Mathematica 11.3 Integration Test Results

Test results for the 243 problems in "7.3.2 (d x)^m (a+b arctanh(c x^n))^p.m"

Problem 19: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(a + b \operatorname{ArcTanh}[c x])^2}{x} \, dx$$

Optimal (type 4, 117 leaves, 6 steps):

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

Result (type 4, 151 leaves):

$$a^2 \operatorname{Log}[c x] + a b (-\operatorname{PolyLog}[2, -c x] + \operatorname{PolyLog}[2, c x]) + b^2 \left(\frac{i \pi^3}{24} - \frac{2}{3} \operatorname{ArcTanh}[c x]^3 - \operatorname{ArcTanh}[c x]^2 \operatorname{Log}\left[1 + e^{-2 \operatorname{ArcTanh}[c x]}\right] + \operatorname{ArcTanh}[c x]^2 \operatorname{Log}\left[1 - e^{2 \operatorname{ArcTanh}[c x]}\right] + \operatorname{ArcTanh}[c x] \operatorname{PolyLog}\left[2, -e^{-2 \operatorname{ArcTanh}[c x]}\right] + \operatorname{ArcTanh}[c x] \operatorname{PolyLog}\left[2, e^{2 \operatorname{ArcTanh}[c x]}\right] + \frac{1}{2} \operatorname{PolyLog}\left[3, -e^{-2 \operatorname{ArcTanh}[c x]}\right] - \frac{1}{2} \operatorname{PolyLog}\left[3, e^{2 \operatorname{ArcTanh}[c x]}\right]\right)$$

Problem 30: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(a + b \operatorname{ArcTanh}[c x])^3}{x} \, dx$$

Optimal (type 4, 184 leaves, 8 steps):

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

Result (type 4, 315 leaves):

$$a^3\,\text{Log}[c\,x]+\frac{3}{2}\,a^2\,b\,(-\text{PolyLog}[2,\,-c\,x]+\text{PolyLog}[2,\,c\,x])+$$
$$3\,a\,b^2\left(\frac{i\,\pi^3}{24}-\frac{2}{3}\,\text{ArcTanh}[c\,x]^3-\text{ArcTanh}[c\,x]^2\,\text{Log}\left[1+e^{-2\,\text{ArcTanh}[c\,x]}\right]+\right.$$
$$\text{ArcTanh}[c\,x]^2\,\text{Log}\left[1-e^{2\,\text{ArcTanh}[c\,x]}\right]+\text{ArcTanh}[c\,x]\,\text{PolyLog}\left[2,\,-e^{-2\,\text{ArcTanh}[c\,x]}\right]+\text{ArcTanh}[c\,x]$$
$$\left.\text{PolyLog}\left[2,\,e^{2\,\text{ArcTanh}[c\,x]}\right]+\frac{1}{2}\,\text{PolyLog}\left[3,\,-e^{-2\,\text{ArcTanh}[c\,x]}\right]-\frac{1}{2}\,\text{PolyLog}\left[3,\,e^{2\,\text{ArcTanh}[c\,x]}\right]\right)+$$
$$\frac{1}{64}\,b^3\,\left(\pi^4-32\,\text{ArcTanh}[c\,x]^4-64\,\text{ArcTanh}[c\,x]^3\,\text{Log}\left[1+e^{-2\,\text{ArcTanh}[c\,x]}\right]+\right.$$
$$64\,\text{ArcTanh}[c\,x]^3\,\text{Log}\left[1-e^{2\,\text{ArcTanh}[c\,x]}\right]+96\,\text{ArcTanh}[c\,x]^2\,\text{PolyLog}\left[2,\,-e^{-2\,\text{ArcTanh}[c\,x]}\right]+$$
$$96\,\text{ArcTanh}[c\,x]^2\,\text{PolyLog}\left[2,\,e^{2\,\text{ArcTanh}[c\,x]}\right]+$$
$$96\,\text{ArcTanh}[c\,x]\,\text{PolyLog}\left[3,\,-e^{-2\,\text{ArcTanh}[c\,x]}\right]-96\,\text{ArcTanh}[c\,x]\,\text{PolyLog}\left[3,\,e^{2\,\text{ArcTanh}[c\,x]}\right]+$$
$$\left.48\,\text{PolyLog}\left[4,\,-e^{-2\,\text{ArcTanh}[c\,x]}\right]+48\,\text{PolyLog}\left[4,\,e^{2\,\text{ArcTanh}[c\,x]}\right]\right)$$

Problem 31: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 102 leaves, 5 steps):

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

Result (type 4, 196 leaves):

$$-\frac{a^3}{x}-\frac{3\,a^2\,b\,\text{ArcTanh}[c\,x]}{x}+3\,a^2\,b\,c\,\text{Log}[x]-\frac{3}{2}\,a^2\,b\,c\,\text{Log}\left[1-c^2\,x^2\right]+$$
$$3\,a\,b^2\,c\left(\text{ArcTanh}[c\,x]\left(\text{ArcTanh}[c\,x]-\frac{\text{ArcTanh}[c\,x]}{c\,x}+2\,\text{Log}\left[1-e^{-2\,\text{ArcTanh}[c\,x]}\right]\right)-\text{PolyLog}\left[2,\,e^{-2\,\text{ArcTanh}[c\,x]}\right]\right)+$$
$$b^3\,c\left(\frac{i\,\pi^3}{8}-\text{ArcTanh}[c\,x]^3-\frac{\text{ArcTanh}[c\,x]^3}{c\,x}+3\,\text{ArcTanh}[c\,x]^2\,\text{Log}\left[1-e^{2\,\text{ArcTanh}[c\,x]}\right]+3\,\text{ArcTanh}[c\,x]\,\text{PolyLog}\left[2,\,e^{2\,\text{ArcTanh}[c\,x]}\right]-\frac{3}{2}\,\text{PolyLog}\left[3,\,e^{2\,\text{ArcTanh}[c\,x]}\right]\right)$$

Problem 33: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(a+b\,\text{ArcTanh}[c\,x])^3}{x^4}\,dx$$

Optimal (type 4, 200 leaves, 14 steps):

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

Result (type 4, 323 leaves):

$$-\frac{1}{24\,x^3}\left(8\,a^3+12\,a^2\,b\,c\,x+24\,a^2\,b\,\text{ArcTanh}[c\,x]-24\,a^2\,b\,c^3\,x^3\,\text{Log}[x]+12\,a^2\,b\,c^3\,x^3\,\text{Log}\left[1-c^2\,x^2\right]+24\,a\,b^2\left(c^2\,x^2+\left(1-c^3\,x^3\right)\text{ArcTanh}[c\,x]^2-c\,x\,\text{ArcTanh}[c\,x]\left(-1+c^2\,x^2+2\,c^2\,x^2\,\text{Log}\left[1-e^{-2\,\text{ArcTanh}[c\,x]}\right]\right)+c^3\,x^3\,\text{PolyLog}\left[2,\,e^{-2\,\text{ArcTanh}[c\,x]}\right]\right)+\right.$$
$$b^3\left(-i\,c^3\,\pi^3\,x^3+24\,c^2\,x^2\,\text{ArcTanh}[c\,x]+12\,c\,x\,\text{ArcTanh}[c\,x]^2-12\,c^3\,x^3\,\text{ArcTanh}[c\,x]^2+8\,\text{ArcTanh}[c\,x]^3+8\,c^3\,x^3\,\text{ArcTanh}[c\,x]^3-24\,c^3\,x^3\,\text{ArcTanh}[c\,x]^2\,\text{Log}\left[1-e^{2\,\text{ArcTanh}[c\,x]}\right]-24\,c^3\,x^3\,\text{Log}\left[\frac{c\,x}{\sqrt{1-c^2\,x^2}}\right]-\right.$$
$$\left.\left.24\,c^3\,x^3\,\text{ArcTanh}[c\,x]\,\text{PolyLog}\left[2,\,e^{2\,\text{ArcTanh}[c\,x]}\right]+12\,c^3\,x^3\,\text{PolyLog}\left[3,\,e^{2\,\text{ArcTanh}[c\,x]}\right]\right)\right)$$

Problem 68: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 137 leaves, 7 steps):

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

Result (type 4, 181 leaves) :

$$a^2\,\text{Log}[x]+\frac{1}{2}\,a\,b\,\left(-\text{PolyLog}\left[2,\,-c\,x^2\right]+\text{PolyLog}\left[2,\,c\,x^2\right]\right)+$$
$$\frac{1}{2}\,b^2\,\left(\frac{i\,\pi^3}{24}-\frac{2}{3}\,\text{ArcTanh}\left[c\,x^2\right]^3-\text{ArcTanh}\left[c\,x^2\right]^2\,\text{Log}\left[1+e^{-2\,\text{ArcTanh}\left[c\,x^2\right]}\right]+\right.$$
$$\text{ArcTanh}\left[c\,x^2\right]^2\,\text{Log}\left[1-e^{2\,\text{ArcTanh}\left[c\,x^2\right]}\right]+\text{ArcTanh}\left[c\,x^2\right]\,\text{PolyLog}\left[2,\,-e^{-2\,\text{ArcTanh}\left[c\,x^2\right]}\right]+$$
$$\text{ArcTanh}\left[c\,x^2\right]\,\text{PolyLog}\left[2,\,e^{2\,\text{ArcTanh}\left[c\,x^2\right]}\right]+$$
$$\left.\frac{1}{2}\,\text{PolyLog}\left[3,\,-e^{-2\,\text{ArcTanh}\left[c\,x^2\right]}\right]-\frac{1}{2}\,\text{PolyLog}\left[3,\,e^{2\,\text{ArcTanh}\left[c\,x^2\right]}\right]\right)$$

Problem 71: Unable to integrate problem.

$$\int x^4\,\left(a+b\,\text{ArcTanh}\left[c\,x^2\right]\right)^2\,dx$$

Optimal (type 4, 1173 leaves, 102 steps) :

$$\frac{8\,b^2\,x}{15\,c^2}+\frac{2\,a\,b\,x^3}{15\,c}-\frac{2}{25}\,a\,b\,x^5+\frac{2\,a\,b\,\text{ArcTan}\left[\sqrt{c}\,x\right]}{5\,c^{5/2}}-\frac{4\,b^2\,\text{ArcTan}\left[\sqrt{c}\,x\right]}{15\,c^{5/2}}+\frac{i\,b^2\,\text{ArcTan}\left[\sqrt{c}\,x\right]^2}{5\,c^{5/2}}-$$

$$\frac{4\,b^2\,\text{ArcTanh}\left[\sqrt{c}\,x\right]}{15\,c^{5/2}}-\frac{b^2\,\text{ArcTanh}\left[\sqrt{c}\,x\right]^2}{5\,c^{5/2}}+\frac{2\,b^2\,\text{ArcTanh}\left[\sqrt{c}\,x\right]\,\text{Log}\left[\frac{2}{1-\sqrt{c}\,x}\right]}{5\,c^{5/2}}-$$

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

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

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

$$\frac{b^2\,\text{ArcTan}\left[\sqrt{c}\,x\right]\,\text{Log}\left[\frac{(1-i)\,\left(1+\sqrt{c}\,x\right)}{1-i\,\sqrt{c}\,x}\right]}{5\,c^{5/2}}-\frac{b^2\,x^3\,\text{Log}\left[1-c\,x^2\right]}{15\,c}+\frac{1}{25}\,b^2\,x^5\,\text{Log}\left[1-c\,x^2\right]-$$

$$\frac{b^2\,\text{ArcTan}\left[\sqrt{c}\,x\right]\,\text{Log}\left[1-c\,x^2\right]}{5\,c^{5/2}}+\frac{b\,x^3\,\left(2\,a-b\,\text{Log}\left[1-c\,x^2\right]\right)}{15\,c}+\frac{1}{25}\,b\,x^5\,\left(2\,a-b\,\text{Log}\left[1-c\,x^2\right]\right)-$$

$$\frac{b\,\text{ArcTanh}\left[\sqrt{c}\,x\right]\,\left(2\,a-b\,\text{Log}\left[1-c\,x^2\right]\right)}{5\,c^{5/2}}+\frac{1}{20}\,x^5\,\left(2\,a-b\,\text{Log}\left[1-c\,x^2\right]\right)^2+$$

$$\frac{2\,b^2\,x^3\,\text{Log}\left[1+c\,x^2\right]}{15\,c}+\frac{1}{5}\,a\,b\,x^5\,\text{Log}\left[1+c\,x^2\right]+\frac{b^2\,\text{ArcTan}\left[\sqrt{c}\,x\right]\,\text{Log}\left[1+c\,x^2\right]}{5\,c^{5/2}}-$$

$$\frac{b^2\,\text{ArcTanh}\left[\sqrt{c}\,x\right]\,\text{Log}\left[1+c\,x^2\right]}{5\,c^{5/2}}-\frac{1}{10}\,b^2\,x^5\,\text{Log}\left[1-c\,x^2\right]\,\text{Log}\left[1+c\,x^2\right]+\frac{1}{20}\,b^2\,x^5\,\text{Log}\left[1+c\,x^2\right]^2+$$

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

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

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

Result (type 8, 18 leaves):

$$\int x^4\,\left(a+b\,\text{ArcTanh}\left[c\,x^2\right]\right)^2\,dx$$

Problem 72: Unable to integrate problem.

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

Optimal (type 4, 1129 leaves, 86 steps):

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

Result (type 8, 18 leaves):

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

Problem 75: Unable to integrate problem.

$$\int \frac{\left(a + b\,\text{ArcTanh}\left[c\,x^2\right]\right)^2}{x^4}\,dx$$

Optimal (type 4, 1102 leaves, 64 steps):

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

Result (type 8, 18 leaves) :

$$\int \frac{\left(a+b\,\text{ArcTanh}\left[c\,x^2\right]\right)^2}{x^4}\,dx$$

Problem 76: Unable to integrate problem.

$$\int \frac{\left(a+b\,\text{ArcTanh}\left[c\,x^2\right]\right)^2}{x^6}\,dx$$

Optimal (type 4, 1176 leaves, 77 steps) :

$$-\frac{2\,a\,b\,c}{15\,x^3}+\frac{2\,a\,b\,c^2}{5\,x}-\frac{8\,b^2\,c^2}{15\,x}+\frac{2}{5}\,a\,b\,c^{5/2}\,\text{ArcTan}\left[\sqrt{c}\,x\right]-$$
$$\frac{4}{15}\,b^2\,c^{5/2}\,\text{ArcTan}\left[\sqrt{c}\,x\right]+\frac{1}{5}\,i\,b^2\,c^{5/2}\,\text{ArcTan}\left[\sqrt{c}\,x\right]^2+\frac{4}{15}\,b^2\,c^{5/2}\,\text{ArcTanh}\left[\sqrt{c}\,x\right]+$$
$$\frac{1}{5}\,b^2\,c^{5/2}\,\text{ArcTanh}\left[\sqrt{c}\,x\right]^2-\frac{2}{5}\,b^2\,c^{5/2}\,\text{ArcTanh}\left[\sqrt{c}\,x\right]\,\text{Log}\left[\frac{2}{1-\sqrt{c}\,x}\right]-$$
$$\frac{2}{5}\,b^2\,c^{5/2}\,\text{ArcTan}\left[\sqrt{c}\,x\right]\,\text{Log}\left[\frac{2}{1-i\,\sqrt{c}\,x}\right]+\frac{1}{5}\,b^2\,c^{5/2}\,\text{ArcTan}\left[\sqrt{c}\,x\right]\,\text{Log}\left[\frac{(1+i)\,\left(1-\sqrt{c}\,x\right)}{1-i\,\sqrt{c}\,x}\right]+$$
$$\frac{2}{5}\,b^2\,c^{5/2}\,\text{ArcTan}\left[\sqrt{c}\,x\right]\,\text{Log}\left[\frac{2}{1+i\,\sqrt{c}\,x}\right]+\frac{2}{5}\,b^2\,c^{5/2}\,\text{ArcTanh}\left[\sqrt{c}\,x\right]\,\text{Log}\left[\frac{2}{1+\sqrt{c}\,x}\right]-$$
$$\frac{1}{5}\,b^2\,c^{5/2}\,\text{ArcTanh}\left[\sqrt{c}\,x\right]\,\text{Log}\left[-\frac{2\,\sqrt{c}\,\left(1-\sqrt{-c}\,x\right)}{\left(\sqrt{-c}-\sqrt{c}\right)\,\left(1+\sqrt{c}\,x\right)}\right]-$$
$$\frac{1}{5}\,b^2\,c^{5/2}\,\text{ArcTanh}\left[\sqrt{c}\,x\right]\,\text{Log}\left[\frac{2\,\sqrt{c}\,\left(1+\sqrt{-c}\,x\right)}{\left(\sqrt{-c}+\sqrt{c}\right)\,\left(1+\sqrt{c}\,x\right)}\right]+$$
$$\frac{1}{5}\,b^2\,c^{5/2}\,\text{ArcTan}\left[\sqrt{c}\,x\right]\,\text{Log}\left[\frac{(1-i)\,\left(1+\sqrt{c}\,x\right)}{1-i\,\sqrt{c}\,x}\right]+\frac{b^2\,c\,\text{Log}\left[1-c\,x^2\right]}{15\,x^3}-\frac{b^2\,c^2\,\text{Log}\left[1-c\,x^2\right]}{5\,x}-$$
$$\frac{1}{5}\,b^2\,c^{5/2}\,\text{ArcTan}\left[\sqrt{c}\,x\right]\,\text{Log}\left[1-c\,x^2\right]-\frac{b\,c\,\left(2\,a-b\,\text{Log}\left[1-c\,x^2\right]\right)}{15\,x^3}-\frac{b\,c^2\,\left(2\,a-b\,\text{Log}\left[1-c\,x^2\right]\right)}{5\,x}+$$
$$\frac{1}{5}\,b\,c^{5/2}\,\text{ArcTanh}\left[\sqrt{c}\,x\right]\,\left(2\,a-b\,\text{Log}\left[1-c\,x^2\right]\right)-\frac{\left(2\,a-b\,\text{Log}\left[1-c\,x^2\right]\right)^2}{20\,x^5}-$$
$$\frac{a\,b\,\text{Log}\left[1+c\,x^2\right]}{5\,x^5}-\frac{2\,b^2\,c\,\text{Log}\left[1+c\,x^2\right]}{15\,x^3}+\frac{1}{5}\,b^2\,c^{5/2}\,\text{ArcTan}\left[\sqrt{c}\,x\right]\,\text{Log}\left[1+c\,x^2\right]+$$
$$\frac{1}{5}\,b^2\,c^{5/2}\,\text{ArcTanh}\left[\sqrt{c}\,x\right]\,\text{Log}\left[1+c\,x^2\right]+\frac{b^2\,\text{Log}\left[1-c\,x^2\right]\,\text{Log}\left[1+c\,x^2\right]}{10\,x^5}-\frac{b^2\,\text{Log}\left[1+c\,x^2\right]^2}{20\,x^5}-$$
$$\frac{1}{5}\,b^2\,c^{5/2}\,\text{PolyLog}\left[2,1-\frac{2}{1-\sqrt{c}\,x}\right]+\frac{1}{5}\,i\,b^2\,c^{5/2}\,\text{PolyLog}\left[2,1-\frac{2}{1-i\,\sqrt{c}\,x}\right]-$$
$$\frac{1}{10}\,i\,b^2\,c^{5/2}\,\text{PolyLog}\left[2,1-\frac{(1+i)\,\left(1-\sqrt{c}\,x\right)}{1-i\,\sqrt{c}\,x}\right]+\frac{1}{5}\,i\,b^2\,c^{5/2}\,\text{PolyLog}\left[2,1-\frac{2}{1+i\,\sqrt{c}\,x}\right]-$$
$$\frac{1}{5}\,b^2\,c^{5/2}\,\text{PolyLog}\left[2,1-\frac{2}{1+\sqrt{c}\,x}\right]+\frac{1}{10}\,b^2\,c^{5/2}\,\text{PolyLog}\left[2,1+\frac{2\,\sqrt{c}\,\left(1-\sqrt{-c}\,x\right)}{\left(\sqrt{-c}-\sqrt{c}\right)\,\left(1+\sqrt{c}\,x\right)}\right]+$$
$$\frac{1}{10}\,b^2\,c^{5/2}\,\text{PolyLog}\left[2,1-\frac{2\,\sqrt{c}\,\left(1+\sqrt{-c}\,x\right)}{\left(\sqrt{-c}+\sqrt{c}\right)\,\left(1+\sqrt{c}\,x\right)}\right]-$$
$$\frac{1}{10}\,i\,b^2\,c^{5/2}\,\text{PolyLog}\left[2,1-\frac{(1-i)\,\left(1+\sqrt{c}\,x\right)}{1-i\,\sqrt{c}\,x}\right]$$

Result (type 8, 18 leaves):

$$\int \frac{\left(a+b\,\text{ArcTanh}\left[c\,x^2\right]\right)^2}{x^6}\,dx$$

Problem 79: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 207 leaves, 9 steps):

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

Result (type 4, 371 leaves):

$$a^3\,\text{Log}[x]+\frac{3}{4}\,a^2\,b\,\left(-\text{PolyLog}\left[2,\,-c\,x^2\right]+\text{PolyLog}\left[2,\,c\,x^2\right]\right)+\frac{3}{2}\,a\,b^2\left(\frac{i\,\pi^3}{24}-\frac{2}{3}\,\text{ArcTanh}\left[c\,x^2\right]^3-\text{ArcTanh}\left[c\,x^2\right]^2\,\text{Log}\left[1+e^{-2\,\text{ArcTanh}\left[c\,x^2\right]}\right]+\text{ArcTanh}\left[c\,x^2\right]^2\,\text{Log}\left[1-e^{2\,\text{ArcTanh}\left[c\,x^2\right]}\right]+\text{ArcTanh}\left[c\,x^2\right]\,\text{PolyLog}\left[2,\,-e^{-2\,\text{ArcTanh}\left[c\,x^2\right]}\right]+\text{ArcTanh}\left[c\,x^2\right]\,\text{PolyLog}\left[2,\,e^{2\,\text{ArcTanh}\left[c\,x^2\right]}\right]+\frac{1}{2}\,\text{PolyLog}\left[3,\,-e^{-2\,\text{ArcTanh}\left[c\,x^2\right]}\right]-\frac{1}{2}\,\text{PolyLog}\left[3,\,e^{2\,\text{ArcTanh}\left[c\,x^2\right]}\right]\right)+\frac{1}{128}\,b^3\,\left(\pi^4-32\,\text{ArcTanh}\left[c\,x^2\right]^4-64\,\text{ArcTanh}\left[c\,x^2\right]^3\,\text{Log}\left[1+e^{-2\,\text{ArcTanh}\left[c\,x^2\right]}\right]+64\,\text{ArcTanh}\left[c\,x^2\right]^3\,\text{Log}\left[1-e^{2\,\text{ArcTanh}\left[c\,x^2\right]}\right]+96\,\text{ArcTanh}\left[c\,x^2\right]^2\,\text{PolyLog}\left[2,\,-e^{-2\,\text{ArcTanh}\left[c\,x^2\right]}\right]+96\,\text{ArcTanh}\left[c\,x^2\right]^2\,\text{PolyLog}\left[2,\,e^{2\,\text{ArcTanh}\left[c\,x^2\right]}\right]+96\,\text{ArcTanh}\left[c\,x^2\right]\,\text{PolyLog}\left[3,\,-e^{-2\,\text{ArcTanh}\left[c\,x^2\right]}\right]-96\,\text{ArcTanh}\left[c\,x^2\right]\,\text{PolyLog}\left[3,\,e^{2\,\text{ArcTanh}\left[c\,x^2\right]}\right]+48\,\text{PolyLog}\left[4,\,-e^{-2\,\text{ArcTanh}\left[c\,x^2\right]}\right]+48\,\text{PolyLog}\left[4,\,e^{2\,\text{ArcTanh}\left[c\,x^2\right]}\right]\right)$$

Problem 80: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 125 leaves, 6 steps):

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

Result (type 4, 222 leaves):

$$\frac{1}{4} \left(-\frac{2 a^3}{x^2} - \frac{6 a^2 b \operatorname{ArcTanh}[c x^2]}{x^2} + 12 a^2 b c \operatorname{Log}[x] - 3 a^2 b c \operatorname{Log}[1 - c^2 x^4] + 6 a b^2 c \left(\operatorname{ArcTanh}[c x^2] \left(\left(1 - \frac{1}{c x^2}\right) \operatorname{ArcTanh}[c x^2] + 2 \operatorname{Log}\left[1 - e^{-2 \operatorname{ArcTanh}[c x^2]}\right]\right) - \operatorname{PolyLog}\left[2, e^{-2 \operatorname{ArcTanh}[c x^2]}\right]\right) + 2 b^3 c \left(\frac{i \pi^3}{8} - \operatorname{ArcTanh}[c x^2]^3 - \frac{\operatorname{ArcTanh}[c x^2]^3}{c x^2} + 3 \operatorname{ArcTanh}[c x^2]^2 \operatorname{Log}\left[1 - e^{2 \operatorname{ArcTanh}[c x^2]}\right] + 3 \operatorname{ArcTanh}[c x^2] \operatorname{PolyLog}\left[2, e^{2 \operatorname{ArcTanh}[c x^2]}\right] - \frac{3}{2} \operatorname{PolyLog}\left[3, e^{2 \operatorname{ArcTanh}[c x^2]}\right]\right)\right)$$

Problem 90: Attempted integration timed out after 120 seconds.

$$\int \sqrt{d x} \left(a + b \operatorname{ArcTanh}[c x^2]\right)^2 dx$$

Optimal (type 4, 6327 leaves, 238 steps):

$$-\frac{8}{9} a b x \sqrt{d x} - \frac{2 \sqrt{2} a b \sqrt{d x} \operatorname{ArcTan}\left[1 - \sqrt{2} c^{1/4} \sqrt{x}\right]}{3 c^{3/4} \sqrt{x}} + \frac{2 \sqrt{2} a b \sqrt{d x} \operatorname{ArcTan}\left[1 + \sqrt{2} c^{1/4} \sqrt{x}\right]}{3 c^{3/4} \sqrt{x}} - \frac{2 i b^2 \sqrt{d x} \operatorname{ArcTan}\left[(-c)^{1/4} \sqrt{x}\right]^2}{3 (-c)^{3/4} \sqrt{x}} - \frac{2 i b^2 \sqrt{d x} \operatorname{ArcTan}\left[c^{1/4} \sqrt{x}\right]^2}{3 c^{3/4} \sqrt{x}} - \frac{2 b^2 \sqrt{d x} \operatorname{ArcTanh}\left[(-c)^{1/4} \sqrt{x}\right]^2}{3 (-c)^{3/4} \sqrt{x}} - \frac{2 b^2 \sqrt{d x} \operatorname{ArcTanh}\left[c^{1/4} \sqrt{x}\right]^2}{3 c^{3/4} \sqrt{x}} + \frac{4 b^2 \sqrt{d x} \operatorname{ArcTanh}\left[(-c)^{1/4} \sqrt{x}\right] \operatorname{Log}\left[\frac{2}{1-(-c)^{1/4} \sqrt{x}}\right]}{3 (-c)^{3/4} \sqrt{x}} + \frac{4 b^2 \sqrt{d x} \operatorname{ArcTan}\left[(-c)^{1/4} \sqrt{x}\right] \operatorname{Log}\left[\frac{2}{1-i (-c)^{1/4} \sqrt{x}}\right]}{3 (-c)^{3/4} \sqrt{x}} - \frac{2 b^2 \sqrt{d x} \operatorname{ArcTan}\left[(-c)^{1/4} \sqrt{x}\right] \operatorname{Log}\left[-\frac{2 (-c)^{1/4} \left(1-\sqrt{-\sqrt{c}} \sqrt{x}\right)}{\left(i \sqrt{-\sqrt{c}} - (-c)^{1/4}\right) \left(1-i (-c)^{1/4} \sqrt{x}\right)}\right]}{3 (-c)^{3/4} \sqrt{x}} -$$

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

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

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

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

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

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

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

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

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

$$\frac{4 b^2 \sqrt{d x} \operatorname{ArcTanh}\left[c^{1/4} \sqrt{x}\right] \operatorname{Log}\left[\frac{2}{1-c^{1/4} \sqrt{x}}\right]}{3 c^{3/4} \sqrt{x}}-$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\frac{\sqrt{2}\ a b \sqrt{d x}\ \mathrm{Log}\left[1+\sqrt{2}\ c^{1/4} \sqrt{x}+\sqrt{c}\ x\right]}{3 c^{3/4} \sqrt{x}}+\frac{4}{9} b^2 x \sqrt{d x}\ \mathrm{Log}\left[1-c x^2\right]+$$

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

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

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

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

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

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

$$\frac{1}{3} b^2 x \sqrt{d x}\ \mathrm{Log}\left[1-c x^2\right] \mathrm{Log}\left[1+c x^2\right]+\frac{1}{6} b^2 x \sqrt{d x}\ \mathrm{Log}\left[1+c x^2\right]^2+$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\frac{2\, \mathrm{i}\, b^2 \sqrt{d\,x}\, \text{PolyLog}\left[2,\, 1-\frac{2}{1+\mathrm{i}\, c^{1/4} \sqrt{x}}\right]}{3\, c^{3/4} \sqrt{x}}+\frac{2\, b^2 \sqrt{d\,x}\, \text{PolyLog}\left[2,\, 1-\frac{2}{1+c^{1/4} \sqrt{x}}\right]}{3\, c^{3/4} \sqrt{x}}-$$

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

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

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

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

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

Result (type 1, 1 leaves):

???

Problem 91: Attempted integration timed out after 120 seconds.

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

Optimal (type 4, 6177 leaves, 241 steps):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\frac{2 b^2 \sqrt{x}\, \text{PolyLog}\left[2, 1-\frac{2}{1-c^{1/4} \sqrt{x}}\right]}{c^{1/4} \sqrt{d x}}-\frac{\mathrm{i}\, b^2 \sqrt{x}\, \text{PolyLog}\left[2, 1-\frac{2 (-c)^{1/4} \left(1-c^{1/4} \sqrt{x}\right)}{\left((-c)^{1/4}-\mathrm{i}\, c^{1/4}\right) \left(1-\mathrm{i}\, (-c)^{1/4} \sqrt{x}\right)}\right]}{(-c)^{1/4} \sqrt{d x}}-$$

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

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

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

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

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

$$\frac{2\, \mathrm{i}\, b^2 \sqrt{x}\, \text{PolyLog}\left[2, 1-\frac{2}{1+\mathrm{i}\, c^{1/4} \sqrt{x}}\right]}{c^{1/4} \sqrt{d x}}+\frac{2 b^2 \sqrt{x}\, \text{PolyLog}\left[2, 1-\frac{2}{1+c^{1/4} \sqrt{x}}\right]}{c^{1/4} \sqrt{d x}}-$$

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

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

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

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

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

Result (type 1, 1 leaves):

???

Problem 92: Attempted integration timed out after 120 seconds.

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

Optimal (type 4, 6334 leaves, 197 steps):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\frac{2 b^2 c^{1/4} \sqrt{x} \operatorname{ArcTanh}\left[c^{1/4} \sqrt{x}\right] \operatorname{Log}\left[-\frac{2 c^{1/4} \left(1-(-c)^{1/4} \sqrt{x}\right)}{\left((-c)^{1/4}-c^{1/4}\right)\left(1+c^{1/4} \sqrt{x}\right)}\right]}{d \sqrt{d x}} -$$

$$\frac{2 b^2 c^{1/4} \sqrt{x} \operatorname{ArcTanh}\left[c^{1/4} \sqrt{x}\right] \operatorname{Log}\left[\frac{2 c^{1/4} \left(1+(-c)^{1/4} \sqrt{x}\right)}{\left((-c)^{1/4}+c^{1/4}\right)\left(1+c^{1/4} \sqrt{x}\right)}\right]}{d \sqrt{d x}} + \frac{1}{d \sqrt{d x}}$$

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

$$\frac{2 b^2 (-c)^{1/4} \sqrt{x} \operatorname{ArcTanh}\left[(-c)^{1/4} \sqrt{x}\right] \operatorname{Log}\left[\frac{2 (-c)^{1/4} \left(1+c^{1/4} \sqrt{x}\right)}{\left((-c)^{1/4}+c^{1/4}\right)\left(1+(-c)^{1/4} \sqrt{x}\right)}\right]}{d \sqrt{d x}} -$$

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

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

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

$$\frac{2 b^2 (-c)^{1/4} \sqrt{x} \operatorname{ArcTanh}\left[(-c)^{1/4} \sqrt{x}\right] \operatorname{Log}\left[1-c x^2\right]}{d \sqrt{d x}} -$$

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

$$\frac{2 b c^{1/4} \sqrt{x} \operatorname{ArcTanh}\left[c^{1/4} \sqrt{x}\right] \left(2 a-b \operatorname{Log}\left[1-c x^2\right]\right)}{d \sqrt{d x}} - \frac{\left(2 a-b \operatorname{Log}\left[1-c x^2\right]\right)^2}{2 d \sqrt{d x}} -$$

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

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

$$\frac{2 b^2 c^{1/4} \sqrt{x} \operatorname{ArcTanh}\left[c^{1/4} \sqrt{x}\right] \operatorname{Log}\left[1+c x^2\right]}{d \sqrt{d x}} + \frac{b^2 \operatorname{Log}\left[1-c x^2\right] \operatorname{Log}\left[1+c x^2\right]}{d \sqrt{d x}} - \frac{b^2 \operatorname{Log}\left[1+c x^2\right]^2}{2 d \sqrt{d x}} -$$

$$\frac{2 b^2 (-c)^{1/4} \sqrt{x} \operatorname{PolyLog}\left[2, 1-\frac{2}{1-(-c)^{1/4} \sqrt{x}}\right]}{d \sqrt{d x}} + \frac{2 i b^2 (-c)^{1/4} \sqrt{x} \operatorname{PolyLog}\left[2, 1-\frac{2}{1-i (-c)^{1/4} \sqrt{x}}\right]}{d \sqrt{d x}} -$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 1, 1 leaves):

???

Problem 93: Attempted integration timed out after 120 seconds.

$$\int \frac{\left(a+b\, \text{ArcTanh}\left[c\, x^2\right]\right)^2}{(d\, x)^{5/2}}\, dx$$

Optimal (type 4, 6520 leaves, 197 steps):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\frac{4 b^2 c^{3/4} \sqrt{x} \, \text{ArcTanh}\left[c^{1/4} \sqrt{x}\right] \text{Log}\left[\frac{2}{1-c^{1/4} \sqrt{x}}\right]}{3 d^2 \sqrt{d x}}-\frac{1}{3 d^2 \sqrt{d x}}$$

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

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

$$\frac{4 b^2 c^{3/4} \sqrt{x} \operatorname{ArcTan}\left[c^{1/4} \sqrt{x}\right] \operatorname{Log}\left[\frac{2}{1-i c^{1/4} \sqrt{x}}\right]}{3 d^2 \sqrt{d x}}-$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 1, 1 leaves):

???

Problem 120: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 140 leaves, 7 steps):

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

Result (type 4, 181 leaves):

$$a^2 \text{Log}[x] + \frac{1}{3} a\, b \left(-\text{PolyLog}\left[2, -c\, x^3\right] + \text{PolyLog}\left[2, c\, x^3\right]\right) +$$
$$\frac{1}{3} b^2 \left(\frac{i\, \pi^3}{24} - \frac{2}{3} \text{ArcTanh}\left[c\, x^3\right]^3 - \text{ArcTanh}\left[c\, x^3\right]^2 \text{Log}\left[1 + e^{-2\, \text{ArcTanh}\left[c\, x^3\right]}\right] + \right.$$
$$\text{ArcTanh}\left[c\, x^3\right]^2 \text{Log}\left[1 - e^{2\, \text{ArcTanh}\left[c\, x^3\right]}\right] + \text{ArcTanh}\left[c\, x^3\right] \text{PolyLog}\left[2, -e^{-2\, \text{ArcTanh}\left[c\, x^3\right]}\right] +$$
$$\text{ArcTanh}\left[c\, x^3\right] \text{PolyLog}\left[2, e^{2\, \text{ArcTanh}\left[c\, x^3\right]}\right] +$$
$$\left. \frac{1}{2} \text{PolyLog}\left[3, -e^{-2\, \text{ArcTanh}\left[c\, x^3\right]}\right] - \frac{1}{2} \text{PolyLog}\left[3, e^{2\, \text{ArcTanh}\left[c\, x^3\right]}\right]\right)$$

Problem 127: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 210 leaves, 9 steps):

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

Result (type 4, 368 leaves):

$$a^3\,\text{Log}[x]+\frac{1}{2}a^2 b\left(-\text{PolyLog}\left[2,-c\,x^3\right]+\text{PolyLog}\left[2,c\,x^3\right]\right)+a\,b^2\left(\frac{i\,\pi^3}{24}-\frac{2}{3}\text{ArcTanh}\left[c\,x^3\right]^3-\text{ArcTanh}\left[c\,x^3\right]^2\text{Log}\left[1+e^{-2\,\text{ArcTanh}\left[c\,x^3\right]}\right]+\text{ArcTanh}\left[c\,x^3\right]^2\text{Log}\left[1-e^{2\,\text{ArcTanh}\left[c\,x^3\right]}\right]+\text{ArcTanh}\left[c\,x^3\right]\text{PolyLog}\left[2,-e^{-2\,\text{ArcTanh}\left[c\,x^3\right]}\right]+\text{ArcTanh}\left[c\,x^3\right]\text{PolyLog}\left[2,e^{2\,\text{ArcTanh}\left[c\,x^3\right]}\right]+\frac{1}{2}\text{PolyLog}\left[3,-e^{-2\,\text{ArcTanh}\left[c\,x^3\right]}\right]-\frac{1}{2}\text{PolyLog}\left[3,e^{2\,\text{ArcTanh}\left[c\,x^3\right]}\right]\right)+\frac{1}{192}b^3\left(\pi^4-32\,\text{ArcTanh}\left[c\,x^3\right]^4-64\,\text{ArcTanh}\left[c\,x^3\right]^3\text{Log}\left[1+e^{-2\,\text{ArcTanh}\left[c\,x^3\right]}\right]+64\,\text{ArcTanh}\left[c\,x^3\right]^3\text{Log}\left[1-e^{2\,\text{ArcTanh}\left[c\,x^3\right]}\right]+96\,\text{ArcTanh}\left[c\,x^3\right]^2\text{PolyLog}\left[2,-e^{-2\,\text{ArcTanh}\left[c\,x^3\right]}\right]+96\,\text{ArcTanh}\left[c\,x^3\right]^2\text{PolyLog}\left[2,e^{2\,\text{ArcTanh}\left[c\,x^3\right]}\right]+96\,\text{ArcTanh}\left[c\,x^3\right]\text{PolyLog}\left[3,-e^{-2\,\text{ArcTanh}\left[c\,x^3\right]}\right]-96\,\text{ArcTanh}\left[c\,x^3\right]\text{PolyLog}\left[3,e^{2\,\text{ArcTanh}\left[c\,x^3\right]}\right]+48\,\text{PolyLog}\left[4,-e^{-2\,\text{ArcTanh}\left[c\,x^3\right]}\right]+48\,\text{PolyLog}\left[4,e^{2\,\text{ArcTanh}\left[c\,x^3\right]}\right]\right)$$

Problem 128: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\left(a+b\,\text{ArcTanh}\left[c\,x^3\right]\right)^3}{x^4}\,dx$$

Optimal (type 4, 120 leaves, 6 steps):

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

Result (type 4, 223 leaves):

$$-\frac{a^3}{3 x^3}-\frac{a^2 b \operatorname{ArcTanh}\left[c x^3\right]}{x^3}+3 a^2 b c \operatorname{Log}[x]-\frac{1}{2} a^2 b c \operatorname{Log}\left[1-c^2 x^6\right]+$$
$$a b^2 c\left(\operatorname{ArcTanh}\left[c x^3\right]\left(\left(1-\frac{1}{c x^3}\right) \operatorname{ArcTanh}\left[c x^3\right]+2 \operatorname{Log}\left[1-e^{-2 \operatorname{ArcTanh}\left[c x^3\right]}\right]\right)-\right.$$
$$\left.\operatorname{PolyLog}\left[2, e^{-2 \operatorname{ArcTanh}\left[c x^3\right]}\right]\right)+$$
$$\frac{1}{3} b^3 c\left(\frac{i \pi^3}{8}-\operatorname{ArcTanh}\left[c x^3\right]^3-\frac{\operatorname{ArcTanh}\left[c x^3\right]^3}{c x^3}+3 \operatorname{ArcTanh}\left[c x^3\right]^2 \operatorname{Log}\left[1-e^{2 \operatorname{ArcTanh}\left[c x^3\right]}\right]+\right.$$
$$\left.3 \operatorname{ArcTanh}\left[c x^3\right] \operatorname{PolyLog}\left[2, e^{2 \operatorname{ArcTanh}\left[c x^3\right]}\right]-\frac{3}{2} \operatorname{PolyLog}\left[3, e^{2 \operatorname{ArcTanh}\left[c x^3\right]}\right]\right)$$

Problem 147: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 133 leaves, 7 steps):

$$-2\left(a+b \operatorname{ArcCoth}\left[\frac{x}{c}\right]\right)^2 \operatorname{ArcTanh}\left[1-\frac{2}{1-\frac{c}{x}}\right]+$$
$$b\left(a+b \operatorname{ArcCoth}\left[\frac{x}{c}\right]\right) \operatorname{PolyLog}\left[2, 1-\frac{2}{1-\frac{c}{x}}\right]-b\left(a+b \operatorname{ArcCoth}\left[\frac{x}{c}\right]\right) \operatorname{PolyLog}\left[2,-1+\frac{2}{1-\frac{c}{x}}\right]-$$
$$\frac{1}{2} b^2 \operatorname{PolyLog}\left[3, 1-\frac{2}{1-\frac{c}{x}}\right]+\frac{1}{2} b^2 \operatorname{PolyLog}\left[3,-1+\frac{2}{1-\frac{c}{x}}\right]$$

Result (type 4, 177 leaves):

$$a^2 \operatorname{Log}[x]+a b\left(\operatorname{PolyLog}\left[2,-\frac{c}{x}\right]-\operatorname{PolyLog}\left[2, \frac{c}{x}\right]\right)+b^2$$
$$\left(-\frac{i \pi^3}{24}+\frac{2}{3} \operatorname{ArcTanh}\left[\frac{c}{x}\right]^3+\operatorname{ArcTanh}\left[\frac{c}{x}\right]^2 \operatorname{Log}\left[1+e^{-2 \operatorname{ArcTanh}\left[\frac{c}{x}\right]}\right]-\operatorname{ArcTanh}\left[\frac{c}{x}\right]^2 \operatorname{Log}\left[1-e^{2 \operatorname{ArcTanh}\left[\frac{c}{x}\right]}\right]-\right.$$
$$\operatorname{ArcTanh}\left[\frac{c}{x}\right] \operatorname{PolyLog}\left[2,-e^{-2 \operatorname{ArcTanh}\left[\frac{c}{x}\right]}\right]-\operatorname{ArcTanh}\left[\frac{c}{x}\right] \operatorname{PolyLog}\left[2, e^{2 \operatorname{ArcTanh}\left[\frac{c}{x}\right]}\right]-$$
$$\left.\frac{1}{2} \operatorname{PolyLog}\left[3,-e^{-2 \operatorname{ArcTanh}\left[\frac{c}{x}\right]}\right]+\frac{1}{2} \operatorname{PolyLog}\left[3, e^{2 \operatorname{ArcTanh}\left[\frac{c}{x}\right]}\right]\right)$$

Problem 151: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 217 leaves, 15 steps):

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

Result (type 4, 316 leaves):

$$\frac{1}{6} \left(3 a^2 b c x^2 + 2 a^3 x^3 + 6 a^2 b x^3 \text{ArcTanh}\left[\frac{c}{x}\right] + 3 a^2 b c^3 \text{Log}\left[-c^2 + x^2\right] + 6 a b^2 \left(c^2 x + \left(-c^3 + x^3\right) \text{ArcTanh}\left[\frac{c}{x}\right]^2 + c \,\text{ArcTanh}\left[\frac{c}{x}\right] \left(-c^2 + x^2 - 2 c^2 \text{Log}\left[1 - e^{-2 \text{ArcTanh}\left[\frac{c}{x}\right]}\right]\right) + c^3 \text{PolyLog}\left[2, e^{-2 \text{ArcTanh}\left[\frac{c}{x}\right]}\right]\right) + \frac{1}{4} b^3 \left(-i c^3 \pi^3 + 24 c^2 x \text{ArcTanh}\left[\frac{c}{x}\right] - 12 c^3 \text{ArcTanh}\left[\frac{c}{x}\right]^2 + 12 c x^2 \text{ArcTanh}\left[\frac{c}{x}\right]^2 + 8 c^3 \text{ArcTanh}\left[\frac{c}{x}\right]^3 + 8 x^3 \text{ArcTanh}\left[\frac{c}{x}\right]^3 - 24 c^3 \text{ArcTanh}\left[\frac{c}{x}\right]^2 \text{Log}\left[1 - e^{2 \text{ArcTanh}\left[\frac{c}{x}\right]}\right] - 24 c^3 \text{Log}\left[\frac{c}{\sqrt{1 - \frac{c^2}{x^2}}\, x}\right] - 24 c^3 \text{ArcTanh}\left[\frac{c}{x}\right] \text{PolyLog}\left[2, e^{2 \text{ArcTanh}\left[\frac{c}{x}\right]}\right] + 12 c^3 \text{PolyLog}\left[3, e^{2 \text{ArcTanh}\left[\frac{c}{x}\right]}\right]\right)\right)$$

Problem 153: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 108 leaves, 6 steps):

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

Result (type 4, 198 leaves):

$$a^3 x + 3 a^2 b x \,\text{ArcTanh}\left[\frac{c}{x}\right] + \frac{3}{2} a^2 b c \,\text{Log}\left[-c^2 + x^2\right] - 3 a b^2 \left(\text{ArcTanh}\left[\frac{c}{x}\right] \left((c - x) \,\text{ArcTanh}\left[\frac{c}{x}\right] + 2 c \,\text{Log}\left[1 - e^{-2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right]\right) - c \,\text{PolyLog}\left[2, e^{-2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right]\right) + \frac{1}{8} b^3 \left(-i c \pi^3 + 8 c \,\text{ArcTanh}\left[\frac{c}{x}\right]^3 + 8 x \,\text{ArcTanh}\left[\frac{c}{x}\right]^3 - 24 c \,\text{ArcTanh}\left[\frac{c}{x}\right]^2 \text{Log}\left[1 - e^{2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right] - 24 c \,\text{ArcTanh}\left[\frac{c}{x}\right] \text{PolyLog}\left[2, e^{2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right] + 12 c \,\text{PolyLog}\left[3, e^{2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right]\right)$$

Problem 154: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 208 leaves, 9 steps):

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

Result (type 4, 373 leaves):

$$a^3 \,\text{Log}[x] + \frac{3}{2} a^2 b \left(\text{PolyLog}\left[2, -\frac{c}{x}\right] - \text{PolyLog}\left[2, \frac{c}{x}\right]\right) + 3 a b^2 \left(-\frac{i \pi^3}{24} + \frac{2}{3} \text{ArcTanh}\left[\frac{c}{x}\right]^3 + \text{ArcTanh}\left[\frac{c}{x}\right]^2 \text{Log}\left[1 + e^{-2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right] - \text{ArcTanh}\left[\frac{c}{x}\right]^2 \text{Log}\left[1 - e^{2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right] - \text{ArcTanh}\left[\frac{c}{x}\right] \text{PolyLog}\left[2, -e^{-2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right] - \text{ArcTanh}\left[\frac{c}{x}\right] \text{PolyLog}\left[2, e^{2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right] - \frac{1}{2} \text{PolyLog}\left[3, -e^{-2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right] + \frac{1}{2} \text{PolyLog}\left[3, e^{2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right]\right) + \frac{1}{64} b^3 \left(-\pi^4 + 32 \,\text{ArcTanh}\left[\frac{c}{x}\right]^4 + 64 \,\text{ArcTanh}\left[\frac{c}{x}\right]^3 \text{Log}\left[1 + e^{-2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right] - 64 \,\text{ArcTanh}\left[\frac{c}{x}\right]^3 \text{Log}\left[1 - e^{2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right] - 96 \,\text{ArcTanh}\left[\frac{c}{x}\right]^2 \text{PolyLog}\left[2, -e^{-2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right] - 96 \,\text{ArcTanh}\left[\frac{c}{x}\right]^2 \text{PolyLog}\left[2, e^{2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right] - 96 \,\text{ArcTanh}\left[\frac{c}{x}\right] \text{PolyLog}\left[3, -e^{-2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right] + 96 \,\text{ArcTanh}\left[\frac{c}{x}\right] \text{PolyLog}\left[3, e^{2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right] - 48 \,\text{PolyLog}\left[4, -e^{-2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right] - 48 \,\text{PolyLog}\left[4, e^{2 \,\text{ArcTanh}\left[\frac{c}{x}\right]}\right]\right)$$

Problem 173: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 144 leaves, 7 steps):

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

Result (type 4, 183 leaves):

$$a^2\,\text{Log}[x] + \frac{1}{2} a b \left(\text{PolyLog}\left[2, -\frac{c}{x^2}\right] - \text{PolyLog}\left[2, \frac{c}{x^2}\right]\right) + \frac{1}{2} b^2 \left(-\frac{i \pi^3}{24} + \frac{2}{3} \text{ArcTanh}\left[\frac{c}{x^2}\right]^3 + \text{ArcTanh}\left[\frac{c}{x^2}\right]^2 \text{Log}\left[1 + e^{-2\,\text{ArcTanh}\left[\frac{c}{x^2}\right]}\right] - \text{ArcTanh}\left[\frac{c}{x^2}\right]^2 \text{Log}\left[1 - e^{2\,\text{ArcTanh}\left[\frac{c}{x^2}\right]}\right] - \text{ArcTanh}\left[\frac{c}{x^2}\right] \text{PolyLog}\left[2, -e^{-2\,\text{ArcTanh}\left[\frac{c}{x^2}\right]}\right] - \text{ArcTanh}\left[\frac{c}{x^2}\right] \text{PolyLog}\left[2, e^{2\,\text{ArcTanh}\left[\frac{c}{x^2}\right]}\right] - \frac{1}{2} \text{PolyLog}\left[3, -e^{-2\,\text{ArcTanh}\left[\frac{c}{x^2}\right]}\right] + \frac{1}{2} \text{PolyLog}\left[3, e^{2\,\text{ArcTanh}\left[\frac{c}{x^2}\right]}\right]\right)$$

Problem 176: Unable to integrate problem.

$$\int x^4 \left(a + b\,\text{ArcTanh}\left[\frac{c}{x^2}\right]\right)^2 dx$$

Optimal (type 4, 1214 leaves, 98 steps):

$$\frac{8}{15} b^2 c^2 x + \frac{2}{15} a b c x^3 + \frac{2}{5} a b c^{5/2} \text{ArcTan}\left[\frac{x}{\sqrt{c}}\right] - \frac{4}{15} b^2 c^{5/2} \text{ArcTan}\left[\frac{x}{\sqrt{c}}\right] -$$
$$\frac{1}{5} i b^2 c^{5/2} \text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]^2 - \frac{4}{15} b^2 c^{5/2} \text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right] + \frac{1}{5} b^2 c^{5/2} \text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right]^2 +$$
$$\frac{2}{5} b^2 c^{5/2} \text{ArcTan}\left[\frac{x}{\sqrt{c}}\right] \text{Log}\left[2 - \frac{2\sqrt{c}}{\sqrt{c} - i x}\right] - \frac{1}{15} b^2 c x^3 \text{Log}\left[1 - \frac{c}{x^2}\right] -$$
$$\frac{1}{5} b^2 c^{5/2} \text{ArcTan}\left[\frac{x}{\sqrt{c}}\right] \text{Log}\left[1 - \frac{c}{x^2}\right] + \frac{1}{15} b c x^3 \left(2 a - b \text{Log}\left[1 - \frac{c}{x^2}\right]\right) -$$
$$\frac{1}{5} b c^{5/2} \text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right] \left(2 a - b \text{Log}\left[1 - \frac{c}{x^2}\right]\right) + \frac{1}{20} x^5 \left(2 a - b \text{Log}\left[1 - \frac{c}{x^2}\right]\right)^2 +$$
$$\frac{2}{15} b^2 c x^3 \text{Log}\left[1 + \frac{c}{x^2}\right] + \frac{1}{5} a b x^5 \text{Log}\left[1 + \frac{c}{x^2}\right] + \frac{1}{5} b^2 c^{5/2} \text{ArcTan}\left[\frac{x}{\sqrt{c}}\right] \text{Log}\left[1 + \frac{c}{x^2}\right] -$$
$$\frac{1}{5} b^2 c^{5/2} \text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right] \text{Log}\left[1 + \frac{c}{x^2}\right] - \frac{1}{10} b^2 x^5 \text{Log}\left[1 - \frac{c}{x^2}\right] \text{Log}\left[1 + \frac{c}{x^2}\right] + \frac{1}{20} b^2 x^5 \text{Log}\left[1 + \frac{c}{x^2}\right]^2 -$$
$$\frac{2}{5} b^2 c^{5/2} \text{ArcTan}\left[\frac{x}{\sqrt{c}}\right] \text{Log}\left[\frac{2\sqrt{c}}{\sqrt{c} - i x}\right] + \frac{1}{5} b^2 c^{5/2} \text{ArcTan}\left[\frac{x}{\sqrt{c}}\right] \text{Log}\left[\frac{(1 + i)\left(\sqrt{c} - x\right)}{\sqrt{c} - i x}\right] -$$
$$\frac{2}{5} b^2 c^{5/2} \text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right] \text{Log}\left[\frac{2\sqrt{c}}{\sqrt{c} + x}\right] + \frac{1}{5} b^2 c^{5/2} \text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right] \text{Log}\left[\frac{2\sqrt{c}\left(\sqrt{-c} - x\right)}{\left(\sqrt{-c} - \sqrt{c}\right)\left(\sqrt{c} + x\right)}\right] +$$
$$\frac{1}{5} b^2 c^{5/2} \text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right] \text{Log}\left[\frac{2\sqrt{c}\left(\sqrt{-c} + x\right)}{\left(\sqrt{-c} + \sqrt{c}\right)\left(\sqrt{c} + x\right)}\right] +$$
$$\frac{1}{5} b^2 c^{5/2} \text{ArcTan}\left[\frac{x}{\sqrt{c}}\right] \text{Log}\left[\frac{(1 - i)\left(\sqrt{c} + x\right)}{\sqrt{c} - i x}\right] + \frac{2}{5} b^2 c^{5/2} \text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right] \text{Log}\left[2 - \frac{2\sqrt{c}}{\sqrt{c} + x}\right] +$$
$$\frac{1}{5} i b^2 c^{5/2} \text{PolyLog}\left[2, 1 - \frac{2\sqrt{c}}{\sqrt{c} - i x}\right] - \frac{1}{5} i b^2 c^{5/2} \text{PolyLog}\left[2, -1 + \frac{2\sqrt{c}}{\sqrt{c} - i x}\right] -$$
$$\frac{1}{10} i b^2 c^{5/2} \text{PolyLog}\left[2, 1 - \frac{(1 + i)\left(\sqrt{c} - x\right)}{\sqrt{c} - i x}\right] + \frac{1}{5} b^2 c^{5/2} \text{PolyLog}\left[2, -\frac{x}{\sqrt{c}}\right] -$$
$$\frac{1}{5} i b^2 c^{5/2} \text{PolyLog}\left[2, -\frac{i x}{\sqrt{c}}\right] + \frac{1}{5} i b^2 c^{5/2} \text{PolyLog}\left[2, \frac{i x}{\sqrt{c}}\right] -$$
$$\frac{1}{5} b^2 c^{5/2} \text{PolyLog}\left[2, \frac{x}{\sqrt{c}}\right] + \frac{1}{5} b^2 c^{5/2} \text{PolyLog}\left[2, 1 - \frac{2\sqrt{c}}{\sqrt{c} + x}\right] -$$
$$\frac{1}{5} b^2 c^{5/2} \text{PolyLog}\left[2, -1 + \frac{2\sqrt{c}}{\sqrt{c} + x}\right] - \frac{1}{10} b^2 c^{5/2} \text{PolyLog}\left[2, 1 - \frac{2\sqrt{c}\left(\sqrt{-c} - x\right)}{\left(\sqrt{-c} - \sqrt{c}\right)\left(\sqrt{c} + x\right)}\right] -$$
$$\frac{1}{10} b^2 c^{5/2} \text{PolyLog}\left[2, 1 - \frac{2\sqrt{c}\left(\sqrt{-c} + x\right)}{\left(\sqrt{-c} + \sqrt{c}\right)\left(\sqrt{c} + x\right)}\right] - \frac{1}{10} i b^2 c^{5/2} \text{PolyLog}\left[2, 1 - \frac{(1 - i)\left(\sqrt{c} + x\right)}{\sqrt{c} - i x}\right]$$

Result (type 8, 18 leaves):

$$\int x^4 \left(a + b \, \text{ArcTanh}\left[\frac{c}{x^2}\right]\right)^2 dx$$

Problem 177: Unable to integrate problem.

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

Optimal (type 4, 1172 leaves, 80 steps) :

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

Result (type 8, 18 leaves) :

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

Problem 180: Unable to integrate problem.

$$\int \frac{\left(a+b\,\text{ArcTanh}\left[\frac{c}{x^2}\right]\right)^2}{x^4}\,dx$$

Optimal (type 4, 1263 leaves, 105 steps):

$$\frac{2ab}{9x^3}-\frac{2ab}{3cx}-\frac{2ab\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]}{3c^{3/2}}+\frac{4b^2\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]}{3c^{3/2}}+\frac{i\,b^2\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]^2}{3c^{3/2}}+\frac{4b^2\,\text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right]}{3c^{3/2}}-$$
$$\frac{b^2\,\text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right]^2}{3c^{3/2}}-\frac{2b^2\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]\text{Log}\left[2-\frac{2\sqrt{c}}{\sqrt{c}-i x}\right]}{3c^{3/2}}-\frac{b^2\,\text{Log}\left[1-\frac{c}{x^2}\right]}{9x^3}+\frac{b^2\,\text{Log}\left[1-\frac{c}{x^2}\right]}{3cx}+$$
$$\frac{b^2\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]\text{Log}\left[1-\frac{c}{x^2}\right]}{3c^{3/2}}-\frac{b\left(2a-b\,\text{Log}\left[1-\frac{c}{x^2}\right]\right)}{9x^3}-\frac{b\left(2a-b\,\text{Log}\left[1-\frac{c}{x^2}\right]\right)}{3cx}+$$
$$\frac{b\,\text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right]\left(2a-b\,\text{Log}\left[1-\frac{c}{x^2}\right]\right)}{3c^{3/2}}-\frac{\left(2a-b\,\text{Log}\left[1-\frac{c}{x^2}\right]\right)^2}{12x^3}-\frac{ab\,\text{Log}\left[1+\frac{c}{x^2}\right]}{3x^3}-$$
$$\frac{2b^2\,\text{Log}\left[1+\frac{c}{x^2}\right]}{3cx}-\frac{b^2\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]\text{Log}\left[1+\frac{c}{x^2}\right]}{3c^{3/2}}+\frac{b^2\,\text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right]\text{Log}\left[1+\frac{c}{x^2}\right]}{3c^{3/2}}+$$
$$\frac{b^2\,\text{Log}\left[1-\frac{c}{x^2}\right]\text{Log}\left[1+\frac{c}{x^2}\right]}{6x^3}-\frac{b^2\,\text{Log}\left[1+\frac{c}{x^2}\right]^2}{12x^3}+\frac{2b^2\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]\text{Log}\left[\frac{2\sqrt{c}}{\sqrt{c}-i x}\right]}{3c^{3/2}}-$$
$$\frac{b^2\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]\text{Log}\left[\frac{(1+i)\left(\sqrt{c}-x\right)}{\sqrt{c}-i x}\right]}{3c^{3/2}}+\frac{2b^2\,\text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right]\text{Log}\left[\frac{2\sqrt{c}}{\sqrt{c}+x}\right]}{3c^{3/2}}-$$
$$\frac{b^2\,\text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right]\text{Log}\left[\frac{2\sqrt{c}\left(\sqrt{-c}-x\right)}{\left(\sqrt{-c}-\sqrt{c}\right)\left(\sqrt{c}+x\right)}\right]}{3c^{3/2}}-\frac{b^2\,\text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right]\text{Log}\left[\frac{2\sqrt{c}\left(\sqrt{-c}+x\right)}{\left(\sqrt{-c}+\sqrt{c}\right)\left(\sqrt{c}+x\right)}\right]}{3c^{3/2}}-$$
$$\frac{b^2\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]\text{Log}\left[\frac{(1-i)\left(\sqrt{c}+x\right)}{\sqrt{c}-i x}\right]}{3c^{3/2}}-\frac{2b^2\,\text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right]\text{Log}\left[2-\frac{2\sqrt{c}}{\sqrt{c}+x}\right]}{3c^{3/2}}-$$
$$\frac{i\,b^2\,\text{PolyLog}\left[2,1-\frac{2\sqrt{c}}{\sqrt{c}-i x}\right]}{3c^{3/2}}+\frac{i\,b^2\,\text{PolyLog}\left[2,-1+\frac{2\sqrt{c}}{\sqrt{c}-i x}\right]}{3c^{3/2}}+\frac{i\,b^2\,\text{PolyLog}\left[2,1-\frac{(1+i)\left(\sqrt{c}-x\right)}{\sqrt{c}-i x}\right]}{6c^{3/2}}-$$
$$\frac{b^2\,\text{PolyLog}\left[2,-\frac{x}{\sqrt{c}}\right]}{3c^{3/2}}+\frac{i\,b^2\,\text{PolyLog}\left[2,-\frac{i x}{\sqrt{c}}\right]}{3c^{3/2}}-\frac{i\,b^2\,\text{PolyLog}\left[2,\frac{i x}{\sqrt{c}}\right]}{3c^{3/2}}+\frac{b^2\,\text{PolyLog}\left[2,\frac{x}{\sqrt{c}}\right]}{3c^{3/2}}-$$
$$\frac{b^2\,\text{PolyLog}\left[2,1-\frac{2\sqrt{c}}{\sqrt{c}+x}\right]}{3c^{3/2}}+\frac{b^2\,\text{PolyLog}\left[2,-1+\frac{2\sqrt{c}}{\sqrt{c}+x}\right]}{3c^{3/2}}+\frac{b^2\,\text{PolyLog}\left[2,1-\frac{2\sqrt{c}\left(\sqrt{-c}-x\right)}{\left(\sqrt{-c}-\sqrt{c}\right)\left(\sqrt{c}+x\right)}\right]}{6c^{3/2}}+$$
$$\frac{b^2\,\text{PolyLog}\left[2,1-\frac{2\sqrt{c}\left(\sqrt{-c}+x\right)}{\left(\sqrt{-c}+\sqrt{c}\right)\left(\sqrt{c}+x\right)}\right]}{6c^{3/2}}+\frac{i\,b^2\,\text{PolyLog}\left[2,1-\frac{(1-i)\left(\sqrt{c}+x\right)}{\sqrt{c}-i x}\right]}{6c^{3/2}}$$

Result (type 8, 18 leaves):

$$\int \frac{\left(a + b\,\text{ArcTanh}\left[\frac{c}{x^2}\right]\right)^2}{x^4}\,dx$$

Problem 181: Unable to integrate problem.

$$\int \frac{\left(a + b\,\text{ArcTanh}\left[\frac{c}{x^2}\right]\right)^2}{x^6}\,dx$$

Optimal (type 4, 1337 leaves, 130 steps):

$$\frac{2\,a\,b}{25\,x^5}-\frac{2\,a\,b}{15\,c\,x^3}+\frac{2\,a\,b}{5\,c^2\,x}-\frac{8\,b^2}{15\,c^2\,x}+\frac{2\,a\,b\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]}{5\,c^{5/2}}-\frac{4\,b^2\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]}{15\,c^{5/2}}-\frac{i\,b^2\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]^2}{5\,c^{5/2}}+$$
$$\frac{4\,b^2\,\text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right]}{15\,c^{5/2}}-\frac{b^2\,\text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right]^2}{5\,c^{5/2}}+\frac{2\,b^2\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]\,\text{Log}\left[2-\frac{2\sqrt{c}}{\sqrt{c}-i\,x}\right]}{5\,c^{5/2}}-$$
$$\frac{b^2\,\text{Log}\left[1-\frac{c}{x^2}\right]}{25\,x^5}+\frac{b^2\,\text{Log}\left[1-\frac{c}{x^2}\right]}{15\,c\,x^3}-\frac{b^2\,\text{Log}\left[1-\frac{c}{x^2}\right]}{5\,c^2\,x}-\frac{b^2\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]\,\text{Log}\left[1-\frac{c}{x^2}\right]}{5\,c^{5/2}}-$$
$$\frac{b\left(2\,a-b\,\text{Log}\left[1-\frac{c}{x^2}\right]\right)}{25\,x^5}-\frac{b\left(2\,a-b\,\text{Log}\left[1-\frac{c}{x^2}\right]\right)}{15\,c\,x^3}-\frac{b\left(2\,a-b\,\text{Log}\left[1-\frac{c}{x^2}\right]\right)}{5\,c^2\,x}+$$
$$\frac{b\,\text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right]\left(2\,a-b\,\text{Log}\left[1-\frac{c}{x^2}\right]\right)}{5\,c^{5/2}}-\frac{\left(2\,a-b\,\text{Log}\left[1-\frac{c}{x^2}\right]\right)^2}{20\,x^5}-\frac{a\,b\,\text{Log}\left[1+\frac{c}{x^2}\right]}{5\,x^5}-$$
$$\frac{2\,b^2\,\text{Log}\left[1+\frac{c}{x^2}\right]}{15\,c\,x^3}+\frac{b^2\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]\,\text{Log}\left[1+\frac{c}{x^2}\right]}{5\,c^{5/2}}+\frac{b^2\,\text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right]\,\text{Log}\left[1+\frac{c}{x^2}\right]}{5\,c^{5/2}}+$$
$$\frac{b^2\,\text{Log}\left[1-\frac{c}{x^2}\right]\,\text{Log}\left[1+\frac{c}{x^2}\right]}{10\,x^5}-\frac{b^2\,\text{Log}\left[1+\frac{c}{x^2}\right]^2}{20\,x^5}-\frac{2\,b^2\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]\,\text{Log}\left[\frac{2\sqrt{c}}{\sqrt{c}-i\,x}\right]}{5\,c^{5/2}}+$$
$$\frac{b^2\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]\,\text{Log}\left[\frac{(1+i)\left(\sqrt{c}-x\right)}{\sqrt{c}-i\,x}\right]}{5\,c^{5/2}}+\frac{2\,b^2\,\text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right]\,\text{Log}\left[\frac{2\sqrt{c}}{\sqrt{c}+x}\right]}{5\,c^{5/2}}-$$
$$\frac{b^2\,\text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right]\,\text{Log}\left[\frac{2\sqrt{c}\left(\sqrt{-c}-x\right)}{\left(\sqrt{-c}-\sqrt{c}\right)\left(\sqrt{c}+x\right)}\right]}{5\,c^{5/2}}-\frac{b^2\,\text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right]\,\text{Log}\left[\frac{2\sqrt{c}\left(\sqrt{-c}+x\right)}{\left(\sqrt{-c}+\sqrt{c}\right)\left(\sqrt{c}+x\right)}\right]}{5\,c^{5/2}}+$$
$$\frac{b^2\,\text{ArcTan}\left[\frac{x}{\sqrt{c}}\right]\,\text{Log}\left[\frac{(1-i)\left(\sqrt{c}+x\right)}{\sqrt{c}-i\,x}\right]}{5\,c^{5/2}}-\frac{2\,b^2\,\text{ArcTanh}\left[\frac{x}{\sqrt{c}}\right]\,\text{Log}\left[2-\frac{2\sqrt{c}}{\sqrt{c}+x}\right]}{5\,c^{5/2}}+$$
$$\frac{i\,b^2\,\text{PolyLog}\left[2,1-\frac{2\sqrt{c}}{\sqrt{c}-i\,x}\right]}{5\,c^{5/2}}-\frac{i\,b^2\,\text{PolyLog}\left[2,-1+\frac{2\sqrt{c}}{\sqrt{c}-i\,x}\right]}{5\,c^{5/2}}-\frac{i\,b^2\,\text{PolyLog}\left[2,1-\frac{(1+i)\left(\sqrt{c}-x\right)}{\sqrt{c}-i\,x}\right]}{10\,c^{5/2}}-$$
$$\frac{b^2\,\text{PolyLog}\left[2,-\frac{x}{\sqrt{c}}\right]}{5\,c^{5/2}}-\frac{i\,b^2\,\text{PolyLog}\left[2,-\frac{i\,x}{\sqrt{c}}\right]}{5\,c^{5/2}}+\frac{i\,b^2\,\text{PolyLog}\left[2,\frac{i\,x}{\sqrt{c}}\right]}{5\,c^{5/2}}+\frac{b^2\,\text{PolyLog}\left[2,\frac{x}{\sqrt{c}}\right]}{5\,c^{5/2}}-$$
$$\frac{b^2\,\text{PolyLog}\left[2,1-\frac{2\sqrt{c}}{\sqrt{c}+x}\right]}{5\,c^{5/2}}+\frac{b^2\,\text{PolyLog}\left[2,-1+\frac{2\sqrt{c}}{\sqrt{c}+x}\right]}{5\,c^{5/2}}+\frac{b^2\,\text{PolyLog}\left[2,1-\frac{2\sqrt{c}\left(\sqrt{-c}-x\right)}{\left(\sqrt{-c}-\sqrt{c}\right)\left(\sqrt{c}+x\right)}\right]}{10\,c^{5/2}}+$$
$$\frac{b^2\,\text{PolyLog}\left[2,1-\frac{2\sqrt{c}\left(\sqrt{-c}+x\right)}{\left(\sqrt{-c}+\sqrt{c}\right)\left(\sqrt{c}+x\right)}\right]}{10\,c^{5/2}}-\frac{i\,b^2\,\text{PolyLog}\left[2,1-\frac{(1-i)\left(\sqrt{c}+x\right)}{\sqrt{c}-i\,x}\right]}{10\,c^{5/2}}$$

Result (type 8, 18 leaves) :

$$\int\frac{\left(a+b\,\text{ArcTanh}\left[\frac{c}{x^2}\right]\right)^2}{x^6}\,dx$$

Problem 199: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 145 leaves, 7 steps):

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

Result (type 4, 203 leaves):

$$a^2\,\text{Log}[x]+2\,a\,b\,\left(-\text{PolyLog}\left[2,\,-c\,\sqrt{x}\right]+\text{PolyLog}\left[2,\,c\,\sqrt{x}\right]\right)+2\,b^2\,\left(\frac{i\,\pi^3}{24}-\frac{2}{3}\,\text{ArcTanh}\left[c\,\sqrt{x}\right]^3-\text{ArcTanh}\left[c\,\sqrt{x}\right]^2\,\text{Log}\left[1+e^{-2\,\text{ArcTanh}\left[c\,\sqrt{x}\right]}\right]+\text{ArcTanh}\left[c\,\sqrt{x}\right]^2\,\text{Log}\left[1-e^{2\,\text{ArcTanh}\left[c\,\sqrt{x}\right]}\right]+\text{ArcTanh}\left[c\,\sqrt{x}\right]\,\text{PolyLog}\left[2,\,-e^{-2\,\text{ArcTanh}\left[c\,\sqrt{x}\right]}\right]+\text{ArcTanh}\left[c\,\sqrt{x}\right]\,\text{PolyLog}\left[2,\,e^{2\,\text{ArcTanh}\left[c\,\sqrt{x}\right]}\right]+\frac{1}{2}\,\text{PolyLog}\left[3,\,-e^{-2\,\text{ArcTanh}\left[c\,\sqrt{x}\right]}\right]-\frac{1}{2}\,\text{PolyLog}\left[3,\,e^{2\,\text{ArcTanh}\left[c\,\sqrt{x}\right]}\right]\right)$$

Problem 206: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 224 leaves, 9 steps):

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

Result (type 4, 423 leaves):

$$a^3\,\text{Log}[x]+3\,a^2\,b\left(-\text{PolyLog}\left[2,-c\sqrt{x}\right]+\text{PolyLog}\left[2,c\sqrt{x}\right]\right)+$$
$$6\,a\,b^2\left(\frac{i\,\pi^3}{24}-\frac{2}{3}\text{ArcTanh}\left[c\sqrt{x}\right]^3-\text{ArcTanh}\left[c\sqrt{x}\right]^2\text{Log}\left[1+e^{-2\,\text{ArcTanh}\left[c\sqrt{x}\right]}\right]+\right.$$
$$\text{ArcTanh}\left[c\sqrt{x}\right]^2\text{Log}\left[1-e^{2\,\text{ArcTanh}\left[c\sqrt{x}\right]}\right]+\text{ArcTanh}\left[c\sqrt{x}\right]\text{PolyLog}\left[2,-e^{-2\,\text{ArcTanh}\left[c\sqrt{x}\right]}\right]+$$
$$\text{ArcTanh}\left[c\sqrt{x}\right]\text{PolyLog}\left[2,e^{2\,\text{ArcTanh}\left[c\sqrt{x}\right]}\right]+$$
$$\left.\frac{1}{2}\text{PolyLog}\left[3,-e^{-2\,\text{ArcTanh}\left[c\sqrt{x}\right]}\right]-\frac{1}{2}\text{PolyLog}\left[3,e^{2\,\text{ArcTanh}\left[c\sqrt{x}\right]}\right]\right)+$$
$$\frac{1}{32}b^3\left(\pi^4-32\,\text{ArcTanh}\left[c\sqrt{x}\right]^4-64\,\text{ArcTanh}\left[c\sqrt{x}\right]^3\text{Log}\left[1+e^{-2\,\text{ArcTanh}\left[c\sqrt{x}\right]}\right]+\right.$$
$$64\,\text{ArcTanh}\left[c\sqrt{x}\right]^3\text{Log}\left[1-e^{2\,\text{ArcTanh}\left[c\sqrt{x}\right]}\right]+96\,\text{ArcTanh}\left[c\sqrt{x}\right]^2\text{PolyLog}\left[2,-e^{-2\,\text{ArcTanh}\left[c\sqrt{x}\right]}\right]+$$
$$96\,\text{ArcTanh}\left[c\sqrt{x}\right]^2\text{PolyLog}\left[2,e^{2\,\text{ArcTanh}\left[c\sqrt{x}\right]}\right]+96\,\text{ArcTanh}\left[c\sqrt{x}\right]$$
$$\text{PolyLog}\left[3,-e^{-2\,\text{ArcTanh}\left[c\sqrt{x}\right]}\right]-96\,\text{ArcTanh}\left[c\sqrt{x}\right]\text{PolyLog}\left[3,e^{2\,\text{ArcTanh}\left[c\sqrt{x}\right]}\right]+$$
$$\left.48\,\text{PolyLog}\left[4,-e^{-2\,\text{ArcTanh}\left[c\sqrt{x}\right]}\right]+48\,\text{PolyLog}\left[4,e^{2\,\text{ArcTanh}\left[c\sqrt{x}\right]}\right]\right)$$

Problem 222: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 156 leaves, 7 steps):

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

Result (type 4, 207 leaves):

$$a^2 \text{Log}[x] + \frac{2}{3} a b \left(-\text{PolyLog}\left[2, -c x^{3/2}\right] + \text{PolyLog}\left[2, c x^{3/2}\right]\right) + \frac{2}{3} b^2 \left(\frac{i \pi^3}{24} - \frac{2}{3} \text{ArcTanh}\left[c x^{3/2}\right]^3 - \text{ArcTanh}\left[c x^{3/2}\right]^2 \text{Log}\left[1 + e^{-2 \text{ArcTanh}\left[c x^{3/2}\right]}\right] + \text{ArcTanh}\left[c x^{3/2}\right]^2 \text{Log}\left[1 - e^{2 \text{ArcTanh}\left[c x^{3/2}\right]}\right] + \text{ArcTanh}\left[c x^{3/2}\right] \text{PolyLog}\left[2, -e^{-2 \text{ArcTanh}\left[c x^{3/2}\right]}\right] + \text{ArcTanh}\left[c x^{3/2}\right] \text{PolyLog}\left[2, e^{2 \text{ArcTanh}\left[c x^{3/2}\right]}\right] + \frac{1}{2} \text{PolyLog}\left[3, -e^{-2 \text{ArcTanh}\left[c x^{3/2}\right]}\right] - \frac{1}{2} \text{PolyLog}\left[3, e^{2 \text{ArcTanh}\left[c x^{3/2}\right]}\right]\right)$$

Problem 227: Result unnecessarily involves higher level functions.

$$\int \frac{a + b \text{ArcTanh}[c x^n]}{x} \, dx$$

Optimal (type 4, 36 leaves, 2 steps):

$$a \text{Log}[x] - \frac{b \text{PolyLog}[2, -c x^n]}{2 n} + \frac{b \text{PolyLog}[2, c x^n]}{2 n}$$

Result (type 5, 39 leaves):

$$\frac{b c x^n \text{HypergeometricPFQ}\left[\left\{\frac{1}{2}, \frac{1}{2}, 1\right\}, \left\{\frac{3}{2}, \frac{3}{2}\right\}, c^2 x^{2 n}\right]}{n} + a \text{Log}[x]$$

Problem 233: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{(a + b \text{ArcTanh}[c x^n])^2}{x} \, dx$$

Optimal (type 4, 148 leaves, 7 steps):

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

Result (type 4, 181 leaves):

$$a^2 \text{Log}[x] + \frac{a\, b\, (-\text{PolyLog}[2, -c\, x^n] + \text{PolyLog}[2, c\, x^n])}{n} + \frac{1}{n} b^2 \left(\frac{i\, \pi^3}{24} - \frac{2}{3} \text{ArcTanh}[c\, x^n]^3 - \text{ArcTanh}[c\, x^n]^2 \text{Log}\left[1 + e^{-2 \text{ArcTanh}[c\, x^n]}\right] + \text{ArcTanh}[c\, x^n]^2 \text{Log}\left[1 - e^{2 \text{ArcTanh}[c\, x^n]}\right] + \text{ArcTanh}[c\, x^n] \text{PolyLog}\left[2, -e^{-2 \text{ArcTanh}[c\, x^n]}\right] + \text{ArcTanh}[c\, x^n] \text{PolyLog}\left[2, e^{2 \text{ArcTanh}[c\, x^n]}\right] + \frac{1}{2} \text{PolyLog}\left[3, -e^{-2 \text{ArcTanh}[c\, x^n]}\right] - \frac{1}{2} \text{PolyLog}\left[3, e^{2 \text{ArcTanh}[c\, x^n]}\right]\right)$$

Problem 236: Result unnecessarily involves higher level functions.

$$\int \frac{\text{ArcTanh}[a\, x^n]}{x} \, dx$$

Optimal (type 4, 30 leaves, 2 steps):

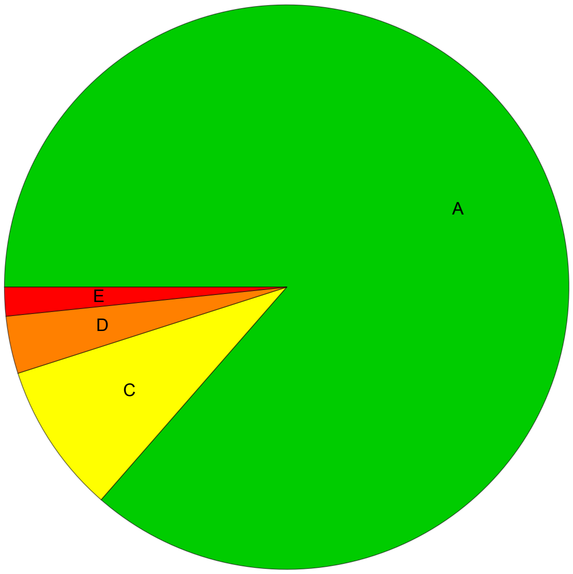
$$-\frac{\text{PolyLog}[2, -a\, x^n]}{2\, n} + \frac{\text{PolyLog}[2, a\, x^n]}{2\, n}$$

Result (type 5, 33 leaves):

$$\frac{a\, x^n \text{HypergeometricPFQ}\left[\left\{\frac{1}{2}, \frac{1}{2}, 1\right\}, \left\{\frac{3}{2}, \frac{3}{2}\right\}, a^2 x^{2 n}\right]}{n}$$

Summary of Integration Test Results

243 integration problems



A - 210 optimal antiderivatives

B - 0 more than twice size of optimal antiderivatives

C - 21 unnecessarily complex antiderivatives

D - 8 unable to integrate problems

E - 4 integration timeouts