Mathematica 11.3 Integration Test Results

Test results for the 641 problems in "3.4 u (a+b log(c (d+e x^m)^n))^p.m"

Problem 80: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Log}\left[c \left(a+b x^2\right)^p\right]^2}{x} \, dx$$

Optimal (type 4, 72 leaves, 5 steps):

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

Result (type 4, 163 leaves):

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

Problem 81: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 80 leaves, 4 steps):

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

Result (type 4, 446 leaves):

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

Problem 82: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\mathrm{Log}\left[c\,\left(a+b\,x^2\right)^p\right]^2}{x^5}\,dx$$

Optimal (type 4, 129 leaves, 8 steps):

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

Result (type 4, 550 leaves):

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

Problem 83: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{Log}\left[c\left(a+b x^2\right)^p\right]^2}{x^7}\,dx$$

Optimal (type 4, 193 leaves, 12 steps):

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

Result (type 4, 583 leaves):

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

Problem 87: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Log}\left[c \left(a+b x^2\right)^p\right]^2}{x^2}\, dx$$

Optimal (type 4, 190 leaves, 7 steps):

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

Result (type 4, 387 leaves):

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

Problem 94: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 106 leaves, 6 steps):

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

Result (type 4, 279 leaves):

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

Problem 95: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 119 leaves, 6 steps):

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

Result (type 4, 627 leaves):

$$\frac{1}{2\,a\,x^2}\Bigg(a\,\left(p\,\mathrm{Log}\left[a+b\,x^2\right]-\mathrm{Log}\left[c\,\left(a+b\,x^2\right)^p\right]\right)^3+6\,b\,p\,x^2\,\mathrm{Log}[x]\,\left(-p\,\mathrm{Log}\left[a+b\,x^2\right]+\mathrm{Log}\left[c\,\left(a+b\,x^2\right)^p\right]\right)^2-$$
$$3\,a\,p\,\mathrm{Log}\left[a+b\,x^2\right]\,\left(-p\,\mathrm{Log}\left[a+b\,x^2\right]+\mathrm{Log}\left[c\,\left(a+b\,x^2\right)^p\right]\right)^2-$$
$$3\,b\,p\,x^2\,\mathrm{Log}\left[a+b\,x^2\right]\,\left(-p\,\mathrm{Log}\left[a+b\,x^2\right]+\mathrm{Log}\left[c\,\left(a+b\,x^2\right)^p\right]\right)^2+$$
$$3\,p^2\,\left(p\,\mathrm{Log}\left[a+b\,x^2\right]-\mathrm{Log}\left[c\,\left(a+b\,x^2\right)^p\right]\right)\,\Bigg(a\,\mathrm{Log}\left[a+b\,x^2\right]^2+$$
$$b\,x^2\,\Bigg(\mathrm{Log}\left[-\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]^2+\mathrm{Log}\left[\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]^2+2\,\mathrm{Log}\left[-\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]\,\mathrm{Log}\left[\frac{1}{2}-\frac{i\,\sqrt{b}\,x}{2\,\sqrt{a}}\right]+$$
$$2\,\mathrm{Log}\left[\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]\,\mathrm{Log}\left[\frac{1}{2}+\frac{i\,\sqrt{b}\,x}{2\,\sqrt{a}}\right]+4\,\mathrm{Log}[x]\,\mathrm{Log}\left[1-\frac{i\,\sqrt{b}\,x}{\sqrt{a}}\right]+$$
$$4\,\mathrm{Log}[x]\,\mathrm{Log}\left[1+\frac{i\,\sqrt{b}\,x}{\sqrt{a}}\right]-4\,\mathrm{Log}[x]\,\mathrm{Log}\left[a+b\,x^2\right]-2\,\mathrm{Log}\left[-\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]\,\mathrm{Log}\left[a+b\,x^2\right]-$$
$$2\,\mathrm{Log}\left[\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]\,\mathrm{Log}\left[a+b\,x^2\right]+2\,\mathrm{Log}\left[a+b\,x^2\right]^2+4\,\mathrm{PolyLog}\left[2,\,-\frac{i\,\sqrt{b}\,x}{\sqrt{a}}\right]+$$
$$4\,\mathrm{PolyLog}\left[2,\,\frac{i\,\sqrt{b}\,x}{\sqrt{a}}\right]+2\,\mathrm{PolyLog}\left[2,\,\frac{1}{2}-\frac{i\,\sqrt{b}\,x}{2\,\sqrt{a}}\right]+2\,\mathrm{PolyLog}\left[2,\,\frac{1}{2}+\frac{i\,\sqrt{b}\,x}{2\,\sqrt{a}}\right]\Bigg)\Bigg)-$$
$$p^3\,\Bigg(\mathrm{Log}\left[a+b\,x^2\right]^2\,\left(-3\,b\,x^2\,\mathrm{Log}\left[-\frac{b\,x^2}{a}\right]+\left(a+b\,x^2\right)\,\mathrm{Log}\left[a+b\,x^2\right]\right)-$$
$$6\,b\,x^2\,\mathrm{Log}\left[a+b\,x^2\right]\,\mathrm{PolyLog}\left[2,\,1+\frac{b\,x^2}{a}\right]+6\,b\,x^2\,\mathrm{PolyLog}\left[3,\,1+\frac{b\,x^2}{a}\right]\Bigg)\Bigg)$$

Problem 96: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\mathrm{Log}\left[c\,\left(a+b\,x^2\right)^p\right]^3}{x^5}\,dx$$

Optimal (type 4, 219 leaves, 10 steps):

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

Result (type 4, 803 leaves):

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

Problem 97: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{Log}\left[c \left(a+b x^2\right)^p\right]^3}{x^7} \, dx$$

Optimal (type 4, 352 leaves, 17 steps):

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

Result (type 4, 1013 leaves):

$$\frac{1}{12 a^3 x^6}\Big(2 a^3 \left(p \text{Log}\left[a+b x^2\right]-\text{Log}\left[c \left(a+b x^2\right)^p\right]\right)^3-3 a^2 b p x^2 \left(-p \text{Log}\left[a+b x^2\right]+\text{Log}\left[c \left(a+b x^2\right)^p\right]\right)^2+$$
$$6 a b^2 p x^4 \left(-p \text{Log}\left[a+b x^2\right]+\text{Log}\left[c \left(a+b x^2\right)^p\right]\right)^2+$$
$$12 b^3 p x^6 \text{Log}[x] \left(-p \text{Log}\left[a+b x^2\right]+\text{Log}\left[c \left(a+b x^2\right)^p\right]\right)^2-$$
$$6 a^3 p \text{Log}\left[a+b x^2\right] \left(-p \text{Log}\left[a+b x^2\right]+\text{Log}\left[c \left(a+b x^2\right)^p\right]\right)^2-6 b^3 p x^6 \text{Log}\left[a+b x^2\right]$$
$$\left(-p \text{Log}\left[a+b x^2\right]+\text{Log}\left[c \left(a+b x^2\right)^p\right]\right)^2+6 p^2 \left(p \text{Log}\left[a+b x^2\right]-\text{Log}\left[c \left(a+b x^2\right)^p\right]\right)$$
$$\Big(a^3 \text{Log}\left[a+b x^2\right]^2+b x^2 \Big(a b x^2+6 b^2 x^4 \text{Log}[x]+b^2 x^4 \text{Log}\left[-\frac{i \sqrt{a}}{\sqrt{b}}+x\right]^2+b^2 x^4 \text{Log}\left[\frac{i \sqrt{a}}{\sqrt{b}}+x\right]^2+$$
$$2 b^2 x^4 \text{Log}\left[-\frac{i \sqrt{a}}{\sqrt{b}}+x\right] \text{Log}\left[\frac{1}{2}-\frac{i \sqrt{b}\, x}{2 \sqrt{a}}\right]+2 b^2 x^4 \text{Log}\left[\frac{i \sqrt{a}}{\sqrt{b}}+x\right] \text{Log}\left[\frac{1}{2}+\frac{i \sqrt{b}\, x}{2 \sqrt{a}}\right]+$$
$$4 b^2 x^4 \text{Log}[x] \text{Log}\left[1-\frac{i \sqrt{b}\, x}{\sqrt{a}}\right]+4 b^2 x^4 \text{Log}[x] \text{Log}\left[1+\frac{i \sqrt{b}\, x}{\sqrt{a}}\right]+a^2 \text{Log}\left[a+b x^2\right]-$$
$$2 a b x^2 \text{Log}\left[a+b x^2\right]-3 b^2 x^4 \text{Log}\left[a+b x^2\right]-4 b^2 x^4 \text{Log}[x] \text{Log}\left[a+b x^2\right]-$$
$$2 b^2 x^4 \text{Log}\left[-\frac{i \sqrt{a}}{\sqrt{b}}+x\right] \text{Log}\left[a+b x^2\right]-2 b^2 x^4 \text{Log}\left[\frac{i \sqrt{a}}{\sqrt{b}}+x\right] \text{Log}\left[a+b x^2\right]+$$
$$2 b^2 x^4 \text{Log}\left[a+b x^2\right]^2+4 b^2 x^4 \text{PolyLog}\left[2,-\frac{i \sqrt{b}\, x}{\sqrt{a}}\right]+4 b^2 x^4 \text{PolyLog}\left[2,\frac{i \sqrt{b}\, x}{\sqrt{a}}\right]+$$
$$2 b^2 x^4 \text{PolyLog}\left[2,\frac{1}{2}-\frac{i \sqrt{b}\, x}{2 \sqrt{a}}\right]+2 b^2 x^4 \text{PolyLog}\left[2,\frac{1}{2}+\frac{i \sqrt{b}\, x}{2 \sqrt{a}}\right]\Big)\Big)-$$
$$p^3 \Big(-6 b^3 x^6 \text{Log}\left[-\frac{b x^2}{a}\right]+6 a b^2 x^4 \text{Log}\left[a+b x^2\right]+6 b^3 x^6 \text{Log}\left[a+b x^2\right]+18 b^3 x^6 \text{Log}\left[-\frac{b x^2}{a}\right]$$
$$\text{Log}\left[a+b x^2\right]+3 a^2 b x^2 \text{Log}\left[a+b x^2\right]^2-6 a b^2 x^4 \text{Log}\left[a+b x^2\right]^2-9 b^3 x^6 \text{Log}\left[a+b x^2\right]^2-$$
$$6 b^3 x^6 \text{Log}\left[-\frac{b x^2}{a}\right] \text{Log}\left[a+b x^2\right]^2+2 a^3 \text{Log}\left[a+b x^2\right]^3+2 b^3 x^6 \text{Log}\left[a+b x^2\right]^3+$$
$$6 b^3 x^6 \left(3-2 \text{Log}\left[a+b x^2\right]\right) \text{PolyLog}\left[2,1+\frac{b x^2}{a}\right]+12 b^3 x^6 \text{PolyLog}\left[3,1+\frac{b x^2}{a}\right]\Big)\Big)$$

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

$$\int \frac{\text{Log}\left[c \left(d+e x^3\right)^p\right]^2}{x} \, dx$$

Optimal (type 4, 77 leaves, 5 steps):

$$\frac{1}{3} \text{Log}\left[-\frac{e x^3}{d}\right] \text{Log}\left[c \left(d+e x^3\right)^p\right]^2+$$
$$\frac{2}{3} p \text{Log}\left[c \left(d+e x^3\right)^p\right] \text{PolyLog}\left[2,1+\frac{e x^3}{d}\right]-\frac{2}{3} p^2 \text{PolyLog}\left[3,1+\frac{e x^3}{d}\right]$$

Result (type 4, 2965 leaves):

$$\mathrm{Log}[x]\left(-p\,\mathrm{Log}\left[d+e x^3\right]+\mathrm{Log}\left[c\left(d+e x^3\right)^p\right]\right)^2+2p\left(-p\,\mathrm{Log}\left[d+e x^3\right]+\mathrm{Log}\left[c\left(d+e x^3\right)^p\right]\right)$$
$$\left(\mathrm{Log}[x]\left(\mathrm{Log}\left[d+e x^3\right]-\mathrm{Log}\left[1+\frac{e x^3}{d}\right]\right)-\frac{1}{3}\mathrm{PolyLog}\left[2,-\frac{e x^3}{d}\right]\right)+$$
$$p^2\left(\mathrm{Log}\left[-\frac{e^{1/3}x}{d^{1/3}}\right]\mathrm{Log}\left[\frac{d^{1/3}}{e^{1/3}}+x\right]^2+2\,\mathrm{Log}\left[-\frac{e^{1/3}x}{d^{1/3}}\right]\mathrm{Log}\left[\frac{d^{1/3}}{e^{1/3}}+x\right]\mathrm{Log}\left[-\frac{(-1)^{1/3}d^{1/3}}{e^{1/3}}+x\right]+\right.$$
$$\mathrm{Log}\left[-\frac{(-1)^{2/3}e^{1/3}x}{d^{1/3}}\right]\mathrm{Log}\left[-\frac{(-1)^{1/3}d^{1/3}}{e^{1/3}}+x\right]^2+2\,\mathrm{Log}\left[-\frac{e^{1/3}x}{d^{1/3}}\right]\mathrm{Log}\left[\frac{d^{1/3}}{e^{1/3}}+x\right]$$
$$\mathrm{Log}\left[\frac{(-1)^{2/3}d^{1/3}}{e^{1/3}}+x\right]+2\,\mathrm{Log}\left[-\frac{(-1)^{2/3}e^{1/3}x}{d^{1/3}}\right]\mathrm{Log}\left[-\frac{(-1)^{1/3}d^{1/3}}{e^{1/3}}+x\right]\mathrm{Log}\left[\frac{(-1)^{2/3}d^{1/3}}{e^{1/3}}+x\right]+$$
$$\mathrm{Log}\left[\frac{(-1)^{1/3}e^{1/3}x}{d^{1/3}}\right]\mathrm{Log}\left[\frac{(-1)^{2/3}d^{1/3}}{e^{1/3}}+x\right]^2+\mathrm{Log}\left[\frac{(-1)^{2/3}\left(\frac{(-1)^{2/3}d^{1/3}}{e^{1/3}}+x\right)}{-\frac{(-1)^{1/3}d^{1/3}}{e^{1/3}}+x}\right]^2$$
$$\left(\mathrm{Log}\left[-\frac{(-1)^{2/3}e^{1/3}x}{d^{1/3}}\right]+\mathrm{Log}\left[\frac{i\sqrt{3}\,d^{1/3}}{(-1)^{1/3}d^{1/3}-e^{1/3}x}\right]-\mathrm{Log}\left[\frac{(-1)^{2/3}\left(1+(-1)^{1/3}\right)e^{1/3}x}{(-1)^{1/3}d^{1/3}-e^{1/3}x}\right]\right)+$$
$$\left(\mathrm{Log}\left[-\frac{e^{1/3}x}{d^{1/3}}\right]+\mathrm{Log}\left[-\frac{\left(-1+(-1)^{2/3}\right)d^{1/3}}{d^{1/3}+e^{1/3}x}\right]-\mathrm{Log}\left[\frac{\left(1+(-1)^{1/3}\right)e^{1/3}x}{d^{1/3}+e^{1/3}x}\right]\right)$$
$$\mathrm{Log}\left[\frac{d^{1/3}-(-1)^{1/3}e^{1/3}x}{d^{1/3}+e^{1/3}x}\right]^2+$$
$$\left(\mathrm{Log}[2]+\mathrm{Log}\left[-\frac{e^{1/3}x}{d^{1/3}}\right]+\mathrm{Log}\left[\frac{\left(1+(-1)^{1/3}\right)d^{1/3}}{d^{1/3}+e^{1/3}x}\right]-\mathrm{Log}\left[\frac{\left(3-i\sqrt{3}\right)e^{1/3}x}{d^{1/3}+e^{1/3}x}\right]\right)$$
$$\mathrm{Log}\left[\frac{d^{1/3}+(-1)^{2/3}e^{1/3}x}{d^{1/3}+e^{1/3}x}\right]^2+2\left(\mathrm{Log}\left[\frac{(-1)^{1/3}e^{1/3}x}{d^{1/3}}\right]-\mathrm{Log}\left[-\frac{(-1)^{2/3}e^{1/3}x}{d^{1/3}}\right]\right)$$
$$\mathrm{Log}\left[\frac{(-1)^{2/3}\left(\frac{(-1)^{2/3}d^{1/3}}{e^{1/3}}+x\right)}{-\frac{(-1)^{1/3}d^{1/3}}{e^{1/3}}+x}\right]\mathrm{Log}\left[1-\frac{(-1)^{1/3}e^{1/3}x}{d^{1/3}}\right]+$$
$$2\left(-\mathrm{Log}\left[-\frac{e^{1/3}x}{d^{1/3}}\right]+\mathrm{Log}\left[\frac{(-1)^{1/3}e^{1/3}x}{d^{1/3}}\right]\right)\mathrm{Log}\left[\frac{d^{1/3}-(-1)^{1/3}e^{1/3}x}{d^{1/3}+e^{1/3}x}\right]\mathrm{Log}\left[1-\frac{(-1)^{1/3}e^{1/3}x}{d^{1/3}}\right]+$$
$$\left(\mathrm{Log}\left[-\frac{e^{1/3}x}{d^{1/3}}\right]-\mathrm{Log}\left[\frac{(-1)^{1/3}e^{1/3}x}{d^{1/3}}\right]\right)\mathrm{Log}\left[1-\frac{(-1)^{1/3}e^{1/3}x}{d^{1/3}}\right]$$
$$\left(-2\,\mathrm{Log}\left[\frac{d^{1/3}}{e^{1/3}}+x\right]+\mathrm{Log}\left[1-\frac{(-1)^{1/3}e^{1/3}x}{d^{1/3}}\right]\right)+\left(-\mathrm{Log}\left[\frac{(-1)^{1/3}e^{1/3}x}{d^{1/3}}\right]+\mathrm{Log}\left[-\frac{(-1)^{2/3}e^{1/3}x}{d^{1/3}}\right]\right)$$
$$\mathrm{Log}\left[1-\frac{(-1)^{1/3}e^{1/3}x}{d^{1/3}}\right]\left(-2\,\mathrm{Log}\left[-\frac{(-1)^{1/3}d^{1/3}}{e^{1/3}}+x\right]+\mathrm{Log}\left[1-\frac{(-1)^{1/3}e^{1/3}x}{d^{1/3}}\right]\right)+$$

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

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

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

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

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

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

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

$$\left.\text{PolyLog}\left[2,-\frac{e^{1/3}\,x}{d^{1/3}}\right]-\text{PolyLog}\left[2,\frac{(-1)^{1/3}\,e^{1/3}\,x}{d^{1/3}}\right]-\text{PolyLog}\left[2,-\frac{(-1)^{2/3}\,e^{1/3}\,x}{d^{1/3}}\right]\right)+$$

$$2\,\text{Log}\left[\frac{(-1)^{2/3}\left(\frac{(-1)^{2/3}\,d^{1/3}}{e^{1/3}}+x\right)}{-\frac{(-1)^{1/3}\,d^{1/3}}{e^{1/3}}+x}\right]\left(-\text{PolyLog}\left[2,\frac{(-1)^{2/3}\left(\frac{(-1)^{2/3}\,d^{1/3}}{e^{1/3}}+x\right)}{-\frac{(-1)^{1/3}\,d^{1/3}}{e^{1/3}}+x}\right]+\right.$$

$$\left.\text{PolyLog}\left[2,\frac{(-1)^{2/3}\,d^{1/3}+e^{1/3}\,x}{-(-1)^{1/3}\,d^{1/3}+e^{1/3}\,x}\right]\right)+2\,\text{Log}\left[\frac{d^{1/3}-(-1)^{1/3}\,e^{1/3}\,x}{d^{1/3}+e^{1/3}\,x}\right]$$

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

$$2\,\text{Log}\left[\frac{d^{1/3}+(-1)^{2/3}\,e^{1/3}\,x}{d^{1/3}+e^{1/3}\,x}\right]\left(\text{PolyLog}\left[2,\frac{-(-1)^{1/3}\,d^{1/3}+e^{1/3}\,x}{d^{1/3}+e^{1/3}\,x}\right]-\right.$$

$$\left.\text{PolyLog}\left[2,\frac{d^{1/3}+(-1)^{2/3}\,e^{1/3}\,x}{d^{1/3}+e^{1/3}\,x}\right]\right)+2\,\text{Log}\left[\frac{d^{1/3}}{e^{1/3}}+x\right]\text{PolyLog}\left[2,1+\frac{e^{1/3}\,x}{d^{1/3}}\right]+$$

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

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

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

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

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

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

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

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

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

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

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

$$6\,\text{PolyLog}\left[3,1+\frac{e^{1/3}x}{d^{1/3}}\right]-6\,\text{PolyLog}\left[3,1-\frac{(-1)^{1/3}e^{1/3}x}{d^{1/3}}\right]-6\,\text{PolyLog}\left[3,1+\frac{(-1)^{2/3}e^{1/3}x}{d^{1/3}}\right]\Bigg)$$

Problem 132: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\text{Log}\left[c\left(d+e\,x^3\right)^p\right]^2}{x^4}\,dx$$

Optimal (type 4, 86 leaves, 4 steps):

$$\frac{2\,e\,p\,\text{Log}\left[-\frac{e\,x^3}{d}\right]\text{Log}\left[c\left(d+e\,x^3\right)^p\right]}{3\,d}-\frac{\left(d+e\,x^3\right)\text{Log}\left[c\left(d+e\,x^3\right)^p\right]^2}{3\,d\,x^3}+\frac{2\,e\,p^2\,\text{PolyLog}\left[2,1+\frac{e\,x^3}{d}\right]}{3\,d}$$

Result (type 4, 1374 leaves):

$$-\frac{1}{9\,d\,x^3}\Bigg(6\,p\left(3\,e\,x^3\,\text{Log}[x]-\left(d+e\,x^3\right)\text{Log}\left[d+e\,x^3\right]\right)\left(p\,\text{Log}\left[d+e\,x^3\right]-\text{Log}\left[c\left(d+e\,x^3\right)^p\right]\right)+$$

$$3\,d\left(-p\,\text{Log}\left[d+e\,x^3\right]+\text{Log}\left[c\left(d+e\,x^3\right)^p\right]\right)^2+$$

$$p^2 \left(3\,d\,\mathrm{Log}\left[d+e\,x^3\right]^2+e\,x^3\left(6\,\mathrm{Log}[2]^2+\mathrm{Log}[6]\,\mathrm{Log}[64]-4\,\mathrm{Log}[8]\,\mathrm{Log}[x]-\right.\right.$$

$$2\,\mathrm{Log}[4096]\,\mathrm{Log}[x]+3\,\mathrm{Log}\left[\frac{d^{1/3}}{e^{1/3}}+x\right]^2-2\,\mathrm{Log}[8]\,\mathrm{Log}\left[\frac{\left(-1-\mathbb{i}\sqrt{3}\right)d^{1/3}}{e^{1/3}}+2\,x\right]-$$

$$\mathrm{Log}[46656]\,\mathrm{Log}\left[\frac{\left(-1-\mathbb{i}\sqrt{3}\right)d^{1/3}}{e^{1/3}}+2\,x\right]+3\,\mathrm{Log}\left[\frac{\left(-1-\mathbb{i}\sqrt{3}\right)d^{1/3}}{e^{1/3}}+2\,x\right]^2-$$

$$\mathrm{Log}[64]\,\mathrm{Log}\left[\frac{\mathbb{i}\left(\mathbb{i}+\sqrt{3}\right)d^{1/3}}{e^{1/3}}+2\,x\right]+3\,\mathrm{Log}\left[\frac{\mathbb{i}\left(\mathbb{i}+\sqrt{3}\right)d^{1/3}}{e^{1/3}}+2\,x\right]^2-$$

$$2\,\mathrm{Log}[8]\,\mathrm{Log}\left[\frac{-2\,\mathbb{i}\,d^{1/3}+\left(\mathbb{i}+\sqrt{3}\right)e^{1/3}\,x}{\left(-3\,\mathbb{i}+\sqrt{3}\right)d^{1/3}}\right]+6\,\mathrm{Log}\left[\frac{\mathbb{i}\left(\mathbb{i}+\sqrt{3}\right)d^{1/3}}{e^{1/3}}+2\,x\right]$$

$$\mathrm{Log}\left[\frac{-2\,\mathbb{i}\,d^{1/3}+\left(\mathbb{i}+\sqrt{3}\right)e^{1/3}\,x}{\left(-3\,\mathbb{i}+\sqrt{3}\right)d^{1/3}}\right]+6\,\mathrm{Log}\left[\frac{d^{1/3}}{e^{1/3}}+x\right]\mathrm{Log}\left[\frac{\mathbb{i}+\sqrt{3}-\frac{2\,\mathbb{i}\,e^{1/3}\,x}{d^{1/3}}}{3\,\mathbb{i}+\sqrt{3}}\right]+$$

$$6\,\mathrm{Log}\left[\frac{d^{1/3}}{e^{1/3}}+x\right]\mathrm{Log}\left[-\frac{-\mathbb{i}+\sqrt{3}+\frac{2\,\mathbb{i}\,e^{1/3}\,x}{d^{1/3}}}{3\,\mathbb{i}-\sqrt{3}}\right]+18\,\mathrm{Log}[x]\,\mathrm{Log}\left[1+\frac{e^{1/3}\,x}{d^{1/3}}\right]-$$

$$\mathrm{Log}[64]\,\mathrm{Log}\left[\frac{2\,\mathbb{i}\left(1+\frac{e^{1/3}\,x}{d^{1/3}}\right)}{3\,\mathbb{i}-\sqrt{3}}\right]+6\,\mathrm{Log}\left[\frac{\left(-1-\mathbb{i}\sqrt{3}\right)d^{1/3}}{e^{1/3}}+2\,x\right]\mathrm{Log}\left[\frac{2\,\mathbb{i}\left(1+\frac{e^{1/3}\,x}{d^{1/3}}\right)}{3\,\mathbb{i}-\sqrt{3}}\right]-$$

$$\mathrm{Log}[64]\,\mathrm{Log}\left[\frac{2\,\mathbb{i}\left(1+\frac{e^{1/3}\,x}{d^{1/3}}\right)}{3\,\mathbb{i}+\sqrt{3}}\right]+6\,\mathrm{Log}\left[\frac{\mathbb{i}\left(\mathbb{i}+\sqrt{3}\right)d^{1/3}}{e^{1/3}}+2\,x\right]\mathrm{Log}\left[\frac{2\,\mathbb{i}\left(1+\frac{e^{1/3}\,x}{d^{1/3}}\right)}{3\,\mathbb{i}+\sqrt{3}}\right]-$$

$$\mathrm{Log}[64]\,\mathrm{Log}\left[3+\mathbb{i}\sqrt{3}-\frac{2\,\mathbb{i}\sqrt{3}\,e^{1/3}\,x}{d^{1/3}}\right]+$$

$$6\,\mathrm{Log}\left[\frac{\left(-1-\mathbb{i}\sqrt{3}\right)d^{1/3}}{e^{1/3}}+2\,x\right]\mathrm{Log}\left[3+\mathbb{i}\sqrt{3}-\frac{2\,\mathbb{i}\sqrt{3}\,e^{1/3}\,x}{d^{1/3}}\right]+$$

$$18\,\mathrm{Log}[x]\,\mathrm{Log}\left[2+\frac{\left(-1-\mathbb{i}\sqrt{3}\right)e^{1/3}\,x}{d^{1/3}}\right]+18\,\mathrm{Log}[x]\,\mathrm{Log}\left[2+\frac{\mathbb{i}\left(\mathbb{i}+\sqrt{3}\right)e^{1/3}\,x}{d^{1/3}}\right]+$$

$$\mathrm{Log}[16]\,\mathrm{Log}\left[d+e\,x^3\right]+\mathrm{Log}[256]\,\mathrm{Log}\left[d+e\,x^3\right]-18\,\mathrm{Log}[x]\,\mathrm{Log}\left[d+e\,x^3\right]-$$

$$6\,\mathrm{Log}\left[\frac{d^{1/3}}{e^{1/3}}+x\right]\mathrm{Log}\left[d+e\,x^3\right]-6\,\mathrm{Log}\left[\frac{\left(-1-\mathbb{i}\sqrt{3}\right)d^{1/3}}{e^{1/3}}+2\,x\right]\mathrm{Log}\left[d+e\,x^3\right]-$$

$$6\,\mathrm{Log}\left[\frac{\mathbb{i}\left(\mathbb{i}+\sqrt{3}\right)d^{1/3}}{e^{1/3}}+2\,x\right]\mathrm{Log}\left[d+e\,x^3\right]+6\,\mathrm{Log}\left[d+e\,x^3\right]^2+18\,\mathrm{PolyLog}\left[2,-\frac{e^{1/3}\,x}{d^{1/3}}\right]+$$

$$18\,\mathrm{PolyLog}\left[2,\frac{\left(1-\mathbb{i}\sqrt{3}\right)e^{1/3}\,x}{2\,d^{1/3}}\right]+18\,\mathrm{PolyLog}\left[2,\frac{\left(1+\mathbb{i}\sqrt{3}\right)e^{1/3}\,x}{2\,d^{1/3}}\right]+$$

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

Problem 133: Result unnecessarily involves higher level functions.

$$\int x\,\text{Log}\left[c\left(d+e\,x^3\right)^p\right]^2\,dx$$

Optimal (type 4, 1294 leaves, 49 steps):

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

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

Result (type 5, 2364 leaves):

$$p\,\left(-\frac{3\,e\,x^5\,\text{Hypergeometric2F1}\left[1,\frac{5}{3},\frac{8}{3},-\frac{e\,x^3}{d}\right]}{5\,d}+x^2\,\text{Log}\left[d+e\,x^3\right]\right)$$
$$\left(-p\,\text{Log}\left[d+e\,x^3\right]+\text{Log}\left[c\,\left(d+e\,x^3\right)^p\right]\right)+\frac{1}{2}\,x^2\,\left(-p\,\text{Log}\left[d+e\,x^3\right]+\text{Log}\left[c\,\left(d+e\,x^3\right)^p\right]\right)^2+$$
$$p^2\,\left(\frac{1}{2}\,x^2\,\text{Log}\left[d+e\,x^3\right]^2-3\,e\,\left(\frac{1}{e}\left(-\frac{d^{1/3}}{e^{1/3}}+\frac{(-1)^{1/3}\,d^{1/3}}{e^{1/3}}-\frac{(-1)^{2/3}\,d^{1/3}}{e^{1/3}}\right)\,\left(\frac{d^{1/3}}{e^{1/3}}+x\right)\right.\right.$$
$$\left(-1+\text{Log}\left[\frac{d^{1/3}}{e^{1/3}}+x\right]\right)-\frac{d^{4/3}\,\text{Log}\left[\frac{d^{1/3}}{e^{1/3}}+x\right]^2}{2\,\left(-\frac{d^{1/3}}{e^{1/3}}-\frac{(-1)^{1/3}\,d^{1/3}}{e^{1/3}}\right)\,\left(\frac{d^{1/3}}{e^{1/3}}-\frac{(-1)^{2/3}\,d^{1/3}}{e^{1/3}}\right)\,e^{7/3}}+\frac{1}{e}$$
$$\left(-\frac{d^{1/3}}{e^{1/3}}+\frac{(-1)^{1/3}\,d^{1/3}}{e^{1/3}}-\frac{(-1)^{2/3}\,d^{1/3}}{e^{1/3}}\right)\,\left(-\frac{(-1)^{1/3}\,d^{1/3}}{e^{1/3}}+x\right)\,\left(-1+\text{Log}\left[-\frac{(-1)^{1/3}\,d^{1/3}}{e^{1/3}}+x\right]\right)+$$
$$\frac{(-1)^{1/3}\,d^{4/3}\,\text{Log}\left[-\frac{(-1)^{1/3}\,d^{1/3}}{e^{1/3}}+x\right]^2}{2\,\left(\frac{d^{1/3}}{e^{1/3}}+\frac{(-1)^{1/3}\,d^{1/3}}{e^{1/3}}\right)\,\left(-\frac{(-1)^{1/3}\,d^{1/3}}{e^{1/3}}-\frac{(-1)^{2/3}\,d^{1/3}}{e^{1/3}}\right)\,e^{7/3}}+\frac{1}{e}$$
$$\left(-\frac{d^{1/3}}{e^{1/3}}+\frac{(-1)^{1/3}\,d^{1/3}}{e^{1/3}}-\frac{(-1)^{2/3}\,d^{1/3}}{e^{1/3}}\right)\,\left(\frac{(-1)^{2/3}\,d^{1/3}}{e^{1/3}}+x\right)\,\left(-1+\text{Log}\left[\frac{(-1)^{2/3}\,d^{1/3}}{e^{1/3}}+x\right]\right)+$$
$$\frac{(-1)^{2/3}\,d^{4/3}\,\text{Log}\left[\frac{(-1)^{2/3}\,d^{1/3}}{e^{1/3}}+x\right]^2}{2\,\left(\frac{d^{1/3}}{e^{1/3}}-\frac{(-1)^{2/3}\,d^{1/3}}{e^{1/3}}\right)\,\left(-\frac{(-1)^{1/3}\,d^{1/3}}{e^{1/3}}-\frac{(-1)^{2/3}\,d^{1/3}}{e^{1/3}}\right)\,e^{7/3}}+\frac{1}{e}$$

$$\left(-\frac{1}{2}e^{1/3}\left(-\frac{d^{1/3}x}{e^{2/3}}+\frac{x^2}{2e^{1/3}}+\frac{d^{2/3}\,\mathrm{Log}\left[d^{1/3}+e^{1/3}x\right]}{e}\right)+\frac{1}{2}x^2\,\mathrm{Log}\left[\frac{d^{1/3}+e^{1/3}x}{e^{1/3}}\right]\right)+\frac{1}{e}$$

$$\left(-\frac{1}{4e^{2/3}}\left(e^{1/3}x\left(2\left(-1\right)^{1/3}d^{1/3}+e^{1/3}x\right)+2\left(-1\right)^{2/3}d^{2/3}\,\mathrm{Log}\left[-\left(-1\right)^{1/3}d^{1/3}+e^{1/3}x\right]\right)+\right.$$

$$\left.\frac{1}{2}x^2\,\mathrm{Log}\left[\frac{-\left(-1\right)^{1/3}d^{1/3}+e^{1/3}x}{e^{1/3}}\right]\right)+\frac{1}{e}$$

$$\left(-\frac{1}{2}e^{1/3}\left(-\frac{\left(-1\right)^{2/3}d^{1/3}x}{e^{2/3}}+\frac{x^2}{2e^{1/3}}-\frac{\left(-1\right)^{1/3}d^{2/3}\,\mathrm{Log}\left[\left(-1\right)^{2/3}d^{1/3}+e^{1/3}x\right]}{e}\right)+\right.$$

$$\left.\frac{1}{2}x^2\,\mathrm{Log}\left[\frac{\left(-1\right)^{2/3}d^{1/3}+e^{1/3}x}{e^{1/3}}\right]\right)+\frac{1}{6e^{5/3}}\left(3e^{2/3}x^2+2\sqrt{3}\,d^{2/3}\,\mathrm{ArcTan}\left[\frac{1-\frac{2e^{1/3}x}{d^{1/3}}}{\sqrt{3}}\right]+\right.$$

$$\left.2d^{2/3}\,\mathrm{Log}\left[d^{1/3}+e^{1/3}x\right]-d^{2/3}\,\mathrm{Log}\left[d^{2/3}-d^{1/3}e^{1/3}x+e^{2/3}x^2\right]\right)\left(-\mathrm{Log}\left[\frac{d^{1/3}}{e^{1/3}}+x\right]-\right.$$

$$\left.\mathrm{Log}\left[-\frac{\left(-1\right)^{1/3}d^{1/3}}{e^{1/3}}+x\right]-\mathrm{Log}\left[\frac{\left(-1\right)^{2/3}d^{1/3}}{e^{1/3}}+x\right]+\mathrm{Log}\left[d+e\,x^3\right]\right)+\left(\left(-1\right)^{1/3}d^{4/3}\right.$$

$$\left.\left(\mathrm{Log}\left[\frac{d^{1/3}}{e^{1/3}}+x\right]\mathrm{Log}\left[1-\frac{e^{1/3}\left(\frac{d^{1/3}}{e^{1/3}}+x\right)}{d^{1/3}+\left(-1\right)^{1/3}d^{1/3}}\right]+\mathrm{PolyLog}\left[2,\frac{e^{1/3}\left(\frac{d^{1/3}}{e^{1/3}}+x\right)}{d^{1/3}+\left(-1\right)^{1/3}d^{1/3}}\right]\right)\right)\Big/$$

$$\left(\left(\frac{d^{1/3}}{e^{1/3}}+\frac{\left(-1\right)^{1/3}d^{1/3}}{e^{1/3}}\right)\left(-\frac{\left(-1\right)^{1/3}d^{1/3}}{e^{1/3}}-\frac{\left(-1\right)^{2/3}d^{1/3}}{e^{1/3}}\right)e^{7/3}\right)+\left(\left(-1\right)^{2/3}d^{4/3}\right.$$

$$\left.\left(\mathrm{Log}\left[\frac{d^{1/3}}{e^{1/3}}+x\right]\mathrm{Log}\left[1-\frac{e^{1/3}\left(\frac{d^{1/3}}{e^{1/3}}+x\right)}{d^{1/3}-\left(-1\right)^{2/3}d^{1/3}}\right]+\mathrm{PolyLog}\left[2,\frac{e^{1/3}\left(\frac{d^{1/3}}{e^{1/3}}+x\right)}{d^{1/3}-\left(-1\right)^{2/3}d^{1/3}}\right]\right)\right)\Big/$$

$$\left(\left(\frac{d^{1/3}}{e^{1/3}}-\frac{\left(-1\right)^{2/3}d^{1/3}}{e^{1/3}}\right)\left(-\frac{\left(-1\right)^{1/3}d^{1/3}}{e^{1/3}}-\frac{\left(-1\right)^{2/3}d^{1/3}}{e^{1/3}}\right)e^{7/3}\right)-$$

$$\left(d^{4/3}\left(\mathrm{Log}\left[-\frac{\left(-1\right)^{1/3}d^{1/3}}{e^{1/3}}+x\right]\mathrm{Log}\left[1-\frac{e^{1/3}\left(-\frac{\left(-1\right)^{1/3}d^{1/3}}{e^{1/3}}+x\right)}{-d^{1/3}-\left(-1\right)^{1/3}d^{1/3}}\right]+\mathrm{PolyLog}\left[2,\right.\right.\right.$$

$$\left.\left.\left.\frac{e^{1/3}\left(-\frac{\left(-1\right)^{1/3}d^{1/3}}{e^{1/3}}+x\right)}{-d^{1/3}-\left(-1\right)^{1/3}d^{1/3}}\right]\right)\right)\Big/\left(\left(-\frac{d^{1/3}}{e^{1/3}}-\frac{\left(-1\right)^{1/3}d^{1/3}}{e^{1/3}}\right)\left(\frac{d^{1/3}}{e^{1/3}}-\frac{\left(-1\right)^{2/3}d^{1/3}}{e^{1/3}}\right)e^{7/3}\right)+$$

$$\left(\left(-1\right)^{2/3}d^{4/3}\left(\mathrm{Log}\left[-\frac{\left(-1\right)^{1/3}d^{1/3}}{e^{1/3}}+x\right]\mathrm{Log}\left[1-\frac{e^{1/3}\left(-\frac{\left(-1\right)^{1/3}d^{1/3}}{e^{1/3}}+x\right)}{-\left(-1\right)^{1/3}d^{1/3}-\left(-1\right)^{2/3}d^{1/3}}\right]+\right.\right.$$

$$\text{PolyLog}\left[2, \frac{e^{1/3}\left(-\frac{(-1)^{1/3} d^{1/3}}{e^{1/3}}+x\right)}{-(-1)^{1/3} d^{1/3}-(-1)^{2/3} d^{1/3}}\right]\Bigg)\Bigg) \Bigg/$$

$$\left(\left(\frac{d^{1/3}}{e^{1/3}}-\frac{(-1)^{2/3} d^{1/3}}{e^{1/3}}\right)\left(-\frac{(-1)^{1/3} d^{1/3}}{e^{1/3}}-\frac{(-1)^{2/3} d^{1/3}}{e^{1/3}}\right) e^{7/3}\right) -$$

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

$$\frac{e^{1/3}\left(\frac{(-1)^{2/3} d^{1/3}}{e^{1/3}}+x\right)}{-d^{1/3}+(-1)^{2/3} d^{1/3}}\Bigg]\Bigg)\Bigg) \Bigg/ \left(\left(-\frac{d^{1/3}}{e^{1/3}}-\frac{(-1)^{1/3} d^{1/3}}{e^{1/3}}\right)\left(\frac{d^{1/3}}{e^{1/3}}-\frac{(-1)^{2/3} d^{1/3}}{e^{1/3}}\right) e^{7/3}\right) +$$

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

$$\text{PolyLog}\left[2, \frac{e^{1/3}\left(\frac{(-1)^{2/3} d^{1/3}}{e^{1/3}}+x\right)}{(-1)^{1/3} d^{1/3}+(-1)^{2/3} d^{1/3}}\right]\Bigg)\Bigg) \Bigg/$$

$$\left(\left(\frac{d^{1/3}}{e^{1/3}}+\frac{(-1)^{1/3} d^{1/3}}{e^{1/3}}\right)\left(-\frac{(-1)^{1/3} d^{1/3}}{e^{1/3}}-\frac{(-1)^{2/3} d^{1/3}}{e^{1/3}}\right) e^{7/3}\right)\Bigg)\Bigg)$$

Problem 135: Result unnecessarily involves higher level functions.

$$\int \frac{\text{Log}\left[c\left(d+e x^3\right)^p\right]^2}{x^2} \, dx$$

Optimal (type 4, 1137 leaves, 39 steps) :

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

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

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

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

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

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

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

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

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

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

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

$$\frac{2\,e^{1/3}\,p^2\,\text{PolyLog}\left[2,\,\frac{d^{1/3}+e^{1/3}\,x}{\left(1+(-1)^{1/3}\right)\,d^{1/3}}\right]}{d^{1/3}}-\frac{2\,(-1)^{2/3}\,e^{1/3}\,p^2\,\text{PolyLog}\left[2,\,-\frac{(-1)^{2/3}\,\left(d^{1/3}+e^{1/3}\,x\right)}{\left(1-(-1)^{2/3}\right)\,d^{1/3}}\right]}{d^{1/3}}+$$

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

$$\frac{2\,(-1)^{1/3}\,e^{1/3}\,p^2\,\text{PolyLog}\left[2,\,\frac{d^{1/3}-(-1)^{1/3}\,e^{1/3}\,x}{\left(1+(-1)^{1/3}\right)\,d^{1/3}}\right]}{d^{1/3}}+\frac{2\,(-1)^{2/3}\,e^{1/3}\,p^2\,\text{PolyLog}\left[2,\,\frac{d^{1/3}+(-1)^{2/3}\,e^{1/3}\,x}{\left(1+(-1)^{1/3}\right)\,d^{1/3}}\right]}{d^{1/3}}$$

Result (type 5, 994 leaves) :

$$2\,p\left(\frac{3\,e\,x^2\,\text{Hypergeometric2F1}\left[\frac{2}{3},1,\frac{5}{3},-\frac{e\,x^3}{d}\right]}{2\,d}-\frac{\text{Log}\left[d+e\,x^3\right]}{x}\right)$$

$$\left(-p\,\text{Log}\left[d+e\,x^3\right]+\text{Log}\left[c\,\left(d+e\,x^3\right)^p\right]\right)-$$

$$\frac{\left(-p\,\text{Log}\left[d+e\,x^3\right]+\text{Log}\left[c\,\left(d+e\,x^3\right)^p\right]\right)^2}{x}+p^2\left(-\frac{\text{Log}\left[d+e\,x^3\right]^2}{x}-\right.$$

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

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

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

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

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

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

$$\left.\text{PolyLog}\left[2,\frac{d^{1/3}+e^{1/3}\,x}{\left(1+(-1)^{1/3}\right)d^{1/3}}\right]\right)-2\,(-1)^{1/3}\left(-1+(-1)^{2/3}\right)\left(\text{Log}\left[\frac{(-1)^{2/3}\,d^{1/3}}{e^{1/3}}+x\right]\right.$$

$$\left.\text{Log}\left[\frac{d^{1/3}+(-1)^{2/3}\,e^{1/3}\,x}{\left(1+(-1)^{1/3}\right)d^{1/3}}\right]+\text{PolyLog}\left[2,-\frac{\mathrm{i}\,\left((-1)^{2/3}\,d^{1/3}+e^{1/3}\,x\right)}{\sqrt{3}\,d^{1/3}}\right]\right)+$$

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

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

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

$$\left.\left.\left(1+(-1)^{1/3}\right)\left(\text{Log}\left[\frac{d^{1/3}}{e^{1/3}}+x\right]\text{Log}\left[\frac{\mathrm{i}+\sqrt{3}-\frac{2\,\mathrm{i}\,e^{1/3}\,x}{d^{1/3}}}{3\,\mathrm{i}+\sqrt{3}}\right]+\text{PolyLog}\left[2,\frac{2\,\mathrm{i}\,\left(1+\frac{e^{1/3}\,x}{d^{1/3}}\right)}{3\,\mathrm{i}+\sqrt{3}}\right]\right)\right)\right)\right)$$

Problem 136: Result unnecessarily involves higher level functions.

$$\int \frac{\text{Log}\left[c\,\left(d+e\,x^3\right)^p\right]^2}{x^3}\,dx$$

Optimal (type 4, 1170 leaves, 39 steps) :

$$-\frac{e^{2/3} p^2 \text{Log}\left[-d^{1/3}-e^{1/3} x\right]^2}{2 d^{2/3}}-\frac{e^{2/3} p^2 \text{Log}\left[-d^{1/3}-e^{1/3} x\right] \text{Log}\left[-\frac{(-1)^{2/3} d^{1/3}+e^{1/3} x}{\left(1-(-1)^{2/3}\right) d^{1/3}}\right]}{d^{2/3}}-$$

$$\frac{(-1)^{2/3} e^{2/3} p^2 \text{Log}\left[\frac{(-1)^{1/3} \left(d^{1/3}+e^{1/3} x\right)}{\left(1+(-1)^{1/3}\right) d^{1/3}}\right] \text{Log}\left[-d^{1/3}+(-1)^{1/3} e^{1/3} x\right]}{d^{2/3}}-$$

$$\frac{(-1)^{2/3} e^{2/3} p^2 \text{Log}\left[-d^{1/3}+(-1)^{1/3} e^{1/3} x\right]^2}{2 d^{2/3}}+$$

$$\frac{(-1)^{1/3} e^{2/3} p^2 \text{Log}\left[-\frac{(-1)^{2/3} \left(d^{1/3}+e^{1/3} x\right)}{\left(1-(-1)^{2/3}\right) d^{1/3}}\right] \text{Log}\left[-d^{1/3}-(-1)^{2/3} e^{1/3} x\right]}{d^{2/3}}+\frac{1}{d^{2/3}}$$

$$(-1)^{1/3} e^{2/3} p^2 \text{Log}\left[\frac{(-1)^{1/3} \left(d^{1/3}-(-1)^{1/3} e^{1/3} x\right)}{\left(1+(-1)^{1/3}\right) d^{1/3}}\right] \text{Log}\left[-d^{1/3}-(-1)^{2/3} e^{1/3} x\right]+$$

$$\frac{(-1)^{1/3} e^{2/3} p^2 \text{Log}\left[-d^{1/3}-(-1)^{2/3} e^{1/3} x\right]^2}{2 d^{2/3}}-\frac{e^{2/3} p^2 \text{Log}\left[-d^{1/3}-e^{1/3} x\right] \text{Log}\left[\frac{(-1)^{1/3} \left(d^{1/3}+(-1)^{2/3} e^{1/3} x\right)}{\left(1+(-1)^{1/3}\right) d^{1/3}}\right]}{d^{2/3}}-$$

$$\frac{(-1)^{1/3} e^{2/3} p^2 \text{Log}\left[-\frac{(-1)^{2/3} \left(d^{1/3}+e^{1/3} x\right)}{\left(1-(-1)^{2/3}\right) d^{1/3}}\right] \text{Log}\left[\frac{d^{1/3}+(-1)^{2/3} e^{1/3} x}{\left(1-(-1)^{2/3}\right) d^{1/3}}\right]}{d^{2/3}}-\frac{1}{d^{2/3}}$$

$$(-1)^{2/3} e^{2/3} p^2 \text{Log}\left[-d^{1/3}+(-1)^{1/3} e^{1/3} x\right] \text{Log}\left[-\frac{(-1)^{2/3} \left(d^{1/3}+(-1)^{2/3} e^{1/3} x\right)}{\left(1-(-1)^{2/3}\right) d^{1/3}}\right]+$$

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

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

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

$$\frac{e^{2/3} p^2 \text{PolyLog}\left[2,\frac{d^{1/3}+e^{1/3} x}{\left(1+(-1)^{1/3}\right) d^{1/3}}\right]}{d^{2/3}}-\frac{(-1)^{1/3} e^{2/3} p^2 \text{PolyLog}\left[2,-\frac{(-1)^{2/3} \left(d^{1/3}+e^{1/3} x\right)}{\left(1-(-1)^{2/3}\right) d^{1/3}}\right]}{d^{2/3}}-$$

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

$$\frac{(-1)^{2/3} e^{2/3} p^2 \text{PolyLog}\left[2,\frac{d^{1/3}-(-1)^{1/3} e^{1/3} x}{\left(1+(-1)^{1/3}\right) d^{1/3}}\right]}{d^{2/3}}+\frac{(-1)^{1/3} e^{2/3} p^2 \text{PolyLog}\left[2,\frac{d^{1/3}+(-1)^{2/3} e^{1/3} x}{\left(1+(-1)^{1/3}\right) d^{1/3}}\right]}{d^{2/3}}$$

Result (type 5, 964 leaves) :

$$p\left(\frac{3\,e\,x\,\text{Hypergeometric2F1}\left[\frac{1}{3},1,\frac{4}{3},-\frac{e\,x^3}{d}\right]}{d}-\frac{\text{Log}\left[d+e\,x^3\right]}{x^2}\right)\left(-p\,\text{Log}\left[d+e\,x^3\right]+\text{Log}\left[c\,\left(d+e\,x^3\right)^p\right]\right)-$$

$$\frac{\left(-p\,\text{Log}\left[d+e\,x^3\right]+\text{Log}\left[c\,\left(d+e\,x^3\right)^p\right]\right)^2}{2\,x^2}+p^2\left(-\frac{\text{Log}\left[d+e\,x^3\right]^2}{2\,x^2}-\right.$$

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

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

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

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

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

$$\left.\text{PolyLog}\left[2,\frac{(-1)^{1/3}\,d^{1/3}-e^{1/3}\,x}{\left(1+(-1)^{1/3}\right)d^{1/3}}\right]\right)-2\left(-1+(-1)^{2/3}\right)$$

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

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

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

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

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

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

Problem 137: Result unnecessarily involves higher level functions.

$$\int \frac{\text{Log}\left[c\,\left(d+e\,x^3\right)^p\right]^2}{x^5}\,dx$$

Optimal (type 4, 1328 leaves, 48 steps):

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

$$\frac{e^{4/3}\,p^2\,\text{PolyLog}\left[2,\,\frac{d^{1/3}+e^{1/3}\,x}{\left(1+(-1)^{1/3}\right)\,d^{1/3}}\right]}{2\,d^{4/3}}+\frac{(-1)^{2/3}\,e^{4/3}\,p^2\,\text{PolyLog}\left[2,\,-\frac{(-1)^{2/3}\,\left(d^{1/3}+e^{1/3}\,x\right)}{\left(1-(-1)^{2/3}\right)\,d^{1/3}}\right]}{2\,d^{4/3}}-$$

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

$$\frac{(-1)^{1/3}\,e^{4/3}\,p^2\,\text{PolyLog}\left[2,\,\frac{d^{1/3}-(-1)^{1/3}\,e^{1/3}\,x}{\left(1+(-1)^{1/3}\right)\,d^{1/3}}\right]}{2\,d^{4/3}}-\frac{(-1)^{2/3}\,e^{4/3}\,p^2\,\text{PolyLog}\left[2,\,\frac{d^{1/3}+(-1)^{2/3}\,e^{1/3}\,x}{\left(1+(-1)^{1/3}\right)\,d^{1/3}}\right]}{2\,d^{4/3}}$$

Result (type 5, 1296 leaves):

$$\frac{1}{4\,x^4}\left(\frac{1}{d}2\,p\,\left(3\,e\,x^3\,\text{Hypergeometric2F1}\left[-\frac{1}{3},\,1,\,\frac{2}{3},\,-\frac{e\,x^3}{d}\right]+d\,\text{Log}\left[d+e\,x^3\right]\right)\right.$$

$$\left(p\,\text{Log}\left[d+e\,x^3\right]-\text{Log}\left[c\,\left(d+e\,x^3\right)^p\right]\right)-$$

$$\left(-p\,\text{Log}\left[d+e\,x^3\right]+\text{Log}\left[c\,\left(d+e\,x^3\right)^p\right]\right)^2+p^2\,\left(-\text{Log}\left[d+e\,x^3\right]^2+\right.$$

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

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

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

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

$$\left.(-1)^{2/3}\,e^{1/3}\,x\,\text{Log}\left[-(-1)^{1/3}\,d^{1/3}+e^{1/3}\,x\right]\right)-6\,\left(1+(-1)^{1/3}\right)^2\,\left((-1)^{1/3}\,e^{1/3}\,x\,\text{Log}[x]+\right.$$

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

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

$$\left.2\,e^{1/3}\,x\,\text{Log}\left[d^{1/3}+e^{1/3}\,x\right]+e^{1/3}\,x\,\text{Log}\left[d^{2/3}-d^{1/3}\,e^{1/3}\,x+e^{2/3}\,x^2\right]\right)$$

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

$$6\,(-1)^{1/3}\,e^{1/3}\,x\,\Bigg(\text{Log}\Big[-\frac{(-1)^{1/3}\,d^{1/3}}{e^{1/3}}+x\Big]\,\text{Log}\Big[\frac{d^{1/3}+e^{1/3}\,x}{\big(1+(-1)^{1/3}\big)\,d^{1/3}}\Big]+$$

$$\text{PolyLog}\Big[2,\ \frac{(-1)^{1/3}\,d^{1/3}-e^{1/3}\,x}{\big(1+(-1)^{1/3}\big)\,d^{1/3}}\Big]\Bigg)+6\,(-1)^{1/3}\,\big(-1+(-1)^{1/3}\big)\,e^{1/3}\,x$$

$$\Bigg(\text{Log}\Big[\frac{d^{1/3}}{e^{1/3}}+x\Big]\,\text{Log}\Big[\frac{(-1)^{1/3}\,d^{1/3}-e^{1/3}\,x}{\big(1+(-1)^{1/3}\big)\,d^{1/3}}\Big]+\text{PolyLog}\Big[2,\ \frac{d^{1/3}+e^{1/3}\,x}{\big(1+(-1)^{1/3}\big)\,d^{1/3}}\Big]\Bigg)+$$

$$6\,(-1)^{1/3}\,\big(-1+(-1)^{1/3}\big)\,e^{1/3}\,x\,\Bigg(\text{Log}\Big[\frac{(-1)^{2/3}\,d^{1/3}}{e^{1/3}}+x\Big]\,\text{Log}\Big[\frac{d^{1/3}+(-1)^{2/3}\,e^{1/3}\,x}{\big(1+(-1)^{1/3}\big)\,d^{1/3}}\Big]+$$

$$\text{PolyLog}\Big[2,\ -\frac{i\,\big((-1)^{2/3}\,d^{1/3}+e^{1/3}\,x\big)}{\sqrt{3}\,d^{1/3}}\Big]\Bigg)+6\,(-1)^{1/3}\,\big(-1+(-1)^{1/3}\big)^2$$

$$e^{1/3}\,x\,\Bigg(\text{Log}\Big[-\frac{(-1)^{1/3}\,d^{1/3}}{e^{1/3}}+x\Big]\,\text{Log}\Big[-\frac{i\,\big((-1)^{2/3}\,d^{1/3}+e^{1/3}\,x\big)}{\sqrt{3}\,d^{1/3}}\Big]+$$

$$\text{PolyLog}\Big[2,\ \frac{d^{1/3}+(-1)^{2/3}\,e^{1/3}\,x}{\big(1+(-1)^{1/3}\big)\,d^{1/3}}\Big]\Bigg)+6\,(-1)^{1/3}\,e^{1/3}\,x\,\Bigg(\text{Log}\Big[\frac{(-1)^{2/3}\,d^{1/3}}{e^{1/3}}+x\Big]$$

$$\text{Log}\Big[\frac{2\,i\,\big(1+\frac{e^{1/3}\,x}{d^{1/3}}\big)}{3\,i+\sqrt{3}}\Big]+\text{PolyLog}\Big[2,\ \frac{i+\sqrt{3}-\frac{2\,i\,e^{1/3}\,x}{d^{1/3}}}{3\,i+\sqrt{3}}\Big]\Bigg)+6\,(-1)^{1/3}\,\big(-1+(-1)^{1/3}\big)^2$$

$$e^{1/3}\,x\,\Bigg(\text{Log}\Big[\frac{d^{1/3}}{e^{1/3}}+x\Big]\,\text{Log}\Big[\frac{i+\sqrt{3}-\frac{2\,i\,e^{1/3}\,x}{d^{1/3}}}{3\,i+\sqrt{3}}\Big]+\text{PolyLog}\Big[2,\ \frac{2\,i\,\big(1+\frac{e^{1/3}\,x}{d^{1/3}}\big)}{3\,i+\sqrt{3}}\Big]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)$$

Problem 169: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Log}[1+e\,x^n]}{x}\,dx$$

Optimal (type 4, 13 leaves, 1 step):

$$-\frac{\text{PolyLog}[2,\ -e\,x^n]}{n}$$

Result (type 4, 30 leaves):

$$\frac{\text{Log}[-e\,x^n]\,\text{Log}[1+e\,x^n]+\text{PolyLog}[2,\ 1+e\,x^n]}{n}$$

Problem 174: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Log}\left[c\left(d+e\,x^n\right)^p\right]^2}{x}\,dx$$

Optimal (type 4, 79 leaves, 5 steps):

$$\frac{\text{Log}\left[-\frac{e\,x^n}{d}\right]\text{Log}\left[c\left(d+e\,x^n\right)^p\right]^2}{n}+\frac{2\,p\,\text{Log}\left[c\left(d+e\,x^n\right)^p\right]\text{PolyLog}\left[2,1+\frac{e\,x^n}{d}\right]}{n}-\frac{2\,p^2\,\text{PolyLog}\left[3,1+\frac{e\,x^n}{d}\right]}{n}$$

Result (type 4, 164 leaves):

$$\text{Log}[x]\left(-p\,\text{Log}\left[d+e\,x^n\right]+\text{Log}\left[c\left(d+e\,x^n\right)^p\right]\right)^2+2\,p\left(-p\,\text{Log}\left[d+e\,x^n\right]+\text{Log}\left[c\left(d+e\,x^n\right)^p\right]\right)$$
$$\left(\text{Log}[x]\left(\text{Log}\left[d+e\,x^n\right]-\text{Log}\left[1+\frac{e\,x^n}{d}\right]\right)-\frac{\text{PolyLog}\left[2,-\frac{e\,x^n}{d}\right]}{n}\right)+\frac{1}{n}$$
$$p^2\left(\text{Log}\left[-\frac{e\,x^n}{d}\right]\text{Log}\left[d+e\,x^n\right]^2+2\,\text{Log}\left[d+e\,x^n\right]\text{PolyLog}\left[2,1+\frac{e\,x^n}{d}\right]-2\,\text{PolyLog}\left[3,1+\frac{e\,x^n}{d}\right]\right)$$

Problem 175: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Log}\left[c\left(d+e\,x^n\right)^p\right]^3}{x}\,dx$$

Optimal (type 4, 113 leaves, 6 steps):

$$\frac{\text{Log}\left[-\frac{e\,x^n}{d}\right]\text{Log}\left[c\left(d+e\,x^n\right)^p\right]^3}{n}+\frac{3\,p\,\text{Log}\left[c\left(d+e\,x^n\right)^p\right]^2\text{PolyLog}\left[2,1+\frac{e\,x^n}{d}\right]}{n}-$$
$$\frac{6\,p^2\,\text{Log}\left[c\left(d+e\,x^n\right)^p\right]\text{PolyLog}\left[3,1+\frac{e\,x^n}{d}\right]}{n}+\frac{6\,p^3\,\text{PolyLog}\left[4,1+\frac{e\,x^n}{d}\right]}{n}$$

Result (type 4, 270 leaves):

$$\frac{1}{n}\left(-n\,p^3\,\text{Log}[x]\,\text{Log}\left[d+e\,x^n\right]^3+p^3\,\text{Log}\left[-\frac{e\,x^n}{d}\right]\text{Log}\left[d+e\,x^n\right]^3+\right.$$
$$3\,n\,p^2\,\text{Log}[x]\,\text{Log}\left[d+e\,x^n\right]^2\text{Log}\left[c\left(d+e\,x^n\right)^p\right]-3\,p^2\,\text{Log}\left[-\frac{e\,x^n}{d}\right]\text{Log}\left[d+e\,x^n\right]^2\text{Log}\left[c\left(d+e\,x^n\right)^p\right]-$$
$$3\,n\,p\,\text{Log}[x]\,\text{Log}\left[d+e\,x^n\right]\text{Log}\left[c\left(d+e\,x^n\right)^p\right]^2+3\,p\,\text{Log}\left[-\frac{e\,x^n}{d}\right]\text{Log}\left[d+e\,x^n\right]\text{Log}\left[c\left(d+e\,x^n\right)^p\right]^2+$$
$$n\,\text{Log}[x]\,\text{Log}\left[c\left(d+e\,x^n\right)^p\right]^3+3\,p\,\text{Log}\left[c\left(d+e\,x^n\right)^p\right]^2\text{PolyLog}\left[2,1+\frac{e\,x^n}{d}\right]-$$
$$\left.6\,p^2\,\text{Log}\left[c\left(d+e\,x^n\right)^p\right]\text{PolyLog}\left[3,1+\frac{e\,x^n}{d}\right]+6\,p^3\,\text{PolyLog}\left[4,1+\frac{e\,x^n}{d}\right]\right)$$

Problem 188: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Log}\left[c\left(a+b\,x^2\right)^p\right]}{d+e\,x}\,dx$$

Optimal (type 4, 201 leaves, 9 steps):

$$-\frac{p\,\text{Log}\left[\frac{e\left(\sqrt{-a}-\sqrt{b}\,x\right)}{\sqrt{b}\,d+\sqrt{-a}\,e}\right]\text{Log}[d+e\,x]}{e}-\frac{p\,\text{Log}\left[-\frac{e\left(\sqrt{-a}+\sqrt{b}\,x\right)}{\sqrt{b}\,d-\sqrt{-a}\,e}\right]\text{Log}[d+e\,x]}{e}+\frac{\text{Log}[d+e\,x]\,\text{Log}\left[c\left(a+b\,x^2\right)^p\right]}{e}-\frac{p\,\text{PolyLog}\left[2,\frac{\sqrt{b}\,(d+e\,x)}{\sqrt{b}\,d-\sqrt{-a}\,e}\right]}{e}-\frac{p\,\text{PolyLog}\left[2,\frac{\sqrt{b}\,(d+e\,x)}{\sqrt{b}\,d+\sqrt{-a}\,e}\right]}{e}$$

Result (type 4, 262 leaves):

$$\frac{1}{e}\left(-p\,\text{Log}\left[-\frac{i\sqrt{a}}{\sqrt{b}}+x\right]\text{Log}[d+e\,x]-p\,\text{Log}\left[\frac{i\sqrt{a}}{\sqrt{b}}+x\right]\text{Log}[d+e\,x]+p\,\text{Log}\left[\frac{i\sqrt{a}}{\sqrt{b}}+x\right]\text{Log}\left[\frac{\sqrt{b}\,(d+e\,x)}{\sqrt{b}\,d-i\sqrt{a}\,e}\right]+p\,\text{Log}\left[-\frac{i\sqrt{a}}{\sqrt{b}}+x\right]\text{Log}\left[\frac{\sqrt{b}\,(d+e\,x)}{\sqrt{b}\,d+i\sqrt{a}\,e}\right]+\text{Log}[d+e\,x]\,\text{Log}\left[c\left(a+b\,x^2\right)^p\right]+p\,\text{PolyLog}\left[2,\frac{e\left(\sqrt{a}-i\sqrt{b}\,x\right)}{i\sqrt{b}\,d+\sqrt{a}\,e}\right]+p\,\text{PolyLog}\left[2,\frac{e\left(\sqrt{a}+i\sqrt{b}\,x\right)}{-i\sqrt{b}\,d+\sqrt{a}\,e}\right]\right)$$

Problem 206: Result is not expressed in closed-form.

$$\int (d+e\,x)^m\,\text{Log}\left[c\left(a+b\,x^3\right)^p\right]dx$$

Optimal (type 5, 301 leaves, 6 steps):

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

Result (type 7, 399 leaves):

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

Problem 207: Result unnecessarily involves imaginary or complex numbers.

$$\int (d+e\,x)^m\,\text{Log}\left[c\left(a+b\,x^2\right)^p\right]dx$$

Optimal (type 5, 205 leaves, 5 steps):

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

Result (type 5, 285 leaves):

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

Problem 210: Result unnecessarily involves imaginary or complex numbers.

$$\int (d+e\,x)^m \,\text{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right] dx$$

Optimal (type 5, 257 leaves, 9 steps):

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

Result (type 5, 310 leaves):

$$\frac{1}{e\,m\,(1+m)}(d+e\,x)^m\left(2\,d\,p\left(1+\frac{d}{e\,x}\right)^{-m}\text{Hypergeometric2F1}\left[-m,\,-m,\,1-m,\,-\frac{d}{e\,x}\right]-\frac{1}{\sqrt{a}}\left(\sqrt{a}\;d+i\sqrt{b}\;e\right)p\left(\frac{\sqrt{a}\;(d+e\,x)}{e\left(-i\sqrt{b}+\sqrt{a}\;x\right)}\right)^{-m}\text{Hypergeometric2F1}\left[-m,\,-m,\,1-m,\,\frac{\sqrt{a}\;d+i\sqrt{b}\;e}{i\sqrt{b}\;e-\sqrt{a}\;e\,x}\right]-\frac{1}{\sqrt{a}}\left(\sqrt{a}\;d-i\sqrt{b}\;e\right)p\left(\frac{\sqrt{a}\;(d+e\,x)}{e\left(i\sqrt{b}+\sqrt{a}\;x\right)}\right)^{-m}\text{Hypergeometric2F1}\left[-m,\,-m,\,1-m,\,-\frac{\sqrt{a}\;d-i\sqrt{b}\;e}{i\sqrt{b}\;e+\sqrt{a}\;e\,x}\right]+m\,(d+e\,x)\,\text{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]\right)$$

Problem 216: Attempted integration timed out after 120 seconds.

$$\int \frac{\text{Log}\left[c\left(d+e\,x^n\right)^p\right]}{f+g\,x}\,dx$$

Optimal (type 8, 23 leaves, 0 steps):

$$\text{Int}\left[\frac{\text{Log}\left[c\left(d+e\,x^n\right)^p\right]}{f+g\,x},\,x\right]$$

Result (type 1, 1 leaves):

???

Problem 226: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^3 \operatorname{Log}\left[c\left(a+b x^2\right)^p\right]}{d+e x} \, dx$$

Optimal (type 4, 394 leaves, 21 steps):

$$-\frac{2 d^2 p x}{e^3}+\frac{2 a p x}{3 b e}+\frac{d p x^2}{2 e^2}-\frac{2 p x^3}{9 e}+\frac{2 \sqrt{a}\, d^2 p \operatorname{ArcTan}\left[\frac{\sqrt{b}\, x}{\sqrt{a}}\right]}{\sqrt{b}\, e^3}-\frac{2 a^{3/2} p \operatorname{ArcTan}\left[\frac{\sqrt{b}\, x}{\sqrt{a}}\right]}{3 b^{3/2} e}+$$
$$\frac{d^3 p \operatorname{Log}\left[\frac{e\left(\sqrt{-a}-\sqrt{b}\, x\right)}{\sqrt{b}\, d+\sqrt{-a}\, e}\right] \operatorname{Log}[d+e x]}{e^4}+\frac{d^3 p \operatorname{Log}\left[-\frac{e\left(\sqrt{-a}+\sqrt{b}\, x\right)}{\sqrt{b}\, d-\sqrt{-a}\, e}\right] \operatorname{Log}[d+e x]}{e^4}+$$
$$\frac{d^2 x \operatorname{Log}\left[c\left(a+b x^2\right)^p\right]}{e^3}+\frac{x^3 \operatorname{Log}\left[c\left(a+b x^2\right)^p\right]}{3 e}-\frac{d\left(a+b x^2\right) \operatorname{Log}\left[c\left(a+b x^2\right)^p\right]}{2 b e^2}-$$
$$\frac{d^3 \operatorname{Log}[d+e x] \operatorname{Log}\left[c\left(a+b x^2\right)^p\right]}{e^4}+\frac{d^3 p \operatorname{PolyLog}\left[2, \frac{\sqrt{b}\,(d+e x)}{\sqrt{b}\, d-\sqrt{-a}\, e}\right]}{e^4}+\frac{d^3 p \operatorname{PolyLog}\left[2, \frac{\sqrt{b}\,(d+e x)}{\sqrt{b}\, d+\sqrt{-a}\, e}\right]}{e^4}$$

Result (type 4, 509 leaves):

$$-\frac{1}{18 e^4}\left(36 d^2 e p x-\frac{12 a e^3 p x}{b}-9 d e^2 p x^2+4 e^3 p x^3+\frac{12 a^{3/2} e^3 p \operatorname{ArcTan}\left[\frac{\sqrt{b}\, x}{\sqrt{a}}\right]}{b^{3/2}}+\right.$$
$$\frac{18 i \sqrt{a}\, d^2 e p \operatorname{Log}\left[-\frac{i \sqrt{a}}{\sqrt{b}}+x\right]}{\sqrt{b}}-\frac{18 i \sqrt{a}\, d^2 e p \operatorname{Log}\left[\frac{i \sqrt{a}}{\sqrt{b}}+x\right]}{\sqrt{b}}-$$
$$18 d^3 p \operatorname{Log}\left[-\frac{i \sqrt{a}}{\sqrt{b}}+x\right] \operatorname{Log}[d+e x]-18 d^3 p \operatorname{Log}\left[\frac{i \sqrt{a}}{\sqrt{b}}+x\right] \operatorname{Log}[d+e x]+$$
$$18 d^3 p \operatorname{Log}\left[\frac{i \sqrt{a}}{\sqrt{b}}+x\right] \operatorname{Log}\left[\frac{\sqrt{b}\,(d+e x)}{\sqrt{b}\, d-i \sqrt{a}\, e}\right]+18 d^3 p \operatorname{Log}\left[-\frac{i \sqrt{a}}{\sqrt{b}}+x\right] \operatorname{Log}\left[\frac{\sqrt{b}\,(d+e x)}{\sqrt{b}\, d+i \sqrt{a}\, e}\right]+$$
$$\frac{9 a d e^2 p \operatorname{Log}\left[a+b x^2\right]}{b}-18 d^2 e x \operatorname{Log}\left[c\left(a+b x^2\right)^p\right]+9 d e^2 x^2 \operatorname{Log}\left[c\left(a+b x^2\right)^p\right]-$$
$$6 e^3 x^3 \operatorname{Log}\left[c\left(a+b x^2\right)^p\right]+18 d^3 \operatorname{Log}[d+e x] \operatorname{Log}\left[c\left(a+b x^2\right)^p\right]+$$
$$\left.18 d^3 p \operatorname{PolyLog}\left[2, \frac{e\left(\sqrt{a}-i \sqrt{b}\, x\right)}{i \sqrt{b}\, d+\sqrt{a}\, e}\right]+18 d^3 p \operatorname{PolyLog}\left[2, \frac{e\left(\sqrt{a}+i \sqrt{b}\, x\right)}{-i \sqrt{b}\, d+\sqrt{a}\, e}\right]\right)$$

Problem 227: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2 \operatorname{Log}\left[c\left(a+b x^2\right)^p\right]}{d+e x} \, dx$$

Optimal (type 4, 313 leaves, 17 steps):

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

Result (type 4, 438 leaves):

$$\frac{1}{2\,b\,e^3}\left(4\,b\,d\,e\,p\,x-b\,e^2\,p\,x^2+2\,i\,\sqrt{a}\,\sqrt{b}\,d\,e\,p\,\text{Log}\left[-\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]-\right.$$
$$2\,i\,\sqrt{a}\,\sqrt{b}\,d\,e\,p\,\text{Log}\left[\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]-2\,b\,d^2\,p\,\text{Log}\left[-\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]\,\text{Log}[d+e\,x]-$$
$$2\,b\,d^2\,p\,\text{Log}\left[\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]\,\text{Log}[d+e\,x]+2\,b\,d^2\,p\,\text{Log}\left[\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]\,\text{Log}\left[\frac{\sqrt{b}\,(d+e\,x)}{\sqrt{b}\,d-i\,\sqrt{a}\,e}\right]+$$
$$2\,b\,d^2\,p\,\text{Log}\left[-\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]\,\text{Log}\left[\frac{\sqrt{b}\,(d+e\,x)}{\sqrt{b}\,d+i\,\sqrt{a}\,e}\right]+a\,e^2\,p\,\text{Log}\left[a+b\,x^2\right]-$$
$$2\,b\,d\,e\,x\,\text{Log}\left[c\,\left(a+b\,x^2\right)^p\right]+b\,e^2\,x^2\,\text{Log}\left[c\,\left(a+b\,x^2\right)^p\right]+2\,b\,d^2\,\text{Log}[d+e\,x]\,\text{Log}\left[c\,\left(a+b\,x^2\right)^p\right]+$$
$$\left.2\,b\,d^2\,p\,\text{PolyLog}\left[2,\frac{e\,\left(\sqrt{a}-i\,\sqrt{b}\,x\right)}{i\,\sqrt{b}\,d+\sqrt{a}\,e}\right]+2\,b\,d^2\,p\,\text{PolyLog}\left[2,\frac{e\,\left(\sqrt{a}+i\,\sqrt{b}\,x\right)}{-i\,\sqrt{b}\,d+\sqrt{a}\,e}\right]\right)$$

Problem 228: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x\,\text{Log}\left[c\,\left(a+b\,x^2\right)^p\right]}{d+e\,x}\,dx$$

Optimal (type 4, 256 leaves, 14 steps):

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

Result (type 4, 357 leaves):

$$-\frac{1}{e^2}\left(2\,e\,p\,x+\frac{i\,\sqrt{a}\,e\,p\,\text{Log}\left[-\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]}{\sqrt{b}}-\frac{i\,\sqrt{a}\,e\,p\,\text{Log}\left[\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]}{\sqrt{b}}-\right.$$
$$d\,p\,\text{Log}\left[-\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]\,\text{Log}[d+e\,x]-d\,p\,\text{Log}\left[\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]\,\text{Log}[d+e\,x]+$$
$$d\,p\,\text{Log}\left[\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]\,\text{Log}\left[\frac{\sqrt{b}\,(d+e\,x)}{\sqrt{b}\,d-i\,\sqrt{a}\,e}\right]+d\,p\,\text{Log}\left[-\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]\,\text{Log}\left[\frac{\sqrt{b}\,(d+e\,x)}{\sqrt{b}\,d+i\,\sqrt{a}\,e}\right]-$$
$$e\,x\,\text{Log}\left[c\,\left(a+b\,x^2\right)^p\right]+d\,\text{Log}[d+e\,x]\,\text{Log}\left[c\,\left(a+b\,x^2\right)^p\right]+$$
$$\left.d\,p\,\text{PolyLog}\left[2,\frac{e\,\left(\sqrt{a}-i\,\sqrt{b}\,x\right)}{i\,\sqrt{b}\,d+\sqrt{a}\,e}\right]+d\,p\,\text{PolyLog}\left[2,\frac{e\,\left(\sqrt{a}+i\,\sqrt{b}\,x\right)}{-i\,\sqrt{b}\,d+\sqrt{a}\,e}\right]\right)$$

Problem 229: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Log}\left[c\,\left(a+b\,x^2\right)^p\right]}{d+e\,x}\,dx$$

Optimal (type 4, 201 leaves, 9 steps):

$$-\frac{p\,\text{Log}\left[\frac{e\,\left(\sqrt{-a}-\sqrt{b}\,x\right)}{\sqrt{b}\,d+\sqrt{-a}\,e}\right]\,\text{Log}[d+e\,x]}{e}-\frac{p\,\text{Log}\left[-\frac{e\,\left(\sqrt{-a}+\sqrt{b}\,x\right)}{\sqrt{b}\,d-\sqrt{-a}\,e}\right]\,\text{Log}[d+e\,x]}{e}+$$
$$\frac{\text{Log}[d+e\,x]\,\text{Log}\left[c\,\left(a+b\,x^2\right)^p\right]}{e}-\frac{p\,\text{PolyLog}\left[2,\frac{\sqrt{b}\,(d+e\,x)}{\sqrt{b}\,d-\sqrt{-a}\,e}\right]}{e}-\frac{p\,\text{PolyLog}\left[2,\frac{\sqrt{b}\,(d+e\,x)}{\sqrt{b}\,d+\sqrt{-a}\,e}\right]}{e}$$

Result (type 4, 262 leaves):

$$\frac{1}{e}\left(-p\,\text{Log}\left[-\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]\,\text{Log}[d+e\,x]-\right.$$
$$p\,\text{Log}\left[\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]\,\text{Log}[d+e\,x]+p\,\text{Log}\left[\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]\,\text{Log}\left[\frac{\sqrt{b}\,(d+e\,x)}{\sqrt{b}\,d-i\,\sqrt{a}\,e}\right]+$$
$$p\,\text{Log}\left[-\frac{i\,\sqrt{a}}{\sqrt{b}}+x\right]\,\text{Log}\left[\frac{\sqrt{b}\,(d+e\,x)}{\sqrt{b}\,d+i\,\sqrt{a}\,e}\right]+\text{Log}[d+e\,x]\,\text{Log}\left[c\,\left(a+b\,x^2\right)^p\right]+$$
$$\left.p\,\text{PolyLog}\left[2,\frac{e\,\left(\sqrt{a}-i\,\sqrt{b}\,x\right)}{i\,\sqrt{b}\,d+\sqrt{a}\,e}\right]+p\,\text{PolyLog}\left[2,\frac{e\,\left(\sqrt{a}+i\,\sqrt{b}\,x\right)}{-i\,\sqrt{b}\,d+\sqrt{a}\,e}\right]\right)$$

Problem 230: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Log}\left[c\,\left(a+b\,x^2\right)^p\right]}{x\,(d+e\,x)}\,dx$$

Optimal (type 4, 247 leaves, 14 steps):

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

Result (type 4, 361 leaves):

$$-\frac{1}{d}\left(p\,\text{Log}[x]\,\text{Log}\left[1-\frac{i\sqrt{b}\,x}{\sqrt{a}}\right]+p\,\text{Log}[x]\,\text{Log}\left[1+\frac{i\sqrt{b}\,x}{\sqrt{a}}\right]-p\,\text{Log}\left[-\frac{i\sqrt{a}}{\sqrt{b}}+x\right]\text{Log}[d+e\,x]-\right.$$
$$p\,\text{Log}\left[\frac{i\sqrt{a}}{\sqrt{b}}+x\right]\text{Log}[d+e\,x]+p\,\text{Log}\left[\frac{i\sqrt{a}}{\sqrt{b}}+x\right]\text{Log}\left[\frac{\sqrt{b}\,(d+e\,x)}{\sqrt{b}\,d-i\sqrt{a}\,e}\right]+$$
$$p\,\text{Log}\left[-\frac{i\sqrt{a}}{\sqrt{b}}+x\right]\text{Log}\left[\frac{\sqrt{b}\,(d+e\,x)}{\sqrt{b}\,d+i\sqrt{a}\,e}\right]-\text{Log}[x]\,\text{Log}\left[c\left(a+b\,x^2\right)^p\right]+$$
$$\text{Log}[d+e\,x]\,\text{Log}\left[c\left(a+b\,x^2\right)^p\right]+p\,\text{PolyLog}\left[2,-\frac{i\sqrt{b}\,x}{\sqrt{a}}\right]+p\,\text{PolyLog}\left[2,\frac{i\sqrt{b}\,x}{\sqrt{a}}\right]+$$
$$\left.p\,\text{PolyLog}\left[2,\frac{e\left(\sqrt{a}-i\sqrt{b}\,x\right)}{i\sqrt{b}\,d+\sqrt{a}\,e}\right]+p\,\text{PolyLog}\left[2,\frac{e\left(\sqrt{a}+i\sqrt{b}\,x\right)}{-i\sqrt{b}\,d+\sqrt{a}\,e}\right]\right)$$

Problem 231: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Log}\left[c\left(a+b\,x^2\right)^p\right]}{x^2\,(d+e\,x)}\,dx$$

Optimal (type 4, 306 leaves, 16 steps):

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

Result (type 4, 417 leaves):

$$\frac{1}{d^2}\left(\frac{2\sqrt{b}\,d\,p\,\text{ArcTan}\left[\frac{\sqrt{b}\,x}{\sqrt{a}}\right]}{\sqrt{a}}+e\,p\,\text{Log}[x]\,\text{Log}\left[1-\frac{i\sqrt{b}\,x}{\sqrt{a}}\right]+\right.$$
$$e\,p\,\text{Log}[x]\,\text{Log}\left[1+\frac{i\sqrt{b}\,x}{\sqrt{a}}\right]-e\,p\,\text{Log}\left[-\frac{i\sqrt{a}}{\sqrt{b}}+x\right]\text{Log}[d+e\,x]-$$
$$e\,p\,\text{Log}\left[\frac{i\sqrt{a}}{\sqrt{b}}+x\right]\text{Log}[d+e\,x]+e\,p\,\text{Log}\left[\frac{i\sqrt{a}}{\sqrt{b}}+x\right]\text{Log}\left[\frac{\sqrt{b}\,(d+e\,x)}{\sqrt{b}\,d-i\sqrt{a}\,e}\right]+$$
$$e\,p\,\text{Log}\left[-\frac{i\sqrt{a}}{\sqrt{b}}+x\right]\text{Log}\left[\frac{\sqrt{b}\,(d+e\,x)}{\sqrt{b}\,d+i\sqrt{a}\,e}\right]-\frac{d\,\text{Log}\left[c\,(a+b\,x^2)^p\right]}{x}-e\,\text{Log}[x]\,\text{Log}\left[c\,(a+b\,x^2)^p\right]+$$
$$e\,\text{Log}[d+e\,x]\,\text{Log}\left[c\,(a+b\,x^2)^p\right]+e\,p\,\text{PolyLog}\left[2,-\frac{i\sqrt{b}\,x}{\sqrt{a}}\right]+e\,p\,\text{PolyLog}\left[2,\frac{i\sqrt{b}\,x}{\sqrt{a}}\right]+$$
$$\left.e\,p\,\text{PolyLog}\left[2,\frac{e\left(\sqrt{a}-i\sqrt{b}\,x\right)}{i\sqrt{b}\,d+\sqrt{a}\,e}\right]+e\,p\,\text{PolyLog}\left[2,\frac{e\left(\sqrt{a}+i\sqrt{b}\,x\right)}{-i\sqrt{b}\,d+\sqrt{a}\,e}\right]\right)$$

Problem 232: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Log}\left[c\,(a+b\,x^2)^p\right]}{x^3\,(d+e\,x)}\,dx$$

Optimal (type 4, 371 leaves, 21 steps):

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

Result (type 4, 503 leaves):

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

Problem 247: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^3 \operatorname{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]}{d+e x}\, dx$$

Optimal (type 4, 421 leaves, 25 steps):

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

Result (type 4, 528 leaves):

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

$$3 d e^2 x^2 \operatorname{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]-2 e^3 x^3 \operatorname{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]+\frac{6 i \sqrt{b} d^2 e p \operatorname{Log}\left[-\frac{i \sqrt{b}}{\sqrt{a}}+x\right]}{\sqrt{a}}-$$

$$\frac{6 i \sqrt{b} d^2 e p \operatorname{Log}\left[\frac{i \sqrt{b}}{\sqrt{a}}+x\right]}{\sqrt{a}}+6 d^3 \operatorname{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right] \operatorname{Log}[d+e x]+12 d^3 p \operatorname{Log}[x] \operatorname{Log}[d+e x]-$$

$$6 d^3 p \operatorname{Log}\left[-\frac{i \sqrt{b}}{\sqrt{a}}+x\right] \operatorname{Log}[d+e x]-6 d^3 p \operatorname{Log}\left[\frac{i \sqrt{b}}{\sqrt{a}}+x\right] \operatorname{Log}[d+e x]+$$

$$6 d^3 p \operatorname{Log}\left[\frac{i \sqrt{b}}{\sqrt{a}}+x\right] \operatorname{Log}\left[\frac{\sqrt{a}(d+e x)}{\sqrt{a} d-i \sqrt{b} e}\right]+6 d^3 p \operatorname{Log}\left[-\frac{i \sqrt{b}}{\sqrt{a}}+x\right] \operatorname{Log}\left[\frac{\sqrt{a}(d+e x)}{\sqrt{a} d+i \sqrt{b} e}\right]-$$

$$12 d^3 p \operatorname{Log}[x] \operatorname{Log}\left[1+\frac{e x}{d}\right]+\frac{3 b d e^2 p \operatorname{Log}\left[b+a x^2\right]}{a}-12 d^3 p \operatorname{PolyLog}\left[2,-\frac{e x}{d}\right]+$$

$$\left.6 d^3 p \operatorname{PolyLog}\left[2, \frac{e\left(\sqrt{b}-i \sqrt{a} x\right)}{i \sqrt{a} d+\sqrt{b} e}\right]+6 d^3 p \operatorname{PolyLog}\left[2, \frac{e\left(\sqrt{b}+i \sqrt{a} x\right)}{-i \sqrt{a} d+\sqrt{b} e}\right]\right)$$

Problem 248: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{x^2 \operatorname{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]}{d+e x} \, dx$$

Optimal (type 4, 353 leaves, 21 steps):

$$-\frac{2 \sqrt{b} d p \operatorname{ArcTan}\left[\frac{\sqrt{a} x}{\sqrt{b}}\right]}{\sqrt{a} e^2}-\frac{d x \operatorname{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]}{e^2}+\frac{x^2 \operatorname{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]}{2 e}+$$

$$\frac{d^2 \operatorname{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right] \operatorname{Log}[d+e x]}{e^3}+\frac{2 d^2 p \operatorname{Log}\left[-\frac{e x}{d}\right] \operatorname{Log}[d+e x]}{e^3}-$$

$$\frac{d^2 p \operatorname{Log}\left[\frac{e\left(\sqrt{b}-\sqrt{-a} x\right)}{\sqrt{-a} d+\sqrt{b} e}\right] \operatorname{Log}[d+e x]}{e^3}-\frac{d^2 p \operatorname{Log}\left[-\frac{e\left(\sqrt{b}+\sqrt{-a} x\right)}{\sqrt{-a} d-\sqrt{b} e}\right] \operatorname{Log}[d+e x]}{e^3}+\frac{b p \operatorname{Log}\left[b+a x^2\right]}{2 a e}-$$

$$\frac{d^2 p \operatorname{PolyLog}\left[2, \frac{\sqrt{-a}(d+e x)}{\sqrt{-a} d-\sqrt{b} e}\right]}{e^3}-\frac{d^2 p \operatorname{PolyLog}\left[2, \frac{\sqrt{-a}(d+e x)}{\sqrt{-a} d+\sqrt{b} e}\right]}{e^3}+\frac{2 d^2 p \operatorname{PolyLog}\left[2, 1+\frac{e x}{d}\right]}{e^3}$$

Result (type 4, 470 leaves):

$$\frac{1}{2\,a\,e^3}\left(-2\,a\,d\,e\,x\,\mathrm{Log}\left[c\,\left(a+\frac{b}{x^2}\right)^p\right]+a\,e^2\,x^2\,\mathrm{Log}\left[c\,\left(a+\frac{b}{x^2}\right)^p\right]+\right.$$
$$2\,\mathrm{i}\,\sqrt{a}\,\sqrt{b}\,d\,e\,p\,\mathrm{Log}\left[-\frac{\mathrm{i}\,\sqrt{b}}{\sqrt{a}}+x\right]-2\,\mathrm{i}\,\sqrt{a}\,\sqrt{b}\,d\,e\,p\,\mathrm{Log}\left[\frac{\mathrm{i}\,\sqrt{b}}{\sqrt{a}}+x\right]+$$
$$2\,a\,d^2\,\mathrm{Log}\left[c\,\left(a+\frac{b}{x^2}\right)^p\right]\,\mathrm{Log}[d+e\,x]+4\,a\,d^2\,p\,\mathrm{Log}[x]\,\mathrm{Log}[d+e\,x]-$$
$$2\,a\,d^2\,p\,\mathrm{Log}\left[-\frac{\mathrm{i}\,\sqrt{b}}{\sqrt{a}}+x\right]\,\mathrm{Log}[d+e\,x]-2\,a\,d^2\,p\,\mathrm{Log}\left[\frac{\mathrm{i}\,\sqrt{b}}{\sqrt{a}}+x\right]\,\mathrm{Log}[d+e\,x]+$$
$$2\,a\,d^2\,p\,\mathrm{Log}\left[\frac{\mathrm{i}\,\sqrt{b}}{\sqrt{a}}+x\right]\,\mathrm{Log}\left[\frac{\sqrt{a}\,(d+e\,x)}{\sqrt{a}\,d-\mathrm{i}\,\sqrt{b}\,e}\right]+2\,a\,d^2\,p\,\mathrm{Log}\left[-\frac{\mathrm{i}\,\sqrt{b}}{\sqrt{a}}+x\right]\,\mathrm{Log}\left[\frac{\sqrt{a}\,(d+e\,x)}{\sqrt{a}\,d+\mathrm{i}\,\sqrt{b}\,e}\right]-$$
$$4\,a\,d^2\,p\,\mathrm{Log}[x]\,\mathrm{Log}\left[1+\frac{e\,x}{d}\right]+b\,e^2\,p\,\mathrm{Log}\left[b+a\,x^2\right]-4\,a\,d^2\,p\,\mathrm{PolyLog}\left[2,-\frac{e\,x}{d}\right]+$$
$$\left.2\,a\,d^2\,p\,\mathrm{PolyLog}\left[2,\frac{e\,\left(\sqrt{b}-\mathrm{i}\,\sqrt{a}\,x\right)}{\mathrm{i}\,\sqrt{a}\,d+\sqrt{b}\,e}\right]+2\,a\,d^2\,p\,\mathrm{PolyLog}\left[2,\frac{e\,\left(\sqrt{b}+\mathrm{i}\,\sqrt{a}\,x\right)}{-\mathrm{i}\,\sqrt{a}\,d+\sqrt{b}\,e}\right]\right)$$

Problem 249: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{x\,\mathrm{Log}\left[c\,\left(a+\frac{b}{x^2}\right)^p\right]}{d+e\,x}\,dx$$

Optimal (type 4, 291 leaves, 18 steps):

$$\frac{2\,\sqrt{b}\,p\,\mathrm{ArcTan}\left[\frac{\sqrt{a}\,x}{\sqrt{b}}\right]}{\sqrt{a}\,e}+\frac{x\,\mathrm{Log}\left[c\,\left(a+\frac{b}{x^2}\right)^p\right]}{e}-$$
$$\frac{d\,\mathrm{Log}\left[c\,\left(a+\frac{b}{x^2}\right)^p\right]\,\mathrm{Log}[d+e\,x]}{e^2}-\frac{2\,d\,p\,\mathrm{Log}\left[-\frac{e\,x}{d}\right]\,\mathrm{Log}[d+e\,x]}{e^2}+$$
$$\frac{d\,p\,\mathrm{Log}\left[\frac{e\,\left(\sqrt{b}-\sqrt{-a}\,x\right)}{\sqrt{-a}\,d+\sqrt{b}\,e}\right]\,\mathrm{Log}[d+e\,x]}{e^2}+\frac{d\,p\,\mathrm{Log}\left[-\frac{e\,\left(\sqrt{b}+\sqrt{-a}\,x\right)}{\sqrt{-a}\,d-\sqrt{b}\,e}\right]\,\mathrm{Log}[d+e\,x]}{e^2}+$$
$$\frac{d\,p\,\mathrm{PolyLog}\left[2,\frac{\sqrt{-a}\,(d+e\,x)}{\sqrt{-a}\,d-\sqrt{b}\,e}\right]}{e^2}+\frac{d\,p\,\mathrm{PolyLog}\left[2,\frac{\sqrt{-a}\,(d+e\,x)}{\sqrt{-a}\,d+\sqrt{b}\,e}\right]}{e^2}-\frac{2\,d\,p\,\mathrm{PolyLog}\left[2,1+\frac{e\,x}{d}\right]}{e^2}$$

Result (type 4, 392 leaves):

$$-\frac{1}{e^2}\left(-e\,x\,\text{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]+\frac{i\sqrt{b}\,e\,p\,\text{Log}\left[-\frac{i\sqrt{b}}{\sqrt{a}}+x\right]}{\sqrt{a}}-\frac{i\sqrt{b}\,e\,p\,\text{Log}\left[\frac{i\sqrt{b}}{\sqrt{a}}+x\right]}{\sqrt{a}}+\right.$$
$$d\,\text{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]\text{Log}[d+e\,x]+2\,d\,p\,\text{Log}[x]\,\text{Log}[d+e\,x]-d\,p\,\text{Log}\left[-\frac{i\sqrt{b}}{\sqrt{a}}+x\right]\text{Log}[d+e\,x]-$$
$$d\,p\,\text{Log}\left[\frac{i\sqrt{b}}{\sqrt{a}}+x\right]\text{Log}[d+e\,x]+d\,p\,\text{Log}\left[\frac{i\sqrt{b}}{\sqrt{a}}+x\right]\text{Log}\left[\frac{\sqrt{a}\,(d+e\,x)}{\sqrt{a}\,d-i\sqrt{b}\,e}\right]+$$
$$d\,p\,\text{Log}\left[-\frac{i\sqrt{b}}{\sqrt{a}}+x\right]\text{Log}\left[\frac{\sqrt{a}\,(d+e\,x)}{\sqrt{a}\,d+i\sqrt{b}\,e}\right]-2\,d\,p\,\text{Log}[x]\,\text{Log}\left[1+\frac{e\,x}{d}\right]-2\,d\,p\,\text{PolyLog}\left[2,-\frac{e\,x}{d}\right]+$$
$$\left.d\,p\,\text{PolyLog}\left[2,\frac{e\left(\sqrt{b}-i\sqrt{a}\,x\right)}{i\sqrt{a}\,d+\sqrt{b}\,e}\right]+d\,p\,\text{PolyLog}\left[2,\frac{e\left(\sqrt{b}+i\sqrt{a}\,x\right)}{-i\sqrt{a}\,d+\sqrt{b}\,e}\right]\right)$$

Problem 250: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]}{d+e\,x}\,dx$$

Optimal (type 4, 241 leaves, 13 steps):

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

Result (type 4, 299 leaves):

$$\frac{1}{e}\left(\text{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]\text{Log}[d+e\,x]+2\,p\,\text{Log}[x]\,\text{Log}[d+e\,x]-p\,\text{Log}\left[-\frac{i\sqrt{b}}{\sqrt{a}}+x\right]\text{Log}[d+e\,x]-\right.$$
$$p\,\text{Log}\left[\frac{i\sqrt{b}}{\sqrt{a}}+x\right]\text{Log}[d+e\,x]+p\,\text{Log}\left[\frac{i\sqrt{b}}{\sqrt{a}}+x\right]\text{Log}\left[\frac{\sqrt{a}\,(d+e\,x)}{\sqrt{a}\,d-i\sqrt{b}\,e}\right]+$$
$$p\,\text{Log}\left[-\frac{i\sqrt{b}}{\sqrt{a}}+x\right]\text{Log}\left[\frac{\sqrt{a}\,(d+e\,x)}{\sqrt{a}\,d+i\sqrt{b}\,e}\right]-2\,p\,\text{Log}[x]\,\text{Log}\left[1+\frac{e\,x}{d}\right]-2\,p\,\text{PolyLog}\left[2,-\frac{e\,x}{d}\right]+$$
$$\left.p\,\text{PolyLog}\left[2,\frac{e\left(\sqrt{b}-i\sqrt{a}\,x\right)}{i\sqrt{a}\,d+\sqrt{b}\,e}\right]+p\,\text{PolyLog}\left[2,\frac{e\left(\sqrt{b}+i\sqrt{a}\,x\right)}{-i\sqrt{a}\,d+\sqrt{b}\,e}\right]\right)$$

Problem 251: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]}{x\,(d+e\,x)}\,dx$$

Optimal (type 4, 287 leaves, 18 steps):

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

Result (type 4, 405 leaves):

$$-\frac{1}{d}\left(-\text{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]\text{Log}[x]-p\,\text{Log}[x]^2+p\,\text{Log}[x]\,\text{Log}\left[1-\frac{i\sqrt{a}\,x}{\sqrt{b}}\right]+p\,\text{Log}[x]\,\text{Log}\left[1+\frac{i\sqrt{a}\,x}{\sqrt{b}}\right]+\text{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]\text{Log}[d+e\,x]+2\,p\,\text{Log}[x]\,\text{Log}[d+e\,x]-p\,\text{Log}\left[-\frac{i\sqrt{b}}{\sqrt{a}}+x\right]\text{Log}[d+e\,x]-p\,\text{Log}\left[\frac{i\sqrt{b}}{\sqrt{a}}+x\right]\text{Log}[d+e\,x]+p\,\text{Log}\left[\frac{i\sqrt{b}}{\sqrt{a}}+x\right]\text{Log}\left[\frac{\sqrt{a}\,(d+e\,x)}{\sqrt{a}\,d-i\sqrt{b}\,e}\right]+p\,\text{Log}\left[-\frac{i\sqrt{b}}{\sqrt{a}}+x\right]\text{Log}\left[\frac{\sqrt{a}\,(d+e\,x)}{\sqrt{a}\,d+i\sqrt{b}\,e}\right]-2\,p\,\text{Log}[x]\,\text{Log}\left[1+\frac{e\,x}{d}\right]+p\,\text{PolyLog}\left[2,-\frac{i\sqrt{a}\,x}{\sqrt{b}}\right]+p\,\text{PolyLog}\left[2,\frac{i\sqrt{a}\,x}{\sqrt{b}}\right]-2\,p\,\text{PolyLog}\left[2,-\frac{e\,x}{d}\right]+p\,\text{PolyLog}\left[2,\frac{e\left(\sqrt{b}-i\sqrt{a}\,x\right)}{i\sqrt{a}\,d+\sqrt{b}\,e}\right]+p\,\text{PolyLog}\left[2,\frac{e\left(\sqrt{b}+i\sqrt{a}\,x\right)}{-i\sqrt{a}\,d+\sqrt{b}\,e}\right]\right)$$

Problem 252: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]}{x^2\,(d+e\,x)}\,dx$$

Optimal (type 4, 357 leaves, 22 steps):

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

Result (type 4, 472 leaves):

$$\frac{1}{d^2}\left(\frac{2\,d\,p}{x}+\frac{2\sqrt{a}\,d\,p\,\text{ArcTan}\left[\frac{\sqrt{a}\,x}{\sqrt{b}}\right]}{\sqrt{b}}-\frac{d\,\text{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]}{x}-e\,\text{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]\text{Log}[x]-e\,p\,\text{Log}[x]^2+\right.$$
$$e\,p\,\text{Log}[x]\,\text{Log}\left[1-\frac{i\sqrt{a}\,x}{\sqrt{b}}\right]+e\,p\,\text{Log}[x]\,\text{Log}\left[1+\frac{i\sqrt{a}\,x}{\sqrt{b}}\right]+e\,\text{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]\text{Log}[d+e\,x]+$$
$$2\,e\,p\,\text{Log}[x]\,\text{Log}[d+e\,x]-e\,p\,\text{Log}\left[-\frac{i\sqrt{b}}{\sqrt{a}}+x\right]\text{Log}[d+e\,x]-e\,p\,\text{Log}\left[\frac{i\sqrt{b}}{\sqrt{a}}+x\right]\text{Log}[d+e\,x]+$$
$$e\,p\,\text{Log}\left[\frac{i\sqrt{b}}{\sqrt{a}}+x\right]\text{Log}\left[\frac{\sqrt{a}\,(d+e\,x)}{\sqrt{a}\,d-i\sqrt{b}\,e}\right]+e\,p\,\text{Log}\left[-\frac{i\sqrt{b}}{\sqrt{a}}+x\right]\text{Log}\left[\frac{\sqrt{a}\,(d+e\,x)}{\sqrt{a}\,d+i\sqrt{b}\,e}\right]-$$
$$2\,e\,p\,\text{Log}[x]\,\text{Log}\left[1+\frac{e\,x}{d}\right]+e\,p\,\text{PolyLog}\left[2,-\frac{i\sqrt{a}\,x}{\sqrt{b}}\right]+e\,p\,\text{PolyLog}\left[2,\frac{i\sqrt{a}\,x}{\sqrt{b}}\right]-$$
$$\left.2\,e\,p\,\text{PolyLog}\left[2,-\frac{e\,x}{d}\right]+e\,p\,\text{PolyLog}\left[2,\frac{e\left(\sqrt{b}-i\sqrt{a}\,x\right)}{i\sqrt{a}\,d+\sqrt{b}\,e}\right]+e\,p\,\text{PolyLog}\left[2,\frac{e\left(\sqrt{b}+i\sqrt{a}\,x\right)}{-i\sqrt{a}\,d+\sqrt{b}\,e}\right]\right)$$

Problem 253: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Log}\left[c\left(a+\frac{b}{x^2}\right)^p\right]}{x^3\,(d+e\,x)}\,dx$$

Optimal (type 4, 414 leaves, 25 steps):

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

Result (type 4, 643 leaves):

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

Problem 263: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Log}\left[c\,(d+e\,x)^p\right]}{f+g\,x^2}\,dx$$

Optimal (type 4, 229 leaves, 8 steps):

$$\frac{\text{Log}\left[c\,(d+e\,x)^p\right]\,\text{Log}\left[\frac{e\left(\sqrt{-f}-\sqrt{g}\,x\right)}{e\sqrt{-f}+d\sqrt{g}}\right]}{2\sqrt{-f}\,\sqrt{g}}-\frac{\text{Log}\left[c\,(d+e\,x)^p\right]\,\text{Log}\left[\frac{e\left(\sqrt{-f}+\sqrt{g}\,x\right)}{e\sqrt{-f}-d\sqrt{g}}\right]}{2\sqrt{-f}\,\sqrt{g}}-\frac{p\,\text{PolyLog}\left[2,-\frac{\sqrt{g}\,(d+e\,x)}{e\sqrt{-f}-d\sqrt{g}}\right]}{2\sqrt{-f}\,\sqrt{g}}+\frac{p\,\text{PolyLog}\left[2,\frac{\sqrt{g}\,(d+e\,x)}{e\sqrt{-f}+d\sqrt{g}}\right]}{2\sqrt{-f}\,\sqrt{g}}$$

Result (type 4, 232 leaves):

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

Problem 266: Result is not expressed in closed-form.

$$\int \frac{\text{Log}\left[c\left(d+e\sqrt{x}\right)^p\right]}{f+g\,x^2}\,dx$$

Optimal (type 4, 541 leaves, 19 steps):

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

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

$$\frac{\text{Log}\left[c\left(d+e\sqrt{x}\right)^p\right]\text{Log}\left[\frac{e\left((-f)^{1/4}+g^{1/4}\sqrt{x}\right)}{e\,(-f)^{1/4}-d\,g^{1/4}}\right]}{2\sqrt{-f}\sqrt{g}}-\frac{p\,\text{PolyLog}\left[2,-\frac{g^{1/4}\left(d+e\sqrt{x}\right)}{e\sqrt{-\sqrt{-f}}-d\,g^{1/4}}\right]}{2\sqrt{-f}\sqrt{g}}+$$

$$\frac{p\,\text{PolyLog}\left[2,-\frac{g^{1/4}\left(d+e\sqrt{x}\right)}{e\,(-f)^{1/4}-d\,g^{1/4}}\right]}{2\sqrt{-f}\sqrt{g}}-\frac{p\,\text{PolyLog}\left[2,\frac{g^{1/4}\left(d+e\sqrt{x}\right)}{e\sqrt{-\sqrt{-f}}+d\,g^{1/4}}\right]}{2\sqrt{-f}\sqrt{g}}+\frac{p\,\text{PolyLog}\left[2,\frac{g^{1/4}\left(d+e\sqrt{x}\right)}{e\,(-f)^{1/4}+d\,g^{1/4}}\right]}{2\sqrt{-f}\sqrt{g}}$$

Result (type 7, 227 leaves) :

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

$$\frac{1}{4g}e^2\,p\,\text{RootSum}\left[e^4 f+d^4 g-4d^3 g\,\#1+6d^2 g\,\#1^2-4d\,g\,\#1^3+g\,\#1^4\,\&,\frac{1}{d^2-2d\,\#1+\#1^2}\right.$$
$$\left.\left(-\text{Log}\left[d+e\sqrt{x}\right]^2+2\,\text{Log}\left[d+e\sqrt{x}\right]\text{Log}\left[1-\frac{d+e\sqrt{x}}{\#1}\right]+2\,\text{PolyLog}\left[2,\frac{d+e\sqrt{x}}{\#1}\right]\right)\&\right]$$

Problem 267: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^p\right]}{f+g\,x^2}\,dx$$

Optimal (type 4, 561 leaves, 20 steps) :

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

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

$$\frac{p\,\text{PolyLog}\left[2,\frac{\sqrt{-\sqrt{-f}}\left(d+\frac{e}{\sqrt{x}}\right)}{d\sqrt{-\sqrt{-f}}-e\,g^{1/4}}\right]}{2\sqrt{-f}\,\sqrt{g}}+\frac{p\,\text{PolyLog}\left[2,\frac{(-f)^{1/4}\left(d+\frac{e}{\sqrt{x}}\right)}{d\,(-f)^{1/4}-e\,g^{1/4}}\right]}{2\sqrt{-f}\,\sqrt{g}}-$$

$$\frac{p\,\text{PolyLog}\left[2,\frac{\sqrt{-\sqrt{-f}}\left(d+\frac{e}{\sqrt{x}}\right)}{d\sqrt{-\sqrt{-f}}+e\,g^{1/4}}\right]}{2\sqrt{-f}\,\sqrt{g}}+\frac{p\,\text{PolyLog}\left[2,\frac{(-f)^{1/4}\left(d+\frac{e}{\sqrt{x}}\right)}{d\,(-f)^{1/4}+e\,g^{1/4}}\right]}{2\sqrt{-f}\,\sqrt{g}}$$

Result (type 4, 895 leaves) :

$$\frac{1}{4\sqrt{f}\sqrt{g}}\left(4\,p\,\text{ArcTan}\left[1-\frac{\sqrt{2}\,g^{1/4}\sqrt{x}}{f^{1/4}}\right]\text{Log}\left[d+\frac{e}{\sqrt{x}}\right]+\right.$$

$$4\,p\,\text{ArcTan}\left[1+\frac{\sqrt{2}\,g^{1/4}\sqrt{x}}{f^{1/4}}\right]\text{Log}\left[d+\frac{e}{\sqrt{x}}\right]+4\,p\,\text{ArcTan}\left[\frac{\sqrt{g}\,x}{\sqrt{f}}\right]\text{Log}\left[d+\frac{e}{\sqrt{x}}\right]-$$

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

$$4\,p\,\text{ArcTan}\left[\frac{\sqrt{g}\,x}{\sqrt{f}}\right]\text{Log}\left[\frac{e}{d}+\sqrt{x}\right]-2\,\mathrm{i}\,p\,\text{Log}\left[1+\frac{g^{1/4}\left(e+d\sqrt{x}\right)}{(-1)^{1/4}\,d\,f^{1/4}-e\,g^{1/4}}\right]\text{Log}\left[\frac{e}{d}+\sqrt{x}\right]+$$

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

$$2\,\mathrm{i}\,p\,\text{Log}\left[1-\frac{g^{1/4}\left(e+d\sqrt{x}\right)}{(-1)^{1/4}\,d\,f^{1/4}+e\,g^{1/4}}\right]\text{Log}\left[\frac{e}{d}+\sqrt{x}\right]+$$

$$2\,\mathrm{i}\,p\,\text{Log}\left[1-\frac{g^{1/4}\left(e+d\sqrt{x}\right)}{(-1)^{3/4}\,d\,f^{1/4}+e\,g^{1/4}}\right]\text{Log}\left[\frac{e}{d}+\sqrt{x}\right]+2\,p\,\text{ArcTan}\left[\frac{\sqrt{g}\,x}{\sqrt{f}}\right]\text{Log}[x]-$$

$$\mathrm{i}\,p\,\text{Log}\left[1-\frac{(-1)^{1/4}\,g^{1/4}\sqrt{x}}{f^{1/4}}\right]\text{Log}[x]-\mathrm{i}\,p\,\text{Log}\left[1+\frac{(-1)^{1/4}\,g^{1/4}\sqrt{x}}{f^{1/4}}\right]\text{Log}[x]+$$

$$\mathrm{i}\,p\,\text{Log}\left[1-\frac{(-1)^{3/4}\,g^{1/4}\sqrt{x}}{f^{1/4}}\right]\text{Log}[x]+\mathrm{i}\,p\,\text{Log}\left[1+\frac{(-1)^{3/4}\,g^{1/4}\sqrt{x}}{f^{1/4}}\right]\text{Log}[x]-$$

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

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

$$2\,\mathrm{i}\,p\,\text{PolyLog}\left[2,-\frac{(-1)^{1/4}\,g^{1/4}\sqrt{x}}{f^{1/4}}\right]-2\,\mathrm{i}\,p\,\text{PolyLog}\left[2,\frac{(-1)^{1/4}\,g^{1/4}\sqrt{x}}{f^{1/4}}\right]+$$

$$\left.2\,\mathrm{i}\,p\,\text{PolyLog}\left[2,-\frac{(-1)^{3/4}\,g^{1/4}\sqrt{x}}{f^{1/4}}\right]+2\,\mathrm{i}\,p\,\text{PolyLog}\left[2,\frac{(-1)^{3/4}\,g^{1/4}\sqrt{x}}{f^{1/4}}\right]\right)$$

Problem 274: Result more than twice size of optimal antiderivative.

$$\int\left(f+g\,x^2\right)\text{Log}\left[c\left(d+e\,x^2\right)^p\right]^2\,dx$$

Optimal (type 4, 548 leaves, 30 steps):

$$8\,f\,p^2\,x-\frac{32\,d\,g\,p^2\,x}{9\,e}+\frac{8}{27}\,g\,p^2\,x^3-\frac{8\,\sqrt{d}\,f\,p^2\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]}{\sqrt{e}}+$$
$$\frac{32\,d^{3/2}\,g\,p^2\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]}{9\,e^{3/2}}+\frac{4\,i\,\sqrt{d}\,f\,p^2\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]^2}{\sqrt{e}}-\frac{4\,i\,d^{3/2}\,g\,p^2\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]^2}{3\,e^{3/2}}+$$
$$\frac{8\,\sqrt{d}\,f\,p^2\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]\,\text{Log}\left[\frac{2\,\sqrt{d}}{\sqrt{d}+i\,\sqrt{e}\,x}\right]}{\sqrt{e}}-\frac{8\,d^{3/2}\,g\,p^2\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]\,\text{Log}\left[\frac{2\,\sqrt{d}}{\sqrt{d}+i\,\sqrt{e}\,x}\right]}{3\,e^{3/2}}-$$
$$4\,f\,p\,x\,\text{Log}\left[c\,\left(d+e\,x^2\right)^p\right]+\frac{4\,d\,g\,p\,x\,\text{Log}\left[c\,\left(d+e\,x^2\right)^p\right]}{3\,e}-$$
$$\frac{4}{9}\,g\,p\,x^3\,\text{Log}\left[c\,\left(d+e\,x^2\right)^p\right]+\frac{4\,\sqrt{d}\,f\,p\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]\,\text{Log}\left[c\,\left(d+e\,x^2\right)^p\right]}{\sqrt{e}}-$$
$$\frac{4\,d^{3/2}\,g\,p\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]\,\text{Log}\left[c\,\left(d+e\,x^2\right)^p\right]}{3\,e^{3/2}}+f\,x\,\text{Log}\left[c\,\left(d+e\,x^2\right)^p\right]^2+\frac{1}{3}\,g\,x^3\,\text{Log}\left[c\,\left(d+e\,x^2\right)^p\right]^2+$$
$$\frac{4\,i\,\sqrt{d}\,f\,p^2\,\text{PolyLog}\left[2,\,1-\frac{2\,\sqrt{d}}{\sqrt{d}+i\,\sqrt{e}\,x}\right]}{\sqrt{e}}-\frac{4\,i\,d^{3/2}\,g\,p^2\,\text{PolyLog}\left[2,\,1-\frac{2\,\sqrt{d}}{\sqrt{d}+i\,\sqrt{e}\,x}\right]}{3\,e^{3/2}}$$

Result (type 4, 1125 leaves) :

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

$$2\,g\,p\left(-\frac{2}{3}\,e\left(-\frac{d\,x}{e^2}+\frac{x^3}{3\,e}+\frac{d^{3/2}\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]}{e^{5/2}}\right)+\frac{1}{3}\,x^3\,\text{Log}\left[d+e\,x^2\right]\right)$$

$$\left(-p\,\text{Log}\left[d+e\,x^2\right]+\text{Log}\left[c\,\left(d+e\,x^2\right)^p\right]\right)+f\,x\,\left(-p\,\text{Log}\left[d+e\,x^2\right]+\text{Log}\left[c\,\left(d+e\,x^2\right)^p\right]\right)^2+$$

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

$$\frac{1}{\sqrt{e}}\left(-8\,\sqrt{e}\,x-4\,\mathrm{i}\,\sqrt{d}\,\text{Log}\left[-\frac{\mathrm{i}\,\sqrt{d}}{\sqrt{e}}+x\right]+4\,\sqrt{d}\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]\,\text{Log}\left[-\frac{\mathrm{i}\,\sqrt{d}}{\sqrt{e}}+x\right]+\right.$$

$$\mathrm{i}\,\sqrt{d}\,\text{Log}\left[-\frac{\mathrm{i}\,\sqrt{d}}{\sqrt{e}}+x\right]^2+4\,\mathrm{i}\,\sqrt{d}\,\text{Log}\left[\frac{\mathrm{i}\,\sqrt{d}}{\sqrt{e}}+x\right]+4\,\sqrt{d}\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]\,\text{Log}\left[\frac{\mathrm{i}\,\sqrt{d}}{\sqrt{e}}+x\right]-$$

$$\mathrm{i}\,\sqrt{d}\,\text{Log}\left[\frac{\mathrm{i}\,\sqrt{d}}{\sqrt{e}}+x\right]^2-2\,\mathrm{i}\,\sqrt{d}\,\text{Log}\left[-\frac{\mathrm{i}\,\sqrt{d}}{\sqrt{e}}+x\right]\,\text{Log}\left[\frac{1}{2}-\frac{\mathrm{i}\,\sqrt{e}\,x}{2\,\sqrt{d}}\right]+$$

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

$$\left.\left.\text{Log}\left[d+e\,x^2\right]+2\,\mathrm{i}\,\sqrt{d}\,\text{PolyLog}\left[2,\,\frac{1}{2}-\frac{\mathrm{i}\,\sqrt{e}\,x}{2\,\sqrt{d}}\right]-2\,\mathrm{i}\,\sqrt{d}\,\text{PolyLog}\left[2,\,\frac{1}{2}+\frac{\mathrm{i}\,\sqrt{e}\,x}{2\,\sqrt{d}}\right]\right)\right)+$$

$$g\,p^2\left(\frac{1}{3}\,x^3\,\text{Log}\left[d+e\,x^2\right]^2-\frac{1}{27\,e^{3/2}}\left(96\,d\,\sqrt{e}\,x-8\,e^{3/2}\,x^3-24\,d^{3/2}\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]+36\,\mathrm{i}\,d^{3/2}\right.\right.$$

$$\text{Log}\left[-\frac{\mathrm{i}\,\sqrt{d}}{\sqrt{e}}+x\right]-36\,d^{3/2}\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]\,\text{Log}\left[-\frac{\mathrm{i}\,\sqrt{d}}{\sqrt{e}}+x\right]-9\,\mathrm{i}\,d^{3/2}\,\text{Log}\left[-\frac{\mathrm{i}\,\sqrt{d}}{\sqrt{e}}+x\right]^2-$$

$$36\,\mathrm{i}\,d^{3/2}\,\text{Log}\left[\frac{\mathrm{i}\,\sqrt{d}}{\sqrt{e}}+x\right]-36\,d^{3/2}\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]\,\text{Log}\left[\frac{\mathrm{i}\,\sqrt{d}}{\sqrt{e}}+x\right]+9\,\mathrm{i}\,d^{3/2}\,\text{Log}\left[\frac{\mathrm{i}\,\sqrt{d}}{\sqrt{e}}+x\right]^2+$$

$$18\,\mathrm{i}\,d^{3/2}\,\text{Log}\left[-\frac{\mathrm{i}\,\sqrt{d}}{\sqrt{e}}+x\right]\,\text{Log}\left[\frac{1}{2}-\frac{\mathrm{i}\,\sqrt{e}\,x}{2\,\sqrt{d}}\right]-18\,\mathrm{i}\,d^{3/2}\,\text{Log}\left[\frac{\mathrm{i}\,\sqrt{d}}{\sqrt{e}}+x\right]\,\text{Log}\left[\frac{1}{2}+\frac{\mathrm{i}\,\sqrt{e}\,x}{2\,\sqrt{d}}\right]-$$

$$36\,d\,\sqrt{e}\,x\,\text{Log}\left[d+e\,x^2\right]+12\,e^{3/2}\,x^3\,\text{Log}\left[d+e\,x^2\right]+36\,d^{3/2}\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]\,\text{Log}\left[d+e\,x^2\right]-$$

$$\left.\left.18\,\mathrm{i}\,d^{3/2}\,\text{PolyLog}\left[2,\,\frac{1}{2}-\frac{\mathrm{i}\,\sqrt{e}\,x}{2\,\sqrt{d}}\right]+18\,\mathrm{i}\,d^{3/2}\,\text{PolyLog}\left[2,\,\frac{1}{2}+\frac{\mathrm{i}\,\sqrt{e}\,x}{2\,\sqrt{d}}\right]\right)\right)$$

Problem 341: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{Log}\left[c\,\left(d+e\,x^2\right)^p\right]}{x\,\left(f+g\,x^2\right)}\,dx$$

Optimal (type 4, 119 leaves, 8 steps):

$$\frac{\text{Log}\left[-\frac{e x^2}{d}\right] \text{Log}\left[c \left(d+e x^2\right)^p\right]}{2 f}-\frac{\text{Log}\left[c \left(d+e x^2\right)^p\right] \text{Log}\left[\frac{e \left(f+g x^2\right)}{e f-d g}\right]}{2 f}-\frac{p \,\text{PolyLog}\left[2,-\frac{g \left(d+e x^2\right)}{e f-d g}\right]}{2 f}+\frac{p \,\text{PolyLog}\left[2,1+\frac{e x^2}{d}\right]}{2 f}$$

Result (type 4, 663 leaves):

$$-\frac{1}{2 f}\left(2 p \,\text{Log}[x] \,\text{Log}\left[1-\frac{i \sqrt{e}\, x}{\sqrt{d}}\right]+2 p \,\text{Log}[x] \,\text{Log}\left[1+\frac{i \sqrt{e}\, x}{\sqrt{d}}\right]+\right.$$
$$p \,\text{Log}\left[\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \text{Log}\left[\frac{\sqrt{e} \left(\sqrt{f}-i \sqrt{g}\, x\right)}{\sqrt{e} \sqrt{f}-\sqrt{d} \sqrt{g}}\right]+p \,\text{Log}\left[-\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \text{Log}\left[\frac{\sqrt{e} \left(\sqrt{f}-i \sqrt{g}\, x\right)}{\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}\right]+$$
$$p \,\text{Log}\left[-\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \text{Log}\left[\frac{\sqrt{e} \left(\sqrt{f}+i \sqrt{g}\, x\right)}{\sqrt{e} \sqrt{f}-\sqrt{d} \sqrt{g}}\right]+p \,\text{Log}\left[\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \text{Log}\left[\frac{\sqrt{e} \left(\sqrt{f}+i \sqrt{g}\, x\right)}{\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}\right]-$$
$$2 \,\text{Log}[x] \,\text{Log}\left[c \left(d+e x^2\right)^p\right]-p \,\text{Log}\left[-\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \text{Log}\left[f+g x^2\right]-p \,\text{Log}\left[\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \text{Log}\left[f+g x^2\right]+$$
$$\text{Log}\left[c \left(d+e x^2\right)^p\right] \text{Log}\left[f+g x^2\right]+2 p \,\text{PolyLog}\left[2,-\frac{i \sqrt{e}\, x}{\sqrt{d}}\right]+2 p \,\text{PolyLog}\left[2,\frac{i \sqrt{e}\, x}{\sqrt{d}}\right]+$$
$$p \,\text{PolyLog}\left[2,\frac{\sqrt{g} \left(\sqrt{d}-i \sqrt{e}\, x\right)}{-\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}\right]+p \,\text{PolyLog}\left[2,\frac{\sqrt{g} \left(\sqrt{d}-i \sqrt{e}\, x\right)}{\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}\right]+$$
$$\left.p \,\text{PolyLog}\left[2,\frac{\sqrt{g} \left(\sqrt{d}+i \sqrt{e}\, x\right)}{-\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}\right]+p \,\text{PolyLog}\left[2,\frac{\sqrt{g} \left(\sqrt{d}+i \sqrt{e}\, x\right)}{\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}\right]\right)$$

Problem 342: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{Log}\left[c \left(d+e x^2\right)^p\right]}{x^3 \left(f+g x^2\right)} \, dx$$

Optimal (type 4, 176 leaves, 12 steps):

$$\frac{e p \,\text{Log}[x]}{d f}-\frac{e p \,\text{Log}\left[d+e x^2\right]}{2 d f}-\frac{\text{Log}\left[c \left(d+e x^2\right)^p\right]}{2 f x^2}-\frac{g \,\text{Log}\left[-\frac{e x^2}{d}\right] \text{Log}\left[c \left(d+e x^2\right)^p\right]}{2 f^2}+$$
$$\frac{g \,\text{Log}\left[c \left(d+e x^2\right)^p\right] \text{Log}\left[\frac{e \left(f+g x^2\right)}{e f-d g}\right]}{2 f^2}+\frac{g p \,\text{PolyLog}\left[2,-\frac{g \left(d+e x^2\right)}{e f-d g}\right]}{2 f^2}-\frac{g p \,\text{PolyLog}\left[2,1+\frac{e x^2}{d}\right]}{2 f^2}$$

Result (type 4, 791 leaves):

$$\frac{1}{2\,d\,f^2\,x^2}\left(2\,e\,f\,p\,x^2\,\text{Log}[x]+2\,d\,g\,p\,x^2\,\text{Log}[x]\,\text{Log}\left[1-\frac{i\,\sqrt{e}\,x}{\sqrt{d}}\right]+\right.$$
$$2\,d\,g\,p\,x^2\,\text{Log}[x]\,\text{Log}\left[1+\frac{i\,\sqrt{e}\,x}{\sqrt{d}}\right]+d\,g\,p\,x^2\,\text{Log}\left[\frac{i\,\sqrt{d}}{\sqrt{e}}+x\right]\,\text{Log}\left[\frac{\sqrt{e}\,\left(\sqrt{f}-i\,\sqrt{g}\,x\right)}{\sqrt{e}\,\sqrt{f}-\sqrt{d}\,\sqrt{g}}\right]+$$
$$d\,g\,p\,x^2\,\text{Log}\left[-\frac{i\,\sqrt{d}}{\sqrt{e}}+x\right]\,\text{Log}\left[\frac{\sqrt{e}\,\left(\sqrt{f}-i\,\sqrt{g}\,x\right)}{\sqrt{e}\,\sqrt{f}+\sqrt{d}\,\sqrt{g}}\right]+$$
$$d\,g\,p\,x^2\,\text{Log}\left[-\frac{i\,\sqrt{d}}{\sqrt{e}}+x\right]\,\text{Log}\left[\frac{\sqrt{e}\,\left(\sqrt{f}+i\,\sqrt{g}\,x\right)}{\sqrt{e}\,\sqrt{f}-\sqrt{d}\,\sqrt{g}}\right]+$$
$$d\,g\,p\,x^2\,\text{Log}\left[\frac{i\,\sqrt{d}}{\sqrt{e}}+x\right]\,\text{Log}\left[\frac{\sqrt{e}\,\left(\sqrt{f}+i\,\sqrt{g}\,x\right)}{\sqrt{e}\,\sqrt{f}+\sqrt{d}\,\sqrt{g}}\right]-e\,f\,p\,x^2\,\text{Log}\left[d+e\,x^2\right]-d\,f\,\text{Log}\left[c\,\left(d+e\,x^2\right)^p\right]-$$
$$2\,d\,g\,x^2\,\text{Log}[x]\,\text{Log}\left[c\,\left(d+e\,x^2\right)^p\right]-d\,g\,p\,x^2\,\text{Log}\left[-\frac{i\,\sqrt{d}}{\sqrt{e}}+x\right]\,\text{Log}\left[f+g\,x^2\right]-$$
$$d\,g\,p\,x^2\,\text{Log}\left[\frac{i\,\sqrt{d}}{\sqrt{e}}+x\right]\,\text{Log}\left[f+g\,x^2\right]+d\,g\,x^2\,\text{Log}\left[c\,\left(d+e\,x^2\right)^p\right]\,\text{Log}\left[f+g\,x^2\right]+$$
$$2\,d\,g\,p\,x^2\,\text{PolyLog}\left[2,-\frac{i\,\sqrt{e}\,x}{\sqrt{d}}\right]+2\,d\,g\,p\,x^2\,\text{PolyLog}\left[2,\frac{i\,\sqrt{e}\,x}{\sqrt{d}}\right]+$$
$$d\,g\,p\,x^2\,\text{PolyLog}\left[2,\frac{\sqrt{g}\,\left(\sqrt{d}-i\,\sqrt{e}\,x\right)}{-\sqrt{e}\,\sqrt{f}+\sqrt{d}\,\sqrt{g}}\right]+d\,g\,p\,x^2\,\text{PolyLog}\left[2,\frac{\sqrt{g}\,\left(\sqrt{d}-i\,\sqrt{e}\,x\right)}{\sqrt{e}\,\sqrt{f}+\sqrt{d}\,\sqrt{g}}\right]+$$
$$\left.d\,g\,p\,x^2\,\text{PolyLog}\left[2,\frac{\sqrt{g}\,\left(\sqrt{d}+i\,\sqrt{e}\,x\right)}{-\sqrt{e}\,\sqrt{f}+\sqrt{d}\,\sqrt{g}}\right]+d\,g\,p\,x^2\,\text{PolyLog}\left[2,\frac{\sqrt{g}\,\left(\sqrt{d}+i\,\sqrt{e}\,x\right)}{\sqrt{e}\,\sqrt{f}+\sqrt{d}\,\sqrt{g}}\right]\right)$$

Problem 351: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\text{Log}\left[c\,\left(d+e\,x^2\right)^p\right]}{x\,\left(f+g\,x^2\right)^2}\,dx$$

Optimal (type 4, 201 leaves, 12 steps):

$$-\frac{e\,p\,\text{Log}\left[d+e\,x^2\right]}{2\,f\,\left(e\,f-d\,g\right)}+\frac{\text{Log}\left[c\,\left(d+e\,x^2\right)^p\right]}{2\,f\,\left(f+g\,x^2\right)}+\frac{\text{Log}\left[-\frac{e\,x^2}{d}\right]\,\text{Log}\left[c\,\left(d+e\,x^2\right)^p\right]}{2\,f^2}+\frac{e\,p\,\text{Log}\left[f+g\,x^2\right]}{2\,f\,\left(e\,f-d\,g\right)}-$$
$$\frac{\text{Log}\left[c\,\left(d+e\,x^2\right)^p\right]\,\text{Log}\left[\frac{e\,\left(f+g\,x^2\right)}{e\,f-d\,g}\right]}{2\,f^2}-\frac{p\,\text{PolyLog}\left[2,-\frac{g\,\left(d+e\,x^2\right)}{e\,f-d\,g}\right]}{2\,f^2}+\frac{p\,\text{PolyLog}\left[2,1+\frac{e\,x^2}{d}\right]}{2\,f^2}$$

Result (type 4, 1124 leaves):

$$-\frac{1}{4 f^2}\left(\frac{i \sqrt{f}\, p \operatorname{Log}\left[-\frac{i \sqrt{d}}{\sqrt{e}}+x\right]}{-i \sqrt{f}+\sqrt{g}\, x}-\frac{i \sqrt{f}\, p \operatorname{Log}\left[-\frac{i \sqrt{d}}{\sqrt{e}}+x\right]}{i \sqrt{f}+\sqrt{g}\, x}+\right.$$

$$\frac{2 f p \operatorname{Log}\left[-\frac{i \sqrt{d}}{\sqrt{e}}+x\right]}{f+g x^2}+\frac{i \sqrt{f}\, p \operatorname{Log}\left[\frac{i \sqrt{d}}{\sqrt{e}}+x\right]}{-i \sqrt{f}+\sqrt{g}\, x}-\frac{i \sqrt{f}\, p \operatorname{Log}\left[\frac{i \sqrt{d}}{\sqrt{e}}+x\right]}{i \sqrt{f}+\sqrt{g}\, x}+$$

$$\frac{2 f p \operatorname{Log}\left[\frac{i \sqrt{d}}{\sqrt{e}}+x\right]}{f+g x^2}+4 p \operatorname{Log}[x] \operatorname{Log}\left[1-\frac{i \sqrt{e}\, x}{\sqrt{d}}\right]+4 p \operatorname{Log}[x] \operatorname{Log}\left[1+\frac{i \sqrt{e}\, x}{\sqrt{d}}\right]+$$

$$2 p \operatorname{Log}\left[\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \operatorname{Log}\left[\frac{\sqrt{e}\left(\sqrt{f}-i \sqrt{g}\, x\right)}{\sqrt{e} \sqrt{f}-\sqrt{d} \sqrt{g}}\right]+2 p \operatorname{Log}\left[-\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \operatorname{Log}\left[\frac{\sqrt{e}\left(\sqrt{f}-i \sqrt{g}\, x\right)}{\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}\right]+$$

$$2 p \operatorname{Log}\left[-\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \operatorname{Log}\left[\frac{\sqrt{e}\left(\sqrt{f}+i \sqrt{g}\, x\right)}{\sqrt{e} \sqrt{f}-\sqrt{d} \sqrt{g}}\right]+2 p \operatorname{Log}\left[\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \operatorname{Log}\left[\frac{\sqrt{e}\left(\sqrt{f}+i \sqrt{g}\, x\right)}{\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}\right]+$$

$$\frac{\sqrt{e} \sqrt{f}\, p \operatorname{Log}\left[d+e x^2\right]}{\sqrt{e} \sqrt{f}-\sqrt{d} \sqrt{g}}+\frac{\sqrt{e} \sqrt{f}\, p \operatorname{Log}\left[d+e x^2\right]}{\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}-\frac{2 f \operatorname{Log}\left[c\left(d+e x^2\right)^p\right]}{f+g x^2}-$$

$$4 \operatorname{Log}[x] \operatorname{Log}\left[c\left(d+e x^2\right)^p\right]-\frac{\sqrt{e} \sqrt{f}\, p \operatorname{Log}\left[f+g x^2\right]}{\sqrt{e} \sqrt{f}-\sqrt{d} \sqrt{g}}-\frac{\sqrt{e} \sqrt{f}\, p \operatorname{Log}\left[f+g x^2\right]}{\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}-$$

$$2 p \operatorname{Log}\left[-\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \operatorname{Log}\left[f+g x^2\right]-2 p \operatorname{Log}\left[\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \operatorname{Log}\left[f+g x^2\right]+$$

$$2 \operatorname{Log}\left[c\left(d+e x^2\right)^p\right] \operatorname{Log}\left[f+g x^2\right]+4 p \operatorname{PolyLog}\left[2,-\frac{i \sqrt{e}\, x}{\sqrt{d}}\right]+4 p \operatorname{PolyLog}\left[2, \frac{i \sqrt{e}\, x}{\sqrt{d}}\right]+$$

$$2 p \operatorname{PolyLog}\left[2, \frac{\sqrt{g}\left(\sqrt{d}-i \sqrt{e}\, x\right)}{-\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}\right]+2 p \operatorname{PolyLog}\left[2, \frac{\sqrt{g}\left(\sqrt{d}-i \sqrt{e}\, x\right)}{\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}\right]+$$

$$\left.2 p \operatorname{PolyLog}\left[2, \frac{\sqrt{g}\left(\sqrt{d}+i \sqrt{e}\, x\right)}{-\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}\right]+2 p \operatorname{PolyLog}\left[2, \frac{\sqrt{g}\left(\sqrt{d}+i \sqrt{e}\, x\right)}{\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}\right]\right)$$

Problem 352: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{Log}\left[c\left(d+e x^2\right)^p\right]}{x^3\left(f+g x^2\right)^2}\, dx$$

Optimal (type 4, 251 leaves, 16 steps):

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

Result (type 4, 1197 leaves) :

$$\frac{1}{4 f^3}\left(\frac{4 e f p \operatorname{Log}[x]}{d}+\frac{i \sqrt{f} g p \operatorname{Log}\left[-\frac{i \sqrt{d}}{\sqrt{e}}+x\right]}{-i \sqrt{f}+\sqrt{g} x}-\right.$$

$$\frac{i \sqrt{f} g p \operatorname{Log}\left[-\frac{i \sqrt{d}}{\sqrt{e}}+x\right]}{i \sqrt{f}+\sqrt{g} x}+\frac{2 f g p \operatorname{Log}\left[-\frac{i \sqrt{d}}{\sqrt{e}}+x\right]}{f+g x^2}+\frac{i \sqrt{f} g p \operatorname{Log}\left[\frac{i \sqrt{d}}{\sqrt{e}}+x\right]}{-i \sqrt{f}+\sqrt{g} x}-$$

$$\frac{i \sqrt{f} g p \operatorname{Log}\left[\frac{i \sqrt{d}}{\sqrt{e}}+x\right]}{i \sqrt{f}+\sqrt{g} x}+\frac{2 f g p \operatorname{Log}\left[\frac{i \sqrt{d}}{\sqrt{e}}+x\right]}{f+g x^2}+8 g p \operatorname{Log}[x] \operatorname{Log}\left[1-\frac{i \sqrt{e} x}{\sqrt{d}}\right]+$$

$$8 g p \operatorname{Log}[x] \operatorname{Log}\left[1+\frac{i \sqrt{e} x}{\sqrt{d}}\right]+4 g p \operatorname{Log}\left[\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \operatorname{Log}\left[\frac{\sqrt{e}\left(\sqrt{f}-i \sqrt{g} x\right)}{\sqrt{e} \sqrt{f}-\sqrt{d} \sqrt{g}}\right]+$$

$$4 g p \operatorname{Log}\left[-\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \operatorname{Log}\left[\frac{\sqrt{e}\left(\sqrt{f}-i \sqrt{g} x\right)}{\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}\right]+$$

$$4 g p \operatorname{Log}\left[-\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \operatorname{Log}\left[\frac{\sqrt{e}\left(\sqrt{f}+i \sqrt{g} x\right)}{\sqrt{e} \sqrt{f}-\sqrt{d} \sqrt{g}}\right]+$$

$$4 g p \operatorname{Log}\left[\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \operatorname{Log}\left[\frac{\sqrt{e}\left(\sqrt{f}+i \sqrt{g} x\right)}{\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}\right]-\frac{2 e f p \operatorname{Log}\left[d+e x^2\right]}{d}+$$

$$\frac{\sqrt{e} \sqrt{f} g p \operatorname{Log}\left[d+e x^2\right]}{\sqrt{e} \sqrt{f}-\sqrt{d} \sqrt{g}}+\frac{\sqrt{e} \sqrt{f} g p \operatorname{Log}\left[d+e x^2\right]}{\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}-\frac{2 f \operatorname{Log}\left[c\left(d+e x^2\right)^p\right]}{x^2}-$$

$$\frac{2 f g \operatorname{Log}\left[c\left(d+e x^2\right)^p\right]}{f+g x^2}-8 g \operatorname{Log}[x] \operatorname{Log}\left[c\left(d+e x^2\right)^p\right]-\frac{\sqrt{e} \sqrt{f} g p \operatorname{Log}\left[f+g x^2\right]}{\sqrt{e} \sqrt{f}-\sqrt{d} \sqrt{g}}-$$

$$\frac{\sqrt{e} \sqrt{f} g p \operatorname{Log}\left[f+g x^2\right]}{\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}-4 g p \operatorname{Log}\left[-\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \operatorname{Log}\left[f+g x^2\right]-$$

$$4 g p \operatorname{Log}\left[\frac{i \sqrt{d}}{\sqrt{e}}+x\right] \operatorname{Log}\left[f+g x^2\right]+4 g \operatorname{Log}\left[c\left(d+e x^2\right)^p\right] \operatorname{Log}\left[f+g x^2\right]+$$

$$8 g p \operatorname{PolyLog}\left[2,-\frac{i \sqrt{e} x}{\sqrt{d}}\right]+8 g p \operatorname{PolyLog}\left[2, \frac{i \sqrt{e} x}{\sqrt{d}}\right]+$$

$$4 g p \operatorname{PolyLog}\left[2,-\frac{\sqrt{g}\left(\sqrt{d}-i \sqrt{e} x\right)}{\sqrt{e} \sqrt{f}-\sqrt{d} \sqrt{g}}\right]+4 g p \operatorname{PolyLog}\left[2, \frac{\sqrt{g}\left(\sqrt{d}-i \sqrt{e} x\right)}{\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}\right]+$$

$$\left.4 g p \operatorname{PolyLog}\left[2,-\frac{\sqrt{g}\left(\sqrt{d}+i \sqrt{e} x\right)}{\sqrt{e} \sqrt{f}-\sqrt{d} \sqrt{g}}\right]+4 g p \operatorname{PolyLog}\left[2, \frac{\sqrt{g}\left(\sqrt{d}+i \sqrt{e} x\right)}{\sqrt{e} \sqrt{f}+\sqrt{d} \sqrt{g}}\right]\right)$$

Problem 359: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{Log}\left[d+e\,x^2\right]}{1-x^2}\,dx$$

Optimal (type 4, 217 leaves, 11 steps):

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

Result (type 4, 468 leaves):

$$\frac{1}{2}\left(\text{Log}[1-x]\,\text{Log}\left[-\frac{i\sqrt{d}}{\sqrt{e}}+x\right]-\text{Log}\left[\frac{\sqrt{e}\,(-1+x)}{i\sqrt{d}-\sqrt{e}}\right]\text{Log}\left[-\frac{i\sqrt{d}}{\sqrt{e}}+x\right]-\text{Log}[1+x]\,\text{Log}\left[-\frac{i\sqrt{d}}{\sqrt{e}}+x\right]+\text{Log}\left[-\frac{i\sqrt{e}\,(1+x)}{\sqrt{d}-i\sqrt{e}}\right]\text{Log}\left[-\frac{i\sqrt{d}}{\sqrt{e}}+x\right]+\text{Log}[1-x]\,\text{Log}\left[\frac{i\sqrt{d}}{\sqrt{e}}+x\right]-\text{Log}\left[\frac{\sqrt{e}\,(-1+x)}{-i\sqrt{d}-\sqrt{e}}\right]\text{Log}\left[\frac{i\sqrt{d}}{\sqrt{e}}+x\right]-\text{Log}[1+x]\,\text{Log}\left[\frac{i\sqrt{d}}{\sqrt{e}}+x\right]+\text{Log}\left[\frac{i\sqrt{e}\,(1+x)}{\sqrt{d}+i\sqrt{e}}\right]\text{Log}\left[\frac{i\sqrt{d}}{\sqrt{e}}+x\right]-\text{Log}[1-x]\,\text{Log}\left[d+e\,x^2\right]+\text{Log}[1+x]\,\text{Log}\left[d+e\,x^2\right]-\text{PolyLog}\left[2,\frac{\sqrt{d}-i\sqrt{e}\,x}{\sqrt{d}-i\sqrt{e}}\right]+\text{PolyLog}\left[2,\frac{\sqrt{d}-i\sqrt{e}\,x}{\sqrt{d}+i\sqrt{e}}\right]+\text{PolyLog}\left[2,\frac{\sqrt{d}+i\sqrt{e}\,x}{\sqrt{d}-i\sqrt{e}}\right]-\text{PolyLog}\left[2,\frac{\sqrt{d}+i\sqrt{e}\,x}{\sqrt{d}+i\sqrt{e}}\right]\right)$$

Problem 370: Unable to integrate problem.

$$\int \frac{\text{Log}\left[c\left(d+e\,x^n\right)^p\right]}{x\left(f+g\,x^{2n}\right)}\,dx$$

Optimal (type 4, 266 leaves, 13 steps):

$$\frac{\text{Log}\left[-\frac{e\,x^n}{d}\right]\,\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]}{f\,n}-\frac{\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]\,\text{Log}\left[\frac{e\,\left(\sqrt{-f}-\sqrt{g}\,x^n\right)}{e\,\sqrt{-f}+d\,\sqrt{g}}\right]}{2\,f\,n}-$$
$$\frac{\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]\,\text{Log}\left[\frac{e\,\left(\sqrt{-f}+\sqrt{g}\,x^n\right)}{e\,\sqrt{-f}-d\,\sqrt{g}}\right]}{2\,f\,n}-\frac{p\,\text{PolyLog}\left[2,\,-\frac{\sqrt{g}\,\left(d+e\,x^n\right)}{e\,\sqrt{-f}-d\,\sqrt{g}}\right]}{2\,f\,n}-$$
$$\frac{p\,\text{PolyLog}\left[2,\,\frac{\sqrt{g}\,\left(d+e\,x^n\right)}{e\,\sqrt{-f}+d\,\sqrt{g}}\right]}{2\,f\,n}+\frac{p\,\text{PolyLog}\left[2,\,1+\frac{e\,x^n}{d}\right]}{f\,n}$$

Result (type 8, 29 leaves) :

$$\int \frac{\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]}{x\,\left(f+g\,x^{2\,n}\right)}\,dx$$

Problem 371: Unable to integrate problem.

$$\int \frac{\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]}{x\,\left(f+g\,x^n\right)}\,dx$$

Optimal (type 4, 121 leaves, 8 steps) :

$$\frac{\text{Log}\left[-\frac{e\,x^n}{d}\right]\,\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]}{f\,n}-\frac{\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]\,\text{Log}\left[\frac{e\,\left(f+g\,x^n\right)}{e\,f-d\,g}\right]}{f\,n}-$$
$$\frac{p\,\text{PolyLog}\left[2,\,-\frac{g\,\left(d+e\,x^n\right)}{e\,f-d\,g}\right]}{f\,n}+\frac{p\,\text{PolyLog}\left[2,\,1+\frac{e\,x^n}{d}\right]}{f\,n}$$

Result (type 8, 27 leaves) :

$$\int \frac{\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]}{x\,\left(f+g\,x^n\right)}\,dx$$

Problem 372: Unable to integrate problem.

$$\int \frac{\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]}{x\,\left(f+g\,x^{-n}\right)}\,dx$$

Optimal (type 4, 70 leaves, 5 steps) :

$$\frac{\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]\,\text{Log}\left[-\frac{e\,\left(g+f\,x^n\right)}{d\,f-e\,g}\right]}{f\,n}+\frac{p\,\text{PolyLog}\left[2,\,\frac{f\,\left(d+e\,x^n\right)}{d\,f-e\,g}\right]}{f\,n}$$

Result (type 8, 29 leaves) :

$$\int \frac{\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]}{x\,\left(f+g\,x^{-n}\right)}\,dx$$

Problem 373: Unable to integrate problem.

$$\int \frac{\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]}{x\,\left(f+g\,x^{-2\,n}\right)}\,dx$$

Optimal (type 4, 221 leaves, 9 steps):

$$\frac{\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]\,\text{Log}\left[\frac{e\,\left(\sqrt{g}-\sqrt{-f}\,x^n\right)}{d\,\sqrt{-f}+e\,\sqrt{g}}\right]}{2\,f\,n}+\frac{\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]\,\text{Log}\left[-\frac{e\,\left(\sqrt{g}+\sqrt{-f}\,x^n\right)}{d\,\sqrt{-f}-e\,\sqrt{g}}\right]}{2\,f\,n}+\frac{p\,\text{PolyLog}\left[2,\,\frac{\sqrt{-f}\,\left(d+e\,x^n\right)}{d\,\sqrt{-f}-e\,\sqrt{g}}\right]}{2\,f\,n}+\frac{p\,\text{PolyLog}\left[2,\,\frac{\sqrt{-f}\,\left(d+e\,x^n\right)}{d\,\sqrt{-f}+e\,\sqrt{g}}\right]}{2\,f\,n}$$

Result (type 8, 29 leaves):

$$\int \frac{\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]}{x\,\left(f+g\,x^{-2\,n}\right)}\,dx$$

Problem 374: Unable to integrate problem.

$$\int \frac{\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]}{x\,\left(f+g\,x^{2\,n}\right)^2}\,dx$$

Optimal (type 4, 419 leaves, 19 steps):

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

Result (type 8, 29 leaves):

$$\int \frac{\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]}{x\,\left(f+g\,x^{2\,n}\right)^2}\,dx$$

Problem 375: Unable to integrate problem.

$$\int \frac{\text{Log}\left[c\,\left(d+e\,x^n\right)^p\right]}{x\,\left(f+g\,x^n\right)^2}\,dx$$

Optimal (type 4, 204 leaves, 12 steps):

$$-\frac{e\,p\,\mathrm{Log}[d+e\,x^n]}{f\,(e\,f-d\,g)\,n}+\frac{\mathrm{Log}\left[c\,(d+e\,x^n)^p\right]}{f\,n\,(f+g\,x^n)}+\frac{\mathrm{Log}\left[-\frac{e\,x^n}{d}\right]\mathrm{Log}\left[c\,(d+e\,x^n)^p\right]}{f^2\,n}+\frac{e\,p\,\mathrm{Log}[f+g\,x^n]}{f\,(e\,f-d\,g)\,n}-\frac{\mathrm{Log}\left[c\,(d+e\,x^n)^p\right]\mathrm{Log}\left[\frac{e\,(f+g\,x^n)}{e\,f-d\,g}\right]}{f^2\,n}-\frac{p\,\mathrm{PolyLog}\left[2,-\frac{g\,(d+e\,x^n)}{e\,f-d\,g}\right]}{f^2\,n}+\frac{p\,\mathrm{PolyLog}\left[2,1+\frac{e\,x^n}{d}\right]}{f^2\,n}$$

Result (type 8, 27 leaves) :

$$\int\frac{\mathrm{Log}\left[c\,(d+e\,x^n)^p\right]}{x\,(f+g\,x^n)^2}\,dx$$

Problem 376: Unable to integrate problem.

$$\int\frac{\mathrm{Log}\left[c\,(d+e\,x^n)^p\right]}{x\,(f+g\,x^{-n})^2}\,dx$$

Optimal (type 4, 156 leaves, 10 steps) :

$$\frac{e\,g\,p\,\mathrm{Log}[d+e\,x^n]}{f^2\,(d\,f-e\,g)\,n}+\frac{g\,\mathrm{Log}\left[c\,(d+e\,x^n)^p\right]}{f^2\,n\,(g+f\,x^n)}-\frac{e\,g\,p\,\mathrm{Log}[g+f\,x^n]}{f^2\,(d\,f-e\,g)\,n}+\frac{\mathrm{Log}\left[c\,(d+e\,x^n)^p\right]\mathrm{Log}\left[-\frac{e\,(g+f\,x^n)}{d\,f-e\,g}\right]}{f^2\,n}+\frac{p\,\mathrm{PolyLog}\left[2,\frac{f\,(d+e\,x^n)}{d\,f-e\,g}\right]}{f^2\,n}$$

Result (type 8, 29 leaves) :

$$\int\frac{\mathrm{Log}\left[c\,(d+e\,x^n)^p\right]}{x\,(f+g\,x^{-n})^2}\,dx$$

Problem 377: Unable to integrate problem.

$$\int\frac{\mathrm{Log}\left[c\,(d+e\,x^n)^p\right]}{x\,(f+g\,x^{-2\,n})^2}\,dx$$

Optimal (type 4, 377 leaves, 17 steps) :

$$-\frac{d\,e\,\sqrt{g}\,p\,\mathrm{ArcTan}\left[\frac{\sqrt{f}\,x^n}{\sqrt{g}}\right]}{2\,f^{3/2}\,(d^2\,f+e^2\,g)\,n}-\frac{e^2\,g\,p\,\mathrm{Log}[d+e\,x^n]}{2\,f^2\,(d^2\,f+e^2\,g)\,n}+\frac{g\,\mathrm{Log}\left[c\,(d+e\,x^n)^p\right]}{2\,f^2\,n\,(g+f\,x^{2\,n})}+\frac{\mathrm{Log}\left[c\,(d+e\,x^n)^p\right]\mathrm{Log}\left[\frac{e\,(\sqrt{g}-\sqrt{-f}\,x^n)}{d\,\sqrt{-f}+e\,\sqrt{g}}\right]}{2\,f^2\,n}+\frac{\mathrm{Log}\left[c\,(d+e\,x^n)^p\right]\mathrm{Log}\left[-\frac{e\,(\sqrt{g}+\sqrt{-f}\,x^n)}{d\,\sqrt{-f}-e\,\sqrt{g}}\right]}{2\,f^2\,n}+\frac{e^2\,g\,p\,\mathrm{Log}\left[g+f\,x^{2\,n}\right]}{4\,f^2\,(d^2\,f+e^2\,g)\,n}+\frac{p\,\mathrm{PolyLog}\left[2,\frac{\sqrt{-f}\,(d+e\,x^n)}{d\,\sqrt{-f}-e\,\sqrt{g}}\right]}{2\,f^2\,n}+\frac{p\,\mathrm{PolyLog}\left[2,\frac{\sqrt{-f}\,(d+e\,x^n)}{d\,\sqrt{-f}+e\,\sqrt{g}}\right]}{2\,f^2\,n}$$

Result (type 8, 29 leaves) :

$$\int \frac{\text{Log}\left[c \left(d + e\, x^n\right)^p\right]}{x \left(f + g\, x^{-2\,n}\right)^2}\, dx$$

Problem 380: Unable to integrate problem.

$$\int \frac{\text{Log}\left[c \left(d + e\, x^{-n}\right)\right]}{x \left(c\, e - (1 - c\, d)\, x^n\right)}\, dx$$

Optimal (type 4, 26 leaves, 4 steps):

$$\frac{\text{PolyLog}\left[2,\ 1 - c \left(d + e\, x^{-n}\right)\right]}{c\, e\, n}$$

Result (type 8, 35 leaves):

$$\int \frac{\text{Log}\left[c \left(d + e\, x^{-n}\right)\right]}{x \left(c\, e - (1 - c\, d)\, x^n\right)}\, dx$$

Problem 392: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Log}\left[x^{-n} \left(a + x^n\right)\right]}{x}\, dx$$

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

$$\frac{\text{PolyLog}\left[2,\ -a\, x^{-n}\right]}{n}$$

Result (type 4, 51 leaves):

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

Problem 397: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{Log}\left[\frac{a+b\, x^2}{x^2}\right]}{c + d\, x}\, dx$$

Optimal (type 4, 227 leaves, 14 steps):

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

Result (type 4, 284 leaves):

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

Problem 411: Result more than twice size of optimal antiderivative.

$$\int\frac{\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^n\right]\right)^2}{x}\,dx$$

Optimal (type 4, 93 leaves, 5 steps):

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

Result (type 4, 195 leaves):

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

Problem 418: Result more than twice size of optimal antiderivative.

$$\int\frac{\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^n\right]\right)^3}{x}\,dx$$

Optimal (type 4, 135 leaves, 6 steps):

$$2\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^n\right]\right)^3\text{Log}\left[-\frac{e\sqrt{x}}{d}\right]+$$
$$6\,b\,n\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^n\right]\right)^2\text{PolyLog}\left[2,1+\frac{e\sqrt{x}}{d}\right]-$$
$$12\,b^2\,n^2\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^n\right]\right)\text{PolyLog}\left[3,1+\frac{e\sqrt{x}}{d}\right]+12\,b^3\,n^3\,\text{PolyLog}\left[4,1+\frac{e\sqrt{x}}{d}\right]$$

Result (type 4, 333 leaves):

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

Problem 419: Result more than twice size of optimal antiderivative.

$$\int\frac{\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^n\right]\right)^3}{x^2}\,dx$$

Optimal (type 4, 263 leaves, 10 steps):

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

Result (type 4, 536 leaves):

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

Problem 432: Result more than twice size of optimal antiderivative.

$$\int\frac{\left(a+b\,\text{Log}\left[c\,\left(d+\frac{e}{\sqrt{x}}\right)^n\right]\right)^2}{x}\,dx$$

Optimal (type 4, 93 leaves, 5 steps):

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

Result (type 4, 386 leaves):

$$\left(a-b\,n\,\text{Log}\left[d+\frac{e}{\sqrt{x}}\right]+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^n\right]\right)^2\text{Log}[x]+$$
$$2\,b\,n\left(a-b\,n\,\text{Log}\left[d+\frac{e}{\sqrt{x}}\right]+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^n\right]\right)$$
$$\left(\left(\text{Log}\left[d+\frac{e}{\sqrt{x}}\right]-\text{Log}\left[1+\frac{e}{d\sqrt{x}}\right]\right)\text{Log}[x]+2\,\text{PolyLog}\left[2,-\frac{e}{d\sqrt{x}}\right]\right)+$$
$$\frac{1}{12}b^2n^2\left(24\,\text{Log}\left[\frac{e}{d}+\sqrt{x}\right]^2\text{Log}\left[-\frac{d\sqrt{x}}{e}\right]+12\,\text{Log}\left[d+\frac{e}{\sqrt{x}}\right]^2\text{Log}[x]-12\,\text{Log}\left[\frac{e}{d}+\sqrt{x}\right]^2\text{Log}[x]-\right.$$
$$24\,\text{Log}\left[d+\frac{e}{\sqrt{x}}\right]\text{Log}\left[1+\frac{d\sqrt{x}}{e}\right]\text{Log}[x]+24\,\text{Log}\left[\frac{e}{d}+\sqrt{x}\right]\text{Log}\left[1+\frac{d\sqrt{x}}{e}\right]\text{Log}[x]+$$
$$6\,\text{Log}\left[d+\frac{e}{\sqrt{x}}\right]\text{Log}[x]^2-6\,\text{Log}\left[1+\frac{d\sqrt{x}}{e}\right]\text{Log}[x]^2+\text{Log}[x]^3+$$
$$48\,\text{Log}\left[\frac{e}{d}+\sqrt{x}\right]\text{PolyLog}\left[2,1+\frac{d\sqrt{x}}{e}\right]-48\left(\text{Log}\left[d+\frac{e}{\sqrt{x}}\right]-\text{Log}\left[\frac{e}{d}+\sqrt{x}\right]\right)$$
$$\left.\text{PolyLog}\left[2,-\frac{d\sqrt{x}}{e}\right]-48\,\text{PolyLog}\left[3,1+\frac{d\sqrt{x}}{e}\right]-48\,\text{PolyLog}\left[3,-\frac{d\sqrt{x}}{e}\right]\right)$$

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

$$\int\frac{\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^n\right]\right)^3}{x}\,dx$$

Optimal (type 4, 135 leaves, 6 steps):

$$-2\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^n\right]\right)^3\text{Log}\left[-\frac{e}{d\sqrt{x}}\right]-$$
$$6\,b\,n\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^n\right]\right)^2\text{PolyLog}\left[2,1+\frac{e}{d\sqrt{x}}\right]+$$
$$12\,b^2n^2\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^n\right]\right)\text{PolyLog}\left[3,1+\frac{e}{d\sqrt{x}}\right]-12\,b^3n^3\,\text{PolyLog}\left[4,1+\frac{e}{d\sqrt{x}}\right]$$

Result (type 4, 532 leaves):

$$\left(a-b\,n\,\mathrm{Log}\left[d+\frac{e}{\sqrt{x}}\right]+b\,\mathrm{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^n\right]\right)^3\mathrm{Log}[x]+$$
$$3\,b\,n\left(a-b\,n\,\mathrm{Log}\left[d+\frac{e}{\sqrt{x}}\right]+b\,\mathrm{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^n\right]\right)^2$$
$$\left(\left(\mathrm{Log}\left[d+\frac{e}{\sqrt{x}}\right]-\mathrm{Log}\left[1+\frac{e}{d\sqrt{x}}\right]\right)\mathrm{Log}[x]+2\,\mathrm{PolyLog}\left[2,-\frac{e}{d\sqrt{x}}\right]\right)+$$
$$6\,b^2\,n^2\left(a-b\,n\,\mathrm{Log}\left[d+\frac{e}{\sqrt{x}}\right]+b\,\mathrm{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^n\right]\right)\left(\mathrm{Log}\left[\frac{e}{d}+\sqrt{x}\right]^2\mathrm{Log}\left[-\frac{d\sqrt{x}}{e}\right]+\right.$$
$$\frac{1}{2}\mathrm{Log}\left[d+\frac{e}{\sqrt{x}}\right]^2\mathrm{Log}[x]-\frac{1}{2}\mathrm{Log}\left[\frac{e}{d}+\sqrt{x}\right]^2\mathrm{Log}[x]-\mathrm{Log}\left[d+\frac{e}{\sqrt{x}}\right]\mathrm{Log}\left[1+\frac{d\sqrt{x}}{e}\right]\mathrm{Log}[x]+$$
$$\mathrm{Log}\left[\frac{e}{d}+\sqrt{x}\right]\mathrm{Log}\left[1+\frac{d\sqrt{x}}{e}\right]\mathrm{Log}[x]+\frac{1}{4}\mathrm{Log}\left[d+\frac{e}{\sqrt{x}}\right]\mathrm{Log}[x]^2-\frac{1}{4}\mathrm{Log}\left[1+\frac{d\sqrt{x}}{e}\right]\mathrm{Log}[x]^2+$$
$$\frac{\mathrm{Log}[x]^3}{24}+2\,\mathrm{Log}\left[\frac{e}{d}+\sqrt{x}\right]\mathrm{PolyLog}\left[2,1+\frac{d\sqrt{x}}{e}\right]-2\left(\mathrm{Log}\left[d+\frac{e}{\sqrt{x}}\right]-\mathrm{Log}\left[\frac{e}{d}+\sqrt{x}\right]\right)$$
$$\left.\mathrm{PolyLog}\left[2,-\frac{d\sqrt{x}}{e}\right]-2\,\mathrm{PolyLog}\left[3,1+\frac{d\sqrt{x}}{e}\right]-2\,\mathrm{PolyLog}\left[3,-\frac{d\sqrt{x}}{e}\right]\right)-$$
$$2\,b^3\,n^3\left(\mathrm{Log}\left[d+\frac{e}{\sqrt{x}}\right]^3\mathrm{Log}\left[-\frac{e}{d\sqrt{x}}\right]+3\,\mathrm{Log}\left[d+\frac{e}{\sqrt{x}}\right]^2\mathrm{PolyLog}\left[2,1+\frac{e}{d\sqrt{x}}\right]-\right.$$
$$\left.6\,\mathrm{Log}\left[d+\frac{e}{\sqrt{x}}\right]\mathrm{PolyLog}\left[3,1+\frac{e}{d\sqrt{x}}\right]+6\,\mathrm{PolyLog}\left[4,1+\frac{e}{d\sqrt{x}}\right]\right)$$

Problem 453: Result more than twice size of optimal antiderivative.

$$\int\frac{\left(a+b\,\mathrm{Log}\left[c\left(d+e\,x^{1/3}\right)^n\right]\right)^2}{x}\,dx$$

Optimal (type 4, 93 leaves, 5 steps):

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

Result (type 4, 195 leaves):

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

Problem 460: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 135 leaves, 6 steps):

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

Result (type 4, 333 leaves):

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

Problem 473: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 95 leaves, 5 steps):

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

Result (type 4, 199 leaves):

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

Problem 483: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 139 leaves, 6 steps):

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

Result (type 4, 339 leaves):

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

Problem 500: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 93 leaves, 5 steps):

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

Result (type 4, 389 leaves):

$$\left(a-b\,n\,\text{Log}\left[d+\frac{e}{x^{1/3}}\right]+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^n\right]\right)^2\text{Log}[x]+2\,b\,n\left(a-b\,n\,\text{Log}\left[d+\frac{e}{x^{1/3}}\right]+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^n\right]\right)\left(\left(\text{Log}\left[d+\frac{e}{x^{1/3}}\right]-\text{Log}\left[1+\frac{e}{d\,x^{1/3}}\right]\right)\text{Log}[x]+3\,\text{PolyLog}\left[2,-\frac{e}{d\,x^{1/3}}\right]\right)+3\,b^2\,n^2\left(2\,\text{Log}\left[\frac{e}{d}+x^{1/3}\right]\text{PolyLog}\left[2,1+\frac{d\,x^{1/3}}{e}\right]-2\left(\text{Log}\left[d+\frac{e}{x^{1/3}}\right]-\text{Log}\left[\frac{e}{d}+x^{1/3}\right]\right)\text{PolyLog}\left[2,-\frac{d\,x^{1/3}}{e}\right]+\frac{1}{81}\left(81\,\text{Log}\left[\frac{e}{d}+x^{1/3}\right]^2\text{Log}\left[-\frac{d\,x^{1/3}}{e}\right]+27\,\text{Log}\left[d+\frac{e}{x^{1/3}}\right]^2\text{Log}[x]-27\,\text{Log}\left[\frac{e}{d}+x^{1/3}\right]^2\text{Log}[x]-54\,\text{Log}\left[d+\frac{e}{x^{1/3}}\right]\text{Log}\left[1+\frac{d\,x^{1/3}}{e}\right]\text{Log}[x]+54\,\text{Log}\left[\frac{e}{d}+x^{1/3}\right]\text{Log}\left[1+\frac{d\,x^{1/3}}{e}\right]\text{Log}[x]+9\,\text{Log}\left[d+\frac{e}{x^{1/3}}\right]\text{Log}[x]^2-9\,\text{Log}\left[1+\frac{d\,x^{1/3}}{e}\right]\text{Log}[x]^2+\text{Log}[x]^3-162\,\text{PolyLog}\left[3,1+\frac{d\,x^{1/3}}{e}\right]-162\,\text{PolyLog}\left[3,-\frac{d\,x^{1/3}}{e}\right]\right)\right)$$

Problem 505: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 135 leaves, 6 steps):

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

Result (type 4, 527 leaves):

$$\left(a-b\,n\,\text{Log}\left[d+\frac{e}{x^{1/3}}\right]+b\,\text{Log}\left[c\,\left(d+\frac{e}{x^{1/3}}\right)^n\right]\right)^3\text{Log}[x]+$$
$$3\,b\,n\,\left(a-b\,n\,\text{Log}\left[d+\frac{e}{x^{1/3}}\right]+b\,\text{Log}\left[c\,\left(d+\frac{e}{x^{1/3}}\right)^n\right]\right)^2$$
$$\left(\left(\text{Log}\left[d+\frac{e}{x^{1/3}}\right]-\text{Log}\left[1+\frac{e}{d\,x^{1/3}}\right]\right)\text{Log}[x]+3\,\text{PolyLog}\left[2,-\frac{e}{d\,x^{1/3}}\right]\right)+$$
$$9\,b^2\,n^2\,\left(a-b\,n\,\text{Log}\left[d+\frac{e}{x^{1/3}}\right]+b\,\text{Log}\left[c\,\left(d+\frac{e}{x^{1/3}}\right)^n\right]\right)$$
$$\left(2\,\text{Log}\left[\frac{e}{d}+x^{1/3}\right]\text{PolyLog}\left[2,1+\frac{d\,x^{1/3}}{e}\right]-2\,\left(\text{Log}\left[d+\frac{e}{x^{1/3}}\right]-\text{Log}\left[\frac{e}{d}+x^{1/3}\right]\right)\text{PolyLog}\left[2,-\frac{d\,x^{1/3}}{e}\right]+\right.$$
$$\frac{1}{81}\left(81\,\text{Log}\left[\frac{e}{d}+x^{1/3}\right]^2\text{Log}\left[-\frac{d\,x^{1/3}}{e}\right]+27\,\text{Log}\left[d+\frac{e}{x^{1/3}}\right]^2\text{Log}[x]-27\,\text{Log}\left[\frac{e}{d}+x^{1/3}\right]^2\text{Log}[x]-\right.$$
$$54\,\text{Log}\left[d+\frac{e}{x^{1/3}}\right]\text{Log}\left[1+\frac{d\,x^{1/3}}{e}\right]\text{Log}[x]+54\,\text{Log}\left[\frac{e}{d}+x^{1/3}\right]\text{Log}\left[1+\frac{d\,x^{1/3}}{e}\right]\text{Log}[x]+$$
$$9\,\text{Log}\left[d+\frac{e}{x^{1/3}}\right]\text{Log}[x]^2-9\,\text{Log}\left[1+\frac{d\,x^{1/3}}{e}\right]\text{Log}[x]^2+\text{Log}[x]^3-$$
$$\left.\left.162\,\text{PolyLog}\left[3,1+\frac{d\,x^{1/3}}{e}\right]-162\,\text{PolyLog}\left[3,-\frac{d\,x^{1/3}}{e}\right]\right)\right)-$$
$$3\,b^3\,n^3\,\left(\text{Log}\left[d+\frac{e}{x^{1/3}}\right]^3\text{Log}\left[-\frac{e}{d\,x^{1/3}}\right]+3\,\text{Log}\left[d+\frac{e}{x^{1/3}}\right]^2\text{PolyLog}\left[2,1+\frac{e}{d\,x^{1/3}}\right]-\right.$$
$$\left.6\,\text{Log}\left[d+\frac{e}{x^{1/3}}\right]\text{PolyLog}\left[3,1+\frac{e}{d\,x^{1/3}}\right]+6\,\text{PolyLog}\left[4,1+\frac{e}{d\,x^{1/3}}\right]\right)$$

Problem 518: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 95 leaves, 5 steps):

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

Result (type 4, 1701 leaves):

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

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

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

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

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

$$\frac{1}{3}\left(-\text{Log}\left[d+\frac{e}{x^{2/3}}\right]+\text{Log}\left[-\frac{i\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]+\text{Log}\left[\frac{i\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]-\frac{2\,\text{Log}[x]}{3}\right)^2\text{Log}[x]+\frac{4\,\text{Log}[x]^3}{81}+$$

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

$$2\,\text{Log}\left[\frac{i\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]\text{PolyLog}\left[2,1-\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]+$$

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

$$2\,\text{Log}\left[-\frac{i\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]\text{PolyLog}\left[2,1+\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]+$$

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

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

$$\left(\frac{1}{9}\left(3\,\text{Log}\left[-\frac{i\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]+3\,\text{Log}\left[\frac{i\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]-3\,\text{Log}\left[1-\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]-3\,\text{Log}\left[1+\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]-\right.\right.$$

$$\left.\left.\text{Log}[x]\right)\text{Log}[x]-\text{PolyLog}\left[2,-\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]-\text{PolyLog}\left[2,\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]\right)+$$

$$2\,\text{PolyLog}\left[3,\frac{i\sqrt{e}+\sqrt{d}\,x^{1/3}}{i\sqrt{e}-\sqrt{d}\,x^{1/3}}\right]-2\,\text{PolyLog}\left[3,\frac{i\sqrt{e}+\sqrt{d}\,x^{1/3}}{-i\sqrt{e}+\sqrt{d}\,x^{1/3}}\right]-$$

$$4\,\text{PolyLog}\left[3,1-\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]-4\,\text{PolyLog}\left[3,1+\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]-$$

$$\frac{2}{9}\left(\left(\text{Log}\left[\frac{i\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]-\text{Log}\left[1-\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]\right)\text{Log}[x]^2+\right.$$

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

$$6\,\text{Log}[x]\,\text{PolyLog}\left[2,-\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]-6\,\text{Log}[x]\,\text{PolyLog}\left[2,\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]+$$
$$\left.\left.18\,\text{PolyLog}\left[3,-\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]+18\,\text{PolyLog}\left[3,\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]\right)\right)$$

Problem 523: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 361 leaves, 19 steps):

$$-\frac{8\,b^2\,n^2}{9\,x}+\frac{32\,b^2\,d\,n^2}{3\,e\,x^{1/3}}+\frac{32\,b^2\,d^{3/2}\,n^2\,\text{ArcTan}\left[\frac{\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]}{3\,e^{3/2}}+\frac{4\,i\,b^2\,d^{3/2}\,n^2\,\text{ArcTan}\left[\frac{\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]^2}{e^{3/2}}-$$
$$\frac{8\,b^2\,d^{3/2}\,n^2\,\text{ArcTan}\left[\frac{\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]\,\text{Log}\left[2-\frac{2\sqrt{e}}{\sqrt{e}-i\sqrt{d}\,x^{1/3}}\right]}{e^{3/2}}+\frac{4\,b\,n\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{2/3}}\right)^n\right]\right)}{3\,x}-$$
$$\frac{4\,b\,d\,n\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{2/3}}\right)^n\right]\right)}{e\,x^{1/3}}-\frac{4\,b\,d^{3/2}\,n\,\text{ArcTan}\left[\frac{\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{2/3}}\right)^n\right]\right)}{e^{3/2}}-$$
$$\frac{\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{2/3}}\right)^n\right]\right)^2}{x}+\frac{4\,i\,b^2\,d^{3/2}\,n^2\,\text{PolyLog}\left[2,-1+\frac{2\sqrt{e}}{\sqrt{e}-i\sqrt{d}\,x^{1/3}}\right]}{e^{3/2}}$$

Result (type 4, 797 leaves):

$$\frac{1}{9\,e^{3/2}\,x}\left(6\,b\,n\left(-6\,d^{3/2}\,x\,\text{ArcTan}\left[\frac{\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]+\sqrt{e}\left(2\,e-6\,d\,x^{2/3}-3\,e\,\text{Log}\left[d+\frac{e}{x^{2/3}}\right]\right)\right)\right.$$
$$\left(a-b\,n\,\text{Log}\left[d+\frac{e}{x^{2/3}}\right]+b\,\text{Log}\left[c\left(d+\frac{e}{x^{2/3}}\right)^n\right]\right)-$$
$$9\,e^{3/2}\left(a-b\,n\,\text{Log}\left[d+\frac{e}{x^{2/3}}\right]+b\,\text{Log}\left[c\left(d+\frac{e}{x^{2/3}}\right)^n\right]\right)^2+$$
$$b^2\,n^2\left(-8\,e^{3/2}+96\,d\,\sqrt{e}\,x^{2/3}+96\,d^{3/2}\,x\,\text{ArcTan}\left[\frac{\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]+12\,e^{3/2}\,\text{Log}\left[d+\frac{e}{x^{2/3}}\right]-\right.$$
$$36\,d\,\sqrt{e}\,x^{2/3}\,\text{Log}\left[d+\frac{e}{x^{2/3}}\right]-36\,d^{3/2}\,x\,\text{ArcTan}\left[\frac{\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]\text{Log}\left[d+\frac{e}{x^{2/3}}\right]-$$
$$9\,e^{3/2}\,\text{Log}\left[d+\frac{e}{x^{2/3}}\right]^2+36\,d^{3/2}\,x\,\text{ArcTan}\left[\frac{\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]\text{Log}\left[-\frac{i\,\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]+$$
$$9\,i\,d^{3/2}\,x\,\text{Log}\left[-\frac{i\,\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]^2+36\,d^{3/2}\,x\,\text{ArcTan}\left[\frac{\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]\text{Log}\left[\frac{i\,\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]-$$
$$9\,i\,d^{3/2}\,x\,\text{Log}\left[\frac{i\,\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]^2-18\,i\,d^{3/2}\,x\,\text{Log}\left[-\frac{i\,\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]\text{Log}\left[\frac{1}{2}-\frac{i\,\sqrt{d}\,x^{1/3}}{2\,\sqrt{e}}\right]+$$
$$18\,i\,d^{3/2}\,x\,\text{Log}\left[\frac{i\,\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]\text{Log}\left[\frac{1}{2}+\frac{i\,\sqrt{d}\,x^{1/3}}{2\,\sqrt{e}}\right]-24\,d^{3/2}\,x\,\text{ArcTan}\left[\frac{\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]\text{Log}[x]+$$
$$12\,i\,d^{3/2}\,x\,\text{Log}\left[1-\frac{i\,\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]\text{Log}[x]-12\,i\,d^{3/2}\,x\,\text{Log}\left[1+\frac{i\,\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]\text{Log}[x]+$$
$$18\,i\,d^{3/2}\,x\,\text{PolyLog}\left[2,\frac{1}{2}-\frac{i\,\sqrt{d}\,x^{1/3}}{2\,\sqrt{e}}\right]-18\,i\,d^{3/2}\,x\,\text{PolyLog}\left[2,\frac{1}{2}+\frac{i\,\sqrt{d}\,x^{1/3}}{2\,\sqrt{e}}\right]-$$
$$\left.\left.36\,i\,d^{3/2}\,x\,\text{PolyLog}\left[2,-\frac{i\,\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]+36\,i\,d^{3/2}\,x\,\text{PolyLog}\left[2,\frac{i\,\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]\right)\right)$$

Problem 526: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 139 leaves, 6 steps):

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

Result (type 4, 1841 leaves):

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

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

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

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

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

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

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

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

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

$$\frac{1}{3}\,\left(-\text{Log}\left[d+\frac{e}{x^{2/3}}\right]+\text{Log}\left[-\frac{i\,\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]+\text{Log}\left[\frac{i\,\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]-\frac{2\,\text{Log}[x]}{3}\right)^2\,\text{Log}[x]+\frac{4\,\text{Log}[x]^3}{81}+$$

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

$$2\,\text{Log}\left[\frac{i\,\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]\,\text{PolyLog}\left[2,\,1-\frac{i\,\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]+$$

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

$$2\,\text{Log}\left[-\frac{i\,\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]\,\text{PolyLog}\left[2,\,1+\frac{i\,\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]+$$

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

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

$$\left(\frac{1}{9}\,\left(3\,\text{Log}\left[-\frac{i\,\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]+3\,\text{Log}\left[\frac{i\,\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]-3\,\text{Log}\left[1-\frac{i\,\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]-3\,\text{Log}\left[1+\frac{i\,\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]-\right.\right.$$

$$\left.\left.\text{Log}[x]\right)\,\text{Log}[x]-\text{PolyLog}\left[2,\,-\frac{i\,\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]-\text{PolyLog}\left[2,\,\frac{i\,\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]\right)+$$

$$2\,\text{PolyLog}\left[3,\frac{i\sqrt{e}+\sqrt{d}\,x^{1/3}}{i\sqrt{e}-\sqrt{d}\,x^{1/3}}\right]-2\,\text{PolyLog}\left[3,\frac{i\sqrt{e}+\sqrt{d}\,x^{1/3}}{-i\sqrt{e}+\sqrt{d}\,x^{1/3}}\right]-$$
$$4\,\text{PolyLog}\left[3,1-\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]-4\,\text{PolyLog}\left[3,1+\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]-$$
$$\frac{2}{9}\left(\left(\text{Log}\left[\frac{i\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]-\text{Log}\left[1-\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]\right)\text{Log}[x]^2+\right.$$
$$\left(\text{Log}\left[-\frac{i\sqrt{e}}{\sqrt{d}}+x^{1/3}\right]-\text{Log}\left[1+\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]\right)\text{Log}[x]^2-$$
$$6\,\text{Log}[x]\,\text{PolyLog}\left[2,-\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]-6\,\text{Log}[x]\,\text{PolyLog}\left[2,\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]+$$
$$\left.18\,\text{PolyLog}\left[3,-\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]+18\,\text{PolyLog}\left[3,\frac{i\sqrt{d}\,x^{1/3}}{\sqrt{e}}\right]\right)\Bigg)-$$
$$\frac{3}{2}b^3n^3\left(\text{Log}\left[d+\frac{e}{x^{2/3}}\right]^3\text{Log}\left[-\frac{e}{d\,x^{2/3}}\right]+3\,\text{Log}\left[d+\frac{e}{x^{2/3}}\right]^2\text{PolyLog}\left[2,1+\frac{e}{d\,x^{2/3}}\right]-\right.$$
$$\left.6\,\text{Log}\left[d+\frac{e}{x^{2/3}}\right]\text{PolyLog}\left[3,1+\frac{e}{d\,x^{2/3}}\right]+6\,\text{PolyLog}\left[4,1+\frac{e}{d\,x^{2/3}}\right]\right)$$

Problem 538: Unable to integrate problem.

$$\int x^3\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)^p\,dx$$

Optimal (type 4, 907 leaves, 27 steps):

$$\frac{1}{c^4e^8}2^{-2(1+p)}\,e^{-\frac{4a}{b}}\,\text{Gamma}\left[1+p,-\frac{4\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)}{b}\right]$$
$$\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]}{b}\right)^{-p}-$$
$$\left(2^{1+p}\times7^{-p}\,d\,e^{-\frac{7a}{2b}}\left(d+e\sqrt{x}\right)^7\text{Gamma}\left[1+p,-\frac{7\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)}{2b}\right]\right.$$
$$\left.\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]}{b}\right)^{-p}\right)\Bigg/\left(e^8\left(c\left(d+e\sqrt{x}\right)^2\right)^{7/2}\right)+$$
$$\frac{1}{c^3e^8}7\times3^{-p}\,d^2\,e^{-\frac{3a}{b}}\,\text{Gamma}\left[1+p,-\frac{3\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)}{b}\right]$$
$$\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]}{b}\right)^{-p}-$$

$$\left(7\times 2^{1+p}\times 5^{-p}\, d^3\, e^{-\frac{5a}{2b}} \left(d+e\sqrt{x}\right)^5 \text{Gamma}\left[1+p,\, -\frac{5\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)}{2\,b}\right]\right.$$

$$\left.\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)^p \left(-\frac{a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^8\left(c\left(d+e\sqrt{x}\right)^2\right)^{5/2}\right)+$$

$$\frac{1}{c^2\, e^8} 35\times 2^{-1-p}\, d^4\, e^{-\frac{2a}{b}}\, \text{Gamma}\left[1+p,\, -\frac{2\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)}{b}\right]$$

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

$$\left(7\times 2^{1+p}\times 3^{-p}\, d^5\, e^{-\frac{3a}{2b}} \left(d+e\sqrt{x}\right)^3 \text{Gamma}\left[1+p,\, -\frac{3\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)}{2\,b}\right]\right.$$

$$\left.\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)^p \left(-\frac{a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^8\left(c\left(d+e\sqrt{x}\right)^2\right)^{3/2}\right)+$$

$$\frac{1}{c\, e^8} 7\, d^6\, e^{-\frac{a}{b}}\, \text{Gamma}\left[1+p,\, -\frac{a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]}{b}\right] \left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)^p$$

$$\left(-\frac{a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]}{b}\right)^{-p} - \left(2^{1+p}\, d^7\, e^{-\frac{a}{2b}} \left(d+e\sqrt{x}\right) \text{Gamma}\left[1+p,\, -\frac{a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]}{2\,b}\right]\right.$$

$$\left.\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)^p \left(-\frac{a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^8\sqrt{c\left(d+e\sqrt{x}\right)^2}\right)$$

Result (type 8, 26 leaves):

$$\int x^3\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)^p dx$$

Problem 539: Unable to integrate problem.

$$\int x^2\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)^p dx$$

Optimal (type 4, 677 leaves, 21 steps):

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

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

$$\left(2^{1+p}\times 5^{-p} d\, e^{-\frac{5a}{2b}} \left(d+e\sqrt{x}\right)^5 \text{Gamma}\left[1+p, -\frac{5\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)}{2b}\right]\right.$$

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

$$\frac{1}{c^2 e^6} 5\times 2^{-p} d^2 e^{-\frac{2a}{b}} \text{Gamma}\left[1+p, -\frac{2\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)}{b}\right]$$

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

$$\left(5\times 2^{2+p}\times 3^{-1-p} d^3 e^{-\frac{3a}{2b}} \left(d+e\sqrt{x}\right)^3 \text{Gamma}\left[1+p, -\frac{3\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)}{2b}\right]\right.$$

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

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

$$\left(-\frac{a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]}{b}\right)^{-p} - \left(2^{1+p} d^5 e^{-\frac{a}{2b}} \left(d+e\sqrt{x}\right) \text{Gamma}\left[1+p, -\frac{a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]}{2b}\right]\right.$$

$$\left.\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)^p \left(-\frac{a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]}{b}\right)^{-p}\right) \Big/ \left(e^6 \sqrt{c\left(d+e\sqrt{x}\right)^2}\right)$$

Result (type 8, 26 leaves):

$$\int x^2 \left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)^p \, dx$$

Problem 540: Unable to integrate problem.

$$\int x \left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)^p \, dx$$

Optimal (type 4, 445 leaves, 15 steps):

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

Result (type 8, 24 leaves):

$$\int x \left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)^p dx$$

Problem 541: Unable to integrate problem.

$$\int \left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)^p dx$$

Optimal (type 4, 213 leaves, 9 steps):

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

Result (type 8, 22 leaves) :

$$\int\left(a+b\,\text{Log}\left[c\left(d+e\sqrt{x}\right)^2\right]\right)^p\,dx$$

Problem 553: Unable to integrate problem.

$$\int\frac{\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)^p}{x^2}\,dx$$

Optimal (type 4, 213 leaves, 9 steps) :

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

Result (type 8, 26 leaves) :

$$\int\frac{\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)^p}{x^2}\,dx$$

Problem 554: Unable to integrate problem.

$$\int \frac{\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)^p}{x^4}\,dx$$

Optimal (type 4, 676 leaves, 21 steps):

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

Result (type 8, 26 leaves):

$$\int \frac{\left(a + b \,\text{Log}\left[c \left(d + \frac{e}{\sqrt{x}}\right)^2\right]\right)^p}{x^4} \, dx$$

Problem 555: Unable to integrate problem.

$$\int \frac{\left(a + b \,\text{Log}\left[c \left(d + \frac{e}{\sqrt{x}}\right)^2\right]\right)^p}{x^6} \, dx$$

Optimal (type 4, 1141 leaves, 33 steps):

$$-\frac{1}{c^5 e^{10}} 5^{-1-p} e^{-\frac{5a}{b}} \text{Gamma}\left[1+p, -\frac{5\left(a + b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)}{b}\right] \left(a + b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)^p \left(-\frac{a + b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]}{b}\right)^{-p} +$$
$$\left(2^{1+p} \times 9^{-p} d\, e^{-\frac{9a}{2b}} \left(d+\frac{e}{\sqrt{x}}\right)^9 \text{Gamma}\left[1+p, -\frac{9\left(a + b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)}{2b}\right] \left(a + b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)^p \left(-\frac{a + b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]}{b}\right)^{-p}\right) \Big/ \left(e^{10}\left(c\left(d+\frac{e}{\sqrt{x}}\right)^2\right)^{9/2}\right) -$$
$$\frac{1}{c^4 e^{10}} 9 \times 4^{-p} d^2 e^{-\frac{4a}{b}} \text{Gamma}\left[1+p, -\frac{4\left(a + b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)}{b}\right] \left(a + b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)^p \left(-\frac{a + b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]}{b}\right)^{-p} +$$
$$\left(3 \times 2^{3+p} \times 7^{-p} d^3 e^{-\frac{7a}{2b}} \left(d+\frac{e}{\sqrt{x}}\right)^7 \text{Gamma}\left[1+p, -\frac{7\left(a + b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)}{2b}\right] \left(a + b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)^p \left(-\frac{a + b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]}{b}\right)^{-p}\right) \Big/ \left(e^{10}\left(c\left(d+\frac{e}{\sqrt{x}}\right)^2\right)^{7/2}\right) -$$
$$\frac{1}{c^3 e^{10}} 14 \times 3^{1-p} d^4 e^{-\frac{3a}{b}} \text{Gamma}\left[1+p, -\frac{3\left(a + b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)}{b}\right] \left(a + b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)^p \left(-\frac{a + b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]}{b}\right)^{-p} +$$

$$\left(63\times 2^{2+p}\times 5^{-1-p}\,d^5\,e^{-\frac{5a}{2b}}\left(d+\frac{e}{\sqrt{x}}\right)^5 \text{Gamma}\left[1+p,-\frac{5\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)}{2b}\right]\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^{10}\left(c\left(d+\frac{e}{\sqrt{x}}\right)^2\right)^{5/2}\right)-$$

$$\frac{1}{c^2\,e^{10}}21\times 2^{1-p}\,d^6\,e^{-\frac{2a}{b}}\,\text{Gamma}\left[1+p,-\frac{2\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)}{b}\right]\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]}{b}\right)^{-p}+$$

$$\left(2^{3+p}\times 3^{1-p}\,d^7\,e^{-\frac{3a}{2b}}\left(d+\frac{e}{\sqrt{x}}\right)^3 \text{Gamma}\left[1+p,-\frac{3\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)}{2b}\right]\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^{10}\left(c\left(d+\frac{e}{\sqrt{x}}\right)^2\right)^{3/2}\right)-$$

$$\frac{1}{c\,e^{10}}9\,d^8\,e^{-\frac{a}{b}}\,\text{Gamma}\left[1+p,-\frac{a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]}{b}\right]\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]}{b}\right)^{-p}+\left(2^{1+p}\,d^9\,e^{-\frac{a}{2b}}\left(d+\frac{e}{\sqrt{x}}\right)\text{Gamma}\left[1+p,-\frac{a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]}{2b}\right]\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^{10}\sqrt{c\left(d+\frac{e}{\sqrt{x}}\right)^2}\right)$$

Result (type 8, 26 leaves):

$$\int \frac{\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{\sqrt{x}}\right)^2\right]\right)^p}{x^6}\,dx$$

Problem 562: Unable to integrate problem.

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

Optimal (type 4, 1363 leaves, 39 steps):

$$\frac{1}{c^6\,e^{12}}2^{-2-p}\times 3^{-p}\,e^{-\frac{6a}{b}}\,\text{Gamma}\left[1+p,-\frac{6\left(a+b\,\text{Log}\left[c\left(d+e\,x^{1/3}\right)^2\right]\right)}{b}\right]$$

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

$$\left(3\,\left(\frac{2}{11}\right)^p\,d\,\mathrm{e}^{-\frac{11\,a}{2\,b}}\,\left(d+e\,x^{1/3}\right)^{11}\,\text{Gamma}\left[1+p,\,-\frac{11\,\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)}{2\,b}\right]\right.$$

$$\left.\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)^p\,\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^{12}\,\left(c\,\left(d+e\,x^{1/3}\right)^2\right)^{11/2}\right)+$$

$$\frac{1}{2\,c^5\,e^{12}}33\times5^{-p}\,d^2\,\mathrm{e}^{-\frac{5\,a}{b}}\,\text{Gamma}\left[1+p,\,-\frac{5\,\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)}{b}\right]$$

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

$$\left(55\,\left(\frac{2}{9}\right)^p\,d^3\,\mathrm{e}^{-\frac{9\,a}{2\,b}}\,\left(d+e\,x^{1/3}\right)^{9}\,\text{Gamma}\left[1+p,\,-\frac{9\,\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)}{2\,b}\right]\right.$$

$$\left.\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)^p\,\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^{12}\,\left(c\,\left(d+e\,x^{1/3}\right)^2\right)^{9/2}\right)+$$

$$\frac{1}{c^4\,e^{12}}495\times2^{-2\,(1+p)}\,d^4\,\mathrm{e}^{-\frac{4\,a}{b}}\,\text{Gamma}\left[1+p,\,-\frac{4\,\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)}{b}\right]$$

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

$$\left(99\times2^{1+p}\times7^{-p}\,d^5\,\mathrm{e}^{-\frac{7\,a}{2\,b}}\,\left(d+e\,x^{1/3}\right)^{7}\,\text{Gamma}\left[1+p,\,-\frac{7\,\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)}{2\,b}\right]\right.$$

$$\left.\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)^p\,\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^{12}\,\left(c\,\left(d+e\,x^{1/3}\right)^2\right)^{7/2}\right)+$$

$$\frac{1}{c^3\,e^{12}}77\times3^{1-p}\,d^6\,\mathrm{e}^{-\frac{3\,a}{b}}\,\text{Gamma}\left[1+p,\,-\frac{3\,\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)}{b}\right]$$

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

$$\left(99\times2^{1+p}\times5^{-p}\,d^7\,\mathrm{e}^{-\frac{5\,a}{2\,b}}\,\left(d+e\,x^{1/3}\right)^{5}\,\text{Gamma}\left[1+p,\,-\frac{5\,\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)}{2\,b}\right]\right.$$

$$\left.\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)^p\,\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^{12}\,\left(c\,\left(d+e\,x^{1/3}\right)^2\right)^{5/2}\right)+$$

$$\frac{1}{c^2\,e^{12}}495\times2^{-2-p}\,d^8\,\mathrm{e}^{-\frac{2\,a}{b}}\,\text{Gamma}\left[1+p,\,-\frac{2\,\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)}{b}\right]$$

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

$$\left(55\left(\frac{2}{3}\right)^p d^9\,e^{-\frac{3a}{2b}}\left(d+e\,x^{1/3}\right)^3\,\text{Gamma}\left[1+p,\,-\frac{3\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)}{2\,b}\right]\right.$$

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

$$\frac{1}{2\,c\,e^{12}}33\,d^{10}\,e^{-\frac{a}{b}}\,\text{Gamma}\left[1+p,\,-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]}{b}\right]\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)^p$$

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

$$\left(3\times 2^p\,d^{11}\,e^{-\frac{a}{2b}}\left(d+e\,x^{1/3}\right)\,\text{Gamma}\left[1+p,\,-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]}{2\,b}\right]\right.$$

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

Result (type 8, 26 leaves) :

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

Problem 563: Unable to integrate problem.

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

Optimal (type 4, 1035 leaves, 30 steps) :

$$\left(2^p\times 3^{-1-2p}\,e^{-\frac{9a}{2b}}\left(d+e\,x^{1/3}\right)^9\,\text{Gamma}\left[1+p,\,-\frac{9\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)}{2\,b}\right]\right.$$

$$\left.\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^9\left(c\,\left(d+e\,x^{1/3}\right)^2\right)^{9/2}\right)-$$

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

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

$$\left(3\times 2^{2+p}\times 7^{-p}\,d^2\,e^{-\frac{7a}{2b}}\left(d+e\,x^{1/3}\right)^7\,\text{Gamma}\left[1+p,\,-\frac{7\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)}{2\,b}\right]\right.$$

$$\left.\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^9\left(c\,\left(d+e\,x^{1/3}\right)^2\right)^{7/2}\right)-$$

$$\frac{1}{c^3 e^9}28\times 3^{-p} d^3 e^{-\frac{3a}{b}} \text{Gamma}\left[1+p, -\frac{3\left(a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]\right)}{b}\right]$$
$$\left(a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]\right)^p \left(-\frac{a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]}{b}\right)^{-p} +$$
$$\left(21\times 2^{1+p}\times 5^{-p} d^4 e^{-\frac{5a}{2b}} \left(d+e x^{1/3}\right)^5 \text{Gamma}\left[1+p, -\frac{5\left(a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]\right)}{2b}\right]\right.$$
$$\left.\left(a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]\right)^p \left(-\frac{a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]}{b}\right)^{-p}\right) \bigg/ \left(e^9 \left(c\left(d+e x^{1/3}\right)^2\right)^{5/2}\right) -$$
$$\frac{1}{c^2 e^9}21\times 2^{1-p} d^5 e^{-\frac{2a}{b}} \text{Gamma}\left[1+p, -\frac{2\left(a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]\right)}{b}\right]$$
$$\left(a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]\right)^p \left(-\frac{a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]}{b}\right)^{-p} +$$
$$\left(7\times 2^{2+p}\times 3^{-p} d^6 e^{-\frac{3a}{2b}} \left(d+e x^{1/3}\right)^3 \text{Gamma}\left[1+p, -\frac{3\left(a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]\right)}{2b}\right]\right.$$
$$\left.\left(a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]\right)^p \left(-\frac{a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]}{b}\right)^{-p}\right) \bigg/ \left(e^9 \left(c\left(d+e x^{1/3}\right)^2\right)^{3/2}\right) -$$
$$\frac{1}{c e^9}12 d^7 e^{-\frac{a}{b}} \text{Gamma}\left[1+p, -\frac{a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]}{b}\right] \left(a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]\right)^p$$
$$\left(-\frac{a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]}{b}\right)^{-p} +$$
$$\left(3\times 2^p d^8 e^{-\frac{a}{2b}} \left(d+e x^{1/3}\right) \text{Gamma}\left[1+p, -\frac{a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]}{2b}\right]\right.$$
$$\left.\left(a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]\right)^p \left(-\frac{a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]}{b}\right)^{-p}\right) \bigg/ \left(e^9 \sqrt{c\left(d+e x^{1/3}\right)^2}\right)$$

Result (type 8, 26 leaves) :

$$\int x^2 \left(a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]\right)^p dx$$

Problem 564: Unable to integrate problem.

$$\int x \left(a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]\right)^p dx$$

Optimal (type 4, 673 leaves, 21 steps) :

$$\frac{1}{2\,c^3\,e^6}3^{-p}\,e^{-\frac{3a}{b}}\,\text{Gamma}\left[1+p,\,-\frac{3\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)}{b}\right]$$
$$\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]}{b}\right)^{-p}-$$
$$\left(3\left(\frac{2}{5}\right)^p d\,e^{-\frac{5a}{2b}}\left(d+e\,x^{1/3}\right)^5\text{Gamma}\left[1+p,\,-\frac{5\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)}{2\,b}\right]\right.$$
$$\left.\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^6\left(c\left(d+e\,x^{1/3}\right)^2\right)^{5/2}\right)+$$
$$\frac{1}{c^2\,e^6}15\times 2^{-1-p}\,d^2\,e^{-\frac{2a}{b}}\,\text{Gamma}\left[1+p,\,-\frac{2\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)}{b}\right]$$
$$\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]}{b}\right)^{-p}-$$
$$\left(5\times 2^{1+p}\times 3^{-p}\,d^3\,e^{-\frac{3a}{2b}}\left(d+e\,x^{1/3}\right)^3\text{Gamma}\left[1+p,\,-\frac{3\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)}{2\,b}\right]\right.$$
$$\left.\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^6\left(c\left(d+e\,x^{1/3}\right)^2\right)^{3/2}\right)+$$
$$\frac{1}{2\,c\,e^6}15\,d^4\,e^{-\frac{a}{b}}\,\text{Gamma}\left[1+p,\,-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]}{b}\right]\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)^p$$
$$\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]}{b}\right)^{-p}-$$
$$\left(3\times 2^p\,d^5\,e^{-\frac{a}{2b}}\left(d+e\,x^{1/3}\right)\text{Gamma}\left[1+p,\,-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]}{2\,b}\right]\right.$$
$$\left.\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{1/3}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^6\sqrt{c\left(d+e\,x^{1/3}\right)^2}\right)$$

Result (type 8, 24 leaves):

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

Problem 565: Unable to integrate problem.

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

Optimal (type 4, 338 leaves, 12 steps):

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

Result (type 8, 22 leaves) :

$$\int \left(a+b \text{Log}\left[c\left(d+e x^{1/3}\right)^2\right]\right)^p dx$$

Problem 575: Unable to integrate problem.

$$\int x^3 \left(a+b \text{Log}\left[c\left(d+e x^{2/3}\right)^2\right]\right)^p dx$$

Optimal (type 4, 675 leaves, 21 steps) :

$$\frac{1}{4\,c^3\,e^6}3^{-p}\,e^{-\frac{3a}{b}}\,\text{Gamma}\Big[1+p,\,-\frac{3\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]\right)}{b}\Big]$$
$$\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]}{b}\right)^{-p}-$$
$$\left(3\times 2^{-1+p}\times 5^{-p}\,d\,e^{-\frac{5a}{2b}}\left(d+e\,x^{2/3}\right)^5\,\text{Gamma}\Big[1+p,\,-\frac{5\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]\right)}{2\,b}\Big]\right.$$
$$\left.\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^6\left(c\,\left(d+e\,x^{2/3}\right)^2\right)^{5/2}\right)+$$
$$\frac{1}{c^2\,e^6}15\times 2^{-2-p}\,d^2\,e^{-\frac{2a}{b}}\,\text{Gamma}\Big[1+p,\,-\frac{2\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]\right)}{b}\Big]$$
$$\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]}{b}\right)^{-p}-$$
$$\left(5\left(\frac{2}{3}\right)^p d^3\,e^{-\frac{3a}{2b}}\left(d+e\,x^{2/3}\right)^3\,\text{Gamma}\Big[1+p,\,-\frac{3\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]\right)}{2\,b}\Big]\right.$$
$$\left.\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^6\left(c\,\left(d+e\,x^{2/3}\right)^2\right)^{3/2}\right)+$$
$$\frac{1}{4\,c\,e^6}15\,d^4\,e^{-\frac{a}{b}}\,\text{Gamma}\Big[1+p,\,-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]}{b}\Big]\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]\right)^p$$
$$\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]}{b}\right)^{-p}-$$
$$\left(3\times 2^{-1+p}\,d^5\,e^{-\frac{a}{2b}}\left(d+e\,x^{2/3}\right)\,\text{Gamma}\Big[1+p,\,-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]}{2\,b}\Big]\right.$$
$$\left.\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^6\sqrt{c\,\left(d+e\,x^{2/3}\right)^2}\right)$$

Result (type 8, 26 leaves):

$$\int x^3\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]\right)^p\,dx$$

Problem 576: Unable to integrate problem.

$$\int x\left(a+b\,\text{Log}\left[c\,\left(d+e\,x^{2/3}\right)^2\right]\right)^p\,dx$$

Optimal (type 4, 347 leaves, 12 steps):

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

Result (type 8, 24 leaves):

$$\int x\left(a+b\,\text{Log}\left[c\left(d+e\,x^{2/3}\right)^2\right]\right)^p\,dx$$

Problem 591: Unable to integrate problem.

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

Optimal (type 4, 339 leaves, 12 steps):

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

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

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

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

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

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

Result (type 8, 26 leaves):

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

Problem 592: Unable to integrate problem.

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

Optimal (type 4, 673 leaves, 21 steps):

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

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

$$\frac{1}{c^2 e^6} 15 \times 2^{-1-p} d^2 e^{-\frac{2a}{b}} \text{Gamma}\left[1+p, -\frac{2\left(a+b \text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]\right)}{b}\right] \left(a+b \text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]\right)^p \left(-\frac{a+b \text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]}{b}\right)^{-p} +$$

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

$$\frac{1}{2 c e^6} 15 d^4 e^{-\frac{a}{b}} \text{Gamma}\left[1+p, -\frac{a+b \text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]}{b}\right] \left(a+b \text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]\right)^p \left(-\frac{a+b \text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]}{b}\right)^{-p} + \left(3 \times 2^p d^5 e^{-\frac{a}{2b}} \left(d+\frac{e}{x^{1/3}}\right) \text{Gamma}\left[1+p, -\frac{a+b \text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]}{2b}\right] \left(a+b \text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]\right)^p \left(-\frac{a+b \text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]}{b}\right)^{-p}\right) \Big/ \left(e^6 \sqrt{c\left(d+\frac{e}{x^{1/3}}\right)^2}\right)$$

Result (type 8, 26 leaves):

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

Problem 593: Unable to integrate problem.

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

Optimal (type 4, 1036 leaves, 30 steps):

$$-\left(\left(2^p\times 3^{-1-2p}\,e^{-\frac{9a}{2b}}\left(d+\frac{e}{x^{1/3}}\right)^9 \text{Gamma}\left[1+p,\,-\frac{9\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]\right)}{2b}\right]\right.\right.$$

$$\left.\left.\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^9\left(c\left(d+\frac{e}{x^{1/3}}\right)^2\right)^{9/2}\right)\right)+$$

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

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

$$\left(3\times 2^{2+p}\times 7^{-p}\,d^2\,e^{-\frac{7a}{2b}}\left(d+\frac{e}{x^{1/3}}\right)^7 \text{Gamma}\left[1+p,\,-\frac{7\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]\right)}{2b}\right]\right.$$

$$\left.\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^9\left(c\left(d+\frac{e}{x^{1/3}}\right)^2\right)^{7/2}\right)+$$

$$\frac{1}{c^3 e^9}28\times 3^{-p}\,d^3\,e^{-\frac{3a}{b}}\,\text{Gamma}\left[1+p,\,-\frac{3\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]\right)}{b}\right]$$

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

$$\left(21\times 2^{1+p}\times 5^{-p}\,d^4\,e^{-\frac{5a}{2b}}\left(d+\frac{e}{x^{1/3}}\right)^5 \text{Gamma}\left[1+p,\,-\frac{5\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]\right)}{2b}\right]\right.$$

$$\left.\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^9\left(c\left(d+\frac{e}{x^{1/3}}\right)^2\right)^{5/2}\right)+$$

$$\frac{1}{c^2 e^9}21\times 2^{1-p}\,d^5\,e^{-\frac{2a}{b}}\,\text{Gamma}\left[1+p,\,-\frac{2\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]\right)}{b}\right]$$

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

$$\left(7\times 2^{2+p}\times 3^{-p}\,d^6\,e^{-\frac{3a}{2b}}\left(d+\frac{e}{x^{1/3}}\right)^3\text{Gamma}\left[1+p,-\frac{3\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]\right)}{2b}\right]\right.$$

$$\left.\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^9\left(c\left(d+\frac{e}{x^{1/3}}\right)^2\right)^{3/2}\right)+$$

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

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

$$\left(3\times 2^p\,d^8\,e^{-\frac{a}{2b}}\left(d+\frac{e}{x^{1/3}}\right)\text{Gamma}\left[1+p,-\frac{a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]}{2b}\right]\right.$$

$$\left.\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]\right)^p\left(-\frac{a+b\,\text{Log}\left[c\left(d+\frac{e}{x^{1/3}}\right)^2\right]}{b}\right)^{-p}\right)\Big/\left(e^9\sqrt{c\left(d+\frac{e}{x^{1/3}}\right)^2}\right)$$

Result (type 8, 26 leaves):

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

Problem 619: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Log}\left[f\,x^p\right]\,\text{Log}\left[1+e\,x^m\right]}{x}\,dx$$

Optimal (type 4, 33 leaves, 2 steps):

$$-\frac{\text{Log}\left[f\,x^p\right]\,\text{PolyLog}\left[2,-e\,x^m\right]}{m}+\frac{p\,\text{PolyLog}\left[3,-e\,x^m\right]}{m^2}$$

Result (type 4, 160 leaves):

$$\frac{1}{6\,m^2}\left(-m^3\,p\,\text{Log}[x]^3-3\,m^2\,p\,\text{Log}[x]^2\,\text{Log}\left[\frac{e+x^{-m}}{e}\right]+\right.$$

$$3\,m^2\,p\,\text{Log}[x]^2\,\text{Log}\left[1+e\,x^m\right]-6\,m\,p\,\text{Log}[x]\,\text{Log}\left[-e\,x^m\right]\,\text{Log}\left[1+e\,x^m\right]+$$

$$6\,m\,\text{Log}\left[-e\,x^m\right]\,\text{Log}\left[f\,x^p\right]\,\text{Log}\left[1+e\,x^m\right]+6\,m\,p\,\text{Log}[x]\,\text{PolyLog}\left[2,-\frac{x^{-m}}{e}\right]+$$

$$\left.6\,m\left(-p\,\text{Log}[x]+\text{Log}\left[f\,x^p\right]\right)\text{PolyLog}\left[2,1+e\,x^m\right]+6\,p\,\text{PolyLog}\left[3,-\frac{x^{-m}}{e}\right]\right)$$

Problem 620: Result more than twice size of optimal antiderivative.

$$\int \frac{x^{-1+m}\,\mathrm{Log}[f\,x^p]^2}{d+e\,x^m}\,dx$$

Optimal (type 4, 75 leaves, 3 steps):

$$\frac{\mathrm{Log}[f\,x^p]^2\,\mathrm{Log}\left[1+\frac{e\,x^m}{d}\right]}{e\,m}+\frac{2\,p\,\mathrm{Log}[f\,x^p]\,\mathrm{PolyLog}\left[2,-\frac{e\,x^m}{d}\right]}{e\,m^2}-\frac{2\,p^2\,\mathrm{PolyLog}\left[3,-\frac{e\,x^m}{d}\right]}{e\,m^3}$$

Result (type 4, 210 leaves):

$$\frac{1}{3\,e\,m^3}\left(m^3\,p^2\,\mathrm{Log}[x]^3+3\,m^2\,p^2\,\mathrm{Log}[x]^2\,\mathrm{Log}\left[1+\frac{d\,x^{-m}}{e}\right]-3\,m^2\,p^2\,\mathrm{Log}[x]^2\,\mathrm{Log}[d+e\,x^m]+\right.$$
$$6\,m\,p^2\,\mathrm{Log}[x]\,\mathrm{Log}\left[-\frac{e\,x^m}{d}\right]\,\mathrm{Log}[d+e\,x^m]-6\,m\,p\,\mathrm{Log}\left[-\frac{e\,x^m}{d}\right]\,\mathrm{Log}[f\,x^p]\,\mathrm{Log}[d+e\,x^m]+$$
$$3\,m^2\,\mathrm{Log}[f\,x^p]^2\,\mathrm{Log}[d+e\,x^m]-6\,m\,p^2\,\mathrm{Log}[x]\,\mathrm{PolyLog}\left[2,-\frac{d\,x^{-m}}{e}\right]+$$
$$\left.6\,m\,p\,\left(p\,\mathrm{Log}[x]-\mathrm{Log}[f\,x^p]\right)\,\mathrm{PolyLog}\left[2,1+\frac{e\,x^m}{d}\right]-6\,p^2\,\mathrm{PolyLog}\left[3,-\frac{d\,x^{-m}}{e}\right]\right)$$

Problem 621: Result more than twice size of optimal antiderivative.

$$\int \frac{\mathrm{Log}[f\,x^p]^3\,\left(a+b\,\mathrm{Log}\left[c\,\left(d+e\,x^m\right)^n\right]\right)}{x}\,dx$$

Optimal (type 4, 161 leaves, 6 steps):

$$\frac{\mathrm{Log}[f\,x^p]^4\,\left(a+b\,\mathrm{Log}\left[c\,\left(d+e\,x^m\right)^n\right]\right)}{4\,p}-\frac{b\,n\,\mathrm{Log}[f\,x^p]^4\,\mathrm{Log}\left[1+\frac{e\,x^m}{d}\right]}{4\,p}-$$
$$\frac{b\,n\,\mathrm{Log}[f\,x^p]^3\,\mathrm{PolyLog}\left[2,-\frac{e\,x^m}{d}\right]}{m}+\frac{3\,b\,n\,p\,\mathrm{Log}[f\,x^p]^2\,\mathrm{PolyLog}\left[3,-\frac{e\,x^m}{d}\right]}{m^2}-$$
$$\frac{6\,b\,n\,p^2\,\mathrm{Log}[f\,x^p]\,\mathrm{PolyLog}\left[4,-\frac{e\,x^m}{d}\right]}{m^3}+\frac{6\,b\,n\,p^3\,\mathrm{PolyLog}\left[5,-\frac{e\,x^m}{d}\right]}{m^4}$$

Result (type 4, 659 leaves):

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

Problem 622: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Log}\left[f\, x^p\right]^2 \left(a+b \text{Log}\left[c \left(d+e\, x^m\right)^n\right]\right)}{x} \, dx$$

Optimal (type 4, 132 leaves, 5 steps):

$$\frac{\text{Log}\left[f\, x^p\right]^3 \left(a+b \text{Log}\left[c \left(d+e\, x^m\right)^n\right]\right)}{3 p}-\frac{b\, n \text{Log}\left[f\, x^p\right]^3 \text{Log}\left[1+\frac{e\, x^m}{d}\right]}{3 p}-\frac{b\, n \text{Log}\left[f\, x^p\right]^2 \text{PolyLog}\left[2,-\frac{e\, x^m}{d}\right]}{m}+\frac{2 b\, n\, p \text{Log}\left[f\, x^p\right] \text{PolyLog}\left[3,-\frac{e\, x^m}{d}\right]}{m^2}-\frac{2 b\, n\, p^2 \text{PolyLog}\left[4,-\frac{e\, x^m}{d}\right]}{m^3}$$

Result (type 4, 456 leaves):

$$\frac{1}{4} b m n p^2 \operatorname{Log}[x]^4 - \frac{1}{3} b m n p \operatorname{Log}[x]^3 \operatorname{Log}\left[f x^p\right] + \frac{a \operatorname{Log}[f x^p]^3}{3 p} +$$
$$\frac{2}{3} b n p^2 \operatorname{Log}[x]^3 \operatorname{Log}\left[1 + \frac{d x^{-m}}{e}\right] - b n p \operatorname{Log}[x]^2 \operatorname{Log}\left[f x^p\right] \operatorname{Log}\left[1 + \frac{d x^{-m}}{e}\right] -$$
$$b n p^2 \operatorname{Log}[x]^3 \operatorname{Log}\left[d + e x^m\right] + \frac{b n p^2 \operatorname{Log}[x]^2 \operatorname{Log}\left[-\frac{e x^m}{d}\right] \operatorname{Log}[d + e x^m]}{m} +$$
$$2 b n p \operatorname{Log}[x]^2 \operatorname{Log}\left[f x^p\right] \operatorname{Log}\left[d + e x^m\right] - \frac{2 b n p \operatorname{Log}[x] \operatorname{Log}\left[-\frac{e x^m}{d}\right] \operatorname{Log}[f x^p] \operatorname{Log}[d + e x^m]}{m} -$$
$$b n \operatorname{Log}[x] \operatorname{Log}\left[f x^p\right]^2 \operatorname{Log}\left[d + e x^m\right] + \frac{b n \operatorname{Log}\left[-\frac{e x^m}{d}\right] \operatorname{Log}[f x^p]^2 \operatorname{Log}[d + e x^m]}{m} +$$
$$\frac{1}{3} b p^2 \operatorname{Log}[x]^3 \operatorname{Log}\left[c \left(d + e x^m\right)^n\right] - b p \operatorname{Log}[x]^2 \operatorname{Log}\left[f x^p\right] \operatorname{Log}\left[c \left(d + e x^m\right)^n\right] +$$
$$b \operatorname{Log}[x] \operatorname{Log}\left[f x^p\right]^2 \operatorname{Log}\left[c \left(d + e x^m\right)^n\right] - \frac{b n p \operatorname{Log}[x] \left(p \operatorname{Log}[x] - 2 \operatorname{Log}[f x^p]\right) \operatorname{PolyLog}\left[2, -\frac{d x^{-m}}{e}\right]}{m} +$$
$$\frac{b n \left(-p \operatorname{Log}[x] + \operatorname{Log}[f x^p]\right)^2 \operatorname{PolyLog}\left[2, 1 + \frac{e x^m}{d}\right]}{m} +$$
$$\frac{2 b n p \operatorname{Log}[f x^p] \operatorname{PolyLog}\left[3, -\frac{d x^{-m}}{e}\right]}{m^2} + \frac{2 b n p^2 \operatorname{PolyLog}\left[4, -\frac{d x^{-m}}{e}\right]}{m^3}$$

Problem 623: Result more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{Log}[f x^p] \left(a + b \operatorname{Log}\left[c \left(d + e x^m\right)^n\right]\right)}{x} \, dx$$

Optimal (type 4, 102 leaves, 4 steps):

$$\frac{\operatorname{Log}[f x^p]^2 \left(a + b \operatorname{Log}\left[c \left(d + e x^m\right)^n\right]\right)}{2 p} - \frac{b n \operatorname{Log}[f x^p]^2 \operatorname{Log}\left[1 + \frac{e x^m}{d}\right]}{2 p} -$$
$$\frac{b n \operatorname{Log}[f x^p] \operatorname{PolyLog}\left[2, -\frac{e x^m}{d}\right]}{m} + \frac{b n p \operatorname{PolyLog}\left[3, -\frac{e x^m}{d}\right]}{m^2}$$

Result (type 4, 265 leaves):

$$-\frac{1}{6}\, b\, m\, n\, p\, \text{Log}[x]^3+\frac{a\, \text{Log}\left[f\, x^p\right]^2}{2\, p}-\frac{1}{2}\, b\, n\, p\, \text{Log}[x]^2\, \text{Log}\left[1+\frac{d\, x^{-m}}{e}\right]+b\, n\, p\, \text{Log}[x]^2\, \text{Log}\left[d+e\, x^m\right]-\frac{b\, n\, p\, \text{Log}[x]\, \text{Log}\left[-\frac{e\, x^m}{d}\right]\, \text{Log}\left[d+e\, x^m\right]}{m}-b\, n\, \text{Log}[x]\, \text{Log}\left[f\, x^p\right]\, \text{Log}\left[d+e\, x^m\right]+\frac{b\, n\, \text{Log}\left[-\frac{e\, x^m}{d}\right]\, \text{Log}\left[f\, x^p\right]\, \text{Log}\left[d+e\, x^m\right]}{m}-\frac{1}{2}\, b\, p\, \text{Log}[x]^2\, \text{Log}\left[c\, \left(d+e\, x^m\right)^n\right]+b\, \text{Log}[x]\, \text{Log}\left[f\, x^p\right]\, \text{Log}\left[c\, \left(d+e\, x^m\right)^n\right]+\frac{b\, n\, p\, \text{Log}[x]\, \text{PolyLog}\left[2,-\frac{d\, x^{-m}}{e}\right]}{m}-\frac{b\, n\, \left(p\, \text{Log}[x]-\text{Log}\left[f\, x^p\right]\right)\, \text{PolyLog}\left[2,1+\frac{e\, x^m}{d}\right]}{m}+\frac{b\, n\, p\, \text{PolyLog}\left[3,-\frac{d\, x^{-m}}{e}\right]}{m^2}$$

Problem 628: Unable to integrate problem.

$$\int \text{Log}\left[c\, \left(d+e\, (f+g\, x)^p\right)^q\right]\, dx$$

Optimal (type 5, 76 leaves, 3 steps):

$$-\frac{e\, p\, q\, (f+g\, x)^{1+p}\, \text{Hypergeometric2F1}\left[1,1+\frac{1}{p},2+\frac{1}{p},-\frac{e\, (f+g\, x)^p}{d}\right]}{d\, g\, (1+p)}+\frac{(f+g\, x)\, \text{Log}\left[c\, \left(d+e\, (f+g\, x)^p\right)^q\right]}{g}$$

Result (type 8, 18 leaves):

$$\int \text{Log}\left[c\, \left(d+e\, (f+g\, x)^p\right)^q\right]\, dx$$

Problem 636: Result more than twice size of optimal antiderivative.

$$\int \left(a+b\, \text{Log}\left[c\, \left(d+\frac{e}{f+g\, x}\right)^p\right]\right)^4\, dx$$

Optimal (type 4, 221 leaves, 8 steps):

$$-\frac{4\, b\, e\, p\, \text{Log}\left[-\frac{e}{d\, (f+g\, x)}\right]\, \left(a+b\, \text{Log}\left[c\, \left(d+\frac{e}{f+g\, x}\right)^p\right]\right)^3}{d\, g}+\frac{(e+d\, (f+g\, x))\, \left(a+b\, \text{Log}\left[c\, \left(d+\frac{e}{f+g\, x}\right)^p\right]\right)^4}{d\, g}-\frac{12\, b^2\, e\, p^2\, \left(a+b\, \text{Log}\left[c\, \left(d+\frac{e}{f+g\, x}\right)^p\right]\right)^2\, \text{PolyLog}\left[2,1+\frac{e}{d\, (f+g\, x)}\right]}{d\, g}+\frac{24\, b^3\, e\, p^3\, \left(a+b\, \text{Log}\left[c\, \left(d+\frac{e}{f+g\, x}\right)^p\right]\right)\, \text{PolyLog}\left[3,1+\frac{e}{d\, (f+g\, x)}\right]}{d\, g}-\frac{24\, b^4\, e\, p^4\, \text{PolyLog}\left[4,1+\frac{e}{d\, (f+g\, x)}\right]}{d\, g}$$

Result (type 4, 732 leaves):

$$\frac{1}{d\,g}\left(-4\,b\,p\left(d\,f\,\text{Log}[f+g\,x]-(e+d\,f)\,\text{Log}[e+d\,f+d\,g\,x]-d\,g\,x\,\text{Log}\left[\frac{e+d\,f+d\,g\,x}{f+g\,x}\right]\right)\right.$$
$$\left(a-b\,p\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]+b\,\text{Log}\left[c\left(d+\frac{e}{f+g\,x}\right)^p\right]\right)^3+$$
$$d\,g\,x\left(a-b\,p\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]+b\,\text{Log}\left[c\left(d+\frac{e}{f+g\,x}\right)^p\right]\right)^4+$$
$$6\,b^2\,p^2\left(a-b\,p\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]+b\,\text{Log}\left[c\left(d+\frac{e}{f+g\,x}\right)^p\right]\right)^2$$
$$\left(d\,f\,\text{Log}\left[\frac{f}{g}+x\right]^2+(e+d\,f)\,\text{Log}\left[\frac{e+d\,f+d\,g\,x}{d\,g}\right]^2+d\,g\,x\,\text{Log}\left[\frac{e+d\,f+d\,g\,x}{f+g\,x}\right]^2-2\left(d\,f\,\text{Log}[f+g\,x]-\right.\right.$$
$$\left.(e+d\,f)\,\text{Log}[e+d\,f+d\,g\,x]\right)\left(\text{Log}\left[\frac{f}{g}+x\right]-\text{Log}\left[\frac{e+d\,f+d\,g\,x}{d\,g}\right]+\text{Log}\left[\frac{e+d\,f+d\,g\,x}{f+g\,x}\right]\right)-$$
$$2\,(e+d\,f)\left(\text{Log}\left[\frac{f}{g}+x\right]\,\text{Log}\left[\frac{e+d\,f+d\,g\,x}{e}\right]+\text{PolyLog}\left[2,-\frac{d\,(f+g\,x)}{e}\right]\right)-$$
$$\left.2\,d\,f\left(\text{Log}\left[-\frac{d\,(f+g\,x)}{e}\right]\,\text{Log}\left[\frac{e+d\,f+d\,g\,x}{d\,g}\right]+\text{PolyLog}\left[2,\frac{e+d\,f+d\,g\,x}{e}\right]\right)\right)+$$
$$4\,b^3\,p^3\left(a-b\,p\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]+b\,\text{Log}\left[c\left(d+\frac{e}{f+g\,x}\right)^p\right]\right)$$
$$\left(\text{Log}\left[d+\frac{e}{f+g\,x}\right]^2\left(-3\,e\,\text{Log}\left[-\frac{e}{d\,f+d\,g\,x}\right]+(e+d\,f+d\,g\,x)\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]\right)-\right.$$
$$\left.6\,e\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]\,\text{PolyLog}\left[2,1+\frac{e}{d\,f+d\,g\,x}\right]+6\,e\,\text{PolyLog}\left[3,1+\frac{e}{d\,f+d\,g\,x}\right]\right)-$$
$$b^4\,p^4\left(4\,e\,\text{Log}\left[-\frac{e}{d\,f+d\,g\,x}\right]\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]^3-e\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]^4-\right.$$
$$d\,(f+g\,x)\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]^4+12\,e\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]^2\,\text{PolyLog}\left[2,1+\frac{e}{d\,f+d\,g\,x}\right]-$$
$$\left.\left.24\,e\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]\,\text{PolyLog}\left[3,1+\frac{e}{d\,f+d\,g\,x}\right]+24\,e\,\text{PolyLog}\left[4,1+\frac{e}{d\,f+d\,g\,x}\right]\right)\right)$$

Problem 637: Result more than twice size of optimal antiderivative.

$$\int\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{f+g\,x}\right)^p\right]\right)^3\,dx$$

Optimal (type 4, 168 leaves, 7 steps):

$$-\frac{3\,b\,e\,p\,\text{Log}\left[-\frac{e}{d\,(f+g\,x)}\right]\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{f+g\,x}\right)^p\right]\right)^2}{d\,g}+\frac{(e+d\,(f+g\,x))\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{f+g\,x}\right)^p\right]\right)^3}{d\,g}-$$
$$\frac{6\,b^2\,e\,p^2\left(a+b\,\text{Log}\left[c\left(d+\frac{e}{f+g\,x}\right)^p\right]\right)\,\text{PolyLog}\left[2,1+\frac{e}{d\,(f+g\,x)}\right]}{d\,g}+\frac{6\,b^3\,e\,p^3\,\text{PolyLog}\left[3,1+\frac{e}{d\,(f+g\,x)}\right]}{d\,g}$$

Result (type 4, 441 leaves):

$$\frac{1}{d\,g}\left(3\,b\,d\,p\,(f+g\,x)\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]\left(a-b\,p\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]+b\,\text{Log}\left[c\,\left(d+\frac{e}{f+g\,x}\right)^p\right]\right)^2+\right.$$
$$d\,(f+g\,x)\left(a-b\,p\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]+b\,\text{Log}\left[c\,\left(d+\frac{e}{f+g\,x}\right)^p\right]\right)^3+$$
$$3\,b\,e\,p\left(a-b\,p\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]+b\,\text{Log}\left[c\,\left(d+\frac{e}{f+g\,x}\right)^p\right]\right)^2\text{Log}[e+d\,(f+g\,x)]+$$
$$3\,b^2\,p^2\left(a-b\,p\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]+b\,\text{Log}\left[c\,\left(d+\frac{e}{f+g\,x}\right)^p\right]\right)\left(d\,(f+g\,x)\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]^2+\right.$$
$$e\left(\text{Log}\left[\frac{e}{d}+f+g\,x\right]^2+2\left(\text{Log}[f+g\,x]-\text{Log}\left[\frac{e}{d}+f+g\,x\right]+\text{Log}\left[d+\frac{e}{f+g\,x}\right]\right)\text{Log}\left[\right.\right.$$
$$\left.\left.\left.e+d\,(f+g\,x)\right]-2\left(\text{Log}[f+g\,x]\,\text{Log}\left[1+\frac{d\,(f+g\,x)}{e}\right]+\text{PolyLog}\left[2,-\frac{d\,(f+g\,x)}{e}\right]\right)\right)\right)+$$
$$b^3\,p^3\left(\text{Log}\left[d+\frac{e}{f+g\,x}\right]^2\left(-3\,e\,\text{Log}\left[-\frac{e}{d\,f+d\,g\,x}\right]+(e+d\,f+d\,g\,x)\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]\right)-\right.$$
$$\left.\left.6\,e\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]\text{PolyLog}\left[2,1+\frac{e}{d\,f+d\,g\,x}\right]+6\,e\,\text{PolyLog}\left[3,1+\frac{e}{d\,f+d\,g\,x}\right]\right)\right)$$

Problem 638: Result more than twice size of optimal antiderivative.

$$\int\left(a+b\,\text{Log}\left[c\,\left(d+\frac{e}{f+g\,x}\right)^p\right]\right)^2dx$$

Optimal (type 4, 115 leaves, 5 steps):

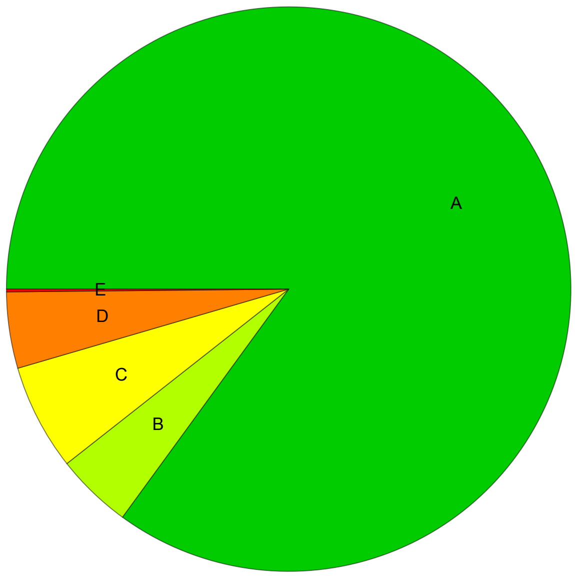
$$-\frac{2\,b\,e\,p\,\text{Log}\left[-\frac{e}{d\,(f+g\,x)}\right]\left(a+b\,\text{Log}\left[c\,\left(d+\frac{e}{f+g\,x}\right)^p\right]\right)}{d\,g}+$$
$$\frac{(e+d\,(f+g\,x))\left(a+b\,\text{Log}\left[c\,\left(d+\frac{e}{f+g\,x}\right)^p\right]\right)^2}{d\,g}-\frac{2\,b^2\,e\,p^2\,\text{PolyLog}\left[2,1+\frac{e}{d\,(f+g\,x)}\right]}{d\,g}$$

Result (type 4, 250 leaves):

$$\frac{1}{d\,g}\left(d\,(f+g\,x)\left(a-b\,p\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]+b\,\text{Log}\left[c\,\left(d+\frac{e}{f+g\,x}\right)^p\right]\right)^2+\right.$$
$$2\,b\,p\left(a-b\,p\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]+b\,\text{Log}\left[c\,\left(d+\frac{e}{f+g\,x}\right)^p\right]\right)$$
$$\left(d\,(f+g\,x)\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]+e\,\text{Log}[e+d\,(f+g\,x)]\right)+b^2\,p^2\left(d\,(f+g\,x)\,\text{Log}\left[d+\frac{e}{f+g\,x}\right]^2+\right.$$
$$e\left(\text{Log}\left[\frac{e}{d}+f+g\,x\right]^2+2\left(\text{Log}[f+g\,x]-\text{Log}\left[\frac{e}{d}+f+g\,x\right]+\text{Log}\left[d+\frac{e}{f+g\,x}\right]\right)\right.$$
$$\left.\left.\left.\text{Log}[e+d\,(f+g\,x)]-2\left(\text{Log}[f+g\,x]\,\text{Log}\left[1+\frac{d\,(f+g\,x)}{e}\right]+\text{PolyLog}\left[2,-\frac{d\,(f+g\,x)}{e}\right]\right)\right)\right)\right)$$

Summary of Integration Test Results

641 integration problems



A - 545 optimal antiderivatives

B - 28 more than twice size of optimal antiderivatives

C - 39 unnecessarily complex antiderivatives

D - 28 unable to integrate problems

E - 1 integration timeouts