n}{b-\sqrt{b^2-4ac}}\right]\Big)\Big/\left(2a^2\left(b^2-4ac\right)^2\left(b^2-4ac-b\sqrt{b^2-4ac}\right)n^2\right)-$$
$$\Big(c\Big(ab^2\left(\sqrt{b^2-4ac}\;e-6cd\,(1-3n)\right)(1-n)-b^3\left(ae+\sqrt{b^2-4ac}\;d\,(1-2n)\right)(1-n)+b^4d\left(1-3n+2n^2\right)+$$
$$2abc\left(2ae\left(1-n-3n^2\right)+\sqrt{b^2-4ac}\;d\left(2-9n+7n^2\right)\right)-4a^2c\left(\sqrt{b^2-4ac}\;e\left(1-4n+3n^2\right)-2cd\left(1-6n+8n^2\right)\right)\Big)$$
$$x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}}\right]\Big)\Big/\left(2a^2\left(b^2-4ac\right)^2\left(b^2-4ac+b\sqrt{b^2-4ac}\right)n^2\right)$$

Result (type 5, 8593 leaves):

$$\frac{1}{2a^3\left(-b^2+4ac\right)^2n^2}$$
$$\left(-b^4d+5ab^2cd-4a^2c^2d+ab^3e-4a^2bce+3b^4dn-21ab^2cdn+24a^2c^2dn-ab^3en+10a^2bcen-2b^4dn^2+16ab^2cdn^2-32a^2c^2dn^2\right)x+$$
$$\frac{1}{2a^3\left(-b^2+4ac\right)^2n^2}$$
$$\left(b^4d-5ab^2cd+4a^2c^2d-ab^3e+4a^2bce-3b^4dn+21ab^2cdn-24a^2c^2dn+ab^3en-10a^2bcen+2b^4dn^2-16ab^2cdn^2+32a^2c^2dn^2\right)x+$$

$$\frac{x\left(-b^2 d+2 a c d+a b e-b c d x^n+2 a c e x^n\right)}{2 a\left(-b^2+4 a c\right) n\left(a+b x^n+c x^{2 n}\right)^2}+$$

$$\left(-b^4 d x+5 a b^2 c d x-4 a^2 c^2 d x+a b^3 e x-4 a^2 b c e x+2 b^4 d n x-15 a b^2 c d n x+16 a^2 c^2 d n x+6 a^2 b c e n x-b^3 c d x^{1+n}+4 a b c^2 d x^{1+n}+a b^2 c e x^{1+n}-4 a^2 c^2 e x^{1+n}+2 b^3 c d n x^{1+n}-14 a b c^2 d n x^{1+n}+12 a^2 c^2 e n x^{1+n}\right) \Big/ \left(2 a^2\left(-b^2+4 a c\right)^2 n^2\left(a+b x^n+c x^{2 n}\right)\right)+$$

$$\frac{1}{a^2\left(-b^2+4 a c\right)^2} b^3 c d x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)-\frac{1}{a\left(-b^2+4 a c\right)^2}$$

$$7 b c^2 d x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)+$$

$$\frac{1}{\left(-b^2+4ac\right)^2} 6 c^2 e\, x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{2a^2\left(-b^2+4ac\right)^2 n^2} b^3 c\, d\, x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)-\frac{1}{a\left(-b^2+4ac\right)^2 n^2}$$

$$2 b c^2 d\, x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)-$$

$$\frac{1}{2a\left(-b^2+4ac\right)^2n^2}b^2\,c\,e\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{\left(-b^2+4ac\right)^2n^2}2\,c^2\,e\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)-\frac{1}{2a^2\left(-b^2+4ac\right)^2n}$$

$$3\,b^3\,c\,d\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+\frac{1}{a\,\left(-b^2+4\,a\,c\right)^2\,n}$$

$$9\,b\,c^2\,d\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{2\,a\,\left(-b^2+4\,a\,c\right)^2\,n}b^2\,c\,e\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\Bigg)-$$

$$\frac{1}{\left(-b^2+4ac\right)^2 n}8c^2 e\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)-$$

$$\frac{1}{a^2\left(-b^2+4ac\right)^2}b^4 d\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{a\left(-b^2+4\,a\,c\right)^2}8\,b^2\,c\,d\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)^2}16\,c^2\,d\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{2\,a^2\left(-b^2+4\,a\,c\right)^2n^2}b^4\,d\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{2a\left(-b^2+4ac\right)^2n^2}5b^2cdx\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}\right.+$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{\left(-b^2+4ac\right)^2n^2}2c^2dx\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}\right.+$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{2 a \left(-b^2+4 a c\right)^2 n^2} b^3 e x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)-$$

$$\frac{1}{\left(-b^2+4 a c\right)^2 n^2} 2 b c e x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)+$$

$$\frac{1}{2 a^2 \left(-b^2+4 a c\right)^2 n} 3 b^4 d x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{2a\left(-b^2+4ac\right)^2 n}21\,b^2\,c\,d\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{\left(-b^2+4ac\right)^2 n}12\,c^2\,d\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{2\,a\,(-b^2+4\,a\,c)^2\,n}b^3\,e\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)+$$

$$\frac{1}{(-b^2+4\,a\,c)^2\,n}5\,b\,c\,e\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)$$

Problem 83: Result more than twice size of optimal antiderivative.

$$\int\frac{1}{(d+e\,x^n)\,(a+b\,x^n+c\,x^{2\,n})^3}\,dx$$

Optimal (type 5, 1708 leaves, 15 steps):

$$\frac{x\,\left(b^2\,c\,d-2\,a\,c^2\,d-b^3\,e+3\,a\,b\,c\,e+c\,(b\,c\,d-b^2\,e+2\,a\,c\,e)\,x^n\right)}{2\,a\,(b^2-4\,a\,c)\,(c\,d^2-b\,d\,e+a\,e^2)\,n\,(a+b\,x^n+c\,x^{2\,n})^2}+\frac{e^2\,x\,\left(b^2\,c\,d-2\,a\,c^2\,d-b^3\,e+3\,a\,b\,c\,e+c\,(b\,c\,d-b^2\,e+2\,a\,c\,e)\,x^n\right)}{a\,(b^2-4\,a\,c)\,(c\,d^2-b\,d\,e+a\,e^2)^2\,n\,(a+b\,x^n+c\,x^{2\,n})}+$$

$$(x\,(2\,a^2\,b\,c^2\,e\,(4-11\,n)-3\,a\,b^3\,c\,e\,(2-5\,n)-4\,a^2\,c^3\,d\,(1-4\,n)+5\,a\,b^2\,c^2\,d\,(1-3\,n)-b^4\,c\,d\,(1-2\,n)+$$

$$b^5\,(e-2\,e\,n)-c\,\left(a\,b^2\,c\,e\,(5-14\,n)-2\,a\,b\,c^2\,d\,(2-7\,n)-4\,a^2\,c^2\,e\,(1-3\,n)+b^3\,c\,d\,(1-2\,n)-b^4\,e\,(1-2\,n)\right)\,x^n\big)\big)\Big/$$

$$\left(2\,a^2\,\left(b^2-4\,a\,c\right)^2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,n^2\,\left(a+b\,x^n+c\,x^{2\,n}\right)\right)-\frac{c\,e^4\,\left(2\,c\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e\right)\,x\,\text{Hypergeometric2F1}\left[1,\,\frac{1}{n},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{\left(b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^3}+$$

$$\left(c\,e^2\,\left(b\,c\,\left(2\,a\,e\,(2-3\,n)+\sqrt{b^2-4\,a\,c}\,\,d\,(1-n)\right)-2\,a\,c\,\left(2\,c\,d\,(1-2\,n)-\sqrt{b^2-4\,a\,c}\,\,e\,(1-n)\right)-b^3\,e\,(1-n)+b^2\,\left(c\,d-\sqrt{b^2-4\,a\,c}\,\,e\right)\,(1-n)\right)\right.$$

$$\left.x\,\text{Hypergeometric2F1}\left[1,\,\frac{1}{n},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

$$\left(a\,\left(b^2-4\,a\,c\right)\,\left(b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\,n\right)-\frac{1}{2\,a^2\,\left(b^2-4\,a\,c\right)^2\,\left(b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,n^2}$$

$$c\,\left(a\,b^2\,c\,\left(\sqrt{b^2-4\,a\,c}\,\,e\,(5-14\,n)-6\,c\,d\,(1-3\,n)\right)\,(1-n)+b^3\,c\,\left(a\,e\,(7-18\,n)+\sqrt{b^2-4\,a\,c}\,\,d\,(1-2\,n)\right)\,(1-n)-\right.$$

$$b^5\,e\,\left(1-3\,n+2\,n^2\right)+b^4\,\left(c\,d-\sqrt{b^2-4\,a\,c}\,\,e\right)\,\left(1-3\,n+2\,n^2\right)-4\,a^2\,c^2\,\left(\sqrt{b^2-4\,a\,c}\,\,e\,\left(1-4\,n+3\,n^2\right)-2\,c\,d\,\left(1-6\,n+8\,n^2\right)\right)-$$

$$\left.2\,a\,b\,c^2\,\left(\sqrt{b^2-4\,a\,c}\,\,d\,\left(2-9\,n+7\,n^2\right)+2\,a\,e\,\left(3-13\,n+13\,n^2\right)\right)\right)\,x\,\text{Hypergeometric2F1}\left[1,\,\frac{1}{n},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]-$$

$$\frac{c\,e^4\,\left(2\,c\,d-\left(b-\sqrt{b^2-4\,a\,c}\right)\,e\right)\,x\,\text{Hypergeometric2F1}\left[1,\,\frac{1}{n},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{\left(b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^3}+$$

$$\left(c\,e^2\,\left(b\,c\,\left(2\,a\,e\,(2-3\,n)-\sqrt{b^2-4\,a\,c}\,\,d\,(1-n)\right)-2\,a\,c\,\left(2\,c\,d\,(1-2\,n)+\sqrt{b^2-4\,a\,c}\,\,e\,(1-n)\right)-b^3\,e\,(1-n)+b^2\,\left(c\,d+\sqrt{b^2-4\,a\,c}\,\,e\right)\,(1-n)\right)\right.$$

$$\left.x\,\text{Hypergeometric2F1}\left[1,\,\frac{1}{n},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(a\,\left(b^2-4\,a\,c\right)\,\left(b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^2\,n\right)+$$

$$\frac{1}{2\,a^2\,\left(b^2-4\,a\,c\right)^2\,\left(b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,n^2}\,c\,\left(a\,b^2\,c\,\left(\sqrt{b^2-4\,a\,c}\,\,e\,(5-14\,n)+6\,c\,d\,(1-3\,n)\right)\,(1-n)-\right.$$

$$b^3\,c\,\left(a\,e\,(7-18\,n)-\sqrt{b^2-4\,a\,c}\,\,d\,(1-2\,n)\right)\,(1-n)+b^5\,e\,\left(1-3\,n+2\,n^2\right)-b^4\,\left(c\,d+\sqrt{b^2-4\,a\,c}\,\,e\right)\,\left(1-3\,n+2\,n^2\right)-$$

$$\left.4\,a^2\,c^2\,\left(\sqrt{b^2-4\,a\,c}\,\,e\,\left(1-4\,n+3\,n^2\right)+2\,c\,d\,\left(1-6\,n+8\,n^2\right)\right)-2\,a\,b\,c^2\,\left(\sqrt{b^2-4\,a\,c}\,\,d\,\left(2-9\,n+7\,n^2\right)-2\,a\,e\,\left(3-13\,n+13\,n^2\right)\right)\right)$$

$$x\,\text{Hypergeometric2F1}\left[1,\,\frac{1}{n},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]+\frac{e^6\,x\,\text{Hypergeometric2F1}\left[1,\,\frac{1}{n},\,1+\frac{1}{n},\,-\frac{e\,x^n}{d}\right]}{d\,\left(c\,d^2-b\,d\,e+a\,e^2\right)^3}$$

Result (type 5, 43 535 leaves) : Display of huge result suppressed!

Problem 84: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(d+e x^n\right)^2 \left(a+b x^n+c x^{2 n}\right)^3}\,dx$$

Optimal (type 5, 2446 leaves, 16 steps):

$$-\left(\left(x\left(2 b^3 c d e-6 a b c^2 d e-b^4 e^2-b^2 c\left(c d^2-4 a e^2\right)+2 a c^2\left(c d^2-a e^2\right)+c\left(2 b^2 c d e-4 a c^2 d e-b^3 e^2-b c\left(c d^2-3 a e^2\right)\right) x^n\right)\right)\Big/\right.$$
$$\left.\left(2 a\left(b^2-4 a c\right)\left(c d^2-b d e+a e^2\right)^2 n\left(a+b x^n+c x^{2 n}\right)^2\right)\right)-$$
$$\left(e^2 x\left(5 b^3 c d e-14 a b c^2 d e-2 b^4 e^2-b^2 c\left(3 c d^2-7 a e^2\right)+2 a c^2\left(3 c d^2-a e^2\right)+c\left(5 b^2 c d e-8 a c^2 d e-2 b^3 e^2-b c\left(3 c d^2-5 a e^2\right)\right) x^n\right)\right)\Big/$$
$$\left(a\left(b^2-4 a c\right)\left(c d^2-b d e+a e^2\right)^3 n\left(a+b x^n+c x^{2 n}\right)\right)-\frac{1}{2 a^2\left(b^2-4 a c\right)^2\left(c d^2-b d e+a e^2\right)^2 n^2\left(a+b x^n+c x^{2 n}\right)}$$
$$x\left(a b^2 c^2\left(a e^2(13-37 n)-5 c d^2(1-3 n)\right)-b^4 c\left(a e^2(7-17 n)-c d^2(1-2 n)\right)-4 a^2 b c^3 d e(4-11 n)+6 a b^3 c^2 d e(2-5 n)+\right.$$
$$4 a^2 c^3\left(c d^2-a e^2\right)(1-4 n)-2 b^5 c d e(1-2 n)+b^6 e^2(1-2 n)+c\left(2 a b c^2\left(a e^2(4-13 n)-c d^2(2-7 n)\right)-\right.$$
$$\left.\left.b^3 c\left(2 a e^2(3-8 n)-c d^2(1-2 n)\right)+2 a b^2 c^2 d e(5-14 n)-8 a^2 c^3 d e(1-3 n)-2 b^4 c d e(1-2 n)+b^5 e^2(1-2 n)\right) x^n\right)-$$
$$\left(c e^4\left(10 c^2 d^2+3 b\left(b+\sqrt{b^2-4 a c}\right) e^2-2 c e\left(5 b d+3 \sqrt{b^2-4 a c}\, d+a e\right)\right) x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}\right]\right)\Big/$$
$$\left(\left(b^2-4 a c-b \sqrt{b^2-4 a c}\right)\left(c d^2-b d e+a e^2\right)^4\right)+$$
$$\frac{1}{a\left(b^2-4 a c\right)\left(b^2-4 a c-b \sqrt{b^2-4 a c}\right)\left(c d^2-b d e+a e^2\right)^3 n}$$
$$c e^2\left(4 a c^2\left(e\left(a e(1-2 n)+2 \sqrt{b^2-4 a c}\, d(1-n)\right)-3 c d^2(1-2 n)\right)-b^2 c\left(e\left(a e(9-13 n)+5 \sqrt{b^2-4 a c}\, d(1-n)\right)-3 c d^2(1-n)\right)+\right.$$
$$\left.b c\left(c d\left(4 a e(5-8 n)+3 \sqrt{b^2-4 a c}\, d(1-n)\right)-5 a \sqrt{b^2-4 a c}\, e^2(1-n)\right)+2 b^4 e^2(1-n)-b^3 e\left(5 c d-2 \sqrt{b^2-4 a c}\, e\right)(1-n)\right)$$
$$x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}\right]+\frac{1}{2 a^2\left(b^2-4 a c\right)^2\left(b-\sqrt{b^2-4 a c}\right)\left(c d^2-b d e+a e^2\right)^2 n^2}$$
$$c\left(\left(2 a b c^2\left(a e^2(4-13 n)-c d^2(2-7 n)\right)-b^3 c\left(2 a e^2(3-8 n)-c d^2(1-2 n)\right)+2 a b^2 c^2 d e(5-14 n)-8 a^2 c^3 d e(1-3 n)-\right.\right.$$
$$\left.2 b^4 c d e(1-2 n)+b^5 e^2(1-2 n)\right)(1-n)-\frac{1}{\sqrt{b^2-4 a c}}\left(b^4 c\left(4 a e^2(2-5 n)-c d^2(1-2 n)\right)(1-n)+2 b^5 c d e\left(1-3 n+2 n^2\right)-\right.$$
$$b^6 e^2\left(1-3 n+2 n^2\right)-8 a^2 c^3\left(c d^2-a e^2\right)\left(1-6 n+8 n^2\right)+8 a^2 b c^3 d e\left(3-13 n+13 n^2\right)-2 a b^3 c^2 d e\left(7-25 n+18 n^2\right)+$$
$$\left.\left.2 a b^2 c^2\left(3 c d^2\left(1-4 n+3 n^2\right)-a e^2\left(9-38 n+35 n^2\right)\right)\right)\right) x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}\right]-$$
$$\left(c e^4\left(10 c^2 d^2+3 b\left(b-\sqrt{b^2-4 a c}\right) e^2-2 c e\left(5 b d-3 \sqrt{b^2-4 a c}\, d+a e\right)\right) x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$

$$\left(\left(b^2-4ac+b\sqrt{b^2-4ac}\right)\left(cd^2-bde+ae^2\right)^4\right)+$$

$$\frac{1}{a\left(b^2-4ac\right)\left(b^2-4ac+b\sqrt{b^2-4ac}\right)\left(cd^2-bde+ae^2\right)^3 n}$$

$$c e^2\left(4ac^2\left(e\left(ae(1-2n)-2\sqrt{b^2-4ac}\,d(1-n)\right)-3cd^2(1-2n)\right)-b^2c\left(e\left(ae(9-13n)-5\sqrt{b^2-4ac}\,d(1-n)\right)-3cd^2(1-n)\right)+\right.$$
$$\left.bc\left(cd\left(4ae(5-8n)-3\sqrt{b^2-4ac}\,d(1-n)\right)+5a\sqrt{b^2-4ac}\,e^2(1-n)\right)+2b^4e^2(1-n)-b^3e\left(5cd+2\sqrt{b^2-4ac}\,e\right)(1-n)\right)$$

$$x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}}\right]+\frac{1}{2a^2\left(b^2-4ac\right)^2\left(b+\sqrt{b^2-4ac}\right)\left(cd^2-bde+ae^2\right)^2 n^2}$$

$$c\left(\left(2abc^2\left(ae^2(4-13n)-cd^2(2-7n)\right)-b^3c\left(2ae^2(3-8n)-cd^2(1-2n)\right)+2ab^2c^2de(5-14n)-\right.\right.$$
$$\left.8a^2c^3de(1-3n)-2b^4cde(1-2n)+b^5e^2(1-2n)\right)(1-n)+\frac{1}{\sqrt{b^2-4ac}}$$
$$\left(b^4c\left(4ae^2(2-5n)-cd^2(1-2n)\right)(1-n)+2b^5cde\left(1-3n+2n^2\right)-b^6e^2\left(1-3n+2n^2\right)-8a^2c^3\left(cd^2-ae^2\right)\left(1-6n+8n^2\right)+\right.$$
$$\left.\left.8a^2bc^3de\left(3-13n+13n^2\right)-2ab^3c^2de\left(7-25n+18n^2\right)+2ab^2c^2\left(3cd^2\left(1-4n+3n^2\right)-ae^2\left(9-38n+35n^2\right)\right)\right)\right)$$

$$x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}}\right]+\frac{3e^6(2cd-be)\,x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{ex^n}{d}\right]}{d\left(cd^2-bde+ae^2\right)^4}+$$

$$\frac{e^6\,x\,\text{Hypergeometric2F1}\left[2,\frac{1}{n},1+\frac{1}{n},-\frac{ex^n}{d}\right]}{d^2\left(cd^2-bde+ae^2\right)^3}$$

Result (type 5, 56 566 leaves) : Display of huge result suppressed!

Problem 85: Result more than twice size of optimal antiderivative.

$$\int\left(d+e\,x^n\right)\sqrt{a+b\,x^n+c\,x^{2n}}\,dx$$

Optimal (type 6, 292 leaves, 6 steps) :

$$\frac{e\,x^{1+n}\sqrt{a+b\,x^n+c\,x^{2\,n}}\;\text{AppellF1}\left[1+\frac{1}{n},-\frac{1}{2},-\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{(1+n)\sqrt{1+\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}}\sqrt{1+\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}}}+$$

$$\frac{d\,x\sqrt{a+b\,x^n+c\,x^{2\,n}}\;\text{AppellF1}\left[\frac{1}{n},-\frac{1}{2},-\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{\sqrt{1+\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}}\sqrt{1+\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}}}$$

Result (type 6, 3778 leaves) :

$$\sqrt{a+b\,x^n+c\,x^{2\,n}}\left(\frac{(2\,c\,d+4\,c\,d\,n+b\,e\,n)\,x}{2\,c\,(1+n)\,(1+2\,n)}+\frac{e\,x^{1+n}}{1+2\,n}\right)-$$

$$\left(2\,a^2\,b\,d\,n\,x^{1+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

$$\left(\left(b-\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)(1+n)^2\left(a+x^n\,(b+c\,x^n)\right)^{3/2}\right.$$

$$\left(-4\,(a+2\,a\,n)\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+n\,x^n\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},\right.\right.\right.$$

$$\left.\left.\left.\left.-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)-$$

$$\left(4\,a^3\,e\,n\,x^{1+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

$$\left(\left(b-\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)(1+n)^2\left(a+x^n\,(b+c\,x^n)\right)^{3/2}\right.$$

$$\left(-4\,(a+2\,a\,n)\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+n\,x^n\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},\right.\right.\right.$$

$$\left.\left.\left.\left.-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)+$$

$$\left(2\,a^2\,b^2\,e\,n\,x^{1+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

$$\left(c\left(b-\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)(1+n)^2\left(a+x^n\,(b+c\,x^n)\right)^{3/2}\right.$$

$$\left(-4\,(a+2\,a\,n)\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+n\,x^n\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},\right.\right.\right.$$

$$-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}] + \left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}[2+\frac{1}{n},\ \frac{3}{2},\ \frac{1}{2},\ 3+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}]))))\ -$$

$$(4\,a^2\,b\,d\,n^2\,x^{1+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}[1+\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 2+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}])\Big/$$

$$(\left(b-\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)(1+n)^2\left(a+x^n\left(b+c\,x^n\right)\right)^{3/2}$$

$$(-4\,(a+2\,a\,n)\,\text{AppellF1}[1+\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 2+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}] + n\,x^n\,((b+\sqrt{b^2-4\,a\,c})\,\text{AppellF1}[2+\frac{1}{n},\ \frac{1}{2},\ \frac{3}{2},\ 3+\frac{1}{n},$$

$$-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}] + \left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}[2+\frac{1}{n},\ \frac{3}{2},\ \frac{1}{2},\ 3+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}]))))\ -$$

$$(4\,a^3\,e\,n^2\,x^{1+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}[1+\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 2+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}])\Big/$$

$$(\left(b-\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)(1+n)^2\left(a+x^n\left(b+c\,x^n\right)\right)^{3/2}$$

$$(-4\,(a+2\,a\,n)\,\text{AppellF1}[1+\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 2+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}] + n\,x^n\,((b+\sqrt{b^2-4\,a\,c})\,\text{AppellF1}[2+\frac{1}{n},\ \frac{1}{2},\ \frac{3}{2},\ 3+\frac{1}{n},$$

$$-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}] + \left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}[2+\frac{1}{n},\ \frac{3}{2},\ \frac{1}{2},\ 3+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}]))))\ +$$

$$(a^2\,b^2\,e\,n^2\,x^{1+n}\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}[1+\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 2+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}])\Big/$$

$$(c\left(b-\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)(1+n)^2\left(a+x^n\left(b+c\,x^n\right)\right)^{3/2}$$

$$(-4\,(a+2\,a\,n)\,\text{AppellF1}[1+\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 2+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}] + n\,x^n\,((b+\sqrt{b^2-4\,a\,c})\,\text{AppellF1}[2+\frac{1}{n},\ \frac{1}{2},\ \frac{3}{2},\ 3+\frac{1}{n},$$

$$-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}] + \left(b-\sqrt{b^2-4\,a\,c}\right)\,\text{AppellF1}[2+\frac{1}{n},\ \frac{3}{2},\ \frac{1}{2},\ 3+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}]))))\ -$$

$$(4\,a^3\,d\,n\,x\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}[\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 1+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}])\Big/$$

$$(\left(b-\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)(1+2\,n)\left(a+x^n\left(b+c\,x^n\right)\right)^{3/2}$$

$$((\left(b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}[1+\frac{1}{n},\ \frac{1}{2},\ \frac{3}{2},\ 2+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}] - \left(-b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}[1+\frac{1}{n},\ \frac{3}{2},$$

$$\frac{1}{2},\ 2+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}] - 4\,a\,(1+n)\,\text{AppellF1}[\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 1+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}]))\ +$$

$$\left(2 a^3 b e n x \left(b-\sqrt{b^2-4 a c}+2 c x^n\right)\left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$
$$\left(c\left(b-\sqrt{b^2-4 a c}\right)\left(b+\sqrt{b^2-4 a c}\right)(1+2 n)\left(a+x^n\left(b+c x^n\right)\right)^{3/2}\right.$$
$$\left(\left(b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-\left(-b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\right.\right.$$
$$\left.\left.\left.\frac{1}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-4 a(1+n) \text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)-$$
$$\left(8 a^3 d n^2 x \left(b-\sqrt{b^2-4 a c}+2 c x^n\right)\left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$
$$\left(\left(b-\sqrt{b^2-4 a c}\right)\left(b+\sqrt{b^2-4 a c}\right)(1+2 n)\left(a+x^n\left(b+c x^n\right)\right)^{3/2}\right.$$
$$\left(\left(b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-\left(-b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\right.\right.$$
$$\left.\left.\left.\frac{1}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-4 a(1+n) \text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)$$

Problem 86: Result more than twice size of optimal antiderivative.

$$\int \left(d+e x^n\right)\left(a+b x^n+c x^{2 n}\right)^{3/2} dx$$

Optimal (type 6, 294 leaves, 6 steps):

$$\frac{a e x^{1+n} \sqrt{a+b x^n+c x^{2 n}}\, \text{AppellF1}\left[1+\frac{1}{n},-\frac{3}{2},-\frac{3}{2},2+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]}{(1+n)\sqrt{1+\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}}\sqrt{1+\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}}}+$$
$$\frac{a d x \sqrt{a+b x^n+c x^{2 n}}\, \text{AppellF1}\left[\frac{1}{n},-\frac{3}{2},-\frac{3}{2},1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]}{\sqrt{1+\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}}\sqrt{1+\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}}}$$

Result (type 6, 10 587 leaves):

$$\sqrt{a+b x^n+c x^{2 n}}\left(\left(\left(8 a c^2 d+80 a c^2 d n+6 b^2 c d n^2+256 a c^2 d n^2-6 b^3 e n^2+24 a b c e n^2+24 b^2 c d n^3+256 a c^2 d n^3-9 b^3 e n^3+60 a b c e n^3\right) x\right)\Big/\right.$$
$$\left(8 c^2(1+n)(1+2 n)(1+3 n)(1+4 n)\right)+$$

$$\frac{\left(4bcd+4ace+30bcdn+32acen+56bcdn^2+3b^2en^2+60acen^2\right)x^{1+n}}{4c\,(1+2n)\,(1+3n)\,(1+4n)}+\frac{\left(2cd+2be+8cdn+9ben\right)x^{1+2n}}{2\,(1+3n)\,(1+4n)}+\frac{c\,e\,x^{1+3n}}{1+4n}\Bigg)-$$

$$\Bigg(12a^3bdn^2x^{1+n}\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Big/$$

$$\Bigg(\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(1+n)^2\,(1+3n)\,(1+4n)\,\left(a+x^n\left(b+cx^n\right)\right)^{3/2}$$

$$\Bigg(-4\,(a+2an)\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+nx^n\Bigg(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\Big[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},$$

$$-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]+\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg)\Bigg)+$$

$$\Bigg(3a^2b^3dn^2x^{1+n}\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Big/$$

$$\Bigg(c\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(1+n)^2\,(1+3n)\,(1+4n)\,\left(a+x^n\left(b+cx^n\right)\right)^{3/2}$$

$$\Bigg(-4\,(a+2an)\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+nx^n\Bigg(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\Big[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},$$

$$-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]+\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg)\Bigg)-$$

$$\Bigg(12a^4en^2x^{1+n}\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Big/$$

$$\Bigg(\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(1+n)^2\,(1+3n)\,(1+4n)\,\left(a+x^n\left(b+cx^n\right)\right)^{3/2}$$

$$\Bigg(-4\,(a+2an)\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+nx^n\Bigg(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\Big[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},$$

$$-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]+\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg)\Bigg)-$$

$$\Bigg(3a^2b^4en^2x^{1+n}\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Big/$$

$$\Bigg(c^2\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(1+n)^2\,(1+3n)\,(1+4n)\,\left(a+x^n\left(b+cx^n\right)\right)^{3/2}$$

$$\Bigg(-4\,(a+2an)\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+nx^n\Bigg(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\Big[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},$$

$$-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]+\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\Bigg)\Bigg)\Bigg)+$$

$$\left(15\, a^3 b^2 e\, n^2 x^{1+n} \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[1+\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 2+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$

$$\left(c \left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) (1+n)^2 (1+3 n) (1+4 n) \left(a+x^n \left(b+c x^n\right)\right)^{3/2}\right.$$

$$\left(-4 (a+2 a n) \text{AppellF1}\left[1+\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 2+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+n x^n \left(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n}, \frac{1}{2}, \frac{3}{2}, 3+\frac{1}{n},\right.\right.\right.$$

$$\left.\left.\left.\left. -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n}, \frac{3}{2}, \frac{1}{2}, 3+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right) -$$

$$\left(66\, a^3 b\, d\, n^3 x^{1+n} \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[1+\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 2+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$

$$\left(\left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) (1+n)^2 (1+3 n) (1+4 n) \left(a+x^n \left(b+c x^n\right)\right)^{3/2}\right.$$

$$\left(-4 (a+2 a n) \text{AppellF1}\left[1+\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 2+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+n x^n \left(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n}, \frac{1}{2}, \frac{3}{2}, 3+\frac{1}{n},\right.\right.\right.$$

$$\left.\left.\left.\left. -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n}, \frac{3}{2}, \frac{1}{2}, 3+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right) +$$

$$\left(27\, a^2 b^3 d\, n^3 x^{1+n} \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[1+\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 2+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$

$$\left(2 c \left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) (1+n)^2 (1+3 n) (1+4 n) \left(a+x^n \left(b+c x^n\right)\right)^{3/2}\right.$$

$$\left(-4 (a+2 a n) \text{AppellF1}\left[1+\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 2+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+n x^n \left(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n}, \frac{1}{2}, \frac{3}{2}, 3+\frac{1}{n},\right.\right.\right.$$

$$\left.\left.\left.\left. -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n}, \frac{3}{2}, \frac{1}{2}, 3+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right) -$$

$$\left(48\, a^4 e\, n^3 x^{1+n} \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[1+\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 2+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$

$$\left(\left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) (1+n)^2 (1+3 n) (1+4 n) \left(a+x^n \left(b+c x^n\right)\right)^{3/2}\right.$$

$$\left(-4 (a+2 a n) \text{AppellF1}\left[1+\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 2+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+n x^n \left(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n}, \frac{1}{2}, \frac{3}{2}, 3+\frac{1}{n},\right.\right.\right.$$

$$\left.\left.\left.\left. -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n}, \frac{3}{2}, \frac{1}{2}, 3+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right) -$$

$$\left(6\, a^2 b^4 e\, n^3 x^{1+n} \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[1+\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 2+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$

$$\Big(c^2\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(1+n)^2(1+3n)(1+4n)\left(a+x^n\left(b+cx^n\right)\right)^{3/2}$$

$$\Big(-4(a+2an)\,\text{AppellF1}\Big[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]+n\,x^n\Big(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\Big[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},$$

$$-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]+\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\Big[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]\Big)\Big)\Big)+$$

$$\Big(42a^3b^2e\,n^3x^{1+n}\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\Big[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]\Big)\Big/$$

$$\Big(c\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(1+n)^2(1+3n)(1+4n)\left(a+x^n\left(b+cx^n\right)\right)^{3/2}$$

$$\Big(-4(a+2an)\,\text{AppellF1}\Big[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]+n\,x^n\Big(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\Big[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},$$

$$-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]+\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\Big[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]\Big)\Big)\Big)-$$

$$\Big(72a^3b\,d\,n^4x^{1+n}\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\Big[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]\Big)\Big/$$

$$\Big(\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(1+n)^2(1+3n)(1+4n)\left(a+x^n\left(b+cx^n\right)\right)^{3/2}$$

$$\Big(-4(a+2an)\,\text{AppellF1}\Big[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]+n\,x^n\Big(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\Big[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},$$

$$-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]+\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\Big[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]\Big)\Big)\Big)+$$

$$\Big(6a^2b^3d\,n^4x^{1+n}\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\Big[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]\Big)\Big/$$

$$\Big(c\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(1+n)^2(1+3n)(1+4n)\left(a+x^n\left(b+cx^n\right)\right)^{3/2}$$

$$\Big(-4(a+2an)\,\text{AppellF1}\Big[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]+n\,x^n\Big(\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\Big[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},$$

$$-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]+\left(b-\sqrt{b^2-4ac}\right)\text{AppellF1}\Big[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]\Big)\Big)\Big)-$$

$$\Big(36a^4e\,n^4x^{1+n}\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\Big[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\Big]\Big)\Big/$$

$$\Big(\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)(1+n)^2(1+3n)(1+4n)\left(a+x^n\left(b+cx^n\right)\right)^{3/2}$$

$$\left(-4\ (a+2 a n)\ \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+n x^n \left(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},\right.\right.\right.$$

$$\left.\left.\left.-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)-$$

$$\left(9 a^2 b^4 e n^4 x^{1+n} \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$

$$\left(4 c^2 \left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) (1+n)^2\ (1+3 n)\ (1+4 n)\ \left(a+x^n \left(b+c x^n\right)\right)^{3/2}\right.$$

$$\left(-4\ (a+2 a n)\ \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+n x^n \left(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},\right.\right.\right.$$

$$\left.\left.\left.-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)+$$

$$\left(18 a^3 b^2 e n^4 x^{1+n} \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$

$$\left(c \left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) (1+n)^2\ (1+3 n)\ (1+4 n)\ \left(a+x^n \left(b+c x^n\right)\right)^{3/2}\right.$$

$$\left(-4\ (a+2 a n)\ \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+n x^n \left(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},\right.\right.\right.$$

$$\left.\left.\left.-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)-$$

$$\left(12 a^4 d n^2 x \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$

$$\left(\left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) (1+2 n)\ (1+3 n)\ (1+4 n)\ \left(a+x^n \left(b+c x^n\right)\right)^{3/2}\right.$$

$$\left(\left(b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-\left(-b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\right.\right.$$

$$\left.\left.\frac{1}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-4 a\ (1+n)\ \text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)+$$

$$\left(3 a^3 b^2 d n^2 x \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$

$$\left(c \left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) (1+2 n)\ (1+3 n)\ (1+4 n)\ \left(a+x^n \left(b+c x^n\right)\right)^{3/2}\right.$$

$$\left(\left(b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-\left(-b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\right.\right.$$

$$\frac{1}{2},\,2+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-4\,a\,(1+n)\,\text{AppellF1}\Big[\frac{1}{n},\,\frac{1}{2},\,\frac{1}{2},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big)\Big)-$$

$$\Big(3\,a^3\,b^3\,e\,n^2\,x\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\text{AppellF1}\Big[\frac{1}{n},\,\frac{1}{2},\,\frac{1}{2},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

$$\Big(c^2\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,(1+2\,n)\,(1+3\,n)\,(1+4\,n)\,\big(a+x^n\,(b+c\,x^n)\big)^{3/2}$$

$$\Big(\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,n\,x^n\,\text{AppellF1}\Big[1+\frac{1}{n},\,\frac{1}{2},\,\frac{3}{2},\,2+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-\Big(-b+\sqrt{b^2-4\,a\,c}\Big)\,n\,x^n\,\text{AppellF1}\Big[1+\frac{1}{n},\,\frac{3}{2},$$

$$\frac{1}{2},\,2+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-4\,a\,(1+n)\,\text{AppellF1}\Big[\frac{1}{n},\,\frac{1}{2},\,\frac{1}{2},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big)+$$

$$\Big(12\,a^4\,b\,e\,n^2\,x\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\text{AppellF1}\Big[\frac{1}{n},\,\frac{1}{2},\,\frac{1}{2},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

$$\Big(c\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,(1+2\,n)\,(1+3\,n)\,(1+4\,n)\,\big(a+x^n\,(b+c\,x^n)\big)^{3/2}$$

$$\Big(\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,n\,x^n\,\text{AppellF1}\Big[1+\frac{1}{n},\,\frac{1}{2},\,\frac{3}{2},\,2+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-\Big(-b+\sqrt{b^2-4\,a\,c}\Big)\,n\,x^n\,\text{AppellF1}\Big[1+\frac{1}{n},\,\frac{3}{2},$$

$$\frac{1}{2},\,2+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-4\,a\,(1+n)\,\text{AppellF1}\Big[\frac{1}{n},\,\frac{1}{2},\,\frac{1}{2},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big)-$$

$$\Big(72\,a^4\,d\,n^3\,x\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\text{AppellF1}\Big[\frac{1}{n},\,\frac{1}{2},\,\frac{1}{2},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

$$\Big(\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,(1+2\,n)\,(1+3\,n)\,(1+4\,n)\,\big(a+x^n\,(b+c\,x^n)\big)^{3/2}$$

$$\Big(\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,n\,x^n\,\text{AppellF1}\Big[1+\frac{1}{n},\,\frac{1}{2},\,\frac{3}{2},\,2+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-\Big(-b+\sqrt{b^2-4\,a\,c}\Big)\,n\,x^n\,\text{AppellF1}\Big[1+\frac{1}{n},\,\frac{3}{2},$$

$$\frac{1}{2},\,2+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-4\,a\,(1+n)\,\text{AppellF1}\Big[\frac{1}{n},\,\frac{1}{2},\,\frac{1}{2},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big)+$$

$$\Big(12\,a^3\,b^2\,d\,n^3\,x\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\text{AppellF1}\Big[\frac{1}{n},\,\frac{1}{2},\,\frac{1}{2},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

$$\Big(c\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,(1+2\,n)\,(1+3\,n)\,(1+4\,n)\,\big(a+x^n\,(b+c\,x^n)\big)^{3/2}$$

$$\Big(\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,n\,x^n\,\text{AppellF1}\Big[1+\frac{1}{n},\,\frac{1}{2},\,\frac{3}{2},\,2+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-\Big(-b+\sqrt{b^2-4\,a\,c}\Big)\,n\,x^n\,\text{AppellF1}\Big[1+\frac{1}{n},\,\frac{3}{2},$$

$$\frac{1}{2},\,2+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-4\,a\,(1+n)\,\text{AppellF1}\Big[\frac{1}{n},\,\frac{1}{2},\,\frac{1}{2},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big)-$$

$$\left(9\,a^3\,b^3\,e\,n^3\,x\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

$$\left(2\,c^2\left(b-\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)(1+2\,n)\,(1+3\,n)\,(1+4\,n)\,\left(a+x^n\,(b+c\,x^n)\right)^{3/2}\right.$$

$$\left(\left(b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-\left(-b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\right.\right.$$

$$\left.\left.\left.\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-4\,a\,(1+n)\,\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)+$$

$$\left(30\,a^4\,b\,e\,n^3\,x\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

$$\left(c\left(b-\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)(1+2\,n)\,(1+3\,n)\,(1+4\,n)\,\left(a+x^n\,(b+c\,x^n)\right)^{3/2}\right.$$

$$\left(\left(b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-\left(-b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\right.\right.$$

$$\left.\left.\left.\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-4\,a\,(1+n)\,\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)-$$

$$\left(96\,a^4\,d\,n^4\,x\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

$$\left(\left(b-\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)(1+2\,n)\,(1+3\,n)\,(1+4\,n)\,\left(a+x^n\,(b+c\,x^n)\right)^{3/2}\right.$$

$$\left(\left(b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-\left(-b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\right.\right.$$

$$\left.\left.\left.\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-4\,a\,(1+n)\,\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)$$

Problem 87: Result more than twice size of optimal antiderivative.

$$\int\frac{d+e\,x^n}{\sqrt{a+b\,x^n+c\,x^{2\,n}}}\,dx$$

Optimal (type 6, 292 leaves, 6 steps):

$$\frac{e\,x^{1+n}\sqrt{1+\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}}\sqrt{1+\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}}\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{(1+n)\sqrt{a+b\,x^n+c\,x^{2\,n}}}+$$

$$\frac{d\,x\sqrt{1+\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}}\sqrt{1+\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}}\,\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{\sqrt{a+b\,x^n+c\,x^{2\,n}}}$$

Result (type 6, 688 leaves):

$$\frac{1}{c\,(1+n)\,\left(a+x^n\,(b+c\,x^n)\right)^{3/2}}$$
$$a\,x\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(-\left(\left(e\,(1+2\,n)\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\right.\right.$$
$$\left(-4\,(a+2\,a\,n)\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+n\,x^n\left(\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},\right.\right.\right.$$
$$\left.\left.\left.\left.-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(b-\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)+$$
$$\left(d\,(1+n)^2\,\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/\left(-\left(b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},\right.\right.$$
$$\left.2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\left(-b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+$$
$$\left.\left.4\,a\,(1+n)\,\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)$$

Problem 88: Result more than twice size of optimal antiderivative.

$$\int\frac{d+e\,x^n}{\left(a+b\,x^n+c\,x^{2\,n}\right)^{3/2}}\,dx$$

Optimal (type 6, 298 leaves, 6 steps):

$$\frac{e\, x^{1+n} \sqrt{1+\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}}\, \sqrt{1+\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}}\, \text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]}{a\, (1+n)\, \sqrt{a+b x^n+c x^{2 n}}}+$$

$$\frac{d\, x \sqrt{1+\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}}\, \sqrt{1+\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}}\, \text{AppellF1}\left[\frac{1}{n},\frac{3}{2},\frac{3}{2},1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]}{a \sqrt{a+b x^n+c x^{2 n}}}$$

Result (type 6, 3012 leaves):

$$\frac{2 x \left(-b^2 d+2 a c d+a b e-b c d x^n+2 a c e x^n\right)}{a \left(-b^2+4 a c\right) n \sqrt{a+b x^n+c x^{2 n}}}-$$

$$\left(8 a b c d\, (1+2 n)\, x^{1+n} \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$

$$\left(\left(-b^2+4 a c\right) \left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) n\, (1+n) \left(a+x^n \left(b+c x^n\right)\right)^{3/2}\right.$$

$$\left(-4 \left(a+2 a n\right) \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+n x^n \left(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},\right.\right.\right.$$

$$\left.\left.\left.\left.-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)+$$

$$\left(16 a^2 c e\, (1+2 n)\, x^{1+n} \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$

$$\left(\left(-b^2+4 a c\right) \left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) n\, (1+n) \left(a+x^n \left(b+c x^n\right)\right)^{3/2}\right.$$

$$\left(-4 \left(a+2 a n\right) \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+n x^n \left(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},\right.\right.\right.$$

$$\left.\left.\left.\left.-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+\left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)+$$

$$\left(4 a b^2 d\, (1+n)\, x \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$

$$\left(\left(-b^2+4 a c\right) \left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) \left(a+x^n \left(b+c x^n\right)\right)^{3/2}\right.$$

$$\left(\left(b+\sqrt{b^2-4 a c}\right) n x^n\, \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-\left(-b+\sqrt{b^2-4 a c}\right) n x^n\, \text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\right.\right.$$

$$\left.\left.\left.\frac{1}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-4 a\, (1+n)\, \text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)-$$

$$\left(16\,a^2\,c\,d\,(1+n)\,x\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(\left(-b^2+4\,a\,c\right)\left(b-\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)\left(a+x^n\left(b+c\,x^n\right)\right)^{3/2}\right.$$
$$\left(\left(b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-\left(-b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\right.\right.$$
$$\left.\left.\left.\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-4\,a\,(1+n)\,\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)-$$

$$\left(8\,a\,b^2\,d\,(1+n)\,x\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(\left(-b^2+4\,a\,c\right)\left(b-\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)n\left(a+x^n\left(b+c\,x^n\right)\right)^{3/2}\right.$$
$$\left(\left(b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-\left(-b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\right.\right.$$
$$\left.\left.\left.\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-4\,a\,(1+n)\,\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)+$$

$$\left(16\,a^2\,c\,d\,(1+n)\,x\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(\left(-b^2+4\,a\,c\right)\left(b-\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)n\left(a+x^n\left(b+c\,x^n\right)\right)^{3/2}\right.$$
$$\left(\left(b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-\left(-b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\right.\right.$$
$$\left.\left.\left.\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-4\,a\,(1+n)\,\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)+$$

$$\left(8\,a^2\,b\,e\,(1+n)\,x\left(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(\left(-b^2+4\,a\,c\right)\left(b-\sqrt{b^2-4\,a\,c}\right)\left(b+\sqrt{b^2-4\,a\,c}\right)n\left(a+x^n\left(b+c\,x^n\right)\right)^{3/2}\right.$$
$$\left(\left(b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-\left(-b+\sqrt{b^2-4\,a\,c}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\right.\right.$$
$$\left.\left.\left.\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-4\,a\,(1+n)\,\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)$$

Problem 89: Result more than twice size of optimal antiderivative.

$$\int \frac{d+e x^n}{\left(a+b x^n+c x^{2 n}\right)^{5/2}} \, dx$$

Optimal (type 6, 298 leaves, 6 steps):

$$\frac{e x^{1+n} \sqrt{1+\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}} \sqrt{1+\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}} \text{AppellF1}\left[1+\frac{1}{n},\frac{5}{2},\frac{5}{2},2+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]}{a^2 (1+n) \sqrt{a+b x^n+c x^{2 n}}}+$$

$$\frac{d x \sqrt{1+\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}} \sqrt{1+\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}} \text{AppellF1}\left[\frac{1}{n},\frac{5}{2},\frac{5}{2},1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]}{a^2 \sqrt{a+b x^n+c x^{2 n}}}$$

Result (type 6, 8781 leaves):

$$\sqrt{a+b x^n+c x^{2 n}} \left(\frac{2 x \left(-b^2 d+2 a c d+a b e-b c d x^n+2 a c e x^n\right)}{3 a \left(-b^2+4 a c\right) n \left(a+b x^n+c x^{2 n}\right)^2}+\right.$$

$$\left(2 \left(-2 b^4 d x+10 a b^2 c d x-8 a^2 c^2 d x+2 a b^3 e x-8 a^2 b c e x+3 b^4 d n x-22 a b^2 c d n x+24 a^2 c^2 d n x+8 a^2 b c e n x-2 b^3 c d x^{1+n}+8 a b c^2 d x^{1+n}+\right.\right.$$

$$\left.\left.\left.2 a b^2 c e x^{1+n}-8 a^2 c^2 e x^{1+n}+3 b^3 c d n x^{1+n}-20 a b c^2 d n x^{1+n}+16 a^2 c^2 e n x^{1+n}\right)\right) \Big/ \left(3 a^2 \left(-b^2+4 a c\right)^2 n^2 \left(a+b x^n+c x^{2 n}\right)\right)\right)-$$

$$\left(16 b^3 c d (1+2 n) x^{1+n} \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$

$$\left(3 \left(-b^2+4 a c\right)^2 \left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) n^2 (1+n) \left(a+x^n \left(b+c x^n\right)\right)^{3/2}\right.$$

$$\left(-4 (a+2 a n) \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+\right.$$

$$n x^n \left(\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+\right.$$

$$\left.\left.\left.\left(b-\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)+$$

$$\left(64 a b c^2 d (1+2 n) x^{1+n} \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$

$$\left(3 \left(-b^2+4 a c\right)^2 \left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) n^2 (1+n) \left(a+x^n \left(b+c x^n\right)\right)^{3/2}\right.$$

$$\left(-4 (a+2 a n) \text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+\right.$$

$$n\,x^n\,\Bigg(\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,\text{AppellF1}\Big[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]+$$

$$\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\text{AppellF1}\Big[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Bigg)\Bigg)\Bigg)+$$

$$\Bigg(16\,a\,b^2\,c\,e\,(1+2\,n)\,x^{1+n}\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\text{AppellF1}\Big[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Bigg)\Big/$$

$$\Bigg(3\,(-b^2+4\,a\,c)^2\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,n^2\,(1+n)\,\big(a+x^n\,(b+c\,x^n)\big)^{3/2}$$

$$\Bigg(-4\,(a+2\,a\,n)\,\text{AppellF1}\Big[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]+n\,x^n\,\Bigg(\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,\text{AppellF1}\Big[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},$$

$$-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]+\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\text{AppellF1}\Big[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Bigg)\Bigg)\Bigg)-$$

$$\Bigg(64\,a^2\,c^2\,e\,(1+2\,n)\,x^{1+n}\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\text{AppellF1}\Big[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Bigg)\Big/$$

$$\Bigg(3\,(-b^2+4\,a\,c)^2\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,n^2\,(1+n)\,\big(a+x^n\,(b+c\,x^n)\big)^{3/2}$$

$$\Bigg(-4\,(a+2\,a\,n)\,\text{AppellF1}\Big[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]+n\,x^n\,\Bigg(\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,\text{AppellF1}\Big[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},$$

$$-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]+\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\text{AppellF1}\Big[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Bigg)\Bigg)\Bigg)+$$

$$\Bigg(8\,b^3\,c\,d\,(1+2\,n)\,x^{1+n}\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\text{AppellF1}\Big[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Bigg)\Big/$$

$$\Bigg((-b^2+4\,a\,c)^2\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,n\,(1+n)\,\big(a+x^n\,(b+c\,x^n)\big)^{3/2}$$

$$\Bigg(-4\,(a+2\,a\,n)\,\text{AppellF1}\Big[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]+n\,x^n\,\Bigg(\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,\text{AppellF1}\Big[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},$$

$$-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]+\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\text{AppellF1}\Big[2+\frac{1}{n},\frac{3}{2},\frac{1}{2},3+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Bigg)\Bigg)\Bigg)-$$

$$\Bigg(160\,a\,b\,c^2\,d\,(1+2\,n)\,x^{1+n}\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\text{AppellF1}\Big[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Bigg)\Big/$$

$$\Bigg(3\,(-b^2+4\,a\,c)^2\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,n\,(1+n)\,\big(a+x^n\,(b+c\,x^n)\big)^{3/2}$$

$$\Bigg(-4\,(a+2\,a\,n)\,\text{AppellF1}\Big[1+\frac{1}{n},\frac{1}{2},\frac{1}{2},2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]+n\,x^n\,\Bigg(\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,\text{AppellF1}\Big[2+\frac{1}{n},\frac{1}{2},\frac{3}{2},3+\frac{1}{n},$$

$$-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]+\Big(b-\sqrt{b^2-4\,a\,c}\Big)\ \text{AppellF1}\Big[2+\frac{1}{n},\ \frac{3}{2},\ \frac{1}{2},\ 3+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big)\Big)+$$

$$\Big(128\,a^2\,c^2\,e\,(1+2\,n)\,x^{1+n}\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\ \text{AppellF1}\Big[1+\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 2+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

$$\Big(3\,\left(-b^2+4\,a\,c\right)^2\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,n\,(1+n)\,\left(a+x^n\,(b+c\,x^n)\right)^{3/2}$$

$$\Big(-4\,(a+2\,a\,n)\ \text{AppellF1}\Big[1+\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 2+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]+n\,x^n\,\Big(\Big(b+\sqrt{b^2-4\,a\,c}\Big)\ \text{AppellF1}\Big[2+\frac{1}{n},\ \frac{1}{2},\ \frac{3}{2},\ 3+\frac{1}{n},$$

$$-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]+\Big(b-\sqrt{b^2-4\,a\,c}\Big)\ \text{AppellF1}\Big[2+\frac{1}{n},\ \frac{3}{2},\ \frac{1}{2},\ 3+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big)\Big)-$$

$$\Big(4\,b^4\,d\,(1+n)\,x\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\ \text{AppellF1}\Big[\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 1+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

$$\Big(\left(-b^2+4\,a\,c\right)^2\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,\left(a+x^n\,(b+c\,x^n)\right)^{3/2}$$

$$\Big(\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,n\,x^n\,\text{AppellF1}\Big[1+\frac{1}{n},\ \frac{1}{2},\ \frac{3}{2},\ 2+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-\Big(-b+\sqrt{b^2-4\,a\,c}\Big)\,n\,x^n\,\text{AppellF1}\Big[1+\frac{1}{n},\ \frac{3}{2},$$

$$\frac{1}{2},\ 2+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-4\,a\,(1+n)\ \text{AppellF1}\Big[\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 1+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big)+$$

$$\Big(32\,a\,b^2\,c\,d\,(1+n)\,x\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\ \text{AppellF1}\Big[\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 1+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

$$\Big(\left(-b^2+4\,a\,c\right)^2\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,\left(a+x^n\,(b+c\,x^n)\right)^{3/2}$$

$$\Big(\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,n\,x^n\,\text{AppellF1}\Big[1+\frac{1}{n},\ \frac{1}{2},\ \frac{3}{2},\ 2+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-\Big(-b+\sqrt{b^2-4\,a\,c}\Big)\,n\,x^n\,\text{AppellF1}\Big[1+\frac{1}{n},\ \frac{3}{2},$$

$$\frac{1}{2},\ 2+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-4\,a\,(1+n)\ \text{AppellF1}\Big[\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 1+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big)-$$

$$\Big(64\,a^2\,c^2\,d\,(1+n)\,x\,\Big(b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\Big)\ \text{AppellF1}\Big[\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 1+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big/$$

$$\Big(\left(-b^2+4\,a\,c\right)^2\,\Big(b-\sqrt{b^2-4\,a\,c}\Big)\,\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,\left(a+x^n\,(b+c\,x^n)\right)^{3/2}$$

$$\Big(\Big(b+\sqrt{b^2-4\,a\,c}\Big)\,n\,x^n\,\text{AppellF1}\Big[1+\frac{1}{n},\ \frac{1}{2},\ \frac{3}{2},\ 2+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-\Big(-b+\sqrt{b^2-4\,a\,c}\Big)\,n\,x^n\,\text{AppellF1}\Big[1+\frac{1}{n},\ \frac{3}{2},$$

$$\frac{1}{2},\ 2+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]-4\,a\,(1+n)\ \text{AppellF1}\Big[\frac{1}{n},\ \frac{1}{2},\ \frac{1}{2},\ 1+\frac{1}{n},\ -\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\ \frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\Big]\Big)\Big)-$$

$$\left(16 b^4 d (1+n) x \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 1+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$

$$\left(3 \left(-b^2+4 a c\right)^2 \left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) n^2 \left(a+x^n \left(b+c x^n\right)\right)^{3/2}\right.$$

$$\left(\left(b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n}, \frac{1}{2}, \frac{3}{2}, 2+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right] - \left(-b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n}, \frac{3}{2},\right.\right.$$

$$\left.\left.\left.\frac{1}{2}, 2+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right] - 4 a (1+n) \text{AppellF1}\left[\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 1+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right) +$$

$$\left(80 a b^2 c d (1+n) x \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 1+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$

$$\left(3 \left(-b^2+4 a c\right)^2 \left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) n^2 \left(a+x^n \left(b+c x^n\right)\right)^{3/2}\right.$$

$$\left(\left(b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n}, \frac{1}{2}, \frac{3}{2}, 2+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right] - \left(-b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n}, \frac{3}{2},\right.\right.$$

$$\left.\left.\left.\frac{1}{2}, 2+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right] - 4 a (1+n) \text{AppellF1}\left[\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 1+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right) -$$

$$\left(64 a^2 c^2 d (1+n) x \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 1+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$

$$\left(3 \left(-b^2+4 a c\right)^2 \left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) n^2 \left(a+x^n \left(b+c x^n\right)\right)^{3/2}\right.$$

$$\left(\left(b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n}, \frac{1}{2}, \frac{3}{2}, 2+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right] - \left(-b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n}, \frac{3}{2},\right.\right.$$

$$\left.\left.\left.\frac{1}{2}, 2+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right] - 4 a (1+n) \text{AppellF1}\left[\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 1+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right) +$$

$$\left(16 a b^3 e (1+n) x \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 1+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$

$$\left(3 \left(-b^2+4 a c\right)^2 \left(b-\sqrt{b^2-4 a c}\right) \left(b+\sqrt{b^2-4 a c}\right) n^2 \left(a+x^n \left(b+c x^n\right)\right)^{3/2}\right.$$

$$\left(\left(b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n}, \frac{1}{2}, \frac{3}{2}, 2+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right] - \left(-b+\sqrt{b^2-4 a c}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n}, \frac{3}{2},\right.\right.$$

$$\left.\left.\left.\frac{1}{2}, 2+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right] - 4 a (1+n) \text{AppellF1}\left[\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 1+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right) -$$

$$\left(64 a^2 b c e (1+n) x \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 1+\frac{1}{n}, -\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}, \frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right) \Big/$$

$$\left(3\left(-b^2+4ac\right)^2\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)n^2\left(a+x^n\left(b+cx^n\right)\right)^{3/2}\right.$$

$$\left(\left(b+\sqrt{b^2-4ac}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-\left(-b+\sqrt{b^2-4ac}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\right.\right.$$

$$\left.\left.\left.\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-4a\left(1+n\right)\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right)+$$

$$\left(32b^4d\left(1+n\right)x\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$

$$\left(3\left(-b^2+4ac\right)^2\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)n\left(a+x^n\left(b+cx^n\right)\right)^{3/2}\right.$$

$$\left(\left(b+\sqrt{b^2-4ac}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-\left(-b+\sqrt{b^2-4ac}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\right.\right.$$

$$\left.\left.\left.\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-4a\left(1+n\right)\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right)-$$

$$\left(224ab^2cd\left(1+n\right)x\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$

$$\left(3\left(-b^2+4ac\right)^2\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)n\left(a+x^n\left(b+cx^n\right)\right)^{3/2}\right.$$

$$\left(\left(b+\sqrt{b^2-4ac}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-\left(-b+\sqrt{b^2-4ac}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\right.\right.$$

$$\left.\left.\left.\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-4a\left(1+n\right)\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right)+$$

$$\left(256a^2c^2d\left(1+n\right)x\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$

$$\left(3\left(-b^2+4ac\right)^2\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)n\left(a+x^n\left(b+cx^n\right)\right)^{3/2}\right.$$

$$\left(\left(b+\sqrt{b^2-4ac}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{1}{2},\frac{3}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-\left(-b+\sqrt{b^2-4ac}\right)n\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\frac{3}{2},\right.\right.$$

$$\left.\left.\left.\frac{1}{2},2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-4a\left(1+n\right)\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right)-$$

$$\left(8ab^3e\left(1+n\right)x\left(b-\sqrt{b^2-4ac}+2cx^n\right)\left(b+\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\left[\frac{1}{n},\frac{1}{2},\frac{1}{2},1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$

$$\left(3\left(-b^2+4ac\right)^2\left(b-\sqrt{b^2-4ac}\right)\left(b+\sqrt{b^2-4ac}\right)n\left(a+x^n\left(b+cx^n\right)\right)^{3/2}\right.$$

$$\left(\left(b+\sqrt{b^2-4ac}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n}, \frac{1}{2}, \frac{3}{2}, 2+\frac{1}{n}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}, \frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right] - \left(-b+\sqrt{b^2-4ac}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n}, \frac{3}{2}, \frac{1}{2}, 2+\frac{1}{n}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}, \frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right] - 4a(1+n) \text{AppellF1}\left[\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 1+\frac{1}{n}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}, \frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right) +$$

$$\left(32 a^2 b c e (1+n) x \left(b-\sqrt{b^2-4ac}+2cx^n\right) \left(b+\sqrt{b^2-4ac}+2cx^n\right) \text{AppellF1}\left[\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 1+\frac{1}{n}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}, \frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right) \Big/$$

$$\left(\left(-b^2+4ac\right)^2 \left(b-\sqrt{b^2-4ac}\right) \left(b+\sqrt{b^2-4ac}\right) n \left(a+x^n \left(b+cx^n\right)\right)^{3/2}\right.$$

$$\left(\left(b+\sqrt{b^2-4ac}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n}, \frac{1}{2}, \frac{3}{2}, 2+\frac{1}{n}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}, \frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right] - \left(-b+\sqrt{b^2-4ac}\right) n x^n \text{AppellF1}\left[1+\frac{1}{n}, \frac{3}{2}, \frac{1}{2}, 2+\frac{1}{n}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}, \frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right] - 4a(1+n) \text{AppellF1}\left[\frac{1}{n}, \frac{1}{2}, \frac{1}{2}, 1+\frac{1}{n}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}, \frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right)$$

Problem 91: Result more than twice size of optimal antiderivative.

$$\int (d+e x^n)^3 \left(a+b x^n+c x^{2n}\right)^p \, dx$$

Optimal (type 6, 606 leaves, 10 steps):

$$\frac{1}{1+n} 3 d^2 e x^{1+n} \left(1+\frac{2cx^n}{b-\sqrt{b^2-4ac}}\right)^{-p} \left(1+\frac{2cx^n}{b+\sqrt{b^2-4ac}}\right)^{-p} \left(a+bx^n+cx^{2n}\right)^p \text{AppellF1}\left[1+\frac{1}{n}, -p, -p, 2+\frac{1}{n}, -\frac{2cx^n}{b-\sqrt{b^2-4ac}}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}\right] + \frac{1}{1+2n} 3 d e^2 x^{1+2n} \left(1+\frac{2cx^n}{b-\sqrt{b^2-4ac}}\right)^{-p} \left(1+\frac{2cx^n}{b+\sqrt{b^2-4ac}}\right)^{-p} \left(a+bx^n+cx^{2n}\right)^p \text{AppellF1}\left[2+\frac{1}{n}, -p, -p, 3+\frac{1}{n}, -\frac{2cx^n}{b-\sqrt{b^2-4ac}}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}\right] + \frac{1}{1+3n} e^3 x^{1+3n} \left(1+\frac{2cx^n}{b-\sqrt{b^2-4ac}}\right)^{-p} \left(1+\frac{2cx^n}{b+\sqrt{b^2-4ac}}\right)^{-p} \left(a+bx^n+cx^{2n}\right)^p \text{AppellF1}\left[3+\frac{1}{n}, -p, -p, 4+\frac{1}{n}, -\frac{2cx^n}{b-\sqrt{b^2-4ac}}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}\right] + d^3 x \left(1+\frac{2cx^n}{b-\sqrt{b^2-4ac}}\right)^{-p} \left(1+\frac{2cx^n}{b+\sqrt{b^2-4ac}}\right)^{-p} \left(a+bx^n+cx^{2n}\right)^p \text{AppellF1}\left[\frac{1}{n}, -p, -p, 1+\frac{1}{n}, -\frac{2cx^n}{b-\sqrt{b^2-4ac}}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}\right]$$

Result (type 6, 2025 leaves):

$$\left(3 \times 2^{-1-p} c \left(b+\sqrt{b^2-4ac}\right) d^2 e (1+2n) x^{1+n} \left(\frac{b-\sqrt{b^2-4ac}}{2c}+x^n\right)^{-p} \left(\frac{b-\sqrt{b^2-4ac}+2cx^n}{c}\right)^{1+p} \left(-2a+\left(-b+\sqrt{b^2-4ac}\right) x^n\right)^2 \left(a+x^n \left(b+cx^n\right)\right)^{-1+p} \text{AppellF1}\left[1+\frac{1}{n}, -p, -p, 2+\frac{1}{n}, -\frac{2cx^n}{b+\sqrt{b^2-4ac}}, \frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right) \Big/$$

$$((-b+\sqrt{b^2-4ac})\ (1+n)\ (b+\sqrt{b^2-4ac}+2cx^n)\ (-2\ (a+2an)\ \text{AppellF1}[1+\frac{1}{n},-p,-p,2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}]+$$

$$npx^n\ ((-b+\sqrt{b^2-4ac})\ \text{AppellF1}[2+\frac{1}{n},1-p,-p,3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}]-$$

$$(b+\sqrt{b^2-4ac})\ \text{AppellF1}[2+\frac{1}{n},-p,1-p,3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}])))+$$

$$(3\times 2^{-1-p}\ c\ (b+\sqrt{b^2-4ac})\ d\ e^2\ (1+3n)\ x^{1+2n}\ (\frac{b-\sqrt{b^2-4ac}}{2c}+x^n)^{-p}\ (\frac{b-\sqrt{b^2-4ac}+2cx^n}{c})^{1+p}\ (-2a+(-b+\sqrt{b^2-4ac})\ x^n)^2$$

$$(a+x^n\ (b+cx^n))^{-1+p}\ \text{AppellF1}[2+\frac{1}{n},-p,-p,3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}])\Big/$$

$$((-b+\sqrt{b^2-4ac})\ (1+2n)\ (b+\sqrt{b^2-4ac}+2cx^n)\ (-2\ (a+3an)\ \text{AppellF1}[2+\frac{1}{n},-p,-p,3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}]+$$

$$npx^n\ ((-b+\sqrt{b^2-4ac})\ \text{AppellF1}[3+\frac{1}{n},1-p,-p,4+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}]-$$

$$(b+\sqrt{b^2-4ac})\ \text{AppellF1}[3+\frac{1}{n},-p,1-p,4+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}])))+$$

$$(2^{-1-p}\ c\ (b+\sqrt{b^2-4ac})\ e^3\ (1+4n)\ x^{1+3n}\ (\frac{b-\sqrt{b^2-4ac}}{2c}+x^n)^{-p}\ (\frac{b-\sqrt{b^2-4ac}+2cx^n}{c})^{1+p}\ (-2a+(-b+\sqrt{b^2-4ac})\ x^n)^2$$

$$(a+x^n\ (b+cx^n))^{-1+p}\ \text{AppellF1}[3+\frac{1}{n},-p,-p,4+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}])\Big/$$

$$((-b+\sqrt{b^2-4ac})\ (1+3n)\ (b+\sqrt{b^2-4ac}+2cx^n)\ (-2\ (a+4an)\ \text{AppellF1}[3+\frac{1}{n},-p,-p,4+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}]+$$

$$npx^n\ ((-b+\sqrt{b^2-4ac})\ \text{AppellF1}[4+\frac{1}{n},1-p,-p,5+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}]-$$

$$(b+\sqrt{b^2-4ac})\ \text{AppellF1}[4+\frac{1}{n},-p,1-p,5+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}])))-$$

$$(2^{-1-2p}\ (b+\sqrt{b^2-4ac})\ d^3\ (1+n)\ x\ (\frac{b-\sqrt{b^2-4ac}}{2c}+x^n)^{-p}\ (\frac{b+\sqrt{b^2-4ac}}{2c}+x^n)^{-p}\ (-b+\sqrt{b^2-4ac}-2cx^n)$$

$$(\frac{b-\sqrt{b^2-4ac}+2cx^n}{c})^{p}\ (\frac{b+\sqrt{b^2-4ac}+2cx^n}{c})^{-1+p}\ (-2a+(-b+\sqrt{b^2-4ac})\ x^n)^2$$

$$\left(a+x^n\left(b+c\,x^n\right)\right)^{-1+p}\,\text{AppellF1}\left[\frac{1}{n},-p,-p,1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg/$$
$$\Bigg(c\left(-b+\sqrt{b^2-4\,a\,c}\right)\Bigg(\left(-b+\sqrt{b^2-4\,a\,c}\right)n\,p\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},1-p,-p,2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$
$$\left(b+\sqrt{b^2-4\,a\,c}\right)n\,p\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},-p,1-p,2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$
$$2\,a\,(1+n)\,\text{AppellF1}\left[\frac{1}{n},-p,-p,1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)$$

Problem 92: Result more than twice size of optimal antiderivative.

$$\int\left(d+e\,x^n\right)^2\left(a+b\,x^n+c\,x^{2\,n}\right)^p\,dx$$

Optimal (type 6, 447 leaves, 8 steps):

$$\frac{1}{1+n}2\,d\,e\,x^{1+n}\left(1+\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right)^{-p}\left(1+\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right)^{-p}$$
$$\left(a+b\,x^n+c\,x^{2\,n}\right)^p\,\text{AppellF1}\left[1+\frac{1}{n},-p,-p,2+\frac{1}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]+\frac{1}{1+2\,n}$$
$$e^2\,x^{1+2\,n}\left(1+\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right)^{-p}\left(1+\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right)^{-p}\left(a+b\,x^n+c\,x^{2\,n}\right)^p\,\text{AppellF1}\left[2+\frac{1}{n},-p,-p,3+\frac{1}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]+$$
$$d^2\,x\left(1+\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right)^{-p}\left(1+\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right)^{-p}\left(a+b\,x^n+c\,x^{2\,n}\right)^p\,\text{AppellF1}\left[\frac{1}{n},-p,-p,1+\frac{1}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]$$

Result (type 6, 1522 leaves):

$$\Bigg(2^{-p}\,c\left(b+\sqrt{b^2-4\,a\,c}\right)d\,e\,(1+2\,n)\,x^{1+n}\left(\frac{b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)^{-p}\left(\frac{b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n}{c}\right)^{1+p}$$
$$\left(-2\,a+\left(-b+\sqrt{b^2-4\,a\,c}\right)x^n\right)^2\left(a+x^n\left(b+c\,x^n\right)\right)^{-1+p}\,\text{AppellF1}\left[1+\frac{1}{n},-p,-p,2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg/$$
$$\Bigg(\left(-b+\sqrt{b^2-4\,a\,c}\right)(1+n)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\Bigg(-2\,(a+2\,a\,n)\,\text{AppellF1}\left[1+\frac{1}{n},-p,-p,2+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+$$
$$n\,p\,x^n\Bigg(\left(-b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[2+\frac{1}{n},1-p,-p,3+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$
$$\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[2+\frac{1}{n},-p,1-p,3+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\Bigg)\Bigg)\Bigg)+$$

$$\left(2^{-1-p}\, c\, \left(b+\sqrt{b^2-4\,a\,c}\right) e^2\, (1+3\,n)\, x^{1+2\,n} \left(\frac{b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)^{-p} \left(\frac{b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n}{c}\right)^{1+p} \left(-2\,a+\left(-b+\sqrt{b^2-4\,a\,c}\right) x^n\right)^2 \right.$$

$$\left.\left(a+x^n\,(b+c\,x^n)\right)^{-1+p} \text{AppellF1}\left[2+\frac{1}{n},\,-p,\,-p,\,3+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right) \Big/$$

$$\left(\left(-b+\sqrt{b^2-4\,a\,c}\right)(1+2\,n)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(-2\,(a+3\,a\,n)\,\text{AppellF1}\left[2+\frac{1}{n},\,-p,\,-p,\,3+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.\right.$$

$$n\,p\,x^n\left(\left(-b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[3+\frac{1}{n},\,1-p,\,-p,\,4+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$

$$\left.\left.\left.\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[3+\frac{1}{n},\,-p,\,1-p,\,4+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)-$$

$$\left(2^{-1-2\,p}\left(b+\sqrt{b^2-4\,a\,c}\right) d^2\,(1+n)\,x\left(\frac{b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)^{-p}\left(\frac{b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)^{-p}\left(-b+\sqrt{b^2-4\,a\,c}-2\,c\,x^n\right)\right.$$

$$\left(\frac{b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n}{c}\right)^{p}\left(\frac{b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n}{c}\right)^{-1+p}\left(-2\,a+\left(-b+\sqrt{b^2-4\,a\,c}\right)x^n\right)^2$$

$$\left.\left(a+x^n\,(b+c\,x^n)\right)^{-1+p}\text{AppellF1}\left[\frac{1}{n},\,-p,\,-p,\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$

$$\left(c\left(-b+\sqrt{b^2-4\,a\,c}\right)\left(\left(-b+\sqrt{b^2-4\,a\,c}\right)n\,p\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\,1-p,\,-p,\,2+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.\right.$$

$$\left(b+\sqrt{b^2-4\,a\,c}\right)n\,p\,x^n\,\text{AppellF1}\left[1+\frac{1}{n},\,-p,\,1-p,\,2+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-$$

$$\left.\left.2\,a\,(1+n)\,\text{AppellF1}\left[\frac{1}{n},\,-p,\,-p,\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\,\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)$$

Problem 93: Result more than twice size of optimal antiderivative.

$$\int (d+e\,x^n)\,\left(a+b\,x^n+c\,x^{2\,n}\right)^p\,dx$$

Optimal (type 6, 288 leaves, 6 steps):

$$\frac{1}{1+n}e\,x^{1+n}\left(1+\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right)^{-p}\left(1+\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right)^{-p}\left(a+b\,x^n+c\,x^{2\,n}\right)^p\,\text{AppellF1}\left[1+\frac{1}{n},\,-p,\,-p,\,2+\frac{1}{n},\,-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]+$$

$$d\,x\left(1+\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right)^{-p}\left(1+\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right)^{-p}\left(a+b\,x^n+c\,x^{2\,n}\right)^p\,\text{AppellF1}\left[\frac{1}{n},\,-p,\,-p,\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]$$

Result (type 6, 902 leaves):

$$\frac{1}{\left(-b+\sqrt{b^2-4ac}\right)(1+n)\left(b+\sqrt{b^2-4ac}+2cx^n\right)} 2^{-1-2p}\left(b+\sqrt{b^2-4ac}\right) x \left(\frac{b-\sqrt{b^2-4ac}}{2c}+x^n\right)^{-p} \left(\frac{b-\sqrt{b^2-4ac}+2cx^n}{c}\right)^p \left(-2a+\left(-b+\sqrt{b^2-4ac}\right)x^n\right)^2 \left(a+x^n\left(b+cx^n\right)\right)^{-1+p}$$

$$\left(\left(2^p e(1+2n)x^n\left(b-\sqrt{b^2-4ac}+2cx^n\right)\text{AppellF1}\left[1+\frac{1}{n},-p,-p,2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/\right.$$

$$\left(-2(a+2an)\text{AppellF1}\left[1+\frac{1}{n},-p,-p,2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]+\right.$$

$$npx^n\left(\left(-b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[2+\frac{1}{n},1-p,-p,3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-\right.$$

$$\left.\left.\left.\left(b+\sqrt{b^2-4ac}\right)\text{AppellF1}\left[2+\frac{1}{n},-p,1-p,3+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right)\right)-\left(d(1+n)^2\left(\frac{b+\sqrt{b^2-4ac}}{2c}+x^n\right)^{-p}\right.$$

$$\left.\left(-b+\sqrt{b^2-4ac}-2cx^n\right)\left(\frac{b+\sqrt{b^2-4ac}+2cx^n}{c}\right)^p\text{AppellF1}\left[\frac{1}{n},-p,-p,1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\Big/$$

$$\left(\left(-b+\sqrt{b^2-4ac}\right)npx^n\,\text{AppellF1}\left[1+\frac{1}{n},1-p,-p,2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-\left(b+\sqrt{b^2-4ac}\right)npx^n\,\text{AppellF1}\left[1+\frac{1}{n},\right.\right.$$

$$\left.\left.-p,1-p,2+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]-2a(1+n)\text{AppellF1}\left[\frac{1}{n},-p,-p,1+\frac{1}{n},-\frac{2cx^n}{b+\sqrt{b^2-4ac}},\frac{2cx^n}{-b+\sqrt{b^2-4ac}}\right]\right)\right)$$

Test results for the 156 problems in "1.2.3.4 (f x)^m (d+e x^n)^q (a+b x^n+c x^(2 n))^p.m"

Problem 12: Result is not expressed in closed-form.

$$\int \frac{d+ex^3}{x\left(a+bx^3+cx^6\right)}\,dx$$

Optimal (type 3, 78 leaves, 7 steps):

$$\frac{(bd-2ae)\,\text{ArcTanh}\left[\frac{b+2cx^3}{\sqrt{b^2-4ac}}\right]}{3a\sqrt{b^2-4ac}}+\frac{d\,\text{Log}[x]}{a}-\frac{d\,\text{Log}\left[a+bx^3+cx^6\right]}{6a}$$

Result (type 7, 80 leaves):

$$\frac{d \,\text{Log}[x]}{a}-\frac{\text{RootSum}\left[a+b\,\#1^3+c\,\#1^6\,\&,\frac{b\,d\,\text{Log}[x-\#1]-a\,e\,\text{Log}[x-\#1]+c\,d\,\text{Log}[x-\#1]\,\#1^3}{b+2\,c\,\#1^3}\,\&\right]}{3\,a}$$

Problem 13: Result is not expressed in closed-form.

$$\int \frac{d+e\,x^3}{x^4\left(a+b\,x^3+c\,x^6\right)}\,dx$$

Optimal (type 3, 112 leaves, 7 steps):

$$-\frac{d}{3\,a\,x^3}-\frac{\left(b^2\,d-2\,a\,c\,d-a\,b\,e\right)\,\text{ArcTanh}\left[\frac{b+2\,c\,x^3}{\sqrt{b^2-4\,a\,c}}\right]}{3\,a^2\,\sqrt{b^2-4\,a\,c}}-\frac{\left(b\,d-a\,e\right)\,\text{Log}[x]}{a^2}+\frac{\left(b\,d-a\,e\right)\,\text{Log}\left[a+b\,x^3+c\,x^6\right]}{6\,a^2}$$

Result (type 7, 130 leaves):

$$-\frac{d}{3\,a\,x^3}+\frac{\left(-b\,d+a\,e\right)\,\text{Log}[x]}{a^2}+\frac{\text{RootSum}\left[a+b\,\#1^3+c\,\#1^6\,\&,\frac{b^2\,d\,\text{Log}[x-\#1]-a\,c\,d\,\text{Log}[x-\#1]-a\,b\,e\,\text{Log}[x-\#1]+b\,c\,d\,\text{Log}[x-\#1]\,\#1^3-a\,c\,e\,\text{Log}[x-\#1]\,\#1^3}{b+2\,c\,\#1^3}\,\&\right]}{3\,a^2}$$

Problem 14: Result is not expressed in closed-form.

$$\int \frac{x^4\left(d+e\,x^3\right)}{a+b\,x^3+c\,x^6}\,dx$$

Optimal (type 3, 723 leaves, 14 steps):

$$\frac{e x^2}{2 c}-\frac{\left(c d-b e-\frac{b c d-b^2 e+2 a c e}{\sqrt{b^2-4 a c}}\right) \text{ArcTan}\left[\frac{1-\frac{2\cdot 2^{1/3} c^{1/3} x}{\left(b-\sqrt{b^2-4 a c}\right)^{1/3}}}{\sqrt{3}}\right]}{2^{2/3} \sqrt{3}\, c^{5/3} \left(b-\sqrt{b^2-4 a c}\right)^{1/3}}-\frac{\left(c d-b e+\frac{b c d-b^2 e+2 a c e}{\sqrt{b^2-4 a c}}\right) \text{ArcTan}\left[\frac{1-\frac{2\cdot 2^{1/3} c^{1/3} x}{\left(b+\sqrt{b^2-4 a c}\right)^{1/3}}}{\sqrt{3}}\right]}{2^{2/3} \sqrt{3}\, c^{5/3} \left(b+\sqrt{b^2-4 a c}\right)^{1/3}}-$$

$$\frac{\left(c d-b e-\frac{b c d-b^2 e+2 a c e}{\sqrt{b^2-4 a c}}\right) \text{Log}\left[\left(b-\sqrt{b^2-4 a c}\right)^{1/3}+2^{1/3} c^{1/3} x\right]}{3\times 2^{2/3} c^{5/3} \left(b-\sqrt{b^2-4 a c}\right)^{1/3}}-\frac{\left(c d-b e+\frac{b c d-b^2 e+2 a c e}{\sqrt{b^2-4 a c}}\right) \text{Log}\left[\left(b+\sqrt{b^2-4 a c}\right)^{1/3}+2^{1/3} c^{1/3} x\right]}{3\times 2^{2/3} c^{5/3} \left(b+\sqrt{b^2-4 a c}\right)^{1/3}}+$$

$$\frac{\left(c d-b e-\frac{b c d-b^2 e+2 a c e}{\sqrt{b^2-4 a c}}\right) \text{Log}\left[\left(b-\sqrt{b^2-4 a c}\right)^{2/3}-2^{1/3} c^{1/3} \left(b-\sqrt{b^2-4 a c}\right)^{1/3} x+2^{2/3} c^{2/3} x^2\right]}{6\times 2^{2/3} c^{5/3} \left(b-\sqrt{b^2-4 a c}\right)^{1/3}}+$$

$$\frac{\left(c d-b e+\frac{b c d-b^2 e+2 a c e}{\sqrt{b^2-4 a c}}\right) \text{Log}\left[\left(b+\sqrt{b^2-4 a c}\right)^{2/3}-2^{1/3} c^{1/3} \left(b+\sqrt{b^2-4 a c}\right)^{1/3} x+2^{2/3} c^{2/3} x^2\right]}{6\times 2^{2/3} c^{5/3} \left(b+\sqrt{b^2-4 a c}\right)^{1/3}}$$

Result (type 7, 88 leaves) :

$$\frac{3 e x^2-2\, \text{RootSum}\left[a+b\, \#1^3+c\, \#1^6\, \&,\ \frac{a e \,\text{Log}[x-\#1]-c d\, \text{Log}[x-\#1]\, \#1^3+b e\, \text{Log}[x-\#1]\, \#1^3}{b\, \#1+2 c\, \#1^4}\, \&\right]}{6 c}$$

Problem 15: Result is not expressed in closed-form.

$$\int \frac{x^3 \left(d+e x^3\right)}{a+b x^3+c x^6}\, dx$$

Optimal (type 3, 718 leaves, 14 steps) :

$$\frac{e\,x}{c}-\frac{\left(c\,d-b\,e-\frac{b\,c\,d-b^2\,e+2\,a\,c\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{ArcTan}\left[\frac{1-\frac{2\,2^{1/3}\,c^{1/3}\,x}{\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}}}{\sqrt{3}}\right]}{2^{1/3}\,\sqrt{3}\,c^{4/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}}-\frac{\left(c\,d-b\,e+\frac{b\,c\,d-b^2\,e+2\,a\,c\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{ArcTan}\left[\frac{1-\frac{2\,2^{1/3}\,c^{1/3}\,x}{\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}}}{\sqrt{3}}\right]}{2^{1/3}\,\sqrt{3}\,c^{4/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}}+$$

$$\frac{\left(c\,d-b\,e-\frac{b\,c\,d-b^2\,e+2\,a\,c\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{Log}\left[\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}+2^{1/3}\,c^{1/3}\,x\right]}{3\times 2^{1/3}\,c^{4/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}}+\frac{\left(c\,d-b\,e+\frac{b\,c\,d-b^2\,e+2\,a\,c\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{Log}\left[\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}+2^{1/3}\,c^{1/3}\,x\right]}{3\times 2^{1/3}\,c^{4/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}}-$$

$$\frac{\left(c\,d-b\,e-\frac{b\,c\,d-b^2\,e+2\,a\,c\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{Log}\left[\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}-2^{1/3}\,c^{1/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}\,x+2^{2/3}\,c^{2/3}\,x^2\right]}{6\times 2^{1/3}\,c^{4/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}}-$$

$$\frac{\left(c\,d-b\,e+\frac{b\,c\,d-b^2\,e+2\,a\,c\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{Log}\left[\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}-2^{1/3}\,c^{1/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}\,x+2^{2/3}\,c^{2/3}\,x^2\right]}{6\times 2^{1/3}\,c^{4/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}}$$

Result (type 7, 88 leaves):

$$\frac{e\,x}{c}-\frac{\text{RootSum}\left[a+b\,\#1^3+c\,\#1^6\,\&,\ \frac{a\,e\,\text{Log}[x-\#1]-c\,d\,\text{Log}[x-\#1]\,\#1^3+b\,e\,\text{Log}[x-\#1]\,\#1^3}{b\,\#1^2+2\,c\,\#1^5}\,\&\right]}{3\,c}$$

Problem 16: Result is not expressed in closed-form.

$$\int \frac{x\,\left(d+e\,x^3\right)}{a+b\,x^3+c\,x^6}\,dx$$

Optimal (type 3, 634 leaves, 13 steps):

$$-\frac{\left(e+\frac{2\,c\,d-b\,e}{\sqrt{b^2-4\,a\,c}}\right)\,\text{ArcTan}\left[\frac{1-\frac{2\,2^{1/3}\,c^{1/3}\,x}{\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}}}{\sqrt{3}}\right]}{2^{2/3}\,\sqrt{3}\,c^{2/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}}-\frac{\left(e-\frac{2\,c\,d-b\,e}{\sqrt{b^2-4\,a\,c}}\right)\,\text{ArcTan}\left[\frac{1-\frac{2\,2^{1/3}\,c^{1/3}\,x}{\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}}}{\sqrt{3}}\right]}{2^{2/3}\,\sqrt{3}\,c^{2/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}}-\frac{\left(e+\frac{2\,c\,d-b\,e}{\sqrt{b^2-4\,a\,c}}\right)\,\text{Log}\left[\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}+2^{1/3}\,c^{1/3}\,x\right]}{3\times 2^{2/3}\,c^{2/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}}-$$

$$\frac{\left(e-\frac{2\,c\,d-b\,e}{\sqrt{b^2-4\,a\,c}}\right)\,\text{Log}\left[\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}+2^{1/3}\,c^{1/3}\,x\right]}{3\times 2^{2/3}\,c^{2/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}}+\frac{\left(e+\frac{2\,c\,d-b\,e}{\sqrt{b^2-4\,a\,c}}\right)\,\text{Log}\left[\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}-2^{1/3}\,c^{1/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}\,x+2^{2/3}\,c^{2/3}\,x^2\right]}{6\times 2^{2/3}\,c^{2/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}}+$$

$$\frac{\left(e-\frac{2\,c\,d-b\,e}{\sqrt{b^2-4\,a\,c}}\right)\,\text{Log}\left[\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}-2^{1/3}\,c^{1/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}\,x+2^{2/3}\,c^{2/3}\,x^2\right]}{6\times 2^{2/3}\,c^{2/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}}$$

Result (type 7, 59 leaves) :

$$\frac{1}{3}\,\text{RootSum}\left[a+b\,\#1^3+c\,\#1^6\,\&,\,\frac{d\,\text{Log}[x-\#1]+e\,\text{Log}[x-\#1]\,\#1^3}{b\,\#1+2\,c\,\#1^4}\,\&\right]$$

Problem 17: Result is not expressed in closed-form.

$$\int\frac{d+e\,x^3}{a+b\,x^3+c\,x^6}\,dx$$

Optimal (type 3, 634 leaves, 13 steps) :

$$-\frac{\left(e+\frac{2\,c\,d-b\,e}{\sqrt{b^2-4\,a\,c}}\right)\,\text{ArcTan}\left[\frac{1-\frac{2\,2^{1/3}\,c^{1/3}\,x}{\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}}}{\sqrt{3}}\right]}{2^{1/3}\,\sqrt{3}\,c^{1/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}}-\frac{\left(e-\frac{2\,c\,d-b\,e}{\sqrt{b^2-4\,a\,c}}\right)\,\text{ArcTan}\left[\frac{1-\frac{2\,2^{1/3}\,c^{1/3}\,x}{\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}}}{\sqrt{3}}\right]}{2^{1/3}\,\sqrt{3}\,c^{1/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}}+\frac{\left(e+\frac{2\,c\,d-b\,e}{\sqrt{b^2-4\,a\,c}}\right)\,\text{Log}\left[\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}+2^{1/3}\,c^{1/3}\,x\right]}{3\times 2^{1/3}\,c^{1/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}}+$$

$$\frac{\left(e-\frac{2\,c\,d-b\,e}{\sqrt{b^2-4\,a\,c}}\right)\,\text{Log}\left[\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}+2^{1/3}\,c^{1/3}\,x\right]}{3\times 2^{1/3}\,c^{1/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}}-\frac{\left(e+\frac{2\,c\,d-b\,e}{\sqrt{b^2-4\,a\,c}}\right)\,\text{Log}\left[\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}-2^{1/3}\,c^{1/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}\,x+2^{2/3}\,c^{2/3}\,x^2\right]}{6\times 2^{1/3}\,c^{1/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}}-$$

$$\frac{\left(e-\frac{2\,c\,d-b\,e}{\sqrt{b^2-4\,a\,c}}\right)\,\text{Log}\left[\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}-2^{1/3}\,c^{1/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}\,x+2^{2/3}\,c^{2/3}\,x^2\right]}{6\times 2^{1/3}\,c^{1/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}}$$

Result (type 7, 61 leaves) :

$$\frac{1}{3}\,\text{RootSum}\left[a+b\,\#1^3+c\,\#1^6\,\&,\ \frac{d\,\text{Log}[x-\#1]+e\,\text{Log}[x-\#1]\,\#1^3}{b\,\#1^2+2\,c\,\#1^5}\,\&\right]$$

Problem 18: Result is not expressed in closed-form.

$$\int \frac{d+e\,x^3}{x^2\,\left(a+b\,x^3+c\,x^6\right)}\,dx$$

Optimal (type 3, 653 leaves, 14 steps):

$$-\frac{d}{a\,x}+\frac{c^{1/3}\left(d+\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{ArcTan}\left[\frac{1-\frac{2\cdot2^{1/3}\,c^{1/3}\,x}{\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}}}{\sqrt{3}}\right]}{2^{2/3}\,\sqrt{3}\,a\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}}+\frac{c^{1/3}\left(d-\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{ArcTan}\left[\frac{1-\frac{2\cdot2^{1/3}\,c^{1/3}\,x}{\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}}}{\sqrt{3}}\right]}{2^{2/3}\,\sqrt{3}\,a\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}}+$$

$$\frac{c^{1/3}\left(d+\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{Log}\left[\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}+2^{1/3}\,c^{1/3}\,x\right]}{3\times2^{2/3}\,a\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}}+\frac{c^{1/3}\left(d-\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{Log}\left[\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}+2^{1/3}\,c^{1/3}\,x\right]}{3\times2^{2/3}\,a\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}}-$$

$$\frac{c^{1/3}\left(d+\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{Log}\left[\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}-2^{1/3}\,c^{1/3}\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}x+2^{2/3}\,c^{2/3}\,x^2\right]}{6\times2^{2/3}\,a\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}}-$$

$$\frac{c^{1/3}\left(d-\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{Log}\left[\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}-2^{1/3}\,c^{1/3}\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}x+2^{2/3}\,c^{2/3}\,x^2\right]}{6\times2^{2/3}\,a\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}}$$

Result (type 7, 85 leaves):

$$-\frac{d}{a\,x}-\frac{\text{RootSum}\left[a+b\,\#1^3+c\,\#1^6\,\&,\ \frac{b\,d\,\text{Log}[x-\#1]-a\,e\,\text{Log}[x-\#1]+c\,d\,\text{Log}[x-\#1]\,\#1^3}{b\,\#1+2\,c\,\#1^4}\,\&\right]}{3\,a}$$

Problem 19: Result is not expressed in closed-form.

$$\int \frac{d+e\,x^3}{x^3\,\left(a+b\,x^3+c\,x^6\right)}\,dx$$

Optimal (type 3, 655 leaves, 14 steps):

$$-\frac{d}{2\,a\,x^2}+\frac{c^{2/3}\left(d+\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{ArcTan}\left[\frac{1-\frac{2\times2^{1/3}\,c^{1/3}\,x}{\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}}}{\sqrt{3}}\right]}{2^{1/3}\,\sqrt{3}\,a\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}}+\frac{c^{2/3}\left(d-\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{ArcTan}\left[\frac{1-\frac{2\times2^{1/3}\,c^{1/3}\,x}{\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}}}{\sqrt{3}}\right]}{2^{1/3}\,\sqrt{3}\,a\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}}-$$

$$\frac{c^{2/3}\left(d+\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{Log}\left[\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}+2^{1/3}\,c^{1/3}\,x\right]}{3\times2^{1/3}\,a\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}}-\frac{c^{2/3}\left(d-\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{Log}\left[\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}+2^{1/3}\,c^{1/3}\,x\right]}{3\times2^{1/3}\,a\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}}+$$

$$\frac{c^{2/3}\left(d+\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{Log}\left[\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}-2^{1/3}\,c^{1/3}\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}x+2^{2/3}\,c^{2/3}\,x^2\right]}{6\times2^{1/3}\,a\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}}+$$

$$\frac{c^{2/3}\left(d-\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{Log}\left[\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}-2^{1/3}\,c^{1/3}\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}x+2^{2/3}\,c^{2/3}\,x^2\right]}{6\times2^{1/3}\,a\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}}$$

Result (type 7, 89 leaves):

$$-\frac{d}{2\,a\,x^2}-\frac{\text{RootSum}\left[a+b\,\#1^3+c\,\#1^6\,\&,\frac{b\,d\,\text{Log}[x-\#1]-a\,e\,\text{Log}[x-\#1]+c\,d\,\text{Log}[x-\#1]\,\#1^3}{b\,\#1^2+2\,c\,\#1^5}\,\&\right]}{3\,a}$$

Problem 23: Result is not expressed in closed-form.

$$\int\frac{1-x^3}{x\left(1-x^3+x^6\right)}\,dx$$

Optimal (type 3, 41 leaves, 7 steps):

$$\frac{\text{ArcTan}\left[\frac{1-2\,x^3}{\sqrt{3}}\right]}{3\,\sqrt{3}}+\text{Log}[x]-\frac{1}{6}\,\text{Log}\left[1-x^3+x^6\right]$$

Result (type 7, 44 leaves):

$$\text{Log}[x]-\frac{1}{3}\,\text{RootSum}\left[1-\#1^3+\#1^6\,\&,\frac{\text{Log}[x-\#1]\,\#1^3}{-1+2\,\#1^3}\,\&\right]$$

Problem 24: Result is not expressed in closed-form.

$$\int \frac{1-x^3}{x^4\left(1-x^3+x^6\right)}\,dx$$

Optimal (type 3, 31 leaves, 5 steps):

$$-\frac{1}{3x^3}+\frac{2\,\text{ArcTan}\left[\frac{1-2x^3}{\sqrt{3}}\right]}{3\sqrt{3}}$$

Result (type 7, 45 leaves):

$$-\frac{1}{3x^3}-\frac{1}{3}\text{RootSum}\left[1-\#1^3+\#1^6\,\&,\ \frac{\text{Log}[x-\#1]}{-1+2\,\#1^3}\,\&\right]$$

Problem 25: Result is not expressed in closed-form.

$$\int \frac{x^6\left(1-x^3\right)}{1-x^3+x^6}\,dx$$

Optimal (type 3, 418 leaves, 15 steps):

$$-\frac{x^4}{4}-\frac{\left(i+\sqrt{3}\right)\text{ArcTan}\left[\frac{1+\frac{2x}{\left(\frac{1}{2}\left(1-i\sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3\times 2^{1/3}\left(1-i\sqrt{3}\right)^{2/3}}+\frac{\left(i-\sqrt{3}\right)\text{ArcTan}\left[\frac{1+\frac{2x}{\left(\frac{1}{2}\left(1+i\sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3\times 2^{1/3}\left(1+i\sqrt{3}\right)^{2/3}}+$$
$$\frac{\left(3+i\sqrt{3}\right)\text{Log}\left[\left(1-i\sqrt{3}\right)^{1/3}-2^{1/3}x\right]}{9\times 2^{1/3}\left(1-i\sqrt{3}\right)^{2/3}}+\frac{\left(3-i\sqrt{3}\right)\text{Log}\left[\left(1+i\sqrt{3}\right)^{1/3}-2^{1/3}x\right]}{9\times 2^{1/3}\left(1+i\sqrt{3}\right)^{2/3}}-$$
$$\frac{\left(3+i\sqrt{3}\right)\text{Log}\left[\left(1-i\sqrt{3}\right)^{2/3}+\left(2\left(1-i\sqrt{3}\right)\right)^{1/3}x+2^{2/3}x^2\right]}{18\times 2^{1/3}\left(1-i\sqrt{3}\right)^{2/3}}-\frac{\left(3-i\sqrt{3}\right)\text{Log}\left[\left(1+i\sqrt{3}\right)^{2/3}+\left(2\left(1+i\sqrt{3}\right)\right)^{1/3}x+2^{2/3}x^2\right]}{18\times 2^{1/3}\left(1+i\sqrt{3}\right)^{2/3}}$$

Result (type 7, 47 leaves):

$$-\frac{x^4}{4}+\frac{1}{3}\text{RootSum}\left[1-\#1^3+\#1^6\,\&,\ \frac{\text{Log}[x-\#1]\,\#1}{-1+2\,\#1^3}\,\&\right]$$

Problem 26: Result is not expressed in closed-form.

$$\int \frac{x^4 \left(1-x^3\right)}{1-x^3+x^6} \, dx$$

Optimal (type 3, 382 leaves, 15 steps):

$$-\frac{x^2}{2}+\frac{i \operatorname{ArcTan}\left[\frac{1+\frac{2 x}{\left(\frac{1}{2}\left(1-i \sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3 \left(\frac{1}{2}\left(1-i \sqrt{3}\right)\right)^{1/3}}-\frac{i \operatorname{ArcTan}\left[\frac{1+\frac{2 x}{\left(\frac{1}{2}\left(1+i \sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3 \left(\frac{1}{2}\left(1+i \sqrt{3}\right)\right)^{1/3}}+\frac{i \operatorname{Log}\left[\left(1-i \sqrt{3}\right)^{1/3}-2^{1/3} x\right]}{3 \sqrt{3} \left(\frac{1}{2}\left(1-i \sqrt{3}\right)\right)^{1/3}}-\frac{i \operatorname{Log}\left[\left(1+i \sqrt{3}\right)^{1/3}-2^{1/3} x\right]}{3 \sqrt{3} \left(\frac{1}{2}\left(1+i \sqrt{3}\right)\right)^{1/3}}-\frac{i \operatorname{Log}\left[\left(1-i \sqrt{3}\right)^{2/3}+\left(2 \left(1-i \sqrt{3}\right)\right)^{1/3} x+2^{2/3} x^2\right]}{3\times 2^{2/3} \sqrt{3} \left(1-i \sqrt{3}\right)^{1/3}}+\frac{i \operatorname{Log}\left[\left(1+i \sqrt{3}\right)^{2/3}+\left(2 \left(1+i \sqrt{3}\right)\right)^{1/3} x+2^{2/3} x^2\right]}{3\times 2^{2/3} \sqrt{3} \left(1+i \sqrt{3}\right)^{1/3}}$$

Result (type 7, 48 leaves):

$$-\frac{x^2}{2}+\frac{1}{3} \operatorname{RootSum}\left[1-\#1^3+\#1^6 \&, \frac{\operatorname{Log}[x-\#1]}{-\#1+2 \#1^4} \&\right]$$

Problem 27: Result is not expressed in closed-form.

$$\int \frac{x^3 \left(1-x^3\right)}{1-x^3+x^6} \, dx$$

Optimal (type 3, 378 leaves, 14 steps):

$$-x-\frac{i \operatorname{ArcTan}\left[\frac{1+\frac{2 x}{\left(\frac{1}{2}\left(1-i \sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3 \left(\frac{1}{2}\left(1-i \sqrt{3}\right)\right)^{2/3}}+\frac{i \operatorname{ArcTan}\left[\frac{1+\frac{2 x}{\left(\frac{1}{2}\left(1+i \sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3 \left(\frac{1}{2}\left(1+i \sqrt{3}\right)\right)^{2/3}}+\frac{i \operatorname{Log}\left[\left(1-i \sqrt{3}\right)^{1/3}-2^{1/3} x\right]}{3 \sqrt{3} \left(\frac{1}{2}\left(1-i \sqrt{3}\right)\right)^{2/3}}-\frac{i \operatorname{Log}\left[\left(1+i \sqrt{3}\right)^{1/3}-2^{1/3} x\right]}{3 \sqrt{3} \left(\frac{1}{2}\left(1+i \sqrt{3}\right)\right)^{2/3}}-\frac{i \operatorname{Log}\left[\left(1-i \sqrt{3}\right)^{2/3}+\left(2 \left(1-i \sqrt{3}\right)\right)^{1/3} x+2^{2/3} x^2\right]}{3\times 2^{1/3} \sqrt{3} \left(1-i \sqrt{3}\right)^{2/3}}+\frac{i \operatorname{Log}\left[\left(1+i \sqrt{3}\right)^{2/3}+\left(2 \left(1+i \sqrt{3}\right)\right)^{1/3} x+2^{2/3} x^2\right]}{3\times 2^{1/3} \sqrt{3} \left(1+i \sqrt{3}\right)^{2/3}}$$

Result (type 7, 46 leaves):

$$-x+\frac{1}{3} \operatorname{RootSum}\left[1-\#1^3+\#1^6 \&, \frac{\operatorname{Log}[x-\#1]}{-\#1^2+2 \#1^5} \&\right]$$

Problem 28: Result is not expressed in closed-form.

$$\int \frac{x\left(1-x^3\right)}{1-x^3+x^6}\,dx$$

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, 55 leaves):

$$-\frac{1}{3}\text{RootSum}\left[1-\#1^3+\#1^6\,\&,\ \frac{-\text{Log}[x-\#1]+\text{Log}[x-\#1]\,\#1^3}{-\#1+2\,\#1^4}\,\&\right]$$

Problem 29: Result is not expressed in closed-form.

$$\int \frac{1-x^3}{1-x^3+x^6}\,dx$$

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, 57 leaves) :

$$-\frac{1}{3}\,\text{RootSum}\left[1-\#1^3+\#1^6\,\&,\ \frac{-\text{Log}[x-\#1]+\text{Log}[x-\#1]\,\#1^3}{-\#1^2+2\,\#1^5}\,\&\right]$$

Problem 30: Result is not expressed in closed-form.

$$\int\frac{1-x^3}{x^2\,\left(1-x^3+x^6\right)}\,dx$$

Optimal (type 3, 416 leaves, 14 steps) :

$$-\frac{1}{x}-\frac{\left(i+\sqrt{3}\right)\text{ArcTan}\left[\frac{1+\frac{2\,x}{\left(\frac{1}{2}\left(1-i\,\sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3\times 2^{2/3}\left(1-i\,\sqrt{3}\right)^{1/3}}+\frac{\left(i-\sqrt{3}\right)\text{ArcTan}\left[\frac{1+\frac{2\,x}{\left(\frac{1}{2}\left(1+i\,\sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3\times 2^{2/3}\left(1+i\,\sqrt{3}\right)^{1/3}}-$$
$$\frac{\left(3+i\,\sqrt{3}\right)\text{Log}\left[\left(1-i\,\sqrt{3}\right)^{1/3}-2^{1/3}\,x\right]}{9\times 2^{2/3}\left(1-i\,\sqrt{3}\right)^{1/3}}-\frac{\left(3-i\,\sqrt{3}\right)\text{Log}\left[\left(1+i\,\sqrt{3}\right)^{1/3}-2^{1/3}\,x\right]}{9\times 2^{2/3}\left(1+i\,\sqrt{3}\right)^{1/3}}+$$
$$\frac{\left(3+i\,\sqrt{3}\right)\text{Log}\left[\left(1-i\,\sqrt{3}\right)^{2/3}+\left(2\left(1-i\,\sqrt{3}\right)\right)^{1/3}x+2^{2/3}\,x^2\right]}{18\times 2^{2/3}\left(1-i\,\sqrt{3}\right)^{1/3}}+\frac{\left(3-i\,\sqrt{3}\right)\text{Log}\left[\left(1+i\,\sqrt{3}\right)^{2/3}+\left(2\left(1+i\,\sqrt{3}\right)\right)^{1/3}x+2^{2/3}\,x^2\right]}{18\times 2^{2/3}\left(1+i\,\sqrt{3}\right)^{1/3}}$$

Result (type 7, 47 leaves) :

$$-\frac{1}{x}-\frac{1}{3}\,\text{RootSum}\left[1-\#1^3+\#1^6\,\&,\ \frac{\text{Log}[x-\#1]\,\#1^2}{-1+2\,\#1^3}\,\&\right]$$

Problem 31: Result is not expressed in closed-form.

$$\int\frac{1-x^3}{x^3\,\left(1-x^3+x^6\right)}\,dx$$

Optimal (type 3, 418 leaves, 15 steps) :

$$-\frac{1}{2\,x^2}+\frac{\left(i+\sqrt{3}\right)\,\text{ArcTan}\left[\frac{1+\frac{2\,x}{\left(\frac{1}{2}\left(1-i\,\sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3\times 2^{1/3}\,\left(1-i\,\sqrt{3}\right)^{2/3}}-\frac{\left(i-\sqrt{3}\right)\,\text{ArcTan}\left[\frac{1+\frac{2\,x}{\left(\frac{1}{2}\left(1+i\,\sqrt{3}\right)\right)^{1/3}}}{\sqrt{3}}\right]}{3\times 2^{1/3}\,\left(1+i\,\sqrt{3}\right)^{2/3}}-$$

$$\frac{\left(3+i\,\sqrt{3}\right)\,\text{Log}\left[\left(1-i\,\sqrt{3}\right)^{1/3}-2^{1/3}\,x\right]}{9\times 2^{1/3}\,\left(1-i\,\sqrt{3}\right)^{2/3}}-\frac{\left(3-i\,\sqrt{3}\right)\,\text{Log}\left[\left(1+i\,\sqrt{3}\right)^{1/3}-2^{1/3}\,x\right]}{9\times 2^{1/3}\,\left(1+i\,\sqrt{3}\right)^{2/3}}+$$

$$\frac{\left(3+i\,\sqrt{3}\right)\,\text{Log}\left[\left(1-i\,\sqrt{3}\right)^{2/3}+\left(2\,\left(1-i\,\sqrt{3}\right)\right)^{1/3}\,x+2^{2/3}\,x^2\right]}{18\times 2^{1/3}\,\left(1-i\,\sqrt{3}\right)^{2/3}}+\frac{\left(3-i\,\sqrt{3}\right)\,\text{Log}\left[\left(1+i\,\sqrt{3}\right)^{2/3}+\left(2\,\left(1+i\,\sqrt{3}\right)\right)^{1/3}\,x+2^{2/3}\,x^2\right]}{18\times 2^{1/3}\,\left(1+i\,\sqrt{3}\right)^{2/3}}$$

Result (type 7, 47 leaves):

$$-\frac{1}{2\,x^2}-\frac{1}{3}\,\text{RootSum}\left[1-\#1^3+\#1^6\,\&,\,\frac{\text{Log}[x-\#1]\,\#1}{-1+2\,\#1^3}\,\&\right]$$

Problem 33: Result is not expressed in closed-form.

$$\int\frac{1+x^3}{x\,\left(1-x^3+x^6\right)}\,dx$$

Optimal (type 3, 39 leaves, 7 steps):

$$-\frac{\text{ArcTan}\left[\frac{1-2\,x^3}{\sqrt{3}}\right]}{\sqrt{3}}+\text{Log}[x]-\frac{1}{6}\,\text{Log}\left[1-x^3+x^6\right]$$

Result (type 7, 55 leaves):

$$\text{Log}[x]-\frac{1}{3}\,\text{RootSum}\left[1-\#1^3+\#1^6\,\&,\,\frac{-2\,\text{Log}[x-\#1]+\text{Log}[x-\#1]\,\#1^3}{-1+2\,\#1^3}\,\&\right]$$

Problem 34: Result is not expressed in closed-form.

$$\int\frac{1+x^3}{x-x^4+x^7}\,dx$$

Optimal (type 3, 39 leaves, 8 steps):

$$-\frac{\text{ArcTan}\left[\frac{1-2\,x^3}{\sqrt{3}}\right]}{\sqrt{3}}+\text{Log}[x]-\frac{1}{6}\,\text{Log}\left[1-x^3+x^6\right]$$

Result (type 7, 55 leaves) :

$$\text{Log}[x] - \frac{1}{3}\,\text{RootSum}\left[1 - \#1^3 + \#1^6\,\&,\ \frac{-2\,\text{Log}[x-\#1] + \text{Log}[x-\#1]\,\#1^3}{-1+2\,\#1^3}\,\&\right]$$

Problem 35: Result unnecessarily involves imaginary or complex numbers.

$$\int \left(d+e\,x^3\right)^{5/2}\left(a+b\,x^3+c\,x^6\right)\,dx$$

Optimal (type 4, 396 leaves, 6 steps) :

$$\frac{54\,d^2\left(16\,c\,d^2-58\,b\,d\,e+667\,a\,e^2\right)x\,\sqrt{d+e\,x^3}}{124\,729\,e^2}+\frac{30\,d\left(16\,c\,d^2-58\,b\,d\,e+667\,a\,e^2\right)x\left(d+e\,x^3\right)^{3/2}}{124\,729\,e^2}+\frac{2\left(16\,c\,d^2-58\,b\,d\,e+667\,a\,e^2\right)x\left(d+e\,x^3\right)^{5/2}}{11\,339\,e^2}-\frac{2\left(8\,c\,d-29\,b\,e\right)x\left(d+e\,x^3\right)^{7/2}}{667\,e^2}+\frac{2\,c\,x^4\left(d+e\,x^3\right)^{7/2}}{29\,e}+\left(54\times 3^{3/4}\sqrt{2+\sqrt{3}}\;d^3\left(16\,c\,d^2-58\,b\,d\,e+667\,a\,e^2\right)\left(d^{1/3}+e^{1/3}\,x\right)\sqrt{\frac{d^{2/3}-d^{1/3}\,e^{1/3}\,x+e^{2/3}\,x^2}{\left(\left(1+\sqrt{3}\right)d^{1/3}+e^{1/3}\,x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)d^{1/3}+e^{1/3}\,x}{\left(1+\sqrt{3}\right)d^{1/3}+e^{1/3}\,x}\right],\,-7-4\,\sqrt{3}\right]\right)\Big/\left(124\,729\,e^{7/3}\sqrt{\frac{d^{1/3}\left(d^{1/3}+e^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)d^{1/3}+e^{1/3}\,x\right)^2}}\;\sqrt{d+e\,x^3}\right)$$

Result (type 4, 279 leaves) :

$$-\frac{1}{124\,729\,(-e)^{7/3}\sqrt{d+e\,x^3}}\,2\left((-e)^{1/3}\left(d+e\,x^3\right)\left(d^2\left(648\,c\,d^2-29\,e\left(81\,b\,d+1219\,a\,e\right)\right)x-d\,e\left(405\,c\,d^2+29\,e\left(487\,b\,d+851\,a\,e\right)\right)x^4-11\,e^2\left(781\,c\,d^2+29\,e\left(49\,b\,d+23\,a\,e\right)\right)x^7-187\,e^3\left(61\,c\,d+29\,b\,e\right)x^{10}-4301\,c\,e^4\,x^{13}\right)-27\,i\,3^{3/4}\,d^{10/3}\left(16\,c\,d^2+29\,e\left(-2\,b\,d+23\,a\,e\right)\right)\sqrt{(-1)^{5/6}\left(-1+\frac{(-e)^{1/3}\,x}{d^{1/3}}\right)}\;\sqrt{1+\frac{(-e)^{1/3}\,x}{d^{1/3}}+\frac{(-e)^{2/3}\,x^2}{d^{2/3}}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-e)^{1/3}\,x}{d^{1/3}}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)$$

Problem 36: Result unnecessarily involves imaginary or complex numbers.

$$\int \left(d+e x^3\right)^{3/2} \left(a+b x^3+c x^6\right) \, dx$$

Optimal (type 4, 356 leaves, 5 steps):

$$\frac{18 d \left(16 c d^2-46 b d e+391 a e^2\right) x \sqrt{d+e x^3}}{21505 e^2}+\frac{2 \left(16 c d^2-46 b d e+391 a e^2\right) x \left(d+e x^3\right)^{3/2}}{4301 e^2}-\frac{2 (8 c d-23 b e) x \left(d+e x^3\right)^{5/2}}{391 e^2}+\frac{2 c x^4 \left(d+e x^3\right)^{5/2}}{23 e}+\left(18\times 3^{3/4} \sqrt{2+\sqrt{3}}\, d^2 \left(16 c d^2-46 b d e+391 a e^2\right) \left(d^{1/3}+e^{1/3} x\right) \sqrt{\frac{d^{2/3}-d^{1/3} e^{1/3} x+e^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) d^{1/3}+e^{1/3} x\right)^2}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) d^{1/3}+e^{1/3} x}{\left(1+\sqrt{3}\right) d^{1/3}+e^{1/3} x}\right],-7-4 \sqrt{3}\right]\right)\Big/\left(21505 e^{7/3} \sqrt{\frac{d^{1/3} \left(d^{1/3}+e^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) d^{1/3}+e^{1/3} x\right)^2}} \sqrt{d+e x^3}\right)$$

Result (type 4, 249 leaves):

$$-\frac{1}{21505 (-e)^{7/3} \sqrt{d+e x^3}}\left(2 (-e)^{1/3} \left(d+e x^3\right) \left(d \left(216 c d^2-23 e (27 b d+238 a e)\right) x-5 e \left(27 c d^2+23 e (20 b d+17 a e)\right) x^4-55 e^2 (26 c d+23 b e) x^7-935 c e^3 x^{10}\right)-9 i\, 3^{3/4} d^{7/3} \left(16 c d^2+23 e (-2 b d+17 a e)\right) \sqrt{(-1)^{5/6} \left(-1+\frac{(-e)^{1/3} x}{d^{1/3}}\right)} \sqrt{1+\frac{(-e)^{1/3} x}{d^{1/3}}+\frac{(-e)^{2/3} x^2}{d^{2/3}}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-e)^{1/3} x}{d^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)$$

Problem 37: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{d+e x^3} \left(a+b x^3+c x^6\right) \, dx$$

Optimal (type 4, 316 leaves, 4 steps):

$$\frac{2\left(16\,c\,d^2-34\,b\,d\,e+187\,a\,e^2\right)x\sqrt{d+e\,x^3}}{935\,e^2}-\frac{2\left(8\,c\,d-17\,b\,e\right)x\left(d+e\,x^3\right)^{3/2}}{187\,e^2}+\frac{2\,c\,x^4\left(d+e\,x^3\right)^{3/2}}{17\,e}+\left(2\times 3^{3/4}\sqrt{2+\sqrt{3}}\;d\left(16\,c\,d^2-34\,b\,d\,e+187\,a\,e^2\right)\left(d^{1/3}+e^{1/3}\,x\right)\sqrt{\frac{d^{2/3}-d^{1/3}\,e^{1/3}\,x+e^{2/3}\,x^2}{\left(\left(1+\sqrt{3}\right)d^{1/3}+e^{1/3}\,x\right)^2}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)d^{1/3}+e^{1/3}\,x}{\left(1+\sqrt{3}\right)d^{1/3}+e^{1/3}\,x}\right],-7-4\sqrt{3}\right]\right)\Bigg/\left(935\,e^{7/3}\sqrt{\frac{d^{1/3}\left(d^{1/3}+e^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)d^{1/3}+e^{1/3}\,x\right)^2}}\sqrt{d+e\,x^3}\right)$$

Result (type 4, 219 leaves):

$$-\frac{1}{935\,(-e)^{7/3}\sqrt{d+e\,x^3}}2\left((-e)^{1/3}\,x\left(d+e\,x^3\right)\left(-17\,e\left(3\,b\,d+11\,a\,e+5\,b\,e\,x^3\right)+c\left(24\,d^2-15\,d\,e\,x^3-55\,e^2\,x^6\right)\right)-\mathrm{i}\,3^{3/4}\,d^{4/3}\left(16\,c\,d^2+17\,e\left(-2\,b\,d+11\,a\,e\right)\right)\sqrt{(-1)^{5/6}\left(-1+\frac{(-e)^{1/3}\,x}{d^{1/3}}\right)}\sqrt{1+\frac{(-e)^{1/3}\,x}{d^{1/3}}+\frac{(-e)^{2/3}\,x^2}{d^{2/3}}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{\mathrm{i}\,(-e)^{1/3}\,x}{d^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)$$

Problem 38: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{a+b\,x^3+c\,x^6}{\sqrt{d+e\,x^3}}\,dx$$

Optimal (type 4, 278 leaves, 3 steps):

$$-\frac{2\left(8 c d-11 b e\right) x \sqrt{d+e x^3}}{55 e^2}+\frac{2 c x^4 \sqrt{d+e x^3}}{11 e}+\left(2 \sqrt{2+\sqrt{3}}\left(16 c d^2-22 b d e+55 a e^2\right)\left(d^{1/3}+e^{1/3} x\right) \sqrt{\frac{d^{2/3}-d^{1/3} e^{1/3} x+e^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) d^{1/3}+e^{1/3} x\right)^2}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) d^{1/3}+e^{1/3} x}{\left(1+\sqrt{3}\right) d^{1/3}+e^{1/3} x}\right],-7-4 \sqrt{3}\right]\right) \Big/ \left(55\times 3^{1/4} e^{7/3} \sqrt{\frac{d^{1/3}\left(d^{1/3}+e^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) d^{1/3}+e^{1/3} x\right)^2}} \sqrt{d+e x^3}\right)$$

Result (type 4, 194 leaves):

$$\frac{2 \sqrt{d+e x^3}\left(-8 c d x+11 b e x+5 c e x^4\right)}{55 e^2}+\left(2 i d^{1/3}\left(16 c d^2+11 e\left(-2 b d+5 a e\right)\right) \sqrt{(-1)^{5/6}\left(-1+\frac{(-e)^{1/3} x}{d^{1/3}}\right)} \sqrt{1+\frac{(-e)^{1/3} x}{d^{1/3}}+\frac{(-e)^{2/3} x^2}{d^{2/3}}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-e)^{1/3} x}{d^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right) \Big/ \left(55\times 3^{1/4}(-e)^{7/3} \sqrt{d+e x^3}\right)$$

Problem 39: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{a+b x^3+c x^6}{\left(d+e x^3\right)^{3/2}} \, dx$$

Optimal (type 4, 289 leaves, 3 steps):

$$\frac{2\left(c d^2-b d e+a e^2\right) x}{3 d e^2 \sqrt{d+e x^3}}+\frac{2 c x \sqrt{d+e x^3}}{5 e^2}-\left(2 \sqrt{2+\sqrt{3}}\left(16 c d^2-5 e\left(2 b d+a e\right)\right)\left(d^{1/3}+e^{1/3} x\right) \sqrt{\frac{d^{2/3}-d^{1/3} e^{1/3} x+e^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) d^{1/3}+e^{1/3} x\right)^2}} \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) d^{1/3}+e^{1/3} x}{\left(1+\sqrt{3}\right) d^{1/3}+e^{1/3} x}\right],-7-4 \sqrt{3}\right]\right) \Big/ \left(15\times 3^{1/4} d e^{7/3} \sqrt{\frac{d^{1/3}\left(d^{1/3}+e^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) d^{1/3}+e^{1/3} x\right)^2}} \sqrt{d+e x^3}\right)$$

Result (type 4, 197 leaves):

$$\frac{1}{45\, d\, (-e)^{7/3} \sqrt{d+e x^3}} 2 \left(3 (-e)^{1/3} x \left(5 e (-b d+a e)+c d \left(8 d+3 e x^3\right)\right)-i\, 3^{3/4} d^{1/3} \left(16 c d^2-5 e (2 b d+a e)\right) \sqrt{(-1)^{5/6} \left(-1+\frac{(-e)^{1/3} x}{d^{1/3}}\right)} \sqrt{1+\frac{(-e)^{1/3} x}{d^{1/3}}+\frac{(-e)^{2/3} x^2}{d^{2/3}}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i (-e)^{1/3} x}{d^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)$$

Problem 40: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{a+b x^3+c x^6}{\left(d+e x^3\right)^{5/2}} \, dx$$

Optimal (type 4, 309 leaves, 3 steps):

$$\frac{2 \left(c d^2-b d e+a e^2\right) x}{9 d e^2 \left(d+e x^3\right)^{3/2}}-\frac{2 \left(11 c d^2-2 b d e-7 a e^2\right) x}{27 d^2 e^2 \sqrt{d+e x^3}}+\left(2 \sqrt{2+\sqrt{3}} \left(16 c d^2+e (2 b d+7 a e)\right) \left(d^{1/3}+e^{1/3} x\right) \sqrt{\frac{d^{2/3}-d^{1/3} e^{1/3} x+e^{2/3} x^2}{\left(\left(1+\sqrt{3}\right) d^{1/3}+e^{1/3} x\right)^2}}\ \text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right) d^{1/3}+e^{1/3} x}{\left(1+\sqrt{3}\right) d^{1/3}+e^{1/3} x}\right],-7-4 \sqrt{3}\right]\right) \Bigg/ \left(27 \times 3^{1/4} d^2 e^{7/3} \sqrt{\frac{d^{1/3} \left(d^{1/3}+e^{1/3} x\right)}{\left(\left(1+\sqrt{3}\right) d^{1/3}+e^{1/3} x\right)^2}} \sqrt{d+e x^3}\right)$$

Result (type 4, 224 leaves):

$$\frac{1}{81\,d^2\,(-e)^{7/3}\,\left(d+e\,x^3\right)^{3/2}}$$

$$2\left(3\,(-e)^{1/3}\,x\,\left(-c\,d^2\,\left(8\,d+11\,e\,x^3\right)+e\,\left(-b\,d\,\left(d-2\,e\,x^3\right)+a\,e\,\left(10\,d+7\,e\,x^3\right)\right)\right)+\mathrm{i}\,3^{3/4}\,d^{1/3}\,\left(16\,c\,d^2+e\,\left(2\,b\,d+7\,a\,e\right)\right)\,\sqrt{(-1)^{5/6}\left(-1+\frac{(-e)^{1/3}\,x}{d^{1/3}}\right)}\right.$$

$$\left.\sqrt{1+\frac{(-e)^{1/3}\,x}{d^{1/3}}+\frac{(-e)^{2/3}\,x^2}{d^{2/3}}}\,\left(d+e\,x^3\right)\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{\mathrm{i}\,(-e)^{1/3}\,x}{d^{1/3}}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)$$

Problem 41: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{a+b\,x^3+c\,x^6}{\left(d+e\,x^3\right)^{7/2}}\,dx$$

Optimal (type 4, 349 leaves, 4 steps):

$$\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,x}{15\,d\,e^2\,\left(d+e\,x^3\right)^{5/2}}-\frac{2\,\left(17\,c\,d^2-2\,b\,d\,e-13\,a\,e^2\right)\,x}{135\,d^2\,e^2\,\left(d+e\,x^3\right)^{3/2}}+\frac{2\,\left(16\,c\,d^2+14\,b\,d\,e+91\,a\,e^2\right)\,x}{405\,d^3\,e^2\,\sqrt{d+e\,x^3}}+$$

$$\left(2\,\sqrt{2+\sqrt{3}}\,\left(16\,c\,d^2+14\,b\,d\,e+91\,a\,e^2\right)\,\left(d^{1/3}+e^{1/3}\,x\right)\,\sqrt{\frac{d^{2/3}-d^{1/3}\,e^{1/3}\,x+e^{2/3}\,x^2}{\left(\left(1+\sqrt{3}\right)\,d^{1/3}+e^{1/3}\,x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,d^{1/3}+e^{1/3}\,x}{\left(1+\sqrt{3}\right)\,d^{1/3}+e^{1/3}\,x}\right],\,-7-4\,\sqrt{3}\right]\right)\Big/$$

$$\left(405\times3^{1/4}\,d^3\,e^{7/3}\,\sqrt{\frac{d^{1/3}\,\left(d^{1/3}+e^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)\,d^{1/3}+e^{1/3}\,x\right)^2}}\,\sqrt{d+e\,x^3}\right)$$

Result (type 4, 262 leaves):

$$\frac{1}{1215\, d^3\, (-e)^{7/3}\, \left(d+e\,x^3\right)^{5/2}}$$

$$2\left(3\,(-e)^{1/3}\,x\,\left(27\,d^2\,\left(c\,d^2+e\,(-b\,d+a\,e)\right)-3\,d\,\left(17\,c\,d^2-e\,(2\,b\,d+13\,a\,e)\right)\,\left(d+e\,x^3\right)+\left(16\,c\,d^2+7\,e\,(2\,b\,d+13\,a\,e)\right)\,\left(d+e\,x^3\right)^2\right)+\right.$$

$$i\,3^{3/4}\,d^{1/3}\,\left(16\,c\,d^2+7\,e\,(2\,b\,d+13\,a\,e)\right)\,\sqrt{(-1)^{5/6}\,\left(-1+\frac{(-e)^{1/3}\,x}{d^{1/3}}\right)}$$

$$\left.\sqrt{1+\frac{(-e)^{1/3}\,x}{d^{1/3}}+\frac{(-e)^{2/3}\,x^2}{d^{2/3}}}\,\left(d+e\,x^3\right)^2\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-e)^{1/3}\,x}{d^{1/3}}}}{3^{1/4}}\right],\,(-1)^{1/3}\right]\right)$$

Problem 42: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{a+b\,x^3+c\,x^6}{\left(d+e\,x^3\right)^{9/2}}\,dx$$

Optimal (type 4, 389 leaves, 5 steps):

$$\frac{2\,\left(c\,d^2-b\,d\,e+a\,e^2\right)\,x}{21\,d\,e^2\,\left(d+e\,x^3\right)^{7/2}}-\frac{2\,\left(23\,c\,d^2-2\,b\,d\,e-19\,a\,e^2\right)\,x}{315\,d^2\,e^2\,\left(d+e\,x^3\right)^{5/2}}+\frac{2\,\left(16\,c\,d^2+26\,b\,d\,e+247\,a\,e^2\right)\,x}{2835\,d^3\,e^2\,\left(d+e\,x^3\right)^{3/2}}+\frac{2\,\left(16\,c\,d^2+26\,b\,d\,e+247\,a\,e^2\right)\,x}{1215\,d^4\,e^2\,\sqrt{d+e\,x^3}}+$$

$$\left(2\,\sqrt{2+\sqrt{3}}\,\left(16\,c\,d^2+26\,b\,d\,e+247\,a\,e^2\right)\,\left(d^{1/3}+e^{1/3}\,x\right)\,\sqrt{\frac{d^{2/3}-d^{1/3}\,e^{1/3}\,x+e^{2/3}\,x^2}{\left(\left(1+\sqrt{3}\right)\,d^{1/3}+e^{1/3}\,x\right)^2}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\left(1-\sqrt{3}\right)\,d^{1/3}+e^{1/3}\,x}{\left(1+\sqrt{3}\right)\,d^{1/3}+e^{1/3}\,x}\right],\,-7-4\,\sqrt{3}\right]\right)\Big/$$

$$\left(1215\times 3^{1/4}\,d^4\,e^{7/3}\,\sqrt{\frac{d^{1/3}\,\left(d^{1/3}+e^{1/3}\,x\right)}{\left(\left(1+\sqrt{3}\right)\,d^{1/3}+e^{1/3}\,x\right)^2}}\,\sqrt{d+e\,x^3}\right)$$

Result (type 4, 296 leaves):

$$\frac{1}{25515\,d^4\,(-e)^{7/3}\,(d+e\,x^3)^{7/2}}\,2\left(3\,(-e)^{1/3}\,x\,\left(405\,d^3\,(c\,d^2+e\,(-b\,d+a\,e))-27\,d^2\,(23\,c\,d^2-e\,(2\,b\,d+19\,a\,e))\,(d+e\,x^3)+3\,d\,(16\,c\,d^2+13\,e\,(2\,b\,d+19\,a\,e))\,(d+e\,x^3)^2+7\,(16\,c\,d^2+13\,e\,(2\,b\,d+19\,a\,e))\,(d+e\,x^3)^3\right)+7\,i\,3^{3/4}\,d^{1/3}\,(16\,c\,d^2+13\,e\,(2\,b\,d+19\,a\,e))\sqrt{(-1)^{5/6}\left(-1+\frac{(-e)^{1/3}\,x}{d^{1/3}}\right)}\sqrt{1+\frac{(-e)^{1/3}\,x}{d^{1/3}}+\frac{(-e)^{2/3}\,x^2}{d^{2/3}}}\,(d+e\,x^3)^3\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{-(-1)^{5/6}-\frac{i\,(-e)^{1/3}\,x}{d^{1/3}}}}{3^{1/4}}\right],(-1)^{1/3}\right]\right)$$

Problem 43: Result is not expressed in closed-form.

$$\int \frac{x^4\,(d+e\,x^4)}{a+b\,x^4+c\,x^8}\,dx$$

Optimal (type 3, 433 leaves, 8 steps):

$$\frac{e\,x}{c}-\frac{\left(c\,d-b\,e+\frac{b\,c\,d-b^2\,e+2\,a\,c\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{ArcTan}\left[\frac{2^{1/4}\,c^{1/4}\,x}{\left(-b-\sqrt{b^2-4\,a\,c}\right)^{1/4}}\right]}{2\times 2^{1/4}\,c^{5/4}\,\left(-b-\sqrt{b^2-4\,a\,c}\right)^{3/4}}-\frac{\left(c\,d-b\,e-\frac{b\,c\,d-b^2\,e+2\,a\,c\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{ArcTan}\left[\frac{2^{1/4}\,c^{1/4}\,x}{\left(-b+\sqrt{b^2-4\,a\,c}\right)^{1/4}}\right]}{2\times 2^{1/4}\,c^{5/4}\,\left(-b+\sqrt{b^2-4\,a\,c}\right)^{3/4}}-\frac{\left(c\,d-b\,e+\frac{b\,c\,d-b^2\,e+2\,a\,c\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{ArcTanh}\left[\frac{2^{1/4}\,c^{1/4}\,x}{\left(-b-\sqrt{b^2-4\,a\,c}\right)^{1/4}}\right]}{2\times 2^{1/4}\,c^{5/4}\,\left(-b-\sqrt{b^2-4\,a\,c}\right)^{3/4}}-\frac{\left(c\,d-b\,e-\frac{b\,c\,d-b^2\,e+2\,a\,c\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{ArcTanh}\left[\frac{2^{1/4}\,c^{1/4}\,x}{\left(-b+\sqrt{b^2-4\,a\,c}\right)^{1/4}}\right]}{2\times 2^{1/4}\,c^{5/4}\,\left(-b+\sqrt{b^2-4\,a\,c}\right)^{3/4}}$$

Result (type 7, 88 leaves):

$$\frac{e\,x}{c}-\frac{\text{RootSum}\left[a+b\,\#1^4+c\,\#1^8\,\&,\frac{a\,e\,\text{Log}[x-\#1]-c\,d\,\text{Log}[x-\#1]\,\#1^4+b\,e\,\text{Log}[x-\#1]\,\#1^4}{b\,\#1^3+2\,c\,\#1^7}\,\&\right]}{4\,c}$$

Problem 45: Result is not expressed in closed-form.

$$\int \frac{x^2\,(d+e\,x^4)}{a+b\,x^4+c\,x^8}\,dx$$

Optimal (type 3, 375 leaves, 7 steps):

$$\frac{\left(e-\frac{2 c d-b e}{\sqrt{b^2-4 a c}}\right) \text{ArcTan}\left[\frac{2^{1/4} c^{1/4} x}{\left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{2\times 2^{3/4} c^{3/4} \left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}+\frac{\left(e+\frac{2 c d-b e}{\sqrt{b^2-4 a c}}\right) \text{ArcTan}\left[\frac{2^{1/4} c^{1/4} x}{\left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{2\times 2^{3/4} c^{3/4} \left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}-\frac{\left(e-\frac{2 c d-b e}{\sqrt{b^2-4 a c}}\right) \text{ArcTanh}\left[\frac{2^{1/4} c^{1/4} x}{\left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{2\times 2^{3/4} c^{3/4} \left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}-\frac{\left(e+\frac{2 c d-b e}{\sqrt{b^2-4 a c}}\right) \text{ArcTanh}\left[\frac{2^{1/4} c^{1/4} x}{\left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{2\times 2^{3/4} c^{3/4} \left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}$$

Result (type 7, 59 leaves):

$$\frac{1}{4} \text{RootSum}\left[a+b \#1^4+c \#1^8\&,\ \frac{d \text{Log}[x-\#1]+e \text{Log}[x-\#1] \#1^4}{b \#1+2 c \#1^5}\&\right]$$

Problem 47: Result is not expressed in closed-form.

$$\int \frac{d+e x^4}{a+b x^4+c x^8} \, dx$$

Optimal (type 3, 375 leaves, 7 steps):

$$-\frac{\left(e-\frac{2 c d-b e}{\sqrt{b^2-4 a c}}\right) \text{ArcTan}\left[\frac{2^{1/4} c^{1/4} x}{\left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{2\times 2^{1/4} c^{1/4} \left(-b-\sqrt{b^2-4 a c}\right)^{3/4}}-\frac{\left(e+\frac{2 c d-b e}{\sqrt{b^2-4 a c}}\right) \text{ArcTan}\left[\frac{2^{1/4} c^{1/4} x}{\left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{2\times 2^{1/4} c^{1/4} \left(-b+\sqrt{b^2-4 a c}\right)^{3/4}}-\frac{\left(e-\frac{2 c d-b e}{\sqrt{b^2-4 a c}}\right) \text{ArcTanh}\left[\frac{2^{1/4} c^{1/4} x}{\left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{2\times 2^{1/4} c^{1/4} \left(-b-\sqrt{b^2-4 a c}\right)^{3/4}}-\frac{\left(e+\frac{2 c d-b e}{\sqrt{b^2-4 a c}}\right) \text{ArcTanh}\left[\frac{2^{1/4} c^{1/4} x}{\left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{2\times 2^{1/4} c^{1/4} \left(-b+\sqrt{b^2-4 a c}\right)^{3/4}}$$

Result (type 7, 61 leaves):

$$\frac{1}{4} \text{RootSum}\left[a+b \#1^4+c \#1^8\&,\ \frac{d \text{Log}[x-\#1]+e \text{Log}[x-\#1] \#1^4}{b \#1^3+2 c \#1^7}\&\right]$$

Problem 48: Result is not expressed in closed-form.

$$\int \frac{d+e x^4}{x \left(a+b x^4+c x^8\right)} \, dx$$

Optimal (type 3, 78 leaves, 7 steps):

$$\frac{(b d-2 a e) \operatorname{ArcTanh}\left[\frac{b+2 c x^4}{\sqrt{b^2-4 a c}}\right]}{4 a \sqrt{b^2-4 a c}}+\frac{d \operatorname{Log}[x]}{a}-\frac{d \operatorname{Log}\left[a+b x^4+c x^8\right]}{8 a}$$

Result (type 7, 80 leaves):

$$\frac{d \operatorname{Log}[x]}{a}-\frac{\operatorname{RootSum}\left[a+b \sharp 1^4+c \sharp 1^8 \&, \frac{b d \operatorname{Log}[x-\sharp 1]-a e \operatorname{Log}[x-\sharp 1]+c d \operatorname{Log}[x-\sharp 1] \sharp 1^4}{b+2 c \sharp 1^4} \&\right]}{4 a}$$

Problem 49: Result is not expressed in closed-form.

$$\int \frac{d+e x^4}{x^2 \left(a+b x^4+c x^8\right)} \, dx$$

Optimal (type 3, 392 leaves, 8 steps):

$$-\frac{d}{a x}-\frac{c^{1/4} \left(d-\frac{b d-2 a e}{\sqrt{b^2-4 a c}}\right) \operatorname{ArcTan}\left[\frac{2^{1/4} c^{1/4} x}{\left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{2\times 2^{3/4} a \left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}-\frac{c^{1/4} \left(d+\frac{b d-2 a e}{\sqrt{b^2-4 a c}}\right) \operatorname{ArcTan}\left[\frac{2^{1/4} c^{1/4} x}{\left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{2\times 2^{3/4} a \left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}+$$
$$\frac{c^{1/4} \left(d-\frac{b d-2 a e}{\sqrt{b^2-4 a c}}\right) \operatorname{ArcTanh}\left[\frac{2^{1/4} c^{1/4} x}{\left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{2\times 2^{3/4} a \left(-b-\sqrt{b^2-4 a c}\right)^{1/4}}+\frac{c^{1/4} \left(d+\frac{b d-2 a e}{\sqrt{b^2-4 a c}}\right) \operatorname{ArcTanh}\left[\frac{2^{1/4} c^{1/4} x}{\left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}\right]}{2\times 2^{3/4} a \left(-b+\sqrt{b^2-4 a c}\right)^{1/4}}$$

Result (type 7, 85 leaves):

$$-\frac{d}{a x}-\frac{\operatorname{RootSum}\left[a+b \sharp 1^4+c \sharp 1^8 \&, \frac{b d \operatorname{Log}[x-\sharp 1]-a e \operatorname{Log}[x-\sharp 1]+c d \operatorname{Log}[x-\sharp 1] \sharp 1^4}{b \sharp 1+2 c \sharp 1^5} \&\right]}{4 a}$$

Problem 50: Result is not expressed in closed-form.

$$\int \frac{d+e x^4}{x^3 \left(a+b x^4+c x^8\right)} \, dx$$

Optimal (type 3, 199 leaves, 5 steps):

$$-\frac{d}{2\,a\,x^2}-\frac{\sqrt{c}\left(d+\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{ArcTan}\left[\frac{\sqrt{2}\,\sqrt{c}\,x^2}{\sqrt{b-\sqrt{b^2-4\,a\,c}}}\right]}{2\,\sqrt{2}\,a\,\sqrt{b-\sqrt{b^2-4\,a\,c}}}-\frac{\sqrt{c}\left(d-\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{ArcTan}\left[\frac{\sqrt{2}\,\sqrt{c}\,x^2}{\sqrt{b+\sqrt{b^2-4\,a\,c}}}\right]}{2\,\sqrt{2}\,a\,\sqrt{b+\sqrt{b^2-4\,a\,c}}}$$

Result (type 7, 89 leaves):

$$-\frac{d}{2\,a\,x^2}-\frac{\text{RootSum}\left[a+b\,\#1^4+c\,\#1^8\,\&,\frac{b\,d\,\text{Log}[x-\#1]-a\,e\,\text{Log}[x-\#1]+c\,d\,\text{Log}[x-\#1]\,\#1^4}{b\,\#1^2+2\,c\,\#1^6}\,\&\right]}{4\,a}$$

Problem 51: Result is not expressed in closed-form.

$$\int\frac{d+e\,x^4}{x^4\left(a+b\,x^4+c\,x^8\right)}\,dx$$

Optimal (type 3, 394 leaves, 8 steps):

$$-\frac{d}{3\,a\,x^3}+\frac{c^{3/4}\left(d-\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{ArcTan}\left[\frac{2^{1/4}\,c^{1/4}\,x}{\left(-b-\sqrt{b^2-4\,a\,c}\right)^{1/4}}\right]}{2\times2^{1/4}\,a\left(-b-\sqrt{b^2-4\,a\,c}\right)^{3/4}}+\frac{c^{3/4}\left(d+\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{ArcTan}\left[\frac{2^{1/4}\,c^{1/4}\,x}{\left(-b+\sqrt{b^2-4\,a\,c}\right)^{1/4}}\right]}{2\times2^{1/4}\,a\left(-b+\sqrt{b^2-4\,a\,c}\right)^{3/4}}+$$

$$\frac{c^{3/4}\left(d-\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{ArcTanh}\left[\frac{2^{1/4}\,c^{1/4}\,x}{\left(-b-\sqrt{b^2-4\,a\,c}\right)^{1/4}}\right]}{2\times2^{1/4}\,a\left(-b-\sqrt{b^2-4\,a\,c}\right)^{3/4}}+\frac{c^{3/4}\left(d+\frac{b\,d-2\,a\,e}{\sqrt{b^2-4\,a\,c}}\right)\text{ArcTanh}\left[\frac{2^{1/4}\,c^{1/4}\,x}{\left(-b+\sqrt{b^2-4\,a\,c}\right)^{1/4}}\right]}{2\times2^{1/4}\,a\left(-b+\sqrt{b^2-4\,a\,c}\right)^{3/4}}$$

Result (type 7, 86 leaves):

$$-\frac{\frac{4\,d}{x^3}+3\,\text{RootSum}\left[a+b\,\#1^4+c\,\#1^8\,\&,\frac{b\,d\,\text{Log}[x-\#1]-a\,e\,\text{Log}[x-\#1]+c\,d\,\text{Log}[x-\#1]\,\#1^4}{b\,\#1^3+2\,c\,\#1^7}\,\&\right]}{12\,a}$$

Problem 52: Result is not expressed in closed-form.

$$\int\frac{x^4\left(1-x^4\right)}{1-x^4+x^8}\,dx$$

Optimal (type 3, 278 leaves, 20 steps):

$$-x-\frac{\text{ArcTan}\left[\frac{\sqrt{2-\sqrt{3}}-2x}{\sqrt{2+\sqrt{3}}}\right]}{2\sqrt{6}}-\frac{\text{ArcTan}\left[\frac{\sqrt{2+\sqrt{3}}-2x}{\sqrt{2-\sqrt{3}}}\right]}{2\sqrt{6}}+\frac{\text{ArcTan}\left[\frac{\sqrt{2-\sqrt{3}}+2x}{\sqrt{2+\sqrt{3}}}\right]}{2\sqrt{6}}+\frac{\text{ArcTan}\left[\frac{\sqrt{2+\sqrt{3}}+2x}{\sqrt{2-\sqrt{3}}}\right]}{2\sqrt{6}}-$$
$$\frac{\text{Log}\left[1-\sqrt{2-\sqrt{3}}\,x+x^2\right]}{4\sqrt{6}}+\frac{\text{Log}\left[1+\sqrt{2-\sqrt{3}}\,x+x^2\right]}{4\sqrt{6}}-\frac{\text{Log}\left[1-\sqrt{2+\sqrt{3}}\,x+x^2\right]}{4\sqrt{6}}+\frac{\text{Log}\left[1+\sqrt{2+\sqrt{3}}\,x+x^2\right]}{4\sqrt{6}}$$

Result (type 7, 46 leaves):

$$-x+\frac{1}{4}\text{RootSum}\left[1-\#1^4+\#1^8\&,\frac{\text{Log}[x-\#1]}{-\#1^3+2\#1^7}\&\right]$$

Problem 54: Result is not expressed in closed-form.

$$\int\frac{x^2\left(1-x^4\right)}{1-x^4+x^8}\,dx$$

Optimal (type 3, 355 leaves, 21 steps):

$$\frac{\text{ArcTan}\left[\frac{\sqrt{2-\sqrt{3}}-2x}{\sqrt{2+\sqrt{3}}}\right]}{4\sqrt{3\left(2-\sqrt{3}\right)}}-\frac{\text{ArcTan}\left[\frac{\sqrt{2+\sqrt{3}}-2x}{\sqrt{2-\sqrt{3}}}\right]}{4\sqrt{3\left(2+\sqrt{3}\right)}}-\frac{\text{ArcTan}\left[\frac{\sqrt{2-\sqrt{3}}+2x}{\sqrt{2+\sqrt{3}}}\right]}{4\sqrt{3\left(2-\sqrt{3}\right)}}+\frac{\text{ArcTan}\left[\frac{\sqrt{2+\sqrt{3}}+2x}{\sqrt{2-\sqrt{3}}}\right]}{4\sqrt{3\left(2+\sqrt{3}\right)}}+\frac{1}{8}\sqrt{\frac{1}{3}\left(2-\sqrt{3}\right)}\,\text{Log}\left[1-\sqrt{2-\sqrt{3}}\,x+x^2\right]-$$
$$\frac{1}{8}\sqrt{\frac{1}{3}\left(2-\sqrt{3}\right)}\,\text{Log}\left[1+\sqrt{2-\sqrt{3}}\,x+x^2\right]-\frac{1}{8}\sqrt{\frac{1}{3}\left(2+\sqrt{3}\right)}\,\text{Log}\left[1-\sqrt{2+\sqrt{3}}\,x+x^2\right]+\frac{1}{8}\sqrt{\frac{1}{3}\left(2+\sqrt{3}\right)}\,\text{Log}\left[1+\sqrt{2+\sqrt{3}}\,x+x^2\right]$$

Result (type 7, 55 leaves):

$$-\frac{1}{4}\text{RootSum}\left[1-\#1^4+\#1^8\&,\frac{-\text{Log}[x-\#1]+\text{Log}[x-\#1]\,\#1^4}{-\#1+2\#1^5}\&\right]$$

Problem 56: Result is not expressed in closed-form.

$$\int\frac{1-x^4}{1-x^4+x^8}\,dx$$

Optimal (type 3, 355 leaves, 19 steps):

$$-\frac{\text{ArcTan}\left[\frac{\sqrt{2-\sqrt{3}}-2x}{\sqrt{2+\sqrt{3}}}\right]}{4\sqrt{3\left(2-\sqrt{3}\right)}}+\frac{\text{ArcTan}\left[\frac{\sqrt{2+\sqrt{3}}-2x}{\sqrt{2-\sqrt{3}}}\right]}{4\sqrt{3\left(2+\sqrt{3}\right)}}+\frac{\text{ArcTan}\left[\frac{\sqrt{2-\sqrt{3}}+2x}{\sqrt{2+\sqrt{3}}}\right]}{4\sqrt{3\left(2-\sqrt{3}\right)}}-\frac{\text{ArcTan}\left[\frac{\sqrt{2+\sqrt{3}}+2x}{\sqrt{2-\sqrt{3}}}\right]}{4\sqrt{3\left(2+\sqrt{3}\right)}}+\frac{1}{8}\sqrt{\frac{1}{3}\left(2-\sqrt{3}\right)}\,\text{Log}\left[1-\sqrt{2-\sqrt{3}}\,x+x^2\right]-$$

$$\frac{1}{8}\sqrt{\frac{1}{3}\left(2-\sqrt{3}\right)}\,\text{Log}\left[1+\sqrt{2-\sqrt{3}}\,x+x^2\right]-\frac{1}{8}\sqrt{\frac{1}{3}\left(2+\sqrt{3}\right)}\,\text{Log}\left[1-\sqrt{2+\sqrt{3}}\,x+x^2\right]+\frac{1}{8}\sqrt{\frac{1}{3}\left(2+\sqrt{3}\right)}\,\text{Log}\left[1+\sqrt{2+\sqrt{3}}\,x+x^2\right]$$

Result (type 7, 57 leaves):

$$-\frac{1}{4}\,\text{RootSum}\left[1-\#1^4+\#1^8\,\&,\ \frac{-\text{Log}[x-\#1]+\text{Log}[x-\#1]\,\#1^4}{-\#1^3+2\,\#1^7}\,\&\right]$$

Problem 57: Result is not expressed in closed-form.

$$\int\frac{1-x^4}{x\left(1-x^4+x^8\right)}\,dx$$

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, 44 leaves):

$$\text{Log}[x]-\frac{1}{4}\,\text{RootSum}\left[1-\#1^4+\#1^8\,\&,\ \frac{\text{Log}[x-\#1]\,\#1^4}{-1+2\,\#1^4}\,\&\right]$$

Problem 58: Result is not expressed in closed-form.

$$\int\frac{1-x^4}{x^2\left(1-x^4+x^8\right)}\,dx$$

Optimal (type 3, 280 leaves, 20 steps):

$$-\frac{1}{x}+\frac{\text{ArcTan}\left[\frac{\sqrt{2-\sqrt{3}}-2x}{\sqrt{2+\sqrt{3}}}\right]}{2\sqrt{6}}+\frac{\text{ArcTan}\left[\frac{\sqrt{2+\sqrt{3}}-2x}{\sqrt{2-\sqrt{3}}}\right]}{2\sqrt{6}}-\frac{\text{ArcTan}\left[\frac{\sqrt{2-\sqrt{3}}+2x}{\sqrt{2+\sqrt{3}}}\right]}{2\sqrt{6}}-\frac{\text{ArcTan}\left[\frac{\sqrt{2+\sqrt{3}}+2x}{\sqrt{2-\sqrt{3}}}\right]}{2\sqrt{6}}-$$

$$\frac{\text{Log}\left[1-\sqrt{2-\sqrt{3}}\,x+x^2\right]}{4\sqrt{6}}+\frac{\text{Log}\left[1+\sqrt{2-\sqrt{3}}\,x+x^2\right]}{4\sqrt{6}}-\frac{\text{Log}\left[1-\sqrt{2+\sqrt{3}}\,x+x^2\right]}{4\sqrt{6}}+\frac{\text{Log}\left[1+\sqrt{2+\sqrt{3}}\,x+x^2\right]}{4\sqrt{6}}$$

Result (type 7, 47 leaves):

$$-\frac{1}{x}-\frac{1}{4}\,\text{RootSum}\left[1-\#1^4+\#1^8\,\&,\ \frac{\text{Log}[x-\#1]\,\#1^3}{-1+2\,\#1^4}\,\&\right]$$

Problem 59: Result is not expressed in closed-form.

$$\int\frac{1-x^4}{x^3\left(1-x^4+x^8\right)}\,dx$$

Optimal (type 3, 89 leaves, 11 steps):

$$-\frac{1}{2\,x^2}+\frac{1}{4}\,\text{ArcTan}\left[\sqrt{3}-2\,x^2\right]-\frac{1}{4}\,\text{ArcTan}\left[\sqrt{3}+2\,x^2\right]-\frac{\text{Log}\left[1-\sqrt{3}\,x^2+x^4\right]}{8\,\sqrt{3}}+\frac{\text{Log}\left[1+\sqrt{3}\,x^2+x^4\right]}{8\,\sqrt{3}}$$

Result (type 7, 49 leaves):

$$-\frac{1}{2\,x^2}-\frac{1}{4}\,\text{RootSum}\left[1-\#1^4+\#1^8\,\&,\ \frac{\text{Log}[x-\#1]\,\#1^2}{-1+2\,\#1^4}\,\&\right]$$

Problem 60: Result is not expressed in closed-form.

$$\int\frac{1-x^4}{x^4\left(1-x^4+x^8\right)}\,dx$$

Optimal (type 3, 370 leaves, 21 steps):

$$-\frac{1}{3\,x^3}-\frac{1}{4}\,\sqrt{\frac{1}{3}\left(2-\sqrt{3}\right)}\,\text{ArcTan}\left[\frac{\sqrt{2-\sqrt{3}}-2\,x}{\sqrt{2+\sqrt{3}}}\right]+\frac{1}{4}\,\sqrt{\frac{1}{3}\left(2+\sqrt{3}\right)}\,\text{ArcTan}\left[\frac{\sqrt{2+\sqrt{3}}-2\,x}{\sqrt{2-\sqrt{3}}}\right]+$$
$$\frac{1}{4}\,\sqrt{\frac{1}{3}\left(2-\sqrt{3}\right)}\,\text{ArcTan}\left[\frac{\sqrt{2-\sqrt{3}}+2\,x}{\sqrt{2+\sqrt{3}}}\right]-\frac{1}{4}\,\sqrt{\frac{1}{3}\left(2+\sqrt{3}\right)}\,\text{ArcTan}\left[\frac{\sqrt{2+\sqrt{3}}+2\,x}{\sqrt{2-\sqrt{3}}}\right]+\frac{1}{8}\,\sqrt{\frac{1}{3}\left(2+\sqrt{3}\right)}\,\text{Log}\left[1-\sqrt{2-\sqrt{3}}\,x+x^2\right]-$$
$$\frac{1}{8}\,\sqrt{\frac{1}{3}\left(2+\sqrt{3}\right)}\,\text{Log}\left[1+\sqrt{2-\sqrt{3}}\,x+x^2\right]-\frac{1}{8}\,\sqrt{\frac{1}{3}\left(2-\sqrt{3}\right)}\,\text{Log}\left[1-\sqrt{2+\sqrt{3}}\,x+x^2\right]+\frac{1}{8}\,\sqrt{\frac{1}{3}\left(2-\sqrt{3}\right)}\,\text{Log}\left[1+\sqrt{2+\sqrt{3}}\,x+x^2\right]$$

Result (type 7, 47 leaves):

$$-\frac{1}{3\,x^3}-\frac{1}{4}\,\text{RootSum}\left[1-\#1^4+\#1^8\,\&,\ \frac{\text{Log}[x-\#1]\,\#1}{-1+2\,\#1^4}\,\&\right]$$

Problem 79: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\, x^4 \sqrt{d+e x}\, dx$$

Optimal (type 4, 981 leaves, 11 steps):

$$-\frac{1}{3465 a^4 e^4} 2 \left(187 a^4 d^4+64 b^4 e^4+4 a b^2 e^3 (7 b d-69 c e)-4 a^3 d^2 e (2 b d+3 c e)+3 a^2 e^2 \left(3 b^2 d^2-29 b c d e+50 c^2 e^2\right)\right) \sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\, x \sqrt{d+e x}+$$

$$\frac{2}{11} \sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\, x^5 \sqrt{d+e x}+\frac{2 \left(233 a^3 d^3+48 b^3 e^3+a b e^2 (67 b d-157 c e)+4 a^2 d e (18 b d-37 c e)\right) \sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\, x (d+e x)^{3/2}}{3465 a^3 e^4}-$$

$$\frac{2 \left(29 a^2 d^2+8 b^2 e^2+a e (19 b d-18 c e)\right) \sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\, x (d+e x)^{5/2}}{693 a^2 e^4}+\frac{2 (a d+b e) \sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\, x (d+e x)^{7/2}}{99 a e^4}+$$

$$\left(\sqrt{2} \sqrt{b^2-4 a c} \left(128 a^5 d^5+128 b^5 e^5-4 a^4 d^3 e (14 b d-27 c e)-8 a b^3 e^4 (7 b d+87 c e)-\right.\right.$$

$$\left.a^2 b e^3 \left(37 b^2 d^2-258 b c d e-771 c^2 e^2\right)-a^3 d e^2 \left(37 b^2 d^2-135 b c d e+156 c^2 e^2\right)\right) \sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\, x \sqrt{d+e x} \sqrt{-\frac{a \left(c+b x+a x^2\right)}{b^2-4 a c}}$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 a x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2 \sqrt{b^2-4 a c}\, e}{2 a d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right) \Big/ \left(3465 a^5 e^5 \sqrt{\frac{a (d+e x)}{2 a d-\left(b+\sqrt{b^2-4 a c}\right) e}} \left(c+b x+a x^2\right)\right)-$$

$$\left(2\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,\left(a\,d^2-e\,(b\,d-c\,e)\right)\left(128\,a^4\,d^4-64\,b^4\,e^4-4\,a\,b^2\,e^3\,(7\,b\,d-69\,c\,e)+4\,a^3\,d^2\,e\,(2\,b\,d+3\,c\,e)-3\,a^2\,e^2\,\left(3\,b^2\,d^2-29\,b\,c\,d\,e+50\,c^2\,e^2\right)\right)\right.$$

$$\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\;x\,\sqrt{\frac{a\,(d+e\,x)}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\,\sqrt{-\frac{a\,\left(c+b\,x+a\,x^2\right)}{b^2-4\,a\,c}}$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,a\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],\,-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\right)\Big/\left(3465\,a^5\,e^5\,\sqrt{d+e\,x}\,\left(c+b\,x+a\,x^2\right)\right)$$

Result (type 4, 10 904 leaves) :

$$x\,\sqrt{d+e\,x}\,\left(-\frac{1}{3465\,a^4\,e^4}4\,\left(32\,a^4\,d^4-10\,a^3\,b\,d^3\,e-9\,a^2\,b^2\,d^2\,e^2+23\,a^3\,c\,d^2\,e^2-10\,a\,b^3\,d\,e^3+35\,a^2\,b\,c\,d\,e^3+32\,b^4\,e^4-138\,a\,b^2\,c\,e^4+75\,a^2\,c^2\,e^4\right)-\right.$$

$$\frac{2\,\left(-48\,a^3\,d^3+13\,a^2\,b\,d^2\,e+13\,a\,b^2\,d\,e^2-32\,a^2\,c\,d\,e^2-48\,b^3\,e^3+157\,a\,b\,c\,e^3\right)x}{3465\,a^3\,e^3}+$$

$$\left.\frac{4\,\left(-4\,a^2\,d^2+a\,b\,d\,e-4\,b^2\,e^2+9\,a\,c\,e^2\right)x^2}{693\,a^2\,e^2}+\frac{2\,(a\,d+b\,e)\,x^3}{99\,a\,e}+\frac{2\,x^4}{11}\right)\sqrt{a+\frac{c+b\,x}{x^2}}\;+$$

$$\frac{1}{3465\,a^4\,e^6\,\sqrt{c+b\,x+a\,x^2}}\,2\,x\,\sqrt{a+\frac{c+b\,x}{x^2}}\,\left(\left(\left(128\,a^5\,d^5-56\,a^4\,b\,d^4\,e-37\,a^3\,b^2\,d^3\,e^2+108\,a^4\,c\,d^3\,e^2-37\,a^2\,b^3\,d^2\,e^3+135\,a^3\,b\,c\,d^2\,e^3-56\,a\,b^4\,d\,e^4+\right.\right.\right.$$

$$\left.258\,a^2\,b^2\,c\,d\,e^4-156\,a^3\,c^2\,d\,e^4+128\,b^5\,e^5-696\,a\,b^3\,c\,e^5+771\,a^2\,b\,c^2\,e^5\right)(d+e\,x)^{3/2}$$

$$\left(a+\frac{a d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{c e^2}{(d+e x)^2}-\frac{2 a d}{d+e x}+\frac{b e}{d+e x}\right)\Bigg/\left(a\sqrt{\frac{(d+e x)^2\left(a\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{c e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)-$$

$$\frac{1}{a\sqrt{\frac{(d+e x)^2\left(a\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{c e}{d+e x}\right)}{d+e x}\right)}{e^2}}}\left(a d^2-b d e+c e^2\right)(d+e x)\sqrt{a+\frac{a d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{c e^2}{(d+e x)^2}-\frac{2 a d}{d+e x}+\frac{b e}{d+e x}}$$

$$\left(\left(32\, i \sqrt{2}\, a^5 d^5\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.\right.$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\right/$$

$$\left(\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-$$

$$\left(14\, i \sqrt{2}\, a^4 b d^4 e\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-$$

$$\left(37 i a^3 b^2 d^3 e^2\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(2\sqrt{2}\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\left(27 i \sqrt{2}\, a^4 c d^3 e^2\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-$$

$$\left(37 i a^2 b^3 d^2 e^3\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i \text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(2\sqrt{2}\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\left(135 i a^3 b c d^2 e^3\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(2\sqrt{2}\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-$$

$$\left(14\,i\sqrt{2}\,a b^4 d e^4\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\left(129\,i\,a^2 b^2 c d e^4\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(\sqrt{2}\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-$$

$$\left(39\,i\sqrt{2}\,a^3 c^2 d e^4\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\left(32\,i\sqrt{2}\,b^5 e^5\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[\text{i} \operatorname{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[\text{i} \operatorname{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Big/$$

$$\left(\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-$$

$$\left(174\, \text{i}\sqrt{2}\, a b^3 c e^5\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[\text{i} \operatorname{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[\text{i} \operatorname{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right) \Big/$$

$$\left(\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\left(771\, \text{i}\, a^2 b c^2 e^5\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(2\sqrt{2}\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\left(64\,i\sqrt{2}\,a^5 d^4\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\left(4\,i\sqrt{2}\,a^4 b d^3 e\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\Bigl(\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\Bigr)-\Biggl(9\, i\, a^3 b^2 d^2 e^2 \sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\ \mathrm{EllipticF}\left[i\,\mathrm{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Biggr)\Big/$$

$$\Bigl(\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\Bigr)+$$

$$\Biggl(6\, i \sqrt{2}\, a^4 c\, d^2 e^2 \sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\ \sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\mathrm{EllipticF}\left[i\,\mathrm{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Biggr)\Big/$$

$$\Bigl(\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\Bigr)-$$

$$\Biggl(14\, i \sqrt{2}\, a^2 b^3 d\, e^3 \sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\ \sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\mathrm{EllipticF}\left[i\,\mathrm{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Biggr)\Big/$$

$$\left(\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+\left(87\, \mathrm{i}\, a^3 b c d e^3 \sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\left.\sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\ \text{EllipticF}\left[\mathrm{i}\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{2} \sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-$$

$$\left(32\, \mathrm{i} \sqrt{2}\, a b^4 e^4 \sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\ \sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\left.\text{EllipticF}\left[\mathrm{i}\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\left(138\, \mathrm{i} \sqrt{2}\, a^2 b^2 c e^4 \sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\ \sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\left.\text{EllipticF}\left[\mathrm{i}\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-$$

$$\left(75\, i \sqrt{2}\ a^3 c^2 e^4 \sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\ \sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\left.\text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2}\ \sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\left(\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)\right)$$

Problem 80: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\ x^3 \sqrt{d+e x}\ dx$$

Optimal (type 4, 778 leaves, 10 steps) :

$$\frac{2\left(19 a^3 d^3-6 a^2 c d e^2+8 b^3 e^3+3 a b e^2 (b d-9 c e)\right)\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\, x \sqrt{d+e x}}{315 a^3 e^3}+\frac{2}{9}\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\, x^4 \sqrt{d+e x}-$$

$$\frac{4\left(8 a^2 d^2+3 b^2 e^2+a e (4 b d-7 c e)\right)\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\, x\, (d+e x)^{3/2}}{315 a^2 e^3}+\frac{2 (a d+b e)\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\, x\, (d+e x)^{5/2}}{63 a e^3}-$$

$$\left(2\sqrt{2}\sqrt{b^2-4 a c}\left(8 a^4 d^4+8 b^4 e^4-a^3 d^2 e (4 b d-9 c e)-4 a b^2 e^3 (b d+9 c e)-3 a^2 e^2\left(b^2 d^2-5 b c d e-7 c^2 e^2\right)\right)\right.$$

$$\left.\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\, x \sqrt{d+e x}\sqrt{-\frac{a\left(c+b x+a x^2\right)}{b^2-4 a c}}\, \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 a x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\, e}{2 a d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Big/$$

$$\left(315 a^4 e^4\sqrt{\frac{a (d+e x)}{2 a d-\left(b+\sqrt{b^2-4 a c}\right) e}}\left(c+b x+a x^2\right)\right)+$$

$$\left(2\sqrt{2}\sqrt{b^2-4 a c}\left(16 a^3 d^3+6 a^2 c d e^2-8 b^3 e^3-3 a b e^2 (b d-9 c e)\right)\left(a d^2-e (b d-c e)\right)\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\, x\sqrt{\frac{a (d+e x)}{2 a d-\left(b+\sqrt{b^2-4 a c}\right) e}}\right.$$

$$\left.\sqrt{-\frac{a\left(c+b x+a x^2\right)}{b^2-4 a c}}\, \text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 a x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\, e}{2 a d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Big/\left(315 a^4 e^4\sqrt{d+e x}\left(c+b x+a x^2\right)\right)$$

Result (type 4, 7531 leaves):

$$x\sqrt{d+e x}\left(-\frac{2\left(-8 a^3 d^3+3 a^2 b d^2 e+3 a b^2 d e^2-8 a^2 c d e^2-8 b^3 e^3+27 a b c e^3\right)}{315 a^3 e^3}+\frac{4\left(-3 a^2 d^2+a b d e-3 b^2 e^2+7 a c e^2\right) x}{315 a^2 e^2}+\frac{2\left(a d+b e\right) x^2}{63 a e}+\frac{2 x^3}{9}\right)$$

$$\sqrt{a+\frac{c+b x}{x^2}}-\frac{1}{315 a^3 e^5\sqrt{c+b x+a x^2}}$$

$$2 x\sqrt{a+\frac{c+b x}{x^2}}\left(\left(2\left(8 a^4 d^4-4 a^3 b d^3 e-3 a^2 b^2 d^2 e^2+9 a^3 c d^2 e^2-4 a b^3 d e^3+15 a^2 b c d e^3+8 b^4 e^4-36 a b^2 c e^4+21 a^2 c^2 e^4\right)\right.\right.$$

$$\left.\left.(d+e x)^{3/2}\left(a+\frac{a d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{c e^2}{(d+e x)^2}-\frac{2 a d}{d+e x}+\frac{b e}{d+e x}\right)\right)\right/\left(a\sqrt{\frac{(d+e x)^2\left(a\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{c e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)-$$

$$\frac{1}{a\sqrt{\frac{(d+e x)^2\left(a\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{c e}{d+e x}\right)}{d+e x}\right)}{e^2}}}\left(a d^2-b d e+c e^2\right)(d+e x)\sqrt{a+\frac{a d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{c e^2}{(d+e x)^2}-\frac{2 a d}{d+e x}+\frac{b e}{d+e x}}$$

$$\left(\left(4 i\sqrt{2} a^4 d^4\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.\right.$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Bigg)\Bigg/$$

$$\left(\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-$$

$$\Bigg(2\,i\sqrt{2}\,a^3 b d^3 e\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\Bigg(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Bigg)\Bigg/$$

$$\left(\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-$$

$$\Bigg(3\,i\,a^2 b^2 d^2 e^2\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\Bigg(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Bigg)\Big/$$

$$\left(\sqrt{2}\,\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\Bigg(9\,i\,a^3 c\,d^2 e^2\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\,\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\Bigg(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Bigg)\Big/$$

$$\left(\sqrt{2}\,\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-$$

$$\Bigg(2\,i\sqrt{2}\,a b^3 d e^3\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\,\Bigg(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Bigg)\Big/$$

$$\left(\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\Bigg(15\,\mathbb{i}\,a^2 b c d e^3\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\,\Bigg(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Bigg)\Big/$$

$$\left(\sqrt{2}\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\Bigg(4\,\mathbb{i}\,\sqrt{2}\,b^4 e^4\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\,\Bigg(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Bigg)\Big/$$

$$\left(\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-$$

$$\Bigg(18\,i\sqrt{2}\,a b^2 c e^4\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\Bigg(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Bigg)\Big/$$

$$\left(\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\Bigg(21\,i\,a^2 c^2 e^4\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\Bigg(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Bigg)\Big/$$

$$\left(\sqrt{2}\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\left(8 i\sqrt{2}\,a^4 d^3\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-\left(3 i\,a^2 b^2 d e^2\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\left.\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\left(3 i\sqrt{2}\,a^3 c d e^2\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Bigg/$$

$$\left(\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-\Bigg(4\,i\,\sqrt{2}\,a\,b^3\,e^3\,\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Bigg/$$

$$\left(\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+\Bigg(27\,i\,a^2\,b\,c\,e^3\,\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Bigg/$$

$$\left(\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)\Bigg)\Bigg)$$

Problem 81: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\;x^2\,\sqrt{d+e x}\,dx$$

Optimal (type 4, 636 leaves, 8 steps):

$$-\frac{2\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\,x\,\sqrt{d+e\,x}\,\left(4\,a^2\,d^2+4\,b^2\,e^2-a\,e\,(2\,b\,d-5\,c\,e)-3\,a\,e\,(a\,d-4\,b\,e)\,x\right)}{105\,a^2\,e^2}+\frac{2\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\,x\,\sqrt{d+e\,x}\,\left(c+b\,x+a\,x^2\right)}{7\,a}+$$

$$\left(\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,\left(8\,a^3\,d^3+8\,b^3\,e^3-a^2\,d\,e\,(5\,b\,d-16\,c\,e)-a\,b\,e^2\,(5\,b\,d+29\,c\,e)\right)\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\,x\,\sqrt{d+e\,x}\,\sqrt{-\frac{a\left(c+b\,x+a\,x^2\right)}{b^2-4\,a\,c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,a\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4\,a\,c}\,e}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\right)\Bigg/\left(105\,a^3\,e^3\sqrt{\frac{a\,(d+e\,x)}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\,\left(c+b\,x+a\,x^2\right)\right)-$$

$$\left(2\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,\left(8\,a^2\,d^2-4\,b^2\,e^2-a\,e\,(b\,d-10\,c\,e)\right)\left(a\,d^2-e\,(b\,d-c\,e)\right)\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\,x\,\sqrt{\frac{a\,(d+e\,x)}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\right.$$

$$\left.\sqrt{-\frac{a\left(c+b\,x+a\,x^2\right)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,a\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4\,a\,c}\,e}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\right)\Bigg/\left(105\,a^3\,e^3\sqrt{d+e\,x}\,\left(c+b\,x+a\,x^2\right)\right)$$

Result (type 4, 5350 leaves):

$$x\sqrt{d+e\,x}\left(\frac{4\left(-2\,a^2\,d^2+a\,b\,d\,e-2\,b^2\,e^2+5\,a\,c\,e^2\right)}{105\,a^2\,e^2}+\frac{2\,(a\,d+b\,e)\,x}{35\,a\,e}+\frac{2\,x^2}{7}\right)\sqrt{a+\frac{c+b\,x}{x^2}}+$$

$$\frac{1}{105\,a^2\,e^4\,\sqrt{c+b\,x+a\,x^2}}\,2\,x\,\sqrt{a+\frac{c+b\,x}{x^2}}\,\Bigg(\Bigg(\left(8\,a^3\,d^3-5\,a^2\,b\,d^2\,e-5\,a\,b^2\,d\,e^2+16\,a^2\,c\,d\,e^2+8\,b^3\,e^3-29\,a\,b\,c\,e^3\right)\,(d+e\,x)^{3/2}$$

$$\left(a+\frac{a\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{c\,e^2}{(d+e\,x)^2}-\frac{2\,a\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}\right)\Bigg)\Bigg/\left(a\,\sqrt{\frac{(d+e\,x)^2\left(a\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{c\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)-$$

$$\frac{1}{a\,\sqrt{\frac{(d+e\,x)^2\left(a\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{c\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}}\left(a\,d^2-b\,d\,e+c\,e^2\right)\,(d+e\,x)\,\sqrt{a+\frac{a\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{c\,e^2}{(d+e\,x)^2}-\frac{2\,a\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}$$

$$\Bigg(\Bigg(2\,\mathbb{i}\,\sqrt{2}\,a^3\,d^3\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\,\Bigg(\text{EllipticE}\Big[\mathbb{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\,\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]-$$

$$\text{EllipticF}\Big[\mathbb{i}\,\text{ArcSinh}\Big[\frac{\sqrt{2}\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\Big],\,\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\Big]\Bigg)\Bigg)\Bigg/$$

$$\left(\left(a\,d^2-b\,d\,e+c\,e^2\right)\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{a+\frac{a\,d^2-b\,d\,e+c\,e^2}{(d+e\,x)^2}+\frac{-2\,a\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(5\,\mathrm{i}\,a^2 b d^2 e\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(2\sqrt{2}\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-$$

$$\left(5\,\mathrm{i}\,a b^2 d e^2\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(2\sqrt{2}\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\left(4\,i\,\sqrt{2}\,a^2 c\,d\,e^2\left(2\,a\,d-b\,e+\sqrt{b^2 e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e-\sqrt{b^2 e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e+\sqrt{b^2 e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2 e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,a\,d-b\,e-\sqrt{b^2 e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2 e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2 e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,a\,d-b\,e-\sqrt{b^2 e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2 e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/$$

$$\left(\left(a\,d^2-b\,d\,e+c\,e^2\right)\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2 e^2-4\,a\,c\,e^2}}}\sqrt{a+\frac{a\,d^2-b\,d\,e+c\,e^2}{(d+e\,x)^2}+\frac{-2\,a\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(2\,i\,\sqrt{2}\,b^3 e^3\left(2\,a\,d-b\,e+\sqrt{b^2 e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e-\sqrt{b^2 e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e+\sqrt{b^2 e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2 e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,a\,d-b\,e-\sqrt{b^2 e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2 e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2 e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,a\,d-b\,e-\sqrt{b^2 e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2 e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/$$

$$\left(\left(a\,d^2-b\,d\,e+c\,e^2\right)\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2 e^2-4\,a\,c\,e^2}}}\sqrt{a+\frac{a\,d^2-b\,d\,e+c\,e^2}{(d+e\,x)^2}+\frac{-2\,a\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(29\, i\, a\, b\, c\, e^3 \left(2 a d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) \sqrt{1 - \frac{2 \left(a d^2 - b d e + c e^2\right)}{\left(2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}} \sqrt{1 - \frac{2 \left(a d^2 - b d e + c e^2\right)}{\left(2 a d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\right.$$

$$\left(\text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{a d^2 - b d e + c e^2}{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 a d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right] - \right.$$

$$\left.\left.\text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{a d^2 - b d e + c e^2}{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 a d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right)\right) \Big/$$

$$\left(2 \sqrt{2} \left(a d^2 - b d e + c e^2\right) \sqrt{-\frac{a d^2 - b d e + c e^2}{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}} \sqrt{a + \frac{a d^2 - b d e + c e^2}{(d + e x)^2} + \frac{-2 a d + b e}{d + e x}}\right) +$$

$$\left(4\, i \sqrt{2}\, a^3 d^2 \sqrt{1 - \frac{2 \left(a d^2 - b d e + c e^2\right)}{\left(2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}} \sqrt{1 - \frac{2 \left(a d^2 - b d e + c e^2\right)}{\left(2 a d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\right.$$

$$\left.\text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{a d^2 - b d e + c e^2}{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 a d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{a d^2 - b d e + c e^2}{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}} \sqrt{a + \frac{a d^2 - b d e + c e^2}{(d + e x)^2} + \frac{-2 a d + b e}{d + e x}}\right) - \left(i\, a^2 b\, d\, e \sqrt{1 - \frac{2 \left(a d^2 - b d e + c e^2\right)}{\left(2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\right.$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg) \Big/$$

$$\left(\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-$$

$$\left(2 i\sqrt{2}\, a b^2 e^2\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+\left(5 i\sqrt{2}\, a^2 c e^2\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\left.\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\ \text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left.\left(\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)\right)$$

Problem 82: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\, x \sqrt{d+e x}\, dx$$

Optimal (type 4, 550 leaves, 8 steps) :

$$-\frac{2\,(2\,a\,d-b\,e)\,\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\,x\,\sqrt{d+e\,x}}{15\,a\,e}+\frac{2\,\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\,x\,(d+e\,x)^{3/2}}{5\,e}-$$

$$\left(2\,\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,\left(a^2\,d^2+b^2\,e^2-a\,e\,(b\,d+3\,c\,e)\right)\,\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\,x\,\sqrt{d+e\,x}\,\sqrt{-\frac{a\,(c+b\,x+a\,x^2)}{b^2-4\,a\,c}}\right.$$

$$\left.\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,a\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],\,-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Big/\left(15\,a^2\,e^2\,\sqrt{\frac{a\,(d+e\,x)}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\left(c+b\,x+a\,x^2\right)\right)+$$

$$\left(2\,\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,(2\,a\,d-b\,e)\,\left(a\,d^2-e\,(b\,d-c\,e)\right)\,\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\,x\,\sqrt{\frac{a\,(d+e\,x)}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}}\,\sqrt{-\frac{a\,(c+b\,x+a\,x^2)}{b^2-4\,a\,c}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,a\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],\,-\frac{2\,\sqrt{b^2-4\,a\,c}\,e}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)\,e}\right]\right)\Big/\left(15\,a^2\,e^2\,\sqrt{d+e\,x}\,\left(c+b\,x+a\,x^2\right)\right)$$

Result (type 4, 3390 leaves) :

$$\left(\frac{2\,(a\,d+b\,e)}{15\,a\,e}+\frac{2\,x}{5}\right)x\,\sqrt{d+e\,x}\,\sqrt{a+\frac{c+b\,x}{x^2}}\,-$$

$$\frac{1}{15\,a\,e^3\,\sqrt{c+b\,x+a\,x^2}}\,2\,x\,\sqrt{a+\frac{c+b\,x}{x^2}}\left(\frac{2\,\left(a^2\,d^2-a\,b\,d\,e+b^2\,e^2-3\,a\,c\,e^2\right)\,(d+e\,x)^{3/2}\,\left(a+\frac{a\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{c\,e^2}{(d+e\,x)^2}-\frac{2\,a\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}\right)}{a\,\sqrt{\frac{(d+e\,x)^2\,\left(a\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{c\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}}\,-\right.$$

$$\frac{1}{a\,\sqrt{\frac{(d+e\,x)^2\,\left(a\,\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\,\left(b-\frac{b\,d}{d+e\,x}+\frac{c\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}}\left(a\,d^2-b\,d\,e+c\,e^2\right)\,(d+e\,x)\,\sqrt{a+\frac{a\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{c\,e^2}{(d+e\,x)^2}-\frac{2\,a\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}$$

$$\left(\left(\mathbb{i}\,a^2\,d^2\,\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\,\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\,\sqrt{1-\frac{2\,\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.\right.$$

$$\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\left.\left.\left.\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\right)\bigg/$$

$$\left(\sqrt{2}\,\left(a\,d^2-b\,d\,e+c\,e^2\right)\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{a+\frac{a\,d^2-b\,d\,e+c\,e^2}{(d+e\,x)^2}+\frac{-2\,a\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(\mathrm{i}\, a\, b\, d\, e \left(2 a d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) \sqrt{1 - \frac{2 \left(a d^2 - b d e + c e^2\right)}{\left(2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}} \sqrt{1 - \frac{2 \left(a d^2 - b d e + c e^2\right)}{\left(2 a d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\right.$$

$$\left(\text{EllipticE}\left[\mathrm{i}\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{a d^2 - b d e + c e^2}{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 a d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right] - \right.$$

$$\left.\left.\text{EllipticF}\left[\mathrm{i}\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{a d^2 - b d e + c e^2}{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 a d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right)\right) \Big/$$

$$\left(\sqrt{2} \left(a d^2 - b d e + c e^2\right) \sqrt{-\frac{a d^2 - b d e + c e^2}{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}} \sqrt{a + \frac{a d^2 - b d e + c e^2}{(d + e x)^2} + \frac{-2 a d + b e}{d + e x}}\right) +$$

$$\left(\mathrm{i}\, b^2 e^2 \left(2 a d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) \sqrt{1 - \frac{2 \left(a d^2 - b d e + c e^2\right)}{\left(2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}} \sqrt{1 - \frac{2 \left(a d^2 - b d e + c e^2\right)}{\left(2 a d - b e + \sqrt{b^2 e^2 - 4 a c e^2}\right) (d + e x)}}\right.$$

$$\left(\text{EllipticE}\left[\mathrm{i}\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{a d^2 - b d e + c e^2}{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 a d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right] - \right.$$

$$\left.\left.\text{EllipticF}\left[\mathrm{i}\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{a d^2 - b d e + c e^2}{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}}}{\sqrt{d + e x}}\right], \frac{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}{2 a d - b e + \sqrt{b^2 e^2 - 4 a c e^2}}\right]\right)\right) \Big/$$

$$\left(\sqrt{2} \left(a d^2 - b d e + c e^2\right) \sqrt{-\frac{a d^2 - b d e + c e^2}{2 a d - b e - \sqrt{b^2 e^2 - 4 a c e^2}}} \sqrt{a + \frac{a d^2 - b d e + c e^2}{(d + e x)^2} + \frac{-2 a d + b e}{d + e x}}\right) -$$

$$\left(3\,\mathrm{i}\,a\,c\,e^2\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\right.$$

$$\left(\text{EllipticE}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/$$

$$\left(\sqrt{2}\left(a\,d^2-b\,d\,e+c\,e^2\right)\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\sqrt{a+\frac{a\,d^2-b\,d\,e+c\,e^2}{(d+e\,x)^2}+\frac{-2\,a\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(\mathrm{i}\sqrt{2}\,a^2\,d\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\right.$$

$$\left.\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

$$\left(\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\sqrt{a+\frac{a\,d^2-b\,d\,e+c\,e^2}{(d+e\,x)^2}+\frac{-2\,a\,d+b\,e}{d+e\,x}}\right)-\left(\mathrm{i}\,a\,b\,e\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\right.$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\ \text{EllipticF}\left[i \,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg) \Bigg/$$

$$\left(\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)\Bigg)\Bigg)$$

Problem 83: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\sqrt{d+e x}\, dx$$

Optimal (type 4, 955 leaves, 16 steps):

$$\frac{2}{3}\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\, x\sqrt{d+e x}+$$

$$\left(\sqrt{2}\sqrt{b^2-4 a c}\,(a d+b e)\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\, x\sqrt{d+e x}\sqrt{-\frac{a\left(c+b x+a x^2\right)}{b^2-4 a c}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 a x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\, e}{2 a d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right) \Bigg/$$

$$\left(3 a e\sqrt{\frac{a(d+e x)}{2 a d-\left(b+\sqrt{b^2-4 a c}\right) e}}\left(c+b x+a x^2\right)\right)-$$

$$\left(2\sqrt{2}\,\sqrt{b^2-4\,a\,c}\;d\,(a\,d+b\,e)\,\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\;x\,\sqrt{\frac{a\,(d+e\,x)}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\,\sqrt{-\frac{a\,(c+b\,x+a\,x^2)}{b^2-4\,a\,c}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,a\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],\,-\frac{2\,\sqrt{b^2-4\,a\,c}\;e}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\right)\Big/\left(3\,a\,e\,\sqrt{d+e\,x}\;(c+b\,x+a\,x^2)\right)+$$

$$\left(4\sqrt{2}\,\sqrt{b^2-4\,a\,c}\;(b\,d+c\,e)\,\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\;x\,\sqrt{\frac{a\,(d+e\,x)}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\,\sqrt{-\frac{a\,(c+b\,x+a\,x^2)}{b^2-4\,a\,c}}\right.$$

$$\left.\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,a\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],\,-\frac{2\,\sqrt{b^2-4\,a\,c}\;e}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\right)\Big/\left(3\,a\,\sqrt{d+e\,x}\;(c+b\,x+a\,x^2)\right)-\frac{1}{\sqrt{a}\;(c+b\,x+a\,x^2)}$$

$$\sqrt{2}\,c\,\sqrt{2\,a\,d-\left(b-\sqrt{b^2-4\,a\,c}\right)e}\;\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\;x\,\sqrt{1-\frac{2\,a\,(d+e\,x)}{2\,a\,d-\left(b-\sqrt{b^2-4\,a\,c}\right)e}}\,\sqrt{1-\frac{2\,a\,(d+e\,x)}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}$$

$$\text{EllipticPi}\left[\frac{2\,a\,d-b\,e+\sqrt{b^2-4\,a\,c}\;e}{2\,a\,d},\,\text{ArcSin}\left[\frac{\sqrt{2}\,\sqrt{a}\,\sqrt{d+e\,x}}{\sqrt{2\,a\,d-\left(b-\sqrt{b^2-4\,a\,c}\right)e}}\right],\,\frac{b-\sqrt{b^2-4\,a\,c}-\frac{2\,a\,d}{e}}{b+\sqrt{b^2-4\,a\,c}-\frac{2\,a\,d}{e}}\right]$$

Result (type 4, 4144 leaves) :

$$\frac{2}{3}x\sqrt{d+e x}\sqrt{a+\frac{c+b x}{x^2}}+\frac{1}{3 e^2\sqrt{c+b x+a x^2}}2 x\sqrt{a+\frac{c+b x}{x^2}}\left(\frac{(a d+b e)\,(d+e x)^{3/2}\left(a+\frac{a d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{c e^2}{(d+e x)^2}-\frac{2 a d}{d+e x}+\frac{b e}{d+e x}\right)}{a\sqrt{\frac{(d+e x)^2\left(a\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{c e}{d+e x}\right)}{d+e x}\right)}{e^2}}}-\right.$$

$$\frac{1}{a\sqrt{\frac{(d+e x)^2\left(a\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{c e}{d+e x}\right)}{d+e x}\right)}{e^2}}}(d+e x)\sqrt{a+\frac{a d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{c e^2}{(d+e x)^2}-\frac{2 a d}{d+e x}+\frac{b e}{d+e x}}$$

$$\left(\left(\mathbb{i}\, a^2 d^3\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.\right.$$

$$\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\left.\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\right/$$

$$\left(2\sqrt{2}\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-$$

$$\left(\mathbb{i}\, b^2 d e^2\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(2\sqrt{2}\,\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\left(i\,a c d e^2\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\,\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(2\sqrt{2}\,\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\left(i\,b c e^3\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\,\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/$$

$$\left(2\sqrt{2}\,\left(a d^2-b d e+c e^2\right)\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\left(i\,a^2 d^2\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\,\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-$$

$$\left(i\,a b d e\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\,\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{2}\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{a+\frac{a\,d^2-b\,d\,e+c\,e^2}{(d+e\,x)^2}+\frac{-2\,a\,d+b\,e}{d+e\,x}}\right)+\left(\mathrm{i}\,a\,c\,e^2\,\sqrt{1-\frac{2\,\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\left.\sqrt{1-\frac{2\,\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\;\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

$$\left(\sqrt{2}\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{a+\frac{a\,d^2-b\,d\,e+c\,e^2}{(d+e\,x)^2}+\frac{-2\,a\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(3\,\mathrm{i}\,a\,c\,e^2\,\sqrt{1-\frac{2\,\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\,\sqrt{1-\frac{2\,\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\left.\text{EllipticPi}\left[\frac{d\,\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)}{2\,\left(a\,d^2-b\,d\,e+c\,e^2\right)},\,\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

$$\left.\left.\left(\sqrt{2}\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{a+\frac{a\,d^2-b\,d\,e+c\,e^2}{(d+e\,x)^2}+\frac{-2\,a\,d+b\,e}{d+e\,x}}\right)\right)\right)$$

Problem 84: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\,\sqrt{d+e\,x}}{x}\,dx$$

Optimal (type 4, 929 leaves, 16 steps) :

$$-\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\,\sqrt{d+e\,x}\,+$$

$$\left(3\sqrt{b^2-4\,a\,c}\,\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\,x\,\sqrt{d+e\,x}\,\sqrt{-\frac{a\left(c+b\,x+a\,x^2\right)}{b^2-4\,a\,c}}\,\text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,a\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4\,a\,c}\,e}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\right)\Bigg/$$

$$\left(\sqrt{2}\,\sqrt{\frac{a\left(d+e\,x\right)}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\,\left(c+b\,x+a\,x^2\right)\right)-\frac{1}{\sqrt{d+e\,x}\,\left(c+b\,x+a\,x^2\right)}3\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,d\,\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\,x$$

$$\sqrt{\frac{a\left(d+e\,x\right)}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\,\sqrt{-\frac{a\left(c+b\,x+a\,x^2\right)}{b^2-4\,a\,c}}\,\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,a\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4\,a\,c}\,e}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]+$$

$$\frac{1}{a\sqrt{d+e\,x}\,\left(c+b\,x+a\,x^2\right)}2\sqrt{2}\,\sqrt{b^2-4\,a\,c}\,\left(a\,d+b\,e\right)\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\,x\,\sqrt{\frac{a\left(d+e\,x\right)}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\,\sqrt{-\frac{a\left(c+b\,x+a\,x^2\right)}{b^2-4\,a\,c}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,a\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4\,a\,c}\,e}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]-\frac{1}{\sqrt{2}\,\sqrt{a}\,d\,\left(c+b\,x+a\,x^2\right)}$$

$$\left(b\,d+c\,e\right)\sqrt{2\,a\,d-\left(b-\sqrt{b^2-4\,a\,c}\right)e}\,\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\,x\,\sqrt{1-\frac{2\,a\left(d+e\,x\right)}{2\,a\,d-\left(b-\sqrt{b^2-4\,a\,c}\right)e}}\,\sqrt{1-\frac{2\,a\left(d+e\,x\right)}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}$$

$$\text{EllipticPi}\left[\frac{2\,a\,d-b\,e+\sqrt{b^2-4\,a\,c}\,e}{2\,a\,d},\text{ArcSin}\left[\frac{\sqrt{2}\,\sqrt{a}\,\sqrt{d+e\,x}}{\sqrt{2\,a\,d-\left(b-\sqrt{b^2-4\,a\,c}\right)e}}\right],\frac{b-\sqrt{b^2-4\,a\,c}-\frac{2\,a\,d}{e}}{b+\sqrt{b^2-4\,a\,c}-\frac{2\,a\,d}{e}}\right]$$

Result (type 4, 4893 leaves) :

$$-\sqrt{d+e\,x}\,\sqrt{a+\frac{c+b\,x}{x^2}}\;+$$

$$\frac{1}{e\sqrt{c+b\,x+a\,x^2}}\,x\,\sqrt{a+\frac{c+b\,x}{x^2}}\,\left(\frac{3\,(d+e\,x)^{3/2}\left(a+\frac{a\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{c\,e^2}{(d+e\,x)^2}-\frac{2\,a\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}\right)}{\sqrt{\frac{(d+e\,x)^2\left(a\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{c\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}}-\left(3\,i\,a\,d^2\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\right.\right.$$

$$(d+e\,x)\,\sqrt{a+\frac{a\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{c\,e^2}{(d+e\,x)^2}-\frac{2\,a\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}\,\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\,\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Bigg/\left(2\,\sqrt{2}\,\left(a\,d^2-b\,d\,e+c\,e^2\right)\right.$$

$$\left.\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{a+\frac{a\,d^2-b\,d\,e+c\,e^2}{(d+e\,x)^2}+\frac{-2\,a\,d+b\,e}{d+e\,x}}\,\sqrt{\frac{(d+e\,x)^2\left(a\left(-1+\frac{d}{d+e\,x}\right)^2+\frac{e\left(b-\frac{b\,d}{d+e\,x}+\frac{c\,e}{d+e\,x}\right)}{d+e\,x}\right)}{e^2}}\right)+$$

$$\left(3\,i\,b\,d\,e\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)\,\sqrt{a+\frac{a\,d^2}{(d+e\,x)^2}-\frac{b\,d\,e}{(d+e\,x)^2}+\frac{c\,e^2}{(d+e\,x)^2}-\frac{2\,a\,d}{d+e\,x}+\frac{b\,e}{d+e\,x}}\right.$$

$$\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\,\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(2\sqrt{2}\left(a d^2-b d e+c e^2\right)\right.$$

$$\left.\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\sqrt{\frac{(d+e x)^2\left(a\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{c e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)-$$

$$\left(3\,\mathbb{i}\,c e^2\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)\sqrt{a+\frac{a d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{c e^2}{(d+e x)^2}-\frac{2 a d}{d+e x}+\frac{b e}{d+e x}}\right.$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\right)\Big/\left(2\sqrt{2}\left(a d^2-b d e+c e^2\right)\right.$$

$$\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\,\sqrt{\frac{(d+e x)^2\left(a\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{c e}{d+e x}\right)}{d+e x}\right)}{e^2}}\Bigg)-$$

$$\Bigg(\mathrm{i}\, a\, d\,(d+e x)\sqrt{a+\frac{a d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{c e^2}{(d+e x)^2}-\frac{2 a d}{d+e x}+\frac{b e}{d+e x}}\,\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\;\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Bigg/$$

$$\Bigg(\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\,\sqrt{\frac{(d+e x)^2\left(a\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{c e}{d+e x}\right)}{d+e x}\right)}{e^2}}\Bigg)+$$

$$\Bigg(\mathrm{i}\, b\, e\,(d+e x)\sqrt{a+\frac{a d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{c e^2}{(d+e x)^2}-\frac{2 a d}{d+e x}+\frac{b e}{d+e x}}\,\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\;\text{EllipticF}\left[\mathrm{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\Bigg)\Bigg/$$

$$\Bigg(\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\,\sqrt{\frac{(d+e x)^2\left(a\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{c e}{d+e x}\right)}{d+e x}\right)}{e^2}}\Bigg)-$$

$$\left(i\, c\, e^2 (d+e x) \sqrt{a+\frac{a d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{c e^2}{(d+e x)^2}-\frac{2 a d}{d+e x}+\frac{b e}{d+e x}} \sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\left.\sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\ \text{EllipticF}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Bigg/$$

$$\left(\sqrt{2}\, d \sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}} \sqrt{\frac{(d+e x)^2 \left(a \left(-1+\frac{d}{d+e x}\right)^2+\frac{e \left(b-\frac{b d}{d+e x}+\frac{c e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right) +$$

$$\left(i\, b\, e (d+e x) \sqrt{a+\frac{a d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{c e^2}{(d+e x)^2}-\frac{2 a d}{d+e x}+\frac{b e}{d+e x}}\right.$$

$$\sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}} \sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}$$

$$\left.\text{EllipticPi}\left[\frac{d \left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)}{2 \left(a d^2-b d e+c e^2\right)}, i\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Bigg/$$

$$\left(\sqrt{2} \sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}} \sqrt{\frac{(d+e x)^2 \left(a \left(-1+\frac{d}{d+e x}\right)^2+\frac{e \left(b-\frac{b d}{d+e x}+\frac{c e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right) +$$

$$\left(i\, c\, e^2 (d+e x) \sqrt{a+\frac{a d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{c e^2}{(d+e x)^2}-\frac{2 a d}{d+e x}+\frac{b e}{d+e x}}\right.$$

$$\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\ \sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}$$

$$\left.\text{EllipticPi}\left[\frac{d\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)}{2\left(a d^2-b d e+c e^2\right)},\ i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\ \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{2}\, d \sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\ \sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\ \sqrt{\frac{(d+e x)^2\left(a\left(-1+\frac{d}{d+e x}\right)^2+\frac{e\left(b-\frac{b d}{d+e x}+\frac{c e}{d+e x}\right)}{d+e x}\right)}{e^2}}\right)$$

Problem 85: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\ \sqrt{d+e x}}{x^2}\,dx$$

Optimal (type 4, 1287 leaves, 24 steps):

$$-\frac{(b d+c e)\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\ \sqrt{d+e x}}{4 c d}-\frac{\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\ \sqrt{d+e x}}{2 x}+$$

$$\left(\sqrt{b^2-4 a c}\,(b d+c e)\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\ x\sqrt{d+e x}\ \sqrt{-\frac{a\left(c+b x+a x^2\right)}{b^2-4 a c}}\ \text{EllipticE}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4 a c}+2 a x}{\sqrt{b^2-4 a c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4 a c}\ e}{2 a d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]\right)\Big/$$

$$\left(4\sqrt{2}\,c\,d\,\sqrt{\frac{a\,(d+e\,x)}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\,\left(c+b\,x+a\,x^2\right)\right)+\Bigg(3\sqrt{b^2-4\,a\,c}\;e\,\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\;x\,\sqrt{\frac{a\,(d+e\,x)}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}$$

$$\sqrt{-\frac{a\left(c+b\,x+a\,x^2\right)}{b^2-4\,a\,c}}\;\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,a\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4\,a\,c}\;e}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\Bigg)\Big/\left(\sqrt{2}\,\sqrt{d+e\,x}\,\left(c+b\,x+a\,x^2\right)\right)-$$

$$\Bigg(\sqrt{b^2-4\,a\,c}\,\left(b\,d+c\,e\right)\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\;x\,\sqrt{\frac{a\,(d+e\,x)}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}\,\sqrt{-\frac{a\left(c+b\,x+a\,x^2\right)}{b^2-4\,a\,c}}$$

$$\text{EllipticF}\left[\text{ArcSin}\left[\frac{\sqrt{\frac{b+\sqrt{b^2-4\,a\,c}+2\,a\,x}{\sqrt{b^2-4\,a\,c}}}}{\sqrt{2}}\right],-\frac{2\sqrt{b^2-4\,a\,c}\;e}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}\right]\Bigg)\Big/\left(2\sqrt{2}\,c\,\sqrt{d+e\,x}\,\left(c+b\,x+a\,x^2\right)\right)-\frac{1}{\sqrt{2}\,\sqrt{a}\,d\,\left(c+b\,x+a\,x^2\right)}$$

$$\left(a\,d+b\,e\right)\sqrt{2\,a\,d-\left(b-\sqrt{b^2-4\,a\,c}\right)e}\;\sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\;x\,\sqrt{1-\frac{2\,a\,(d+e\,x)}{2\,a\,d-\left(b-\sqrt{b^2-4\,a\,c}\right)e}}\,\sqrt{1-\frac{2\,a\,(d+e\,x)}{2\,a\,d-\left(b+\sqrt{b^2-4\,a\,c}\right)e}}$$

$$\text{EllipticPi}\left[\frac{2\,a\,d-b\,e+\sqrt{b^2-4\,a\,c}\;e}{2\,a\,d},\text{ArcSin}\left[\frac{\sqrt{2}\,\sqrt{a}\,\sqrt{d+e\,x}}{\sqrt{2\,a\,d-\left(b-\sqrt{b^2-4\,a\,c}\right)e}}\right],\frac{b-\sqrt{b^2-4\,a\,c}-\frac{2\,a\,d}{e}}{b+\sqrt{b^2-4\,a\,c}-\frac{2\,a\,d}{e}}\right]+$$

$$\left((b d+c e)^2 \sqrt{2 a d-\left(b-\sqrt{b^2-4 a c}\right) e} \sqrt{a+\frac{c}{x^2}+\frac{b}{x}}\, x \sqrt{1-\frac{2 a (d+e x)}{2 a d-\left(b-\sqrt{b^2-4 a c}\right) e}} \sqrt{1-\frac{2 a (d+e x)}{2 a d-\left(b+\sqrt{b^2-4 a c}\right) e}}\right.$$

$$\left.\text{EllipticPi}\left[\frac{2 a d-b e+\sqrt{b^2-4 a c}\, e}{2 a d}, \text{ArcSin}\left[\frac{\sqrt{2} \sqrt{a} \sqrt{d+e x}}{\sqrt{2 a d-\left(b-\sqrt{b^2-4 a c}\right) e}}\right], \frac{b-\sqrt{b^2-4 a c}-\frac{2 a d}{e}}{b+\sqrt{b^2-4 a c}-\frac{2 a d}{e}}\right]\right) \Big/ \left(4 \sqrt{2} \sqrt{a}\, c d^2 \left(c+b x+a x^2\right)\right)$$

Result (type 4, 6206 leaves) :

$$\left(-\frac{1}{2 x^2}+\frac{-b d-c e}{4 c d x}\right) x \sqrt{d+e x} \sqrt{a+\frac{c+b x}{x^2}}+$$

$$\frac{1}{4 c d e \sqrt{c+b x+a x^2}} x \sqrt{a+\frac{c+b x}{x^2}} \left(\frac{(b d+c e) (d+e x)^{3/2} \left(a+\frac{a d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{c e^2}{(d+e x)^2}-\frac{2 a d}{d+e x}+\frac{b e}{d+e x}\right)}{\sqrt{\frac{(d+e x)^2 \left(a \left(-1+\frac{d}{d+e x}\right)^2+\frac{e \left(b-\frac{b d}{d+e x}+\frac{c e}{d+e x}\right)}{d+e x}\right)}{e^2}}}-\right.$$

$$\frac{1}{\sqrt{\frac{(d+e x)^2 \left(a \left(-1+\frac{d}{d+e x}\right)^2+\frac{e \left(b-\frac{b d}{d+e x}+\frac{c e}{d+e x}\right)}{d+e x}\right)}{e^2}}} d (d+e x) \sqrt{a+\frac{a d^2}{(d+e x)^2}-\frac{b d e}{(d+e x)^2}+\frac{c e^2}{(d+e x)^2}-\frac{2 a d}{d+e x}+\frac{b e}{d+e x}}$$

$$\left(\left(i\, a b d^2 \left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) \sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}} \sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.\right.$$

$$\left(\text{EllipticE}\left[i\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]-\right.$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\Bigg)\Bigg)\Bigg/$$

$$\left(2\,\sqrt{2}\,\left(a\,d^2-b\,d\,e+c\,e^2\right)\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{a+\frac{a\,d^2-b\,d\,e+c\,e^2}{(d+e\,x)^2}+\frac{-2\,a\,d+b\,e}{d+e\,x}}\right)-$$

$$\Bigg(\mathbb{i}\,b^2\,d\,e\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\,\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\,\sqrt{1-\frac{2\,\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\Bigg(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-$$

$$\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\Bigg)\Bigg)\Bigg/$$

$$\left(2\,\sqrt{2}\,\left(a\,d^2-b\,d\,e+c\,e^2\right)\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\,\sqrt{a+\frac{a\,d^2-b\,d\,e+c\,e^2}{(d+e\,x)^2}+\frac{-2\,a\,d+b\,e}{d+e\,x}}\right)+$$

$$\Bigg(\mathbb{i}\,a\,c\,d\,e\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\,\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\,\sqrt{1-\frac{2\,\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}$$

$$\Bigg(\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\,\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/$$

$$\left(2\sqrt{2}\left(a\,d^2-b\,d\,e+c\,e^2\right)\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\sqrt{a+\frac{a\,d^2-b\,d\,e+c\,e^2}{(d+e\,x)^2}+\frac{-2\,a\,d+b\,e}{d+e\,x}}\right)+$$

$$\Bigg(i\,c^2\,e^3\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]-\right.$$

$$\left.\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\right)\Big/$$

$$\left(2\sqrt{2}\,d\left(a\,d^2-b\,d\,e+c\,e^2\right)\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\sqrt{a+\frac{a\,d^2-b\,d\,e+c\,e^2}{(d+e\,x)^2}+\frac{-2\,a\,d+b\,e}{d+e\,x}}\right)+$$

$$\Bigg(i\,a\,b\,d\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}\sqrt{1-\frac{2\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)(d+e\,x)}}$$

$$\left.\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{\sqrt{2}\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Big/$$

$$\left(\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-\left(\mathrm{i}\, b^2 e\,\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\left.\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\ \mathrm{EllipticF}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\ \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-\left(\mathrm{i}\, a c e\,\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\left.\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\ \mathrm{EllipticF}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\ \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}\,\sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\left(\mathrm{i}\,\sqrt{2}\, b c e^2\,\sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\ \sqrt{1-\frac{2\left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right)(d+e x)}}\right.$$

$$\left.\mathrm{EllipticF}\left[\mathrm{i}\,\mathrm{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right],\ \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right)\Big/$$

$$\left(d \sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-\left(\mathrm{i}\, c^2 e^3 \sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\left.\sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}} \text{EllipticF}\left[\mathrm{i}\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{2}\, d^2 \sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)+$$

$$\left(\mathrm{i}\, b^2 e \sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}} \sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\left.\text{EllipticPi}\left[\frac{d \left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)}{2 \left(a d^2-b d e+c e^2\right)}, \mathrm{i}\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{2} \sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}} \sqrt{a+\frac{a d^2-b d e+c e^2}{(d+e x)^2}+\frac{-2 a d+b e}{d+e x}}\right)-$$

$$\left(2 \mathrm{i} \sqrt{2}\, a c e \sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}} \sqrt{1-\frac{2 \left(a d^2-b d e+c e^2\right)}{\left(2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}\right) (d+e x)}}\right.$$

$$\left.\text{EllipticPi}\left[\frac{d \left(2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}\right)}{2 \left(a d^2-b d e+c e^2\right)}, \mathrm{i}\, \text{ArcSinh}\left[\frac{\sqrt{2} \sqrt{-\frac{a d^2-b d e+c e^2}{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}}}{\sqrt{d+e x}}\right], \frac{2 a d-b e-\sqrt{b^2 e^2-4 a c e^2}}{2 a d-b e+\sqrt{b^2 e^2-4 a c e^2}}\right]\right) \Big/$$

$$\left(\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{a+\frac{a\,d^2-b\,d\,e+c\,e^2}{(d+e\,x)^2}+\frac{-2\,a\,d+b\,e}{d+e\,x}}\right)-$$

$$\left(i\,\sqrt{2}\;b\,c\,e^2\,\sqrt{1-\frac{2\,\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\;\sqrt{1-\frac{2\,\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\left.\text{EllipticPi}\left[\frac{d\,\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)}{2\,\left(a\,d^2-b\,d\,e+c\,e^2\right)},\;i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\;\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Bigg/$$

$$\left(d\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{a+\frac{a\,d^2-b\,d\,e+c\,e^2}{(d+e\,x)^2}+\frac{-2\,a\,d+b\,e}{d+e\,x}}\right)+$$

$$\left(i\,c^2\,e^3\,\sqrt{1-\frac{2\,\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\;\sqrt{1-\frac{2\,\left(a\,d^2-b\,d\,e+c\,e^2\right)}{\left(2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)\,(d+e\,x)}}\right.$$

$$\left.\text{EllipticPi}\left[\frac{d\,\left(2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}\right)}{2\,\left(a\,d^2-b\,d\,e+c\,e^2\right)},\;i\,\text{ArcSinh}\left[\frac{\sqrt{2}\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}}{\sqrt{d+e\,x}}\right],\;\frac{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}{2\,a\,d-b\,e+\sqrt{b^2\,e^2-4\,a\,c\,e^2}}\right]\right)\Bigg/$$

$$\left.\left.\left(\sqrt{2}\;d^2\,\sqrt{-\frac{a\,d^2-b\,d\,e+c\,e^2}{2\,a\,d-b\,e-\sqrt{b^2\,e^2-4\,a\,c\,e^2}}}\;\sqrt{a+\frac{a\,d^2-b\,d\,e+c\,e^2}{(d+e\,x)^2}+\frac{-2\,a\,d+b\,e}{d+e\,x}}\right)\right)\right)$$

Problem 90: Unable to integrate problem.

$$\int \frac{(f x)^m \left(a+c x^{2 n}\right)^p}{d+e x^n} \, dx$$

Optimal (type 6, 194 leaves, 6 steps):

$$\frac{x (f x)^m \left(a+c x^{2 n}\right)^p \left(1+\frac{c x^{2 n}}{a}\right)^{-p} \text{AppellF1}\left[\frac{1+m}{2 n},-p,1,1+\frac{1+m}{2 n},-\frac{c x^{2 n}}{a},\frac{e^2 x^{2 n}}{d^2}\right]}{d (1+m)}-\frac{e x^{1+n} (f x)^m \left(a+c x^{2 n}\right)^p \left(1+\frac{c x^{2 n}}{a}\right)^{-p} \text{AppellF1}\left[\frac{1+m+n}{2 n},-p,1,\frac{1+m+3 n}{2 n},-\frac{c x^{2 n}}{a},\frac{e^2 x^{2 n}}{d^2}\right]}{d^2 (1+m+n)}$$

Result (type 8, 28 leaves):

$$\int \frac{(f x)^m \left(a+c x^{2 n}\right)^p}{d+e x^n} \, dx$$

Problem 91: Unable to integrate problem.

$$\int \frac{(f x)^m \left(a+c x^{2 n}\right)^p}{\left(d+e x^n\right)^2} \, dx$$

Optimal (type 6, 302 leaves, 8 steps):

$$\frac{x (f x)^m \left(a+c x^{2 n}\right)^p \left(1+\frac{c x^{2 n}}{a}\right)^{-p} \text{AppellF1}\left[\frac{1+m}{2 n},-p,2,1+\frac{1+m}{2 n},-\frac{c x^{2 n}}{a},\frac{e^2 x^{2 n}}{d^2}\right]}{d^2 (1+m)}-\frac{2 e x^{1+n} (f x)^m \left(a+c x^{2 n}\right)^p \left(1+\frac{c x^{2 n}}{a}\right)^{-p} \text{AppellF1}\left[\frac{1+m+n}{2 n},-p,2,\frac{1+m+3 n}{2 n},-\frac{c x^{2 n}}{a},\frac{e^2 x^{2 n}}{d^2}\right]}{d^3 (1+m+n)}+\frac{e^2 x^{1+2 n} (f x)^m \left(a+c x^{2 n}\right)^p \left(1+\frac{c x^{2 n}}{a}\right)^{-p} \text{AppellF1}\left[\frac{1+m+2 n}{2 n},-p,2,\frac{1+m+4 n}{2 n},-\frac{c x^{2 n}}{a},\frac{e^2 x^{2 n}}{d^2}\right]}{d^4 (1+m+2 n)}$$

Result (type 8, 28 leaves):

$$\int \frac{(f x)^m \left(a+c x^{2 n}\right)^p}{\left(d+e x^n\right)^2} \, dx$$

Problem 92: Unable to integrate problem.

$$\int \frac{(f x)^m \left(a+c x^{2 n}\right)^p}{\left(d+e x^n\right)^3} \, dx$$

Optimal (type 6, 412 leaves, 10 steps):

$$\frac{x\,(f\,x)^m\,\left(a+c\,x^{2\,n}\right)^p\,\left(1+\frac{c\,x^{2\,n}}{a}\right)^{-p}\,\text{AppellF1}\left[\frac{1+m}{2\,n},\,-p,\,3,\,1+\frac{1+m}{2\,n},\,-\frac{c\,x^{2\,n}}{a},\,\frac{e^2\,x^{2\,n}}{d^2}\right]}{d^3\,(1+m)}-$$
$$\frac{3\,e\,x^{1+n}\,(f\,x)^m\,\left(a+c\,x^{2\,n}\right)^p\,\left(1+\frac{c\,x^{2\,n}}{a}\right)^{-p}\,\text{AppellF1}\left[\frac{1+m+n}{2\,n},\,-p,\,3,\,\frac{1+m+3\,n}{2\,n},\,-\frac{c\,x^{2\,n}}{a},\,\frac{e^2\,x^{2\,n}}{d^2}\right]}{d^4\,(1+m+n)}+$$
$$\frac{3\,e^2\,x^{1+2\,n}\,(f\,x)^m\,\left(a+c\,x^{2\,n}\right)^p\,\left(1+\frac{c\,x^{2\,n}}{a}\right)^{-p}\,\text{AppellF1}\left[\frac{1+m+2\,n}{2\,n},\,-p,\,3,\,\frac{1+m+4\,n}{2\,n},\,-\frac{c\,x^{2\,n}}{a},\,\frac{e^2\,x^{2\,n}}{d^2}\right]}{d^5\,(1+m+2\,n)}-$$
$$\frac{e^3\,x^{1+3\,n}\,(f\,x)^m\,\left(a+c\,x^{2\,n}\right)^p\,\left(1+\frac{c\,x^{2\,n}}{a}\right)^{-p}\,\text{AppellF1}\left[\frac{1+m+3\,n}{2\,n},\,-p,\,3,\,\frac{1+m+5\,n}{2\,n},\,-\frac{c\,x^{2\,n}}{a},\,\frac{e^2\,x^{2\,n}}{d^2}\right]}{d^6\,(1+m+3\,n)}$$

Result (type 8, 28 leaves):

$$\int\frac{(f\,x)^m\,\left(a+c\,x^{2\,n}\right)^p}{\left(d+e\,x^n\right)^3}\,dx$$

Problem 93: Result more than twice size of optimal antiderivative.

$$\int(b+2\,c\,x)\,\left(a+b\,x+c\,x^2\right)^{13}\,dx$$

Optimal (type 1, 16 leaves, 1 step):

$$\frac{1}{14}\,\left(a+b\,x+c\,x^2\right)^{14}$$

Result (type 1, 201 leaves):

$$\frac{1}{14}\,x\,(b+c\,x)\,\left(14\,a^{13}+91\,a^{12}\,x\,(b+c\,x)+364\,a^{11}\,x^2\,(b+c\,x)^2+1001\,a^{10}\,x^3\,(b+c\,x)^3+2002\,a^9\,x^4\,(b+c\,x)^4+3003\,a^8\,x^5\,(b+c\,x)^5+3432\,a^7\,x^6\,(b+c\,x)^6+\right.$$
$$\left.3003\,a^6\,x^7\,(b+c\,x)^7+2002\,a^5\,x^8\,(b+c\,x)^8+1001\,a^4\,x^9\,(b+c\,x)^9+364\,a^3\,x^{10}\,(b+c\,x)^{10}+91\,a^2\,x^{11}\,(b+c\,x)^{11}+14\,a\,x^{12}\,(b+c\,x)^{12}+x^{13}\,(b+c\,x)^{13}\right)$$

Problem 94: Result more than twice size of optimal antiderivative.

$$\int x\,\left(b+2\,c\,x^2\right)\,\left(a+b\,x^2+c\,x^4\right)^{13}\,dx$$

Optimal (type 1, 18 leaves, 2 steps):

$$\frac{1}{28}\,\left(a+b\,x^2+c\,x^4\right)^{14}$$

Result (type 1, 233 leaves) :

$$\frac{1}{28} x^2 \left(b + c x^2\right) \left(14 a^{13} + 91 a^{12} x^2 \left(b + c x^2\right) + 364 a^{11} x^4 \left(b + c x^2\right)^2 + 1001 a^{10} x^6 \left(b + c x^2\right)^3 + 2002 a^9 x^8 \left(b + c x^2\right)^4 + 3003 a^8 x^{10} \left(b + c x^2\right)^5 + 3432 a^7 x^{12} \left(b + c x^2\right)^6 + 3003 a^6 x^{14} \left(b + c x^2\right)^7 + 2002 a^5 x^{16} \left(b + c x^2\right)^8 + 1001 a^4 x^{18} \left(b + c x^2\right)^9 + 364 a^3 x^{20} \left(b + c x^2\right)^{10} + 91 a^2 x^{22} \left(b + c x^2\right)^{11} + 14 a x^{24} \left(b + c x^2\right)^{12} + x^{26} \left(b + c x^2\right)^{13}\right)$$

Problem 95: Result more than twice size of optimal antiderivative.

$$\int x^2 \left(b + 2 c x^3\right) \left(a + b x^3 + c x^6\right)^{13} \, dx$$

Optimal (type 1, 18 leaves, 2 steps) :

$$\frac{1}{42} \left(a + b x^3 + c x^6\right)^{14}$$

Result (type 1, 233 leaves) :

$$\frac{1}{42} x^3 \left(b + c x^3\right) \left(14 a^{13} + 91 a^{12} x^3 \left(b + c x^3\right) + 364 a^{11} x^6 \left(b + c x^3\right)^2 + 1001 a^{10} x^9 \left(b + c x^3\right)^3 + 2002 a^9 x^{12} \left(b + c x^3\right)^4 + 3003 a^8 x^{15} \left(b + c x^3\right)^5 + 3432 a^7 x^{18} \left(b + c x^3\right)^6 + 3003 a^6 x^{21} \left(b + c x^3\right)^7 + 2002 a^5 x^{24} \left(b + c x^3\right)^8 + 1001 a^4 x^{27} \left(b + c x^3\right)^9 + 364 a^3 x^{30} \left(b + c x^3\right)^{10} + 91 a^2 x^{33} \left(b + c x^3\right)^{11} + 14 a x^{36} \left(b + c x^3\right)^{12} + x^{39} \left(b + c x^3\right)^{13}\right)$$

Problem 96: Result more than twice size of optimal antiderivative.

$$\int x^{-1+n} \left(b + 2 c x^n\right) \left(a + b x^n + c x^{2 n}\right)^{13} \, dx$$

Optimal (type 3, 23 leaves, 2 steps) :

$$\frac{\left(a + b x^n + c x^{2 n}\right)^{14}}{14 n}$$

Result (type 3, 260 leaves) :

$$\frac{1}{14 n} x^n \left(b + c x^n\right) \left(14 a^{13} + 91 a^{12} x^n \left(b + c x^n\right) + 364 a^{11} x^{2 n} \left(b + c x^n\right)^2 + 1001 a^{10} x^{3 n} \left(b + c x^n\right)^3 + 2002 a^9 x^{4 n} \left(b + c x^n\right)^4 + 3003 a^8 x^{5 n} \left(b + c x^n\right)^5 + 3432 a^7 x^{6 n} \left(b + c x^n\right)^6 + 3003 a^6 x^{7 n} \left(b + c x^n\right)^7 + 2002 a^5 x^{8 n} \left(b + c x^n\right)^8 + 1001 a^4 x^{9 n} \left(b + c x^n\right)^9 + 364 a^3 x^{10 n} \left(b + c x^n\right)^{10} + 91 a^2 x^{11 n} \left(b + c x^n\right)^{11} + 14 a x^{12 n} \left(b + c x^n\right)^{12} + x^{13 n} \left(b + c x^n\right)^{13}\right)$$

Problem 97: Result more than twice size of optimal antiderivative.

$$\int (b + 2 c x) \left(-a + b x + c x^2\right)^{13} \, dx$$

Optimal (type 1, 18 leaves, 1 step):

$$\frac{1}{14} \left(a - b x - c x^2\right)^{14}$$

Result (type 1, 201 leaves):

$$\frac{1}{14} x (b + c x) \left(-14 a^{13} + 91 a^{12} x (b + c x) - 364 a^{11} x^2 (b + c x)^2 + 1001 a^{10} x^3 (b + c x)^3 - 2002 a^9 x^4 (b + c x)^4 + 3003 a^8 x^5 (b + c x)^5 - 3432 a^7 x^6 (b + c x)^6 + 3003 a^6 x^7 (b + c x)^7 - 2002 a^5 x^8 (b + c x)^8 + 1001 a^4 x^9 (b + c x)^9 - 364 a^3 x^{10} (b + c x)^{10} + 91 a^2 x^{11} (b + c x)^{11} - 14 a x^{12} (b + c x)^{12} + x^{13} (b + c x)^{13}\right)$$

Problem 98: Result more than twice size of optimal antiderivative.

$$\int x \left(b + 2 c x^2\right) \left(-a + b x^2 + c x^4\right)^{13} \, dx$$

Optimal (type 1, 20 leaves, 2 steps):

$$\frac{1}{28} \left(a - b x^2 - c x^4\right)^{14}$$

Result (type 1, 233 leaves):

$$\frac{1}{28} x^2 \left(b + c x^2\right) \left(-14 a^{13} + 91 a^{12} x^2 \left(b + c x^2\right) - 364 a^{11} x^4 \left(b + c x^2\right)^2 + 1001 a^{10} x^6 \left(b + c x^2\right)^3 - 2002 a^9 x^8 \left(b + c x^2\right)^4 + 3003 a^8 x^{10} \left(b + c x^2\right)^5 - 3432 a^7 x^{12} \left(b + c x^2\right)^6 + 3003 a^6 x^{14} \left(b + c x^2\right)^7 - 2002 a^5 x^{16} \left(b + c x^2\right)^8 + 1001 a^4 x^{18} \left(b + c x^2\right)^9 - 364 a^3 x^{20} \left(b + c x^2\right)^{10} + 91 a^2 x^{22} \left(b + c x^2\right)^{11} - 14 a x^{24} \left(b + c x^2\right)^{12} + x^{26} \left(b + c x^2\right)^{13}\right)$$

Problem 99: Result more than twice size of optimal antiderivative.

$$\int x^2 \left(b + 2 c x^3\right) \left(-a + b x^3 + c x^6\right)^{13} \, dx$$

Optimal (type 1, 20 leaves, 2 steps):

$$\frac{1}{42} \left(a - b x^3 - c x^6\right)^{14}$$

Result (type 1, 233 leaves):

$$\frac{1}{42} x^3 \left(b+c x^3\right) \left(-14 a^{13}+91 a^{12} x^3 \left(b+c x^3\right)-364 a^{11} x^6 \left(b+c x^3\right)^2+1001 a^{10} x^9 \left(b+c x^3\right)^3-2002 a^9 x^{12} \left(b+c x^3\right)^4+3003 a^8 x^{15} \left(b+c x^3\right)^5-3432 a^7 x^{18} \left(b+c x^3\right)^6+3003 a^6 x^{21} \left(b+c x^3\right)^7-2002 a^5 x^{24} \left(b+c x^3\right)^8+1001 a^4 x^{27} \left(b+c x^3\right)^9-364 a^3 x^{30} \left(b+c x^3\right)^{10}+91 a^2 x^{33} \left(b+c x^3\right)^{11}-14 a x^{36} \left(b+c x^3\right)^{12}+x^{39} \left(b+c x^3\right)^{13}\right)$$

Problem 100: Result more than twice size of optimal antiderivative.

$$\int x^{-1+n} \left(b+2 c x^n\right) \left(-a+b x^n+c x^{2 n}\right)^{13} \, dx$$

Optimal (type 3, 25 leaves, 2 steps):

$$\frac{\left(a-b x^n-c x^{2 n}\right)^{14}}{14 n}$$

Result (type 3, 260 leaves):

$$\frac{1}{14 n} x^n \left(b+c x^n\right) \left(-14 a^{13}+91 a^{12} x^n \left(b+c x^n\right)-364 a^{11} x^{2 n} \left(b+c x^n\right)^2+1001 a^{10} x^{3 n} \left(b+c x^n\right)^3-2002 a^9 x^{4 n} \left(b+c x^n\right)^4+3003 a^8 x^{5 n} \left(b+c x^n\right)^5-3432 a^7 x^{6 n} \left(b+c x^n\right)^6+3003 a^6 x^{7 n} \left(b+c x^n\right)^7-2002 a^5 x^{8 n} \left(b+c x^n\right)^8+1001 a^4 x^{9 n} \left(b+c x^n\right)^9-364 a^3 x^{10 n} \left(b+c x^n\right)^{10}+91 a^2 x^{11 n} \left(b+c x^n\right)^{11}-14 a x^{12 n} \left(b+c x^n\right)^{12}+x^{13 n} \left(b+c x^n\right)^{13}\right)$$

Problem 101: Result more than twice size of optimal antiderivative.

$$\int (b+2 c x) \left(b x+c x^2\right)^{13} \, dx$$

Optimal (type 1, 15 leaves, 1 step):

$$\frac{1}{14} \left(b x+c x^2\right)^{14}$$

Result (type 1, 172 leaves):

$$\frac{b^{14} x^{14}}{14}+b^{13} c x^{15}+\frac{13}{2} b^{12} c^2 x^{16}+26 b^{11} c^3 x^{17}+\frac{143}{2} b^{10} c^4 x^{18}+143 b^9 c^5 x^{19}+\frac{429}{2} b^8 c^6 x^{20}+\frac{1716}{7} b^7 c^7 x^{21}+\frac{429}{2} b^6 c^8 x^{22}+143 b^5 c^9 x^{23}+\frac{143}{2} b^4 c^{10} x^{24}+26 b^3 c^{11} x^{25}+\frac{13}{2} b^2 c^{12} x^{26}+b c^{13} x^{27}+\frac{c^{14} x^{28}}{14}$$

Problem 102: Result more than twice size of optimal antiderivative.

$$\int x \left(b+2 c x^2\right) \left(b x^2+c x^4\right)^{13} \, dx$$

Optimal (type 1, 16 leaves, 3 steps):

$$\frac{1}{28} x^{28} \left(b + c x^2\right)^{14}$$

Result (type 1, 182 leaves):

$$\frac{b^{14} x^{28}}{28} + \frac{1}{2} b^{13} c x^{30} + \frac{13}{4} b^{12} c^2 x^{32} + 13 b^{11} c^3 x^{34} + \frac{143}{4} b^{10} c^4 x^{36} + \frac{143}{2} b^9 c^5 x^{38} + \frac{429}{4} b^8 c^6 x^{40} + \frac{858}{7} b^7 c^7 x^{42} + \frac{429}{4} b^6 c^8 x^{44} + \frac{143}{2} b^5 c^9 x^{46} + \frac{143}{4} b^4 c^{10} x^{48} + 13 b^3 c^{11} x^{50} + \frac{13}{4} b^2 c^{12} x^{52} + \frac{1}{2} b c^{13} x^{54} + \frac{c^{14} x^{56}}{28}$$

Problem 103: Result more than twice size of optimal antiderivative.

$$\int x^2 \left(b + 2 c x^3\right) \left(b x^3 + c x^6\right)^{13} \, dx$$

Optimal (type 1, 16 leaves, 3 steps):

$$\frac{1}{42} x^{42} \left(b + c x^3\right)^{14}$$

Result (type 1, 186 leaves):

$$\frac{b^{14} x^{42}}{42} + \frac{1}{3} b^{13} c x^{45} + \frac{13}{6} b^{12} c^2 x^{48} + \frac{26}{3} b^{11} c^3 x^{51} + \frac{143}{6} b^{10} c^4 x^{54} + \frac{143}{3} b^9 c^5 x^{57} + \frac{143}{2} b^8 c^6 x^{60} + \frac{572}{7} b^7 c^7 x^{63} + \frac{143}{2} b^6 c^8 x^{66} + \frac{143}{3} b^5 c^9 x^{69} + \frac{143}{6} b^4 c^{10} x^{72} + \frac{26}{3} b^3 c^{11} x^{75} + \frac{13}{6} b^2 c^{12} x^{78} + \frac{1}{3} b c^{13} x^{81} + \frac{c^{14} x^{84}}{42}$$

Problem 128: Result more than twice size of optimal antiderivative.

$$\int \frac{x^{-1+n} \left(b + 2 c x^n\right)}{\left(b x^n + c x^{2 n}\right)^8} \, dx$$

Optimal (type 3, 21 leaves, 3 steps):

$$-\frac{x^{-7 n}}{7 n \left(b + c x^n\right)^7}$$

Result (type 3, 127 leaves):

$$-\frac{1}{7 b^{14} n \left(b + c x^n\right)^7} x^{-7 n} \left(b^{14} + 1716 b^7 c^7 x^{7 n} + 12012 b^6 c^8 x^{8 n} + 36036 b^5 c^9 x^{9 n} + 60060 b^4 c^{10} x^{10 n} + 60060 b^3 c^{11} x^{11 n} + 36036 b^2 c^{12} x^{12 n} + 12012 b c^{13} x^{13 n} + 1716 c^{14} x^{14 n}\right)$$

Problem 142: Result more than twice size of optimal antiderivative.

$$\int \frac{(f x)^m \left(d+e x^n\right)}{\left(a+b x^n+c x^{2 n}\right)^2} \, dx$$

Optimal (type 5, 374 leaves, 5 steps):

$$\frac{(f x)^{1+m} \left(b^2 d-2 a c d-a b e+c (b d-2 a e) x^n\right)}{a \left(b^2-4 a c\right) f n \left(a+b x^n+c x^{2 n}\right)}-\left(c \left((b d-2 a e) (1+m-n)-\frac{4 a c d (1+m-2 n)-b^2 d (1+m-n)+2 a b e n}{\sqrt{b^2-4 a c}}\right) (f x)^{1+m} \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}\right]\right) \Big/ \left(a \left(b^2-4 a c\right) \left(b-\sqrt{b^2-4 a c}\right) f (1+m) n\right)-\left(c \left((b d-2 a e) (1+m-n)+\frac{4 a c d (1+m-2 n)-b^2 d (1+m-n)+2 a b e n}{\sqrt{b^2-4 a c}}\right) (f x)^{1+m} \text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]\right) \Big/ \left(a \left(b^2-4 a c\right) \left(b+\sqrt{b^2-4 a c}\right) f (1+m) n\right)$$

Result (type 5, 5363 leaves):

$$\frac{x (f x)^m \left(-b^2 d+2 a c d+a b e-b c d x^n+2 a c e x^n\right)}{a \left(-b^2+4 a c\right) n \left(a+b x^n+c x^{2 n}\right)}-\frac{1}{a \left(-b^2+4 a c\right) (1+m)} b c d x^{1+n} (f x)^m \left(x^n\right)^{\frac{1+m}{n}-\frac{1+m+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}} \text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}} \text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\frac{1}{\left(-b^2+4 a c\right) (1+m)}\right)$$

$$2\,c\,e\,x^{1+n}\,(f\,x)^m\,(x^n)^{\frac{1+m}{n}-\frac{1+m+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},\,-\frac{1+m}{n},\,1-\frac{1+m}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},\,-\frac{1+m}{n},\,1-\frac{1+m}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+\frac{1}{a\,\left(-b^2+4\,a\,c\right)\,(1+m)\,n}$$

$$b\,c\,d\,x^{1+n}\,(f\,x)^m\,(x^n)^{\frac{1+m}{n}-\frac{1+m+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},\,-\frac{1+m}{n},\,1-\frac{1+m}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},\,-\frac{1+m}{n},\,1-\frac{1+m}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)-\frac{1}{\left(-b^2+4\,a\,c\right)\,(1+m)\,n}$$

$$2\,c\,e\,x^{1+n}\,(f\,x)^m\,(x^n)^{\frac{1+m}{n}-\frac{1+m+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},\,-\frac{1+m}{n},\,1-\frac{1+m}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+\frac{1}{a\left(-b^2+4ac\right)(1+m)n}$$

$$b\,c\,d\,m\,x^{1+n}(f\,x)^m\left(x^n\right)^{\frac{1+m}{n}-\frac{1+m+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)-\frac{1}{\left(-b^2+4ac\right)(1+m)n}$$

$$2\,c\,e\,m\,x^{1+n}(f\,x)^m\left(x^n\right)^{\frac{1+m}{n}-\frac{1+m+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{a\left(-b^2+4ac\right)(1+m)} b^2 d x (f x)^m \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}} \text{Hypergeometric2F1}\left[-\frac{1+m}{n}, -\frac{1+m}{n}, 1-\frac{1+m}{n}, -\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}} + \right.$$

$$\left. \frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}} \text{Hypergeometric2F1}\left[-\frac{1+m}{n}, -\frac{1+m}{n}, 1-\frac{1+m}{n}, -\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}} \right) -$$

$$\frac{1}{\left(-b^2+4ac\right)(1+m)} 4 c d x (f x)^m \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}} \text{Hypergeometric2F1}\left[-\frac{1+m}{n}, -\frac{1+m}{n}, 1-\frac{1+m}{n}, -\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}} + \right.$$

$$\left. \frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}} \text{Hypergeometric2F1}\left[-\frac{1+m}{n}, -\frac{1+m}{n}, 1-\frac{1+m}{n}, -\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}} \right) -$$

$$\frac{1}{a\left(-b^2+4ac\right)(1+m)\, n} b^2 d x (f x)^m \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}} \text{Hypergeometric2F1}\left[-\frac{1+m}{n}, -\frac{1+m}{n}, 1-\frac{1+m}{n}, -\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}} + \right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{\left(-b^2+4ac\right)\left(1+m\right)n}2cdx\left(fx\right)^m\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{\left(-b^2+4ac\right)\left(1+m\right)n}bex\left(fx\right)^m\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{a\left(-b^2+4ac\right)(1+m)n}b^2 d m x (f x)^m \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}} \text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}} \text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{\left(-b^2+4ac\right)(1+m)n}2 c d m x (f x)^m \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}} \text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}} \text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{\left(-b^2+4ac\right)(1+m)n}b e m x (f x)^m \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}} \text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-\frac{1}{n}-\frac{m}{n}}\text{Hypergeometric2F1}\left[-\frac{1+m}{n},-\frac{1+m}{n},1-\frac{1+m}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)$$

Problem 143: Result more than twice size of optimal antiderivative.

$$\int\frac{(f x)^m\,(d+e x^n)}{(a+b x^n+c x^{2n})^3}\,dx$$

Optimal (type 5, 816 leaves, 6 steps):

$$\frac{(f x)^{1+m}\left(b^2 d-2acd-abe+c\,(bd-2ae)\,x^n\right)}{2a\,(b^2-4ac)\,f n\,(a+b x^n+c x^{2n})^2}+$$
$$\Big((f x)^{1+m}\,\big((b^2-2ac)\,(abe\,(1+m)+2acd\,(1+m-4n)-b^2 d\,(1+m-2n))+abc\,(bd-2ae)\,(1+m-3n)+$$
$$c\,(ab^2 e\,(1+m)+2abcd\,(2+2m-7n)-4a^2 ce\,(1+m-3n)-b^3 d\,(1+m-2n))\,x^n\big)\Big)\Big/\left(2a^2\,(b^2-4ac)^2 f n^2\,(a+b x^n+c x^{2n})\right)-$$
$$\Bigg(c\,\Bigg((ab^2 e\,(1+m)+2abcd\,(2+2m-7n)-4a^2 ce\,(1+m-3n)-b^3 d\,(1+m-2n))\,(1+m-n)+\frac{1}{\sqrt{b^2-4ac}}$$
$$(ab^3 e\,(1+m)\,(1+m-n)-4a^2 bce\,(1+m^2+m\,(2-n)-n-3n^2)-b^4 d\,(1+m^2+m\,(2-3n)-3n+2n^2)+$$
$$6ab^2 cd\,(1+m^2+m\,(2-4n)-4n+3n^2)-8a^2c^2 d\,(1+m^2+m\,(2-6n)-6n+8n^2))\Bigg)\,(f x)^{1+m}$$
$$\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{2c x^n}{b-\sqrt{b^2-4ac}}\right]\Bigg)\Big/\left(2a^2\,(b^2-4ac)^2\left(b-\sqrt{b^2-4ac}\right)f\,(1+m)\,n^2\right)-$$
$$\Bigg(c\,\Bigg((ab^2 e\,(1+m)+2abcd\,(2+2m-7n)-4a^2 ce\,(1+m-3n)-b^3 d\,(1+m-2n))\,(1+m-n)-\frac{1}{\sqrt{b^2-4ac}}$$
$$(ab^3 e\,(1+m)\,(1+m-n)-4a^2 bce\,(1+m^2+m\,(2-n)-n-3n^2)-b^4 d\,(1+m^2+m\,(2-3n)-3n+2n^2)+$$
$$6ab^2 cd\,(1+m^2+m\,(2-4n)-4n+3n^2)-8a^2c^2 d\,(1+m^2+m\,(2-6n)-6n+8n^2))\Bigg)\,(f x)^{1+m}$$
$$\text{Hypergeometric2F1}\left[1,\frac{1+m}{n},\frac{1+m+n}{n},-\frac{2c x^n}{b+\sqrt{b^2-4ac}}\right]\Bigg)\Big/\left(2a^2\,(b^2-4ac)^2\left(b+\sqrt{b^2-4ac}\right)f\,(1+m)\,n^2\right)$$

Result (type 5, 20 515 leaves) : Display of huge result suppressed!

Problem 145: Unable to integrate problem.

$$\int \frac{(f x)^m \left(d+e x^n\right)^q}{a+b x^n+c x^{2 n}} \, dx$$

Optimal (type 6, 245 leaves, 5 steps):

$$\frac{2 c (f x)^{1+m} \left(d+e x^n\right)^q \left(1+\frac{e x^n}{d}\right)^{-q} \text{AppellF1}\left[\frac{1+m}{n},1,-q,\frac{1+m+n}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}},-\frac{e x^n}{d}\right]}{\sqrt{b^2-4 a c} \left(b-\sqrt{b^2-4 a c}\right) f (1+m)}-\frac{2 c (f x)^{1+m} \left(d+e x^n\right)^q \left(1+\frac{e x^n}{d}\right)^{-q} \text{AppellF1}\left[\frac{1+m}{n},1,-q,\frac{1+m+n}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},-\frac{e x^n}{d}\right]}{\sqrt{b^2-4 a c} \left(b+\sqrt{b^2-4 a c}\right) f (1+m)}$$

Result (type 8, 33 leaves):

$$\int \frac{(f x)^m \left(d+e x^n\right)^q}{a+b x^n+c x^{2 n}} \, dx$$

Problem 146: Unable to integrate problem.

$$\int \frac{x^2 \left(d+e x^n\right)^q}{a+b x^n+c x^{2 n}} \, dx$$

Optimal (type 6, 210 leaves, 5 steps):

$$-\frac{2 c x^3 \left(d+e x^n\right)^q \left(1+\frac{e x^n}{d}\right)^{-q} \text{AppellF1}\left[\frac{3}{n},1,-q,\frac{3+n}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}},-\frac{e x^n}{d}\right]}{3 \left(b^2-4 a c-b \sqrt{b^2-4 a c}\right)}-\frac{2 c x^3 \left(d+e x^n\right)^q \left(1+\frac{e x^n}{d}\right)^{-q} \text{AppellF1}\left[\frac{3}{n},1,-q,\frac{3+n}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},-\frac{e x^n}{d}\right]}{3 \left(b^2-4 a c+b \sqrt{b^2-4 a c}\right)}$$

Result (type 8, 31 leaves):

$$\int \frac{x^2 \left(d+e x^n\right)^q}{a+b x^n+c x^{2 n}} \, dx$$

Problem 147: Unable to integrate problem.

$$\int \frac{x \left(d+e x^n\right)^q}{a+b x^n+c x^{2 n}} \, dx$$

Optimal (type 6, 206 leaves, 5 steps):

$$-\frac{c x^2 \left(d+e x^n\right)^q \left(1+\frac{e x^n}{d}\right)^{-q} \text{AppellF1}\left[\frac{2}{n},1,-q,\frac{2+n}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}},-\frac{e x^n}{d}\right]}{b^2-4 a c-b \sqrt{b^2-4 a c}}-\frac{c x^2 \left(d+e x^n\right)^q \left(1+\frac{e x^n}{d}\right)^{-q} \text{AppellF1}\left[\frac{2}{n},1,-q,\frac{2+n}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},-\frac{e x^n}{d}\right]}{b^2-4 a c+b \sqrt{b^2-4 a c}}$$

Result (type 8, 29 leaves):

$$\int \frac{x \left(d+e x^n\right)^q}{a+b x^n+c x^{2 n}} \, dx$$

Problem 148: Unable to integrate problem.

$$\int \frac{\left(d+e x^n\right)^q}{a+b x^n+c x^{2 n}} \, dx$$

Optimal (type 6, 194 leaves, 5 steps):

$$-\frac{2 c x \left(d+e x^n\right)^q \left(1+\frac{e x^n}{d}\right)^{-q} \text{AppellF1}\left[\frac{1}{n},1,-q,1+\frac{1}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}},-\frac{e x^n}{d}\right]}{b^2-4 a c-b \sqrt{b^2-4 a c}}-\frac{2 c x \left(d+e x^n\right)^q \left(1+\frac{e x^n}{d}\right)^{-q} \text{AppellF1}\left[\frac{1}{n},1,-q,1+\frac{1}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},-\frac{e x^n}{d}\right]}{b^2-4 a c+b \sqrt{b^2-4 a c}}$$

Result (type 8, 28 leaves):

$$\int \frac{\left(d+e x^n\right)^q}{a+b x^n+c x^{2 n}} \, dx$$

Problem 149: Unable to integrate problem.

$$\int \frac{\left(d+e x^n\right)^q}{x \left(a+b x^n+c x^{2 n}\right)} \, dx$$

Optimal (type 5, 263 leaves, 8 steps):

$$\frac{c\left(1+\frac{b}{\sqrt{b^2-4 a c}}\right)\left(d+e x^n\right)^{1+q} \text{Hypergeometric2F1}\left[1,1+q,2+q,\frac{2 c\left(d+e x^n\right)}{2 c d-\left(b-\sqrt{b^2-4 a c}\right) e}\right]}{a\left(2 c d-\left(b-\sqrt{b^2-4 a c}\right) e\right) n(1+q)}+$$

$$\frac{c\left(1-\frac{b}{\sqrt{b^2-4 a c}}\right)\left(d+e x^n\right)^{1+q} \text{Hypergeometric2F1}\left[1,1+q,2+q,\frac{2 c\left(d+e x^n\right)}{2 c d-\left(b+\sqrt{b^2-4 a c}\right) e}\right]}{a\left(2 c d-\left(b+\sqrt{b^2-4 a c}\right) e\right) n(1+q)}-\frac{\left(d+e x^n\right)^{1+q} \text{Hypergeometric2F1}\left[1,1+q,2+q,1+\frac{e x^n}{d}\right]}{a d n(1+q)}$$

Result (type 8, 31 leaves) :

$$\int \frac{\left(d+e x^n\right)^q}{x\left(a+b x^n+c x^{2 n}\right)} \, dx$$

Problem 150: Unable to integrate problem.

$$\int \frac{\left(d+e x^n\right)^q}{x^2\left(a+b x^n+c x^{2 n}\right)} \, dx$$

Optimal (type 6, 212 leaves, 5 steps) :

$$\frac{2 c\left(d+e x^n\right)^q\left(1+\frac{e x^n}{d}\right)^{-q} \text{AppellF1}\left[-\frac{1}{n},1,-q,-\frac{1-n}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}},-\frac{e x^n}{d}\right]}{\left(b^2-4 a c-b\sqrt{b^2-4 a c}\right) x}+$$

$$\frac{2 c\left(d+e x^n\right)^q\left(1+\frac{e x^n}{d}\right)^{-q} \text{AppellF1}\left[-\frac{1}{n},1,-q,-\frac{1-n}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},-\frac{e x^n}{d}\right]}{\left(b^2-4 a c+b\sqrt{b^2-4 a c}\right) x}$$

Result (type 8, 31 leaves) :

$$\int \frac{\left(d+e x^n\right)^q}{x^2\left(a+b x^n+c x^{2 n}\right)} \, dx$$

Problem 151: Unable to integrate problem.

$$\int \frac{\left(d+e x^n\right)^q}{x^3\left(a+b x^n+c x^{2 n}\right)} \, dx$$

Optimal (type 6, 210 leaves, 5 steps) :

$$\frac{c\,(d+e\,x^n)^q\left(1+\frac{e\,x^n}{d}\right)^{-q}\text{AppellF1}\left[-\frac{2}{n},1,-q,-\frac{2-n}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}},-\frac{e\,x^n}{d}\right]}{\left(b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)x^2}+\frac{c\,(d+e\,x^n)^q\left(1+\frac{e\,x^n}{d}\right)^{-q}\text{AppellF1}\left[-\frac{2}{n},1,-q,-\frac{2-n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},-\frac{e\,x^n}{d}\right]}{\left(b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)x^2}$$

Result (type 8, 31 leaves):

$$\int\frac{(d+e\,x^n)^q}{x^3\,(a+b\,x^n+c\,x^{2\,n})}\,dx$$

Problem 152: Result more than twice size of optimal antiderivative.

$$\int(f\,x)^m\,(d+e\,x^n)^2\,(a+b\,x^n+c\,x^{2\,n})^p\,dx$$

Optimal (type 6, 498 leaves, 10 steps):

$$\frac{1}{f\,(1+m)}d^2\,(f\,x)^{1+m}\left(1+\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right)^{-p}\left(1+\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right)^{-p}$$
$$(a+b\,x^n+c\,x^{2\,n})^p\,\text{AppellF1}\left[\frac{1+m}{n},-p,-p,\frac{1+m+n}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]+$$
$$\frac{1}{1+m+n}2\,d\,e\,x^{1+n}\,(f\,x)^m\left(1+\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right)^{-p}\left(1+\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right)^{-p}(a+b\,x^n+c\,x^{2\,n})^p$$
$$\text{AppellF1}\left[\frac{1+m+n}{n},-p,-p,\frac{1+m+2\,n}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]+\frac{1}{1+m+2\,n}e^2\,x^{1+2\,n}\,(f\,x)^m\left(1+\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right)^{-p}$$
$$\left(1+\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right)^{-p}(a+b\,x^n+c\,x^{2\,n})^p\,\text{AppellF1}\left[\frac{1+m+2\,n}{n},-p,-p,\frac{1+m+3\,n}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]$$

Result (type 6, 1615 leaves):

$$-\left(\left(2^{-1-p}\left(b+\sqrt{b^2-4\,a\,c}\right)d^2\,(1+m+n)\,x\,(f\,x)^m\left(\frac{b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)^{-p}\left(-b+\sqrt{b^2-4\,a\,c}-2\,c\,x^n\right)\left(\frac{b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n}{c}\right)^p\right.\right.$$
$$\left.\left(-2\,a+\left(-b+\sqrt{b^2-4\,a\,c}\right)x^n\right)^2\left(a+x^n\,(b+c\,x^n)\right)^{-1+p}\,\text{AppellF1}\left[\frac{1+m}{n},-p,-p,\frac{1+m+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(\left(-b+\sqrt{b^2-4\,a\,c}\right)(1+m)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(-2\,a\,(1+m+n)\,\text{AppellF1}\left[\frac{1+m}{n},-p,-p,\frac{1+m+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.\right.$$
$$n\,p\,x^n\left(\left(-b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{1+m+n}{n},1-p,-p,\frac{1+m+2\,n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$
$$\left.\left.\left.\left.\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{1+m+n}{n},-p,1-p,\frac{1+m+2\,n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)\right)+$$

$$\left(2^{-p}\,c\left(b+\sqrt{b^2-4\,a\,c}\right)d\,e\,(1+m+2\,n)\,x^{1+n}\,(f\,x)^m\left(\frac{b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)^{-p}\left(\frac{b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n}{c}\right)^{1+p}\left(-2\,a+\left(-b+\sqrt{b^2-4\,a\,c}\right)x^n\right)^2\right.$$
$$\left.(a+x^n\,(b+c\,x^n))^{-1+p}\,\text{AppellF1}\left[\frac{1+m+n}{n},-p,-p,\frac{1+m+2\,n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(\left(-b+\sqrt{b^2-4\,a\,c}\right)(1+m+n)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\right.$$
$$\left(-2\,a\,(1+m+2\,n)\,\text{AppellF1}\left[\frac{1+m+n}{n},-p,-p,\frac{1+m+2\,n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$n\,p\,x^n\left(\left(-b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{1+m+2\,n}{n},1-p,-p,\frac{1+m+3\,n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$
$$\left.\left.\left.\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{1+m+2\,n}{n},-p,1-p,\frac{1+m+3\,n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)+$$
$$\left(2^{-1-p}\,c\left(b+\sqrt{b^2-4\,a\,c}\right)e^2\,(1+m+3\,n)\,x^{1+2\,n}\,(f\,x)^m\left(\frac{b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)^{-p}\left(\frac{b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n}{c}\right)^{1+p}\left(-2\,a+\left(-b+\sqrt{b^2-4\,a\,c}\right)x^n\right)^2\right.$$
$$\left.(a+x^n\,(b+c\,x^n))^{-1+p}\,\text{AppellF1}\left[\frac{1+m+2\,n}{n},-p,-p,\frac{1+m+3\,n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Big/$$
$$\left(\left(-b+\sqrt{b^2-4\,a\,c}\right)(1+m+2\,n)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\right.$$
$$\left(-2\,a\,(1+m+3\,n)\,\text{AppellF1}\left[\frac{1+m+2\,n}{n},-p,-p,\frac{1+m+3\,n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.$$
$$n\,p\,x^n\left(\left(-b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{1+m+3\,n}{n},1-p,-p,\frac{1+m+4\,n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$
$$\left.\left.\left.\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{1+m+3\,n}{n},-p,1-p,\frac{1+m+4\,n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)$$

Problem 153: Result more than twice size of optimal antiderivative.

$$\int (f\,x)^m\,(d+e\,x^n)\,\left(a+b\,x^n+c\,x^{2\,n}\right)^p\,dx$$

Optimal (type 6, 323 leaves, 7 steps) :

$$\frac{1}{f(1+m)} d\,(f x)^{1+m} \left(1+\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}\right)^{-p} \left(1+\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right)^{-p} \left(a+b x^n+c x^{2 n}\right)^p \text{AppellF1}\left[\frac{1+m}{n},-p,-p,\frac{1+m+n}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]+\frac{1}{1+m+n} e\, x^{1+n} (f x)^m \left(1+\frac{2 c x^n}{b-\sqrt{b^2-4 a c}}\right)^{-p} \left(1+\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right)^{-p} \left(a+b x^n+c x^{2 n}\right)^p \text{AppellF1}\left[\frac{1+m+n}{n},-p,-p,\frac{1+m+2 n}{n},-\frac{2 c x^n}{b-\sqrt{b^2-4 a c}},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}}\right]$$

Result (type 6, 922 leaves) :

$$\frac{1}{\left(-b+\sqrt{b^2-4 a c}\right) (1+m+n) \left(b+\sqrt{b^2-4 a c}+2 c x^n\right)} 2^{-1-p} \left(b+\sqrt{b^2-4 a c}\right) x\, (f x)^m \left(\frac{b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)^{-p} \left(\frac{b-\sqrt{b^2-4 a c}+2 c x^n}{c}\right)^p \left(-2 a+\left(-b+\sqrt{b^2-4 a c}\right) x^n\right)^2 \left(a+x^n \left(b+c x^n\right)\right)^{-1+p}$$
$$\left(\left(d (1+m+n)^2 \left(-b+\sqrt{b^2-4 a c}-2 c x^n\right) \text{AppellF1}\left[\frac{1+m}{n},-p,-p,\frac{1+m+n}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/\right.$$
$$\left((1+m) \left(2 a (1+m+n) \text{AppellF1}\left[\frac{1+m}{n},-p,-p,\frac{1+m+n}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-\right.\right.$$
$$n p x^n \left(\left(-b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{1+m+n}{n},1-p,-p,\frac{1+m+2 n}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-\right.$$
$$\left.\left.\left.\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{1+m+n}{n},-p,1-p,\frac{1+m+2 n}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)+$$
$$\left(e (1+m+2 n) x^n \left(b-\sqrt{b^2-4 a c}+2 c x^n\right) \text{AppellF1}\left[\frac{1+m+n}{n},-p,-p,\frac{1+m+2 n}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\Big/$$
$$\left(-2 a (1+m+2 n) \text{AppellF1}\left[\frac{1+m+n}{n},-p,-p,\frac{1+m+2 n}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]+\right.$$
$$n p x^n \left(\left(-b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{1+m+2 n}{n},1-p,-p,\frac{1+m+3 n}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]-\right.$$
$$\left.\left.\left.\left(b+\sqrt{b^2-4 a c}\right) \text{AppellF1}\left[\frac{1+m+2 n}{n},-p,1-p,\frac{1+m+3 n}{n},-\frac{2 c x^n}{b+\sqrt{b^2-4 a c}},\frac{2 c x^n}{-b+\sqrt{b^2-4 a c}}\right]\right)\right)\right)$$

Problem 154: Result more than twice size of optimal antiderivative.

$$\int (f x)^m \left(a+b x^n+c x^{2 n}\right)^p \, dx$$

Optimal (type 6, 158 leaves, 2 steps) :

$$\frac{1}{f\,(1+m)}(f\,x)^{1+m}\left(1+\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right)^{-p}\left(1+\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right)^{-p}$$
$$\left(a+b\,x^n+c\,x^{2\,n}\right)^p\,\text{AppellF1}\left[\frac{1+m}{n},-p,-p,\frac{1+m+n}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]$$

Result (type 6, 534 leaves):

$$-\left(\left(2^{-1-p}\left(b+\sqrt{b^2-4\,a\,c}\right)(1+m+n)\,x\,(f\,x)^m\left(\frac{b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)^{-p}\left(-b+\sqrt{b^2-4\,a\,c}-2\,c\,x^n\right)\left(\frac{b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n}{c}\right)^p\right.\right.$$
$$\left.\left(-2\,a+\left(-b+\sqrt{b^2-4\,a\,c}\right)x^n\right)^2\left(a+x^n\left(b+c\,x^n\right)\right)^{-1+p}\,\text{AppellF1}\left[\frac{1+m}{n},-p,-p,\frac{1+m+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\Bigg/$$
$$\left(\left(-b+\sqrt{b^2-4\,a\,c}\right)(1+m)\left(b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n\right)\left(-2\,a\,(1+m+n)\,\text{AppellF1}\left[\frac{1+m}{n},-p,-p,\frac{1+m+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]+\right.\right.$$
$$n\,p\,x^n\left(\left(-b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{1+m+n}{n},1-p,-p,\frac{1+m+2\,n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]-\right.$$
$$\left.\left.\left.\left.\left(b+\sqrt{b^2-4\,a\,c}\right)\text{AppellF1}\left[\frac{1+m+n}{n},-p,1-p,\frac{1+m+2\,n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}},\frac{2\,c\,x^n}{-b+\sqrt{b^2-4\,a\,c}}\right]\right)\right)\right)\right)$$

Test results for the 17 problems in "1.2.3.5 P(x) (d x)^m (a+b x^n+c x^(2 n))^p.m"

Problem 1: Result is not expressed in closed-form.

$$\int\frac{d+e\,x+f\,x^2+g\,x^3+h\,x^4+j\,x^5+k\,x^6+l\,x^7+m\,x^8}{a+b\,x^3+c\,x^6}\,dx$$

Optimal (type 3, 1668 leaves, 37 steps):

$$\frac{k\,x}{c}+\frac{l\,x^2}{2\,c}+\frac{m\,x^3}{3\,c}-\frac{\left(g-\frac{b\,k}{c}+\frac{2\,c^2\,d+b^2\,k-c\,(b\,g+2\,a\,k)}{c\,\sqrt{b^2-4\,a\,c}}\right)\text{ArcTan}\left[\frac{1-\frac{2\,2^{1/3}\,c^{1/3}\,x}{\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}}}{\sqrt{3}}\right]}{2^{1/3}\,\sqrt{3}\,c^{1/3}\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}}-$$
$$\frac{\left(h-\frac{b\,l}{c}+\frac{2\,c^2\,e+b^2\,l-c\,(b\,h+2\,a\,l)}{c\,\sqrt{b^2-4\,a\,c}}\right)\text{ArcTan}\left[\frac{1-\frac{2\,2^{1/3}\,c^{1/3}\,x}{\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}}}{\sqrt{3}}\right]}{2^{2/3}\,\sqrt{3}\,c^{2/3}\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}}-\frac{\left(g-\frac{b\,k}{c}-\frac{2\,c^2\,d-b\,c\,g+b^2\,k-2\,a\,c\,k}{c\,\sqrt{b^2-4\,a\,c}}\right)\text{ArcTan}\left[\frac{1-\frac{2\,2^{1/3}\,c^{1/3}\,x}{\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}}}{\sqrt{3}}\right]}{2^{1/3}\,\sqrt{3}\,c^{1/3}\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}}-$$

$$\frac{\left(h-\frac{b\,l}{c}-\frac{2\,c^2\,e-b\,c\,h+b^2\,l-2\,a\,c\,l}{c\,\sqrt{b^2-4\,a\,c}}\right)\,\text{ArcTan}\left[\frac{1-\frac{2\,2^{1/3}\,c^{1/3}\,x}{\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}}}{\sqrt{3}}\right]}{2^{2/3}\,\sqrt{3}\,c^{2/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}}-\frac{\left(2\,c^2\,f-b\,c\,j+b^2\,m-2\,a\,c\,m\right)\,\text{ArcTanh}\left[\frac{b+2\,c\,x^3}{\sqrt{b^2-4\,a\,c}}\right]}{3\,c^2\,\sqrt{b^2-4\,a\,c}}+$$

$$\frac{\left(g-\frac{b\,k}{c}+\frac{2\,c^2\,d+b^2\,k-c\,(b\,g+2\,a\,k)}{c\,\sqrt{b^2-4\,a\,c}}\right)\,\text{Log}\left[\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}+2^{1/3}\,c^{1/3}\,x\right]}{3\times 2^{1/3}\,c^{1/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}}-\frac{\left(h-\frac{b\,l}{c}+\frac{2\,c^2\,e+b^2\,l-c\,(b\,h+2\,a\,l)}{c\,\sqrt{b^2-4\,a\,c}}\right)\,\text{Log}\left[\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}+2^{1/3}\,c^{1/3}\,x\right]}{3\times 2^{2/3}\,c^{2/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}}+$$

$$\frac{\left(g-\frac{b\,k}{c}-\frac{2\,c^2\,d-b\,c\,g+b^2\,k-2\,a\,c\,k}{c\,\sqrt{b^2-4\,a\,c}}\right)\,\text{Log}\left[\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}+2^{1/3}\,c^{1/3}\,x\right]}{3\times 2^{1/3}\,c^{1/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}}-\frac{\left(h-\frac{b\,l}{c}-\frac{2\,c^2\,e-b\,c\,h+b^2\,l-2\,a\,c\,l}{c\,\sqrt{b^2-4\,a\,c}}\right)\,\text{Log}\left[\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}+2^{1/3}\,c^{1/3}\,x\right]}{3\times 2^{2/3}\,c^{2/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}}-$$

$$\frac{\left(g-\frac{b\,k}{c}+\frac{2\,c^2\,d+b^2\,k-c\,(b\,g+2\,a\,k)}{c\,\sqrt{b^2-4\,a\,c}}\right)\,\text{Log}\left[\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}-2^{1/3}\,c^{1/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}\,x+2^{2/3}\,c^{2/3}\,x^2\right]}{6\times 2^{1/3}\,c^{1/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}}+$$

$$\frac{\left(h-\frac{b\,l}{c}+\frac{2\,c^2\,e+b^2\,l-c\,(b\,h+2\,a\,l)}{c\,\sqrt{b^2-4\,a\,c}}\right)\,\text{Log}\left[\left(b-\sqrt{b^2-4\,a\,c}\right)^{2/3}-2^{1/3}\,c^{1/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}\,x+2^{2/3}\,c^{2/3}\,x^2\right]}{6\times 2^{2/3}\,c^{2/3}\,\left(b-\sqrt{b^2-4\,a\,c}\right)^{1/3}}-$$

$$\frac{\left(g-\frac{b\,k}{c}-\frac{2\,c^2\,d-b\,c\,g+b^2\,k-2\,a\,c\,k}{c\,\sqrt{b^2-4\,a\,c}}\right)\,\text{Log}\left[\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}-2^{1/3}\,c^{1/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}\,x+2^{2/3}\,c^{2/3}\,x^2\right]}{6\times 2^{1/3}\,c^{1/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}}+$$

$$\frac{\left(h-\frac{b\,l}{c}-\frac{2\,c^2\,e-b\,c\,h+b^2\,l-2\,a\,c\,l}{c\,\sqrt{b^2-4\,a\,c}}\right)\,\text{Log}\left[\left(b+\sqrt{b^2-4\,a\,c}\right)^{2/3}-2^{1/3}\,c^{1/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}\,x+2^{2/3}\,c^{2/3}\,x^2\right]}{6\times 2^{2/3}\,c^{2/3}\,\left(b+\sqrt{b^2-4\,a\,c}\right)^{1/3}}+\frac{(c\,j-b\,m)\,\text{Log}\left[a+b\,x^3+c\,x^6\right]}{6\,c^2}$$

Result (type 7, 223 leaves) :

$$\frac{1}{6\,c}\left(6\,k\,x+3\,l\,x^2+2\,m\,x^3-2\,\text{RootSum}\left[a+b\,\#1^3+c\,\#1^6\,\&,\right.\right.$$
$$\frac{1}{b\,\#1^2+2\,c\,\#1^5}\left(-c\,d\,\text{Log}[x-\#1]+a\,k\,\text{Log}[x-\#1]-c\,e\,\text{Log}[x-\#1]\,\#1+a\,l\,\text{Log}[x-\#1]\,\#1-c\,f\,\text{Log}[x-\#1]\,\#1^2+a\,m\,\text{Log}[x-\#1]\,\#1^2-\right.$$
$$\left.\left.\left.c\,g\,\text{Log}[x-\#1]\,\#1^3+b\,k\,\text{Log}[x-\#1]\,\#1^3-c\,h\,\text{Log}[x-\#1]\,\#1^4+b\,l\,\text{Log}[x-\#1]\,\#1^4-c\,j\,\text{Log}[x-\#1]\,\#1^5+b\,m\,\text{Log}[x-\#1]\,\#1^5\right)\,\&\right]\right)$$

Problem 2: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{a + b x^n + c x^{2n}} \, dx$$

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):

$$-2 c x \left(\frac{1 - \left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n}, -\frac{1}{n}, \frac{-1+n}{n}, \frac{b-\sqrt{b^2-4 a c}}{b-\sqrt{b^2-4 a c}+2 c x^n}\right]}{b^2 - 4 a c - b \sqrt{b^2 - 4 a c}} + \frac{1 - 2^{-1/n} \left(\frac{c x^n}{b+\sqrt{b^2-4 a c}+2 c x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n}, -\frac{1}{n}, \frac{-1+n}{n}, \frac{b+\sqrt{b^2-4 a c}}{b+\sqrt{b^2-4 a c}+2 c x^n}\right]}{\sqrt{b^2 - 4 a c} \left(b + \sqrt{b^2 - 4 a c}\right)}\right)$$

Problem 4: Result more than twice size of optimal antiderivative.

$$\int \frac{d + e x + f x^2}{a + b x^n + c x^{2n}} \, dx$$

Optimal (type 5, 404 leaves, 11 steps):

$$-\frac{2\,c\,d\,x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}}-\frac{2\,c\,d\,x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}}-$$

$$\frac{c\,e\,x^2\,\text{Hypergeometric2F1}\left[1,\frac{2}{n},\frac{2+n}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}}-\frac{c\,e\,x^2\,\text{Hypergeometric2F1}\left[1,\frac{2}{n},\frac{2+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}}-$$

$$\frac{2\,c\,f\,x^3\,\text{Hypergeometric2F1}\left[1,\frac{3}{n},\frac{3+n}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{3\left(b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)}-\frac{2\,c\,f\,x^3\,\text{Hypergeometric2F1}\left[1,\frac{3}{n},\frac{3+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{3\left(b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)}$$

Result (type 5, 834 leaves):

$$\frac{1}{12\,a\left(-b^2+4\,a\,c\right)}x\left(2\,f\,x^2\left(\left(-b^2+4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)\left(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},-\frac{3}{n},\frac{-3+n}{n},\frac{b-\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n}\right]\right)+\right.\right.$$

$$\left.\left(-b^2+4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)\left(1-8^{-1/n}\left(\frac{c\,x^n}{b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},-\frac{3}{n},\frac{-3+n}{n},\frac{b+\sqrt{b^2-4\,a\,c}}{b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n}\right]\right)\right)+$$

$$3\,e\,x\left(\left(-b^2+4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)\left(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},\frac{b-\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n}\right]\right)+\right.$$

$$\left.\left(-b^2+4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)\left(1-4^{-1/n}\left(\frac{c\,x^n}{b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},\frac{b+\sqrt{b^2-4\,a\,c}}{b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n}\right]\right)\right)+$$

$$6\,d\left(\left(-b^2+4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)\left(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},\frac{b-\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}+2\,c\,x^n}\right]\right)-\right.$$

$$2^{-1/n}\sqrt{b^2-4\,a\,c}\left(-b+\sqrt{b^2-4\,a\,c}\right)\left(\frac{c\,x^n}{b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n}\right)^{-1/n}$$

$$\left.\left.\left(2^{\frac{1}{n}}\left(\frac{c\,x^n}{b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n}\right)^{\frac{1}{n}}-\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},\frac{b+\sqrt{b^2-4\,a\,c}}{b+\sqrt{b^2-4\,a\,c}+2\,c\,x^n}\right]\right)\right)\right)$$

Problem 5: Result more than twice size of optimal antiderivative.

$$\int \frac{d + e\,x + f\,x^2 + g\,x^3}{a + b\,x^n + c\,x^{2\,n}}\,dx$$

Optimal (type 5, 545 leaves, 13 steps):

$$-\frac{2\,c\,d\,x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}}-\frac{2\,c\,d\,x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}}-$$
$$\frac{c\,e\,x^2\,\text{Hypergeometric2F1}\left[1,\frac{2}{n},\frac{2+n}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}}-\frac{c\,e\,x^2\,\text{Hypergeometric2F1}\left[1,\frac{2}{n},\frac{2+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}}-$$
$$\frac{2\,c\,f\,x^3\,\text{Hypergeometric2F1}\left[1,\frac{3}{n},\frac{3+n}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{3\left(b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)}-\frac{2\,c\,f\,x^3\,\text{Hypergeometric2F1}\left[1,\frac{3}{n},\frac{3+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{3\left(b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)}-$$
$$\frac{c\,g\,x^4\,\text{Hypergeometric2F1}\left[1,\frac{4}{n},\frac{4+n}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{2\left(b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)}-\frac{c\,g\,x^4\,\text{Hypergeometric2F1}\left[1,\frac{4}{n},\frac{4+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{2\left(b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)}$$

Result (type 5, 1093 leaves):

$$\frac{1}{24\,a\,\left(-b^2+4\,a\,c\right)}\,x\,\Bigg(3\,g\,x^3\,\Bigg(\left(-b^2+4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)\,\left(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-4/n}\,\text{Hypergeometric2F1}\left[-\frac{4}{n},\,-\frac{4}{n},\,\frac{-4+n}{n},\,\frac{b-\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}\,+2\,c\,x^n}\right]\right)+$$

$$\left(-b^2+4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)\,\left(1-2^{-4/n}\,\left(\frac{c\,x^n}{b+\sqrt{b^2-4\,a\,c}\,+2\,c\,x^n}\right)^{-4/n}\,\text{Hypergeometric2F1}\left[-\frac{4}{n},\,-\frac{4}{n},\,\frac{-4+n}{n},\,\frac{b+\sqrt{b^2-4\,a\,c}}{b+\sqrt{b^2-4\,a\,c}\,+2\,c\,x^n}\right]\right)\Bigg)+$$

$$4\,f\,x^2\,\Bigg(\left(-b^2+4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)\,\left(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\,\text{Hypergeometric2F1}\left[-\frac{3}{n},\,-\frac{3}{n},\,\frac{-3+n}{n},\,\frac{b-\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}\,+2\,c\,x^n}\right]\right)+$$

$$\left(-b^2+4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)\,\left(1-8^{-1/n}\,\left(\frac{c\,x^n}{b+\sqrt{b^2-4\,a\,c}\,+2\,c\,x^n}\right)^{-3/n}\,\text{Hypergeometric2F1}\left[-\frac{3}{n},\,-\frac{3}{n},\,\frac{-3+n}{n},\,\frac{b+\sqrt{b^2-4\,a\,c}}{b+\sqrt{b^2-4\,a\,c}\,+2\,c\,x^n}\right]\right)\Bigg)+$$

$$6\,e\,x\,\Bigg(\left(-b^2+4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)\,\left(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-2/n}\,\text{Hypergeometric2F1}\left[-\frac{2}{n},\,-\frac{2}{n},\,\frac{-2+n}{n},\,\frac{b-\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}\,+2\,c\,x^n}\right]\right)+$$

$$\left(-b^2+4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)\,\left(1-4^{-1/n}\,\left(\frac{c\,x^n}{b+\sqrt{b^2-4\,a\,c}\,+2\,c\,x^n}\right)^{-2/n}\,\text{Hypergeometric2F1}\left[-\frac{2}{n},\,-\frac{2}{n},\,\frac{-2+n}{n},\,\frac{b+\sqrt{b^2-4\,a\,c}}{b+\sqrt{b^2-4\,a\,c}\,+2\,c\,x^n}\right]\right)\Bigg)+$$

$$12\,d\,\Bigg(\left(-b^2+4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)\,\left(1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\,\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,\frac{b-\sqrt{b^2-4\,a\,c}}{b-\sqrt{b^2-4\,a\,c}\,+2\,c\,x^n}\right]\right)-$$

$$2^{-1/n}\,\sqrt{b^2-4\,a\,c}\,\left(-b+\sqrt{b^2-4\,a\,c}\right)\,\left(\frac{c\,x^n}{b+\sqrt{b^2-4\,a\,c}\,+2\,c\,x^n}\right)^{-1/n}$$

$$\left(2^{\frac{1}{n}}\,\left(\frac{c\,x^n}{b+\sqrt{b^2-4\,a\,c}\,+2\,c\,x^n}\right)^{\frac{1}{n}}-\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,\frac{b+\sqrt{b^2-4\,a\,c}}{b+\sqrt{b^2-4\,a\,c}\,+2\,c\,x^n}\right]\right)\Bigg)\Bigg)$$

Problem 6: Result more than twice size of optimal antiderivative.

$$\int \frac{1}{\left(a+b\,x^n+c\,x^{2\,n}\right)^2}\,dx$$

Optimal (type 5, 283 leaves, 4 steps):

$$\frac{x\left(b^2-2\,a\,c+b\,c\,x^n\right)}{a\left(b^2-4\,a\,c\right)n\left(a+b\,x^n+c\,x^{2\,n}\right)}-\frac{c\left(4\,a\,c\,(1-2\,n)-b^2\,(1-n)-b\,\sqrt{b^2-4\,a\,c}\,(1-n)\right)x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{a\left(b^2-4\,a\,c\right)\left(b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)n}-$$

$$\frac{c\left(4\,a\,c\,(1-2\,n)-b^2\,(1-n)+b\,\sqrt{b^2-4\,a\,c}\,(1-n)\right)x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{a\left(b^2-4\,a\,c\right)\left(b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)n}$$

Result (type 5, 2170 leaves):

$$\frac{\left(-b^2+2\,a\,c+b^2\,n-4\,a\,c\,n\right)x}{a^2\left(-b^2+4\,a\,c\right)n}+\frac{\left(b^2-2\,a\,c-b^2\,n+4\,a\,c\,n\right)x}{a^2\left(-b^2+4\,a\,c\right)n}+\frac{x\left(-b^2+2\,a\,c-b\,c\,x^n\right)}{a\left(-b^2+4\,a\,c\right)n\left(a+b\,x^n+c\,x^{2\,n}\right)}-$$

$$\frac{1}{a\left(-b^2+4\,a\,c\right)}b\,c\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{a\left(-b^2+4\,a\,c\right)n}b\,c\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)+$$

$$\frac{1}{a\left(-b^2+4 a c\right)} b^2 x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)-$$

$$\frac{1}{-b^2+4 a c} 4 c x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)-$$

$$\frac{1}{a\left(-b^2+4\,a\,c\right)\,n}b^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\left(\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}\right)^2}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\left(\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}\right)^2}\right)+$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)\,n}2\,c\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\left(\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}\right)^2}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\left(\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}\right)^2}\right)$$

Problem 7: Result more than twice size of optimal antiderivative.

$$\int\frac{d+e\,x}{\left(a+b\,x^n+c\,x^{2\,n}\right)^2}\,dx$$

Optimal (type 5, 738 leaves, 15 steps):

$$\frac{d\,x\,\left(b^2-2\,a\,c+b\,c\,x^n\right)}{a\,\left(b^2-4\,a\,c\right)\,n\,\left(a+b\,x^n+c\,x^{2\,n}\right)}+\frac{e\,x^2\,\left(b^2-2\,a\,c+b\,c\,x^n\right)}{a\,\left(b^2-4\,a\,c\right)\,n\,\left(a+b\,x^n+c\,x^{2\,n}\right)}-$$

$$\frac{c\,d\,\left(4\,a\,c\,(1-2\,n)-b^2\,(1-n)-b\,\sqrt{b^2-4\,a\,c}\,(1-n)\right)\,x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{a\,\left(b^2-4\,a\,c\right)\,\left(b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)\,n}-$$

$$\frac{c\,d\,\left(4\,a\,c\,(1-2\,n)-b^2\,(1-n)+b\,\sqrt{b^2-4\,a\,c}\,(1-n)\right)\,x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{a\,\left(b^2-4\,a\,c\right)\,\left(b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)\,n}-$$

$$\frac{c\,e\,\left(4\,a\,c\,(1-n)-b^2\,(2-n)\right)\,x^2\,\text{Hypergeometric2F1}\left[1,\frac{2}{n},\frac{2+n}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{a\,\left(b^2-4\,a\,c\right)\,\left(b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)\,n}-$$

$$\frac{c\,e\,\left(4\,a\,c\,(1-n)-b^2\,(2-n)\right)\,x^2\,\text{Hypergeometric2F1}\left[1,\frac{2}{n},\frac{2+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{a\,\left(b^2-4\,a\,c\right)\,\left(b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)\,n}-$$

$$\frac{2\,b\,c^2\,e\,(2-n)\,x^{2+n}\,\text{Hypergeometric2F1}\left[1,\frac{2+n}{n},2\,\left(1+\frac{1}{n}\right),-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{a\,\left(b^2-4\,a\,c\right)^{3/2}\,\left(b-\sqrt{b^2-4\,a\,c}\right)\,n\,(2+n)}+\frac{2\,b\,c^2\,e\,(2-n)\,x^{2+n}\,\text{Hypergeometric2F1}\left[1,\frac{2+n}{n},2\,\left(1+\frac{1}{n}\right),-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{a\,\left(b^2-4\,a\,c\right)^{3/2}\,\left(b+\sqrt{b^2-4\,a\,c}\right)\,n\,(2+n)}$$

Result (type 5, 4162 leaves) :

$$\frac{x\,(d+e\,x)\,\left(-b^2+2\,a\,c-b\,c\,x^n\right)}{a\,\left(-b^2+4\,a\,c\right)\,n\,\left(a+b\,x^n+c\,x^{2\,n}\right)}-\frac{1}{2\,a\,\left(-b^2+4\,a\,c\right)}b\,c\,e\,x^{2+n}\,\left(x^n\right)^{\frac{2}{n}-\frac{2+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-2/n}\,\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-2/n}\,\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{a\left(-b^2+4\,a\,c\right)\,n}\,b\,c\,e\,x^{2+n}\,\left(x^n\right)^{\frac{2}{n}-\frac{2+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-2/n}\,\text{Hypergeometric2F1}\left[-\frac{2}{n},\,-\frac{2}{n},\,\frac{-2+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-2/n}\,\text{Hypergeometric2F1}\left[-\frac{2}{n},\,-\frac{2}{n},\,\frac{-2+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{2\,a\left(-b^2+4\,a\,c\right)}\,b^2\,e\,x^2\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-2/n}\,\text{Hypergeometric2F1}\left[-\frac{2}{n},\,-\frac{2}{n},\,\frac{-2+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-2/n}\,\text{Hypergeometric2F1}\left[-\frac{2}{n},\,-\frac{2}{n},\,\frac{-2+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{-b^2+4\,a\,c}\,2\,c\,e\,x^2\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-2/n}\,\text{Hypergeometric2F1}\left[-\frac{2}{n},\,-\frac{2}{n},\,\frac{-2+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)-$$

$$\frac{1}{a\left(-b^2+4 a c\right) n}b^2 e\, x^2\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)+$$

$$\frac{1}{\left(-b^2+4 a c\right) n}2 c\, e\, x^2\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c\left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)-$$

$$\frac{1}{a\left(-b^2+4\,a\,c\right)}b\,c\,d\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{a\left(-b^2+4\,a\,c\right)n}b\,c\,d\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{a\left(-b^2+4\,a\,c\right)}b^2\,d\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{-b^2+4ac}4cdx\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}\right.+$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{a\left(-b^2+4ac\right)n}b^2dx\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}\right.+$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{\left(-b^2+4 a c\right) n} 2 c d x \left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b-\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b-\sqrt{b^2-4 a c}\right)^2}{2 c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\frac{b \left(-b+\sqrt{b^2-4 a c}\right)}{2 c}+\frac{\left(-b+\sqrt{b^2-4 a c}\right)^2}{2 c}}\right)$$

Problem 8: Result more than twice size of optimal antiderivative.

$$\int \frac{d+e x+f x^2}{\left(a+b x^n+c x^{2 n}\right)^2} \, dx$$

Optimal (type 5, 1194 leaves, 24 steps):

$$\frac{d\,x\,(b^2-2\,a\,c+b\,c\,x^n)}{a\,(b^2-4\,a\,c)\,n\,(a+b\,x^n+c\,x^{2\,n})}+\frac{e\,x^2\,(b^2-2\,a\,c+b\,c\,x^n)}{a\,(b^2-4\,a\,c)\,n\,(a+b\,x^n+c\,x^{2\,n})}+\frac{f\,x^3\,(b^2-2\,a\,c+b\,c\,x^n)}{a\,(b^2-4\,a\,c)\,n\,(a+b\,x^n+c\,x^{2\,n})}-$$

$$\frac{c\,d\,\left(4\,a\,c\,(1-2\,n)-b^2\,(1-n)-b\,\sqrt{b^2-4\,a\,c}\,(1-n)\right)\,x\,\text{Hypergeometric2F1}\left[1,\,\frac{1}{n},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{a\,(b^2-4\,a\,c)\,\left(b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)\,n}-$$

$$\frac{c\,d\,\left(4\,a\,c\,(1-2\,n)-b^2\,(1-n)+b\,\sqrt{b^2-4\,a\,c}\,(1-n)\right)\,x\,\text{Hypergeometric2F1}\left[1,\,\frac{1}{n},\,1+\frac{1}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{a\,(b^2-4\,a\,c)\,\left(b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)\,n}-$$

$$\frac{c\,e\,\left(4\,a\,c\,(1-n)-b^2\,(2-n)\right)\,x^2\,\text{Hypergeometric2F1}\left[1,\,\frac{2}{n},\,\frac{2+n}{n},\,-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{a\,(b^2-4\,a\,c)\,\left(b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)\,n}-$$

$$\frac{c\,e\,\left(4\,a\,c\,(1-n)-b^2\,(2-n)\right)\,x^2\,\text{Hypergeometric2F1}\left[1,\,\frac{2}{n},\,\frac{2+n}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{a\,(b^2-4\,a\,c)\,\left(b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)\,n}-$$

$$\frac{2\,c\,f\,\left(2\,a\,c\,(3-2\,n)-b^2\,(3-n)\right)\,x^3\,\text{Hypergeometric2F1}\left[1,\,\frac{3}{n},\,\frac{3+n}{n},\,-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{3\,a\,(b^2-4\,a\,c)\,\left(b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)\,n}-$$

$$\frac{2\,c\,f\,\left(2\,a\,c\,(3-2\,n)-b^2\,(3-n)\right)\,x^3\,\text{Hypergeometric2F1}\left[1,\,\frac{3}{n},\,\frac{3+n}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{3\,a\,(b^2-4\,a\,c)\,\left(b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)\,n}-$$

$$\frac{2\,b\,c^2\,e\,(2-n)\,x^{2+n}\,\text{Hypergeometric2F1}\left[1,\,\frac{2+n}{n},\,2\,\left(1+\frac{1}{n}\right),\,-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{a\,(b^2-4\,a\,c)^{3/2}\,\left(b-\sqrt{b^2-4\,a\,c}\right)\,n\,(2+n)}+\frac{2\,b\,c^2\,e\,(2-n)\,x^{2+n}\,\text{Hypergeometric2F1}\left[1,\,\frac{2+n}{n},\,2\,\left(1+\frac{1}{n}\right),\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{a\,(b^2-4\,a\,c)^{3/2}\,\left(b+\sqrt{b^2-4\,a\,c}\right)\,n\,(2+n)}-$$

$$\frac{2\,b\,c^2\,f\,(3-n)\,x^{3+n}\,\text{Hypergeometric2F1}\left[1,\,\frac{3+n}{n},\,2+\frac{3}{n},\,-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{a\,(b^2-4\,a\,c)^{3/2}\,\left(b-\sqrt{b^2-4\,a\,c}\right)\,n\,(3+n)}+\frac{2\,b\,c^2\,f\,(3-n)\,x^{3+n}\,\text{Hypergeometric2F1}\left[1,\,\frac{3+n}{n},\,2+\frac{3}{n},\,-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{a\,(b^2-4\,a\,c)^{3/2}\,\left(b+\sqrt{b^2-4\,a\,c}\right)\,n\,(3+n)}$$

Result (type 5, 6525 leaves) :

$$\frac{b^2\,e\,x^2}{2\,a^2\,(-b^2+4\,a\,c)}-\frac{2\,c\,e\,x^2}{a\,(-b^2+4\,a\,c)}-\frac{b^2\,e\,x^2}{a^2\,(-b^2+4\,a\,c)\,n}+\frac{2\,c\,e\,x^2}{a\,(-b^2+4\,a\,c)\,n}+\frac{e\,(2\,b^2-4\,a\,c-b^2\,n+4\,a\,c\,n)\,x^2}{2\,a^2\,(-b^2+4\,a\,c)\,n}+\frac{b^2\,f\,x^3}{3\,a^2\,(-b^2+4\,a\,c)}-$$

$$\frac{4\,c\,f\,x^3}{3\,a\,(-b^2+4\,a\,c)}-\frac{b^2\,f\,x^3}{a^2\,(-b^2+4\,a\,c)\,n}+\frac{2\,c\,f\,x^3}{a\,(-b^2+4\,a\,c)\,n}+\frac{f\,(3\,b^2-6\,a\,c-b^2\,n+4\,a\,c\,n)\,x^3}{3\,a^2\,(-b^2+4\,a\,c)\,n}+\frac{x\,(d+e\,x+f\,x^2)\,(-b^2+2\,a\,c-b\,c\,x^n)}{a\,(-b^2+4\,a\,c)\,n\,(a+b\,x^n+c\,x^{2\,n})}-$$

$$\frac{1}{3\,a\,\left(-b^2+4\,a\,c\right)}b\,c\,f\,x^{3+n}\,\left(x^n\right)^{\frac{3}{n}-\frac{3+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},\,-\frac{3}{n},\,\frac{-3+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},\,-\frac{3}{n},\,\frac{-3+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{a\,\left(-b^2+4\,a\,c\right)\,n}b\,c\,f\,x^{3+n}\,\left(x^n\right)^{\frac{3}{n}-\frac{3+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},\,-\frac{3}{n},\,\frac{-3+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},\,-\frac{3}{n},\,\frac{-3+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{3\,a\,\left(-b^2+4\,a\,c\right)}b^2\,f\,x^3\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},\,-\frac{3}{n},\,\frac{-3+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},-\frac{3}{n},\frac{-3+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{3\left(-b^2+4\,a\,c\right)}4\,c\,f\,x^3\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},-\frac{3}{n},\frac{-3+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},-\frac{3}{n},\frac{-3+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{a\left(-b^2+4\,a\,c\right)n}b^2\,f\,x^3\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},-\frac{3}{n},\frac{-3+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},-\frac{3}{n},\frac{-3+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)+$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)\,n}2\,c\,f\,x^3\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},\,-\frac{3}{n},\,\frac{-3+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},\,-\frac{3}{n},\,\frac{-3+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{2\,a\,\left(-b^2+4\,a\,c\right)}b\,c\,e\,x^{2+n}\left(x^n\right)^{\frac{2}{n}-\frac{2+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},\,-\frac{2}{n},\,\frac{-2+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},\,-\frac{2}{n},\,\frac{-2+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{a\,\left(-b^2+4\,a\,c\right)\,n}b\,c\,e\,x^{2+n}\left(x^n\right)^{\frac{2}{n}-\frac{2+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},\,-\frac{2}{n},\,\frac{-2+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{2a\left(-b^2+4ac\right)}b^2 e x^2\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{-b^2+4ac}2c e x^2\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{a\left(-b^2+4ac\right)n}b^2 e x^2\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{\left(-b^2+4ac\right)n}2 c e x^2\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{a\left(-b^2+4ac\right)}b c d x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{a\left(-b^2+4ac\right)n}b\,c\,d\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{a\left(-b^2+4ac\right)}b^2\,d\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{-b^2+4\,a\,c}4\,c\,d\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\texttt{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\texttt{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{a\left(-b^2+4\,a\,c\right)\,n}b^2\,d\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\texttt{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\texttt{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)+$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)\,n}2\,c\,d\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\texttt{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]$$
$$\frac{}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\Bigg)$$

Problem 9: Result more than twice size of optimal antiderivative.

$$\int\frac{d+e\,x+f\,x^2+g\,x^3}{\left(a+b\,x^n+c\,x^{2n}\right)^2}\,dx$$

Optimal (type 5, 1654 leaves, 33 steps):

$$\frac{d\,x\left(b^2-2ac+b\,c\,x^n\right)}{a\left(b^2-4ac\right)n\left(a+b\,x^n+c\,x^{2n}\right)}+\frac{e\,x^2\left(b^2-2ac+b\,c\,x^n\right)}{a\left(b^2-4ac\right)n\left(a+b\,x^n+c\,x^{2n}\right)}+\frac{f\,x^3\left(b^2-2ac+b\,c\,x^n\right)}{a\left(b^2-4ac\right)n\left(a+b\,x^n+c\,x^{2n}\right)}+$$
$$\frac{g\,x^4\left(b^2-2ac+b\,c\,x^n\right)}{a\left(b^2-4ac\right)n\left(a+b\,x^n+c\,x^{2n}\right)}-\frac{c\,d\left(4ac\,(1-2n)-b^2\,(1-n)-b\sqrt{b^2-4ac}\,(1-n)\right)x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2c\,x^n}{b-\sqrt{b^2-4ac}}\right]}{a\left(b^2-4ac\right)\left(b^2-4ac-b\sqrt{b^2-4ac}\right)n}-$$
$$\frac{c\,d\left(4ac\,(1-2n)-b^2\,(1-n)+b\sqrt{b^2-4ac}\,(1-n)\right)x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2c\,x^n}{b+\sqrt{b^2-4ac}}\right]}{a\left(b^2-4ac\right)\left(b^2-4ac+b\sqrt{b^2-4ac}\right)n}-$$
$$\frac{c\,e\left(4ac\,(1-n)-b^2\,(2-n)\right)x^2\,\text{Hypergeometric2F1}\left[1,\frac{2}{n},\frac{2+n}{n},-\frac{2c\,x^n}{b-\sqrt{b^2-4ac}}\right]}{a\left(b^2-4ac\right)\left(b^2-4ac-b\sqrt{b^2-4ac}\right)n}-$$
$$\frac{c\,e\left(4ac\,(1-n)-b^2\,(2-n)\right)x^2\,\text{Hypergeometric2F1}\left[1,\frac{2}{n},\frac{2+n}{n},-\frac{2c\,x^n}{b+\sqrt{b^2-4ac}}\right]}{a\left(b^2-4ac\right)\left(b^2-4ac+b\sqrt{b^2-4ac}\right)n}-$$
$$\frac{2c\,f\left(2ac\,(3-2n)-b^2\,(3-n)\right)x^3\,\text{Hypergeometric2F1}\left[1,\frac{3}{n},\frac{3+n}{n},-\frac{2c\,x^n}{b-\sqrt{b^2-4ac}}\right]}{3a\left(b^2-4ac\right)\left(b^2-4ac-b\sqrt{b^2-4ac}\right)n}-$$
$$\frac{2c\,f\left(2ac\,(3-2n)-b^2\,(3-n)\right)x^3\,\text{Hypergeometric2F1}\left[1,\frac{3}{n},\frac{3+n}{n},-\frac{2c\,x^n}{b+\sqrt{b^2-4ac}}\right]}{3a\left(b^2-4ac\right)\left(b^2-4ac+b\sqrt{b^2-4ac}\right)n}-$$

$$\frac{c\,g\,\left(4\,a\,c\,(2-n)-b^2\,(4-n)\right)\,x^4\,\text{Hypergeometric2F1}\left[1,\frac{4}{n},\frac{4+n}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{2\,a\,\left(b^2-4\,a\,c\right)\,\left(b^2-4\,a\,c-b\,\sqrt{b^2-4\,a\,c}\right)\,n}-$$

$$\frac{c\,g\,\left(4\,a\,c\,(2-n)-b^2\,(4-n)\right)\,x^4\,\text{Hypergeometric2F1}\left[1,\frac{4}{n},\frac{4+n}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{2\,a\,\left(b^2-4\,a\,c\right)\,\left(b^2-4\,a\,c+b\,\sqrt{b^2-4\,a\,c}\right)\,n}-$$

$$\frac{2\,b\,c^2\,e\,(2-n)\,x^{2+n}\,\text{Hypergeometric2F1}\left[1,\frac{2+n}{n},2\left(1+\frac{1}{n}\right),-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{a\,\left(b^2-4\,a\,c\right)^{3/2}\,\left(b-\sqrt{b^2-4\,a\,c}\right)\,n\,(2+n)}+\frac{2\,b\,c^2\,e\,(2-n)\,x^{2+n}\,\text{Hypergeometric2F1}\left[1,\frac{2+n}{n},2\left(1+\frac{1}{n}\right),-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{a\,\left(b^2-4\,a\,c\right)^{3/2}\,\left(b+\sqrt{b^2-4\,a\,c}\right)\,n\,(2+n)}-$$

$$\frac{2\,b\,c^2\,f\,(3-n)\,x^{3+n}\,\text{Hypergeometric2F1}\left[1,\frac{3+n}{n},2+\frac{3}{n},-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{a\,\left(b^2-4\,a\,c\right)^{3/2}\,\left(b-\sqrt{b^2-4\,a\,c}\right)\,n\,(3+n)}+\frac{2\,b\,c^2\,f\,(3-n)\,x^{3+n}\,\text{Hypergeometric2F1}\left[1,\frac{3+n}{n},2+\frac{3}{n},-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{a\,\left(b^2-4\,a\,c\right)^{3/2}\,\left(b+\sqrt{b^2-4\,a\,c}\right)\,n\,(3+n)}-$$

$$\frac{2\,b\,c^2\,g\,(4-n)\,x^{4+n}\,\text{Hypergeometric2F1}\left[1,\frac{4+n}{n},2\left(1+\frac{2}{n}\right),-\frac{2\,c\,x^n}{b-\sqrt{b^2-4\,a\,c}}\right]}{a\,\left(b^2-4\,a\,c\right)^{3/2}\,\left(b-\sqrt{b^2-4\,a\,c}\right)\,n\,(4+n)}+\frac{2\,b\,c^2\,g\,(4-n)\,x^{4+n}\,\text{Hypergeometric2F1}\left[1,\frac{4+n}{n},2\left(1+\frac{2}{n}\right),-\frac{2\,c\,x^n}{b+\sqrt{b^2-4\,a\,c}}\right]}{a\,\left(b^2-4\,a\,c\right)^{3/2}\,\left(b+\sqrt{b^2-4\,a\,c}\right)\,n\,(4+n)}$$

Result (type 5, 8737 leaves) :

$$\frac{b^2\,e\,x^2}{2\,a^2\,\left(-b^2+4\,a\,c\right)}-\frac{2\,c\,e\,x^2}{a\,\left(-b^2+4\,a\,c\right)}-\frac{b^2\,e\,x^2}{a^2\,\left(-b^2+4\,a\,c\right)\,n}+\frac{2\,c\,e\,x^2}{a\,\left(-b^2+4\,a\,c\right)\,n}+\frac{e\,\left(2\,b^2-4\,a\,c-b^2\,n+4\,a\,c\,n\right)\,x^2}{2\,a^2\,\left(-b^2+4\,a\,c\right)\,n}+\frac{b^2\,f\,x^3}{3\,a^2\,\left(-b^2+4\,a\,c\right)}-$$

$$\frac{4\,c\,f\,x^3}{3\,a\,\left(-b^2+4\,a\,c\right)}-\frac{b^2\,f\,x^3}{a^2\,\left(-b^2+4\,a\,c\right)\,n}+\frac{2\,c\,f\,x^3}{a\,\left(-b^2+4\,a\,c\right)\,n}+\frac{f\,\left(3\,b^2-6\,a\,c-b^2\,n+4\,a\,c\,n\right)\,x^3}{3\,a^2\,\left(-b^2+4\,a\,c\right)\,n}+\frac{b^2\,g\,x^4}{4\,a^2\,\left(-b^2+4\,a\,c\right)}-\frac{c\,g\,x^4}{a\,\left(-b^2+4\,a\,c\right)}-$$

$$\frac{b^2\,g\,x^4}{a^2\,\left(-b^2+4\,a\,c\right)\,n}+\frac{2\,c\,g\,x^4}{a\,\left(-b^2+4\,a\,c\right)\,n}+\frac{g\,\left(4\,b^2-8\,a\,c-b^2\,n+4\,a\,c\,n\right)\,x^4}{4\,a^2\,\left(-b^2+4\,a\,c\right)\,n}+\frac{x\,\left(d+e\,x+f\,x^2+g\,x^3\right)\,\left(-b^2+2\,a\,c-b\,c\,x^n\right)}{a\,\left(-b^2+4\,a\,c\right)\,n\,\left(a+b\,x^n+c\,x^{2\,n}\right)}-$$

$$\frac{1}{4\,a\,\left(-b^2+4\,a\,c\right)}b\,c\,g\,x^{4+n}\,\left(x^n\right)^{\frac{4}{n}-\frac{4+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-4/n}\text{Hypergeometric2F1}\left[-\frac{4}{n},-\frac{4}{n},\frac{-4+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-4/n}\text{Hypergeometric2F1}\left[-\frac{4}{n},-\frac{4}{n},\frac{-4+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{a\left(-b^2+4ac\right)n}b\,c\,g\,x^{4+n}\left(x^n\right)^{\frac{4}{n}-\frac{4+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-4/n}\text{Hypergeometric2F1}\left[-\frac{4}{n},-\frac{4}{n},\frac{-4+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-4/n}\text{Hypergeometric2F1}\left[-\frac{4}{n},-\frac{4}{n},\frac{-4+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{4a\left(-b^2+4ac\right)}b^2\,g\,x^4\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-4/n}\text{Hypergeometric2F1}\left[-\frac{4}{n},-\frac{4}{n},\frac{-4+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-4/n}\text{Hypergeometric2F1}\left[-\frac{4}{n},-\frac{4}{n},\frac{-4+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{-b^2+4\,a\,c}c\,g\,x^4\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-4/n}\text{Hypergeometric2F1}\left[-\frac{4}{n},\,-\frac{4}{n},\,\frac{-4+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-4/n}\text{Hypergeometric2F1}\left[-\frac{4}{n},\,-\frac{4}{n},\,\frac{-4+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{a\left(-b^2+4\,a\,c\right)n}b^2\,g\,x^4\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-4/n}\text{Hypergeometric2F1}\left[-\frac{4}{n},\,-\frac{4}{n},\,\frac{-4+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-4/n}\text{Hypergeometric2F1}\left[-\frac{4}{n},\,-\frac{4}{n},\,\frac{-4+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)+$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)n}2\,c\,g\,x^4\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-4/n}\text{Hypergeometric2F1}\left[-\frac{4}{n},\,-\frac{4}{n},\,\frac{-4+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-4/n}\text{Hypergeometric2F1}\left[-\frac{4}{n},\,-\frac{4}{n},\,\frac{-4+n}{n},\,-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{3a\left(-b^2+4ac\right)}b\,c\,f\,x^{3+n}\left(x^n\right)^{\frac{3}{n}-\frac{3+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},\,-\frac{3}{n},\,\frac{-3+n}{n},\,-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},\,-\frac{3}{n},\,\frac{-3+n}{n},\,-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{a\left(-b^2+4ac\right)n}b\,c\,f\,x^{3+n}\left(x^n\right)^{\frac{3}{n}-\frac{3+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},\,-\frac{3}{n},\,\frac{-3+n}{n},\,-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},\,-\frac{3}{n},\,\frac{-3+n}{n},\,-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{3\,a\,\left(-b^2+4\,a\,c\right)}b^2\,f\,x^3\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},-\frac{3}{n},\frac{-3+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},-\frac{3}{n},\frac{-3+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{3\,\left(-b^2+4\,a\,c\right)}4\,c\,f\,x^3\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},-\frac{3}{n},\frac{-3+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},-\frac{3}{n},\frac{-3+n}{n},-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{a\,\left(-b^2+4\,a\,c\right)\,n}b^2\,f\,x^3\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},-\frac{3}{n},\frac{-3+n}{n},-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},-\frac{3}{n},\frac{-3+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{\left(-b^2+4ac\right)n}2cfx^3\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},-\frac{3}{n},\frac{-3+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-3/n}\text{Hypergeometric2F1}\left[-\frac{3}{n},-\frac{3}{n},\frac{-3+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{2a\left(-b^2+4ac\right)}bcex^{2+n}\left(x^n\right)^{\frac{2}{n}-\frac{2+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{a\left(-b^2+4ac\right)n} b\,c\,e\,x^{2+n}\left(x^n\right)^{\frac{2}{n}-\frac{2+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{2a\left(-b^2+4ac\right)} b^2\,e\,x^2\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{-b^2+4ac} 2\,c\,e\,x^2\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},-\frac{2}{n},\frac{-2+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},\,-\frac{2}{n},\,\frac{-2+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{a\left(-b^2+4\,a\,c\right)n}b^2\,e\,x^2\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},\,-\frac{2}{n},\,\frac{-2+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},\,-\frac{2}{n},\,\frac{-2+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)+$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)n}2\,c\,e\,x^2\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},\,-\frac{2}{n},\,\frac{-2+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-2/n}\text{Hypergeometric2F1}\left[-\frac{2}{n},\,-\frac{2}{n},\,\frac{-2+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b+\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}\right)-$$

$$\frac{1}{a\left(-b^2+4ac\right)} b\,c\,d\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{a\left(-b^2+4ac\right)n} b\,c\,d\,x^{1+n}\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\sqrt{b^2-4ac}}\right)+$$

$$\frac{1}{a\left(-b^2+4ac\right)} b^2\,d\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\Bigg)-$$

$$\frac{1}{-b^2+4ac}4cdx\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\Bigg)-$$

$$\frac{1}{a\left(-b^2+4ac\right)n}b^2dx\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\Bigg)+$$

$$\frac{1}{\left(-b^2+4ac\right)n}2cdx\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)$$

Problem 17: Result more than twice size of optimal antiderivative.

$$\int\frac{A+B\,x^n+C\,x^{2n}+D\,x^{3n}}{\left(a+b\,x^n+c\,x^{2n}\right)^2}\,dx$$

Optimal (type 5, 494 leaves, 4 steps):

$$\frac{x\left(A\,c\left(b^2-2ac\right)-a\left(b\,B\,c-2ac\,C+a\,b\,D\right)+\left(b\,c\left(A\,c+a\,C\right)-a\,b^2\,D-2ac\left(B\,c-a\,D\right)\right)x^n\right)}{a\,c\left(b^2-4ac\right)n\left(a+b\,x^n+c\,x^{2n}\right)}+$$

$$\left(\left(a\,b^2\,D-b\,c\left(A\,c+a\,C\right)(1-n)+2ac\left(B\,c(1-n)-a\,D(1+n)\right)+\right.\right.$$

$$\left.\frac{A\,c^2\left(4ac(1-2n)-b^2(1-n)\right)-a\left(4ac^2\,C+b^3\,D-b^2\,c\,C(1-n)-2bc\left(B\,c\,n+a\,D(2+n)\right)\right)}{\sqrt{b^2-4ac}}\right)$$

$$\left.x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2c\,x^n}{b-\sqrt{b^2-4ac}}\right]\right)\Big/\left(a\,c\left(b^2-4ac\right)\left(b-\sqrt{b^2-4ac}\right)n\right)+$$

$$\left(\left(a\,b^2\,D-b\,c\left(A\,c+a\,C\right)(1-n)+2ac\left(B\,c(1-n)-a\,D(1+n)\right)-\right.\right.$$

$$\left.\frac{A\,c^2\left(4ac(1-2n)-b^2(1-n)\right)-a\left(4ac^2\,C+b^3\,D-b^2\,c\,C(1-n)-2bc\left(B\,c\,n+a\,D(2+n)\right)\right)}{\sqrt{b^2-4ac}}\right)$$

$$\left.x\,\text{Hypergeometric2F1}\left[1,\frac{1}{n},1+\frac{1}{n},-\frac{2c\,x^n}{b+\sqrt{b^2-4ac}}\right]\right)\Big/\left(a\,c\left(b^2-4ac\right)\left(b+\sqrt{b^2-4ac}\right)n\right)$$

Result (type 5, 5439 leaves):

$$\frac{\left(-A b^2 c+a b B c+2 a A c^2-2 a^2 c C+a^2 b D+A b^2 c n-4 a A c^2 n\right) x}{a^2 c \left(-b^2+4 a c\right) n}+\frac{\left(A b^2 c-a b B c-2 a A c^2+2 a^2 c C-a^2 b D-A b^2 c n+4 a A c^2 n\right) x}{a^2 c \left(-b^2+4 a c\right) n}-$$

$$\frac{x \left(A b^2 c-a b B c-2 a A c^2+2 a^2 c C-a^2 b D+A b c^2 x^n-2 a B c^2 x^n+a b c C x^n-a b^2 D x^n+2 a^2 c D x^n\right)}{a c \left(-b^2+4 a c\right) n \left(a+b x^n+c x^{2 n}\right)}-$$

$$\frac{1}{a \left(-b^2+4 a c\right)} A b c x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)+$$

$$\frac{1}{-b^2+4 a c} 2 B c x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)-$$

$$\frac{1}{-b^2+4\,a\,c} b\,C\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{-b^2+4\,a\,c} 2\,a\,D\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{a\,\left(-b^2+4\,a\,c\right)\,n} A\,b\,c\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)-$$

$$\frac{1}{\left(-b^2+4 a c\right) n} 2 B c x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)+$$

$$\frac{1}{\left(-b^2+4 a c\right) n} b C x^{1+n} \left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}} \left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b-\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n}\right)^{-1/n} \text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4 a c}}{2 c \left(-\frac{-b+\sqrt{b^2-4 a c}}{2 c}+x^n\right)}\right]}{\sqrt{b^2-4 a c}}\right)+$$

$$\frac{1}{\left(-b^2+4\,a\,c\right)\,n}2\,a\,D\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)-$$

$$\frac{1}{c\,\left(-b^2+4\,a\,c\right)\,n}b^2\,D\,x^{1+n}\,\left(x^n\right)^{\frac{1}{n}-\frac{1+n}{n}}\left(-\frac{\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}+\right.$$

$$\left.\frac{\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b+\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\sqrt{b^2-4\,a\,c}}\right)+$$

$$\frac{1}{a\,\left(-b^2+4\,a\,c\right)}A\,b^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},\,-\frac{1}{n},\,\frac{-1+n}{n},\,-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c\,\left(-\frac{-b-\sqrt{b^2-4\,a\,c}}{2\,c}+x^n\right)}\right]}{\frac{b\,\left(-b-\sqrt{b^2-4\,a\,c}\right)}{2\,c}+\frac{\left(-b-\sqrt{b^2-4\,a\,c}\right)^2}{2\,c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{-b^2+4ac}4\,A\,c\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{a\left(-b^2+4ac\right)n}A\,b^2\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{\left(-b^2+4ac\right)n}b\,B\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{\left(-b^2+4ac\right)n}2\,A\,c\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)-$$

$$\frac{1}{\left(-b^2+4ac\right)n}2\,a\,C\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

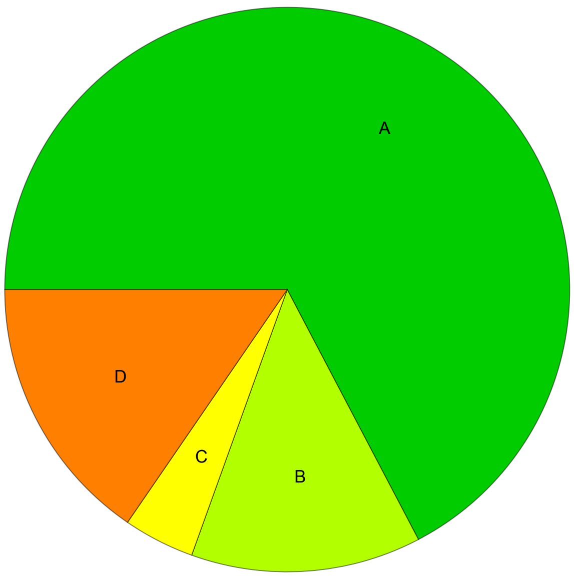
$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)+$$

$$\frac{1}{c\left(-b^2+4ac\right)n}a\,b\,D\,x\left(\frac{1-\left(\frac{x^n}{-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b-\sqrt{b^2-4ac}}{2c\left(-\frac{-b-\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b-\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b-\sqrt{b^2-4ac}\right)^2}{2c}}+\right.$$

$$\left.\frac{1-\left(\frac{x^n}{-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n}\right)^{-1/n}\text{Hypergeometric2F1}\left[-\frac{1}{n},-\frac{1}{n},\frac{-1+n}{n},-\frac{-b+\sqrt{b^2-4ac}}{2c\left(-\frac{-b+\sqrt{b^2-4ac}}{2c}+x^n\right)}\right]}{\frac{b\left(-b+\sqrt{b^2-4ac}\right)}{2c}+\frac{\left(-b+\sqrt{b^2-4ac}\right)^2}{2c}}\right)$$

Summary of Integration Test Results

933 integration problems



A - 628 optimal antiderivatives

B - 123 more than twice size of optimal antiderivatives

C - 38 unnecessarily complex antiderivatives

D - 144 unable to integrate problems

E - 0 integration timeouts