Mathematica 11.3 Integration Test Results

Test results for the 166 problems in "5.3.2 (d x)^m (a+b arctan(c x^n))^p.m"

Problem 81: Unable to integrate problem.

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

Optimal (type 4, 1393 leaves, 86 steps):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\frac{1}{6}\, b^2\, x^3\, \text{Log}\left[1 - i\,c\,x^2\right]\,\text{Log}\left[1 + i\,c\,x^2\right] - \frac{1}{12}\, b^2\, x^3\, \text{Log}\left[1 + i\,c\,x^2\right]^2 +$$

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

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

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

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

Result (type 8, 18 leaves):

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

Problem 82: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 1191 leaves, 69 steps):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 4, 5620 leaves) :

$$a^2 x + \frac{1}{c x}$$

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

$$\left.\left. \text{Log}\left[1 + c x^2 - \sqrt{2} \; \sqrt{c x^2} \right] - \text{Log}\left[1 + c x^2 + \sqrt{2} \; \sqrt{c x^2} \right] \right) \right) +$$

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

$$\left.\left.\left. 2 \, \text{ArcTan}\left[1 + \sqrt{2} \; \sqrt{c x^2} \right] + \text{Log}\left[1 + c x^2 - \sqrt{2} \; \sqrt{c x^2} \right] - \text{Log}\left[1 + c x^2 + \sqrt{2} \; \sqrt{c x^2} \right] \right) - \right.\right.$$

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

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

$$\left(\sqrt{c x^2} \left(1 + \left(1 - \sqrt{2} \; \sqrt{c x^2} \right)^2 \right)^{3/2} \right.$$

$$\left(2 \left(-5 \, \text{ArcTan}[2 + i] \; \text{ArcTan}\left[1 - \sqrt{2} \; \sqrt{c x^2} \right] + 4 \, \text{ArcTan}\left[1 - \sqrt{2} \; \sqrt{c x^2} \right]^2 + \right.\right.$$

$$\left(1 + 2 i \right) \sqrt{1 + i} \; e^{-i \, \text{ArcTan}[2+i]} \, \text{ArcTan}\left[1 - \sqrt{2} \; \sqrt{c x^2} \right]^2 + \left(1 - 2 i \right) \sqrt{1 - i}$$

$$e^{-\text{ArcTanh}[1+2 i]} \, \text{ArcTan}\left[1 - \sqrt{2} \; \sqrt{c x^2} \right]^2 - 5 \, i \, \text{ArcTan}\left[1 - \sqrt{2} \; \sqrt{c x^2} \right]$$

$$\text{ArcTanh}[1 + 2 i] + 5 \, i \left(-\text{ArcTan}[2 + i] + \text{ArcTan}\left[1 - \sqrt{2} \; \sqrt{c x^2} \right] \right)$$

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

$$\left. \text{ArcTanh}[1 + 2 i] \right) \text{Log}\left[1 - e^{2 i \, \text{ArcTan}\left[1 - \sqrt{2} \; \sqrt{c x^2} \right] - 2 \text{ArcTanh}[1+2 i]} \right] +$$

$$5 \, i \, \text{ArcTan}[2 + i] \; \text{Log}\left[-\text{Sin}\left[\text{ArcTan}[2 + i] - \text{ArcTan}\left[1 - \sqrt{2} \; \sqrt{c x^2} \right] \right] \right] -$$

$$5 \, \text{ArcTanh}[1 + 2 i] \; \text{Log}\left[\text{Sin}\left[\text{ArcTan}\left[1 - \sqrt{2} \; \sqrt{c x^2} \right] + i \, \text{ArcTanh}[1 + 2 i] \right] \right] \right) +$$

$$5 \, \text{PolyLog}\left[2, e^{2 i \left(-\text{ArcTan}[2+i] + \text{ArcTan}\left[1 - \sqrt{2} \; \sqrt{c x^2} \right] \right)} \right] - 5 \, \text{PolyLog}\left[2, \right.$$

$$e^{2 i \, \text{ArcTan}\left[1 - \sqrt{2} \; \sqrt{c x^2} \right] - 2 \text{ArcTanh}[1+2 i]} \right) \left(3 + 2 \, \text{Cos}\left[2 \, \text{ArcTan}\left[1 - \sqrt{2} \; \sqrt{c x^2} \right] \right] \right] -$$

$$2 \sin\left[2 \arctan\left[1 - \sqrt{2} \sqrt{c x^2}\right]\right]\right) \Big/ \left(20 \sqrt{2} \left(-1 - c x^2 + \sqrt{2} \sqrt{c x^2}\right)\right.$$

$$\left(1 + c x^2 + \sqrt{2} \sqrt{c x^2}\right) \left(\frac{1}{\sqrt{1 + \left(1 - \sqrt{2} \sqrt{c x^2}\right)^2}} - \frac{1 - \sqrt{2} \sqrt{c x^2}}{\sqrt{1 + \left(1 - \sqrt{2} \sqrt{c x^2}\right)^2}}\right)\right) +$$

$$\frac{1}{1 + c x^2 + \sqrt{2} \sqrt{c x^2}} \left(\frac{1}{20} + \frac{i}{20}\right) e^{-i \arctan[2+i] - \text{ArcTanh}[1+2 i]} \left(-1 - c x^2 + \sqrt{2} \sqrt{c x^2}\right)$$

$$\left(5 + 5 i\right) e^{i \arctan[2+i] + \text{ArcTanh}[1+2 i]} \pi \arctan\left[1 - \sqrt{2} \sqrt{c x^2}\right] + 10 i$$

$$e^{i \arctan[2+i] + \text{ArcTanh}[1+2 i]} \arctan[2 + i] \arctan\left[1 - \sqrt{2} \sqrt{c x^2}\right] + \left(2 - 4 i\right) \sqrt{1 - i}$$

$$e^{i \arctan[2+i]} \arctan\left[1 - \sqrt{2} \sqrt{c x^2}\right]^2 + \left(4 - 2 i\right) \sqrt{1 + i} \, e^{\text{ArcTanh}[1+2 i]} \arctan\Big[$$

$$1 - \sqrt{2} \sqrt{c x^2}\Big]^2 - \left(8 - 8 i\right) e^{i \arctan[2+i] + \text{ArcTanh}[1+2 i]} \arctan\left[1 - \sqrt{2} \sqrt{c x^2}\right]^2 -$$

$$10 i \, e^{i \arctan[2+i] + \text{ArcTanh}[1+2 i]} \arctan\left[1 - \sqrt{2} \sqrt{c x^2}\right] \text{ArcTanh}[1 + 2 i] +$$

$$\left(5 - 5 i\right) e^{i \arctan[2+i] + \text{ArcTanh}[1+2 i]} \pi \log\left[1 + e^{-2 i \arctan\left[1 - \sqrt{2} \sqrt{c x^2}\right]}\right] - 10$$

$$e^{i \arctan[2+i] + \text{ArcTanh}[1+2 i]} \arctan[2 + i] \log\left[1 - e^{2 i \left(-\arctan[2+i] + \arctan\left[1 - \sqrt{2} \sqrt{c x^2}\right]\right)}\right] +$$

$$10 \, e^{i \arctan[2+i] + \text{ArcTanh}[1+2 i]} \arctan\left[1 - \sqrt{2} \sqrt{c x^2}\right]$$

$$\log\left[1 - e^{2 i \left(-\arctan[2+i] + \arctan\left[1 - \sqrt{2} \sqrt{c x^2}\right]\right)}\right] - 10 i \, e^{i \arctan[2+i] + \text{ArcTanh}[1+2 i]}$$

$$\arctan\left[1 - \sqrt{2} \sqrt{c x^2}\right] \log\left[1 - e^{2 i \arctan\left[1 - \sqrt{2} \sqrt{c x^2}\right] - 2 \text{ArcTanh}[1+2 i]}\right] + 10$$

$$e^{i \arctan[2+i] + \text{ArcTanh}[1+2 i]} \text{ArcTanh}[1 + 2 i]$$

$$\log\left[1 - e^{2 i \arctan\left[1 - \sqrt{2} \sqrt{c x^2}\right] - 2 \text{ArcTanh}[1+2 i]}\right] - \left(5 - 5 i\right) e^{i \arctan[2+i] + \text{ArcTanh}[1+2 i]}$$

$$\pi \log\left[\frac{1}{\sqrt{1 + \left(1 - \sqrt{2} \sqrt{c x^2}\right)^2}}\right] + 10 \, e^{i \arctan[2+i] + \text{ArcTanh}[1+2 i]} \arctan[2 + i]$$

$$\log\left[-\sin\left[\arctan[2 + i] - \arctan\left[1 - \sqrt{2} \sqrt{c x^2}\right]\right]\right] - 10 \, e^{i \arctan[2+i] + \text{ArcTanh}[1+2 i]}$$

$$\text{ArcTanh}[1 + 2 i] \log\left[\sin\left[\arctan\left[1 - \sqrt{2} \sqrt{c x^2}\right] + i \, \text{ArcTanh}[1 + 2 i]\right]\right] - 5$$

$$i \, e^{i \arctan[2+i] + \text{ArcTanh}[1+2 i]} \text{PolyLog}\left[2, e^{2 i \left(-\arctan[2+i] + \arctan\left[1 - \sqrt{2} \sqrt{c x^2}\right]\right)}\right] - 5$$

$$\mathbb{e}^{\mathtt{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}}\,\mathtt{PolyLog}\Big[2,\,\mathbb{e}^{2\,\mathtt{i\,ArcTan}\big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\big]-2\,\mathtt{ArcTanh[1+2\,i]}}\Big]$$

$$\Big(3+2\,\mathtt{Cos}\Big[2\,\mathtt{ArcTan}\Big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\Big]\Big]-2\,\mathtt{Sin}\Big[2\,\mathtt{ArcTan}\Big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\Big]\Big]\Big)+$$

$$\Bigg(\Big(\frac{1}{40}+\frac{\mathbb{i}}{40}\Big)\,c\,\mathbb{e}^{-\mathtt{i\,ArcTan[2+i]-ArcTanh[1+2\,i]}}\,x^2\,\Big(1+\Big(1-\sqrt{2}\,\sqrt{c\,x^2}\,\Big)^2\Big)$$

$$\Bigg(\Big(5+5\,\mathbb{i}\Big)\,\mathbb{e}^{\mathtt{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}}\,\pi\,\mathtt{ArcTan}\Big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\Big]+$$

$$10\,\mathbb{e}^{\mathtt{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}}\,\mathtt{ArcTan[2+i]}\,\mathtt{ArcTan}\Big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\Big]+$$

$$\Big(4+2\,\mathbb{i}\Big)\,\sqrt{1-\mathbb{i}}\,\mathbb{e}^{\mathtt{i\,ArcTan[2+i]}}\,\mathtt{ArcTan}\Big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\Big]^2-$$

$$\Big(2+4\,\mathbb{i}\Big)\,\sqrt{1+\mathbb{i}}\,\mathbb{e}^{\mathtt{ArcTanh[1+2\,i]}}\,\mathtt{ArcTan}\Big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\Big]^2+\Big(4-4\,\mathbb{i}\Big)$$

$$\mathbb{e}^{\mathtt{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}}\,\mathtt{ArcTan}\Big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\Big]^2+10\,\mathbb{e}^{\mathtt{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}}$$

$$\mathtt{ArcTan}\Big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\Big]\,\mathtt{ArcTanh[1+2\,i]}+\Big(5-5\,\mathbb{i}\Big)\,\mathbb{e}^{\mathtt{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}}$$

$$\pi\,\mathtt{Log}\Big[1+\mathbb{e}^{-2\,\mathtt{i\,ArcTan}\big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\big]}\Big]+10\,\mathbb{i}\,\mathbb{e}^{\mathtt{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}}\,\mathtt{ArcTan[2+i]}$$

$$\mathtt{Log}\Big[1-\mathbb{e}^{2\,\mathbb{i}\,\big(-\mathtt{ArcTan[2+i]+ArcTan}\big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\big]\big)}\Big]-10\,\mathbb{i}\,\mathbb{e}^{\mathtt{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}}$$

$$\mathtt{ArcTan}\Big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\Big]\,\mathtt{Log}\Big[1-\mathbb{e}^{2\,\mathbb{i}\,\big(-\mathtt{ArcTan[2+i]+ArcTan}\big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\big]\big)}\Big]+$$

$$10\,\mathbb{e}^{\mathtt{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}}\,\mathtt{ArcTan}\Big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\Big]$$

$$\mathtt{Log}\Big[1-\mathbb{e}^{2\,\mathtt{i\,ArcTan}\big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\big]-2\,\mathtt{ArcTanh[1+2\,i]}}\Big]+10\,\mathbb{i}\,\mathbb{e}^{\mathtt{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}}$$

$$\mathtt{ArcTanh[1+2\,i]}\,\mathtt{Log}\Big[1-\mathbb{e}^{2\,\mathtt{i\,ArcTan}\big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\big]-2\,\mathtt{ArcTanh[1+2\,i]}}\Big]-$$

$$\Big(5-5\,\mathbb{i}\Big)\,\mathbb{e}^{\mathtt{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}}\,\pi\,\mathtt{Log}\Big[\frac{1}{\sqrt{1+\Big(1-\sqrt{2}\,\sqrt{c\,x^2}\,\Big)^2}}\Big]-$$

$$10\,\mathbb{i}\,\mathbb{e}^{\mathtt{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}}\,\mathtt{ArcTan[2+i]}\,\mathtt{Log}\Big[$$

$$-\mathtt{Sin}\Big[\mathtt{ArcTan[2+i]}-\mathtt{ArcTan}\Big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\Big]\Big]\Big]-10\,\mathbb{i}\,\mathbb{e}^{\mathtt{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}}$$

$$\mathtt{ArcTanh[1+2\,i]}\,\mathtt{Log}\Big[\mathtt{Sin}\Big[\mathtt{ArcTan}\Big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\Big]+\mathbb{i}\,\mathtt{ArcTanh[1+2\,i]}\Big]\Big]-$$

$$5\,\mathbb{e}^{\mathtt{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}}\,\mathtt{PolyLog}\Big[2,\,\mathbb{e}^{2\,\mathbb{i}\,\big(-\mathtt{ArcTan[2+i]+ArcTan}\big[1-\sqrt{2}\,\sqrt{c\,x^2}\,\big]\big)}\Big]-$$

$$5 \; \mathbb{i} \; \mathbb{e}^{\mathbb{i} \, \mathrm{ArcTan}[2+\mathbb{i}] + \mathrm{ArcTanh}[1+2\,\mathbb{i}]} \; \mathrm{PolyLog}\left[2, \; \mathbb{e}^{2\,\mathbb{i}\,\mathrm{ArcTan}\left[1-\sqrt{2}\,\sqrt{c\,x^2}\,\right] - 2\,\mathrm{ArcTanh}[1+2\,\mathbb{i}]}\right]$$

$$\left(3 + 2\,\mathrm{Cos}\left[2\,\mathrm{ArcTan}\left[1 - \sqrt{2}\,\sqrt{c\,x^2}\,\right]\right] - 2\,\mathrm{Sin}\left[2\,\mathrm{ArcTan}\left[1 - \sqrt{2}\,\sqrt{c\,x^2}\,\right]\right]\right)\Bigg/$$

$$\left(\left(-1 - c\,x^2 + \sqrt{2}\,\sqrt{c\,x^2}\,\right)\left(1 + c\,x^2 + \sqrt{2}\,\sqrt{c\,x^2}\,\right)\left(\frac{1}{\sqrt{1 + \left(1 - \sqrt{2}\,\sqrt{c\,x^2}\,\right)^2}} - \right.\right.$$

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

$$\left(2\left(-5\,\mathrm{ArcTan}[2+\mathbb{i}]\,\mathrm{ArcTan}\left[1 + \sqrt{2}\,\sqrt{c\,x^2}\,\right] + 4\,\mathrm{ArcTan}\left[1 + \sqrt{2}\,\sqrt{c\,x^2}\,\right]^2 + \right.\right.$$

$$\left(1 + 2\,\mathbb{i}\right)\sqrt{1 + \mathbb{i}}\;\mathbb{e}^{-\mathbb{i}\,\mathrm{ArcTan}[2+\mathbb{i}]}\,\mathrm{ArcTan}\left[1 + \sqrt{2}\,\sqrt{c\,x^2}\,\right]^2 + \left(1 - 2\,\mathbb{i}\right)\sqrt{1 - \mathbb{i}}$$

$$\mathbb{e}^{-\mathrm{ArcTanh}[1+2\,\mathbb{i}]}\,\mathrm{ArcTan}\left[1 + \sqrt{2}\,\sqrt{c\,x^2}\,\right]^2 - 5\,\mathbb{i}\,\mathrm{ArcTan}\left[1 + \sqrt{2}\,\sqrt{c\,x^2}\,\right]$$

$$\mathrm{ArcTanh}[1 + 2\,\mathbb{i}] + 5\,\mathbb{i}\,\left(-\mathrm{ArcTan}[2+\mathbb{i}] + \mathrm{ArcTan}\left[1 + \sqrt{2}\,\sqrt{c\,x^2}\,\right]\right)$$

$$\mathrm{Log}\left[1 - \mathbb{e}^{2\,\mathbb{i}\left(-\mathrm{ArcTan}[2+\mathbb{i}] + \mathrm{ArcTan}\left[1 + \sqrt{2}\,\sqrt{c\,x^2}\,\right]\right)}\right] + 5\left(-\mathbb{i}\,\mathrm{ArcTan}\left[1 + \sqrt{2}\,\sqrt{c\,x^2}\,\right] + \right.$$

$$\left.\mathrm{ArcTanh}[1 + 2\,\mathbb{i}]\right)\mathrm{Log}\left[1 - \mathbb{e}^{2\,\mathbb{i}\,\mathrm{ArcTan}\left[1 + \sqrt{2}\,\sqrt{c\,x^2}\,\right] - 2\,\mathrm{ArcTanh}[1+2\,\mathbb{i}]}\right] + $$

$$5\,\mathbb{i}\,\mathrm{ArcTan}[2 + \mathbb{i}]\,\mathrm{Log}\left[-\mathrm{Sin}\left[\mathrm{ArcTan}[2 + \mathbb{i}] - \mathrm{ArcTan}\left[1 + \sqrt{2}\,\sqrt{c\,x^2}\,\right]\right]\right] - $$

$$\left.5\,\mathrm{ArcTanh}[1 + 2\,\mathbb{i}]\,\mathrm{Log}\left[\mathrm{Sin}\left[\mathrm{ArcTan}\left[1 + \sqrt{2}\,\sqrt{c\,x^2}\,\right] + \mathbb{i}\,\mathrm{ArcTanh}[1 + 2\,\mathbb{i}]\right]\right]\right) + $$

$$5\,\mathrm{PolyLog}\left[2,\;\mathbb{e}^{2\,\mathbb{i}\left(-\mathrm{ArcTan}[2+\mathbb{i}] + \mathrm{ArcTan}\left[1 + \sqrt{2}\,\sqrt{c\,x^2}\,\right]\right)}\right] - $$

$$5\,\mathrm{PolyLog}\left[2,\;\mathbb{e}^{2\,\mathbb{i}\,\mathrm{ArcTan}\left[1 + \sqrt{2}\,\sqrt{c\,x^2}\,\right] - 2\,\mathrm{ArcTanh}[1+2\,\mathbb{i}]}\right]\right)$$

$$\left(3 + 2\,\mathrm{Cos}\left[2\,\mathrm{ArcTan}\left[1 + \sqrt{2}\,\sqrt{c\,x^2}\,\right]\right] - 2\,\mathrm{Sin}\left[2\,\mathrm{ArcTan}\left[1 + \sqrt{2}\,\sqrt{c\,x^2}\,\right]\right]\right)\Bigg/$$

$$20 \sqrt{2} \left(-1 - c\,x^2 + \sqrt{2} \sqrt{c\,x^2} \right) \left(1 + c\,x^2 + \sqrt{2} \sqrt{c\,x^2} \right)$$

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

$$\frac{1}{-1 - c\,x^2 + \sqrt{2} \sqrt{c\,x^2}} \left(\frac{1}{20} + \frac{i}{20} \right) e^{-i\,\text{ArcTan}[2+i] - \text{ArcTanh}[1+2\,i]} \left(1 + c\,x^2 + \sqrt{2} \sqrt{c\,x^2} \right)$$

$$\left(5 + 5\,i \right) e^{i\,\text{ArcTan}[2+i] + \text{ArcTanh}[1+2\,i]} \pi\,\text{ArcTan}\left[1 + \sqrt{2} \sqrt{c\,x^2} \right] + 10\,i$$

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

$\sqrt{1-i}\; e^{i\,\text{ArcTan}[2+i]}\,\text{ArcTan}\left[1 + \sqrt{2} \sqrt{c\,x^2} \right]^2 + \left(4 - 2\,i \right) \sqrt{1+i}$

$e^{\text{ArcTanh}[1+2\,i]}\,\text{ArcTan}\left[1 + \sqrt{2} \sqrt{c\,x^2} \right]^2 - \left(8 - 8\,i \right) e^{i\,\text{ArcTan}[2+i] + \text{ArcTanh}[1+2\,i]}$

$\text{ArcTan}\left[1 + \sqrt{2} \sqrt{c\,x^2} \right]^2 - 10\,i\; e^{i\,\text{ArcTan}[2+i] + \text{ArcTanh}[1+2\,i]}$

$\text{ArcTan}\left[1 + \sqrt{2} \sqrt{c\,x^2} \right]\,\text{ArcTanh}[1+2\,i] + \left(5 - 5\,i \right) e^{i\,\text{ArcTan}[2+i] + \text{ArcTanh}[1+2\,i]}$

$\pi\,\text{Log}\left[1 + e^{-2\,i\,\text{ArcTan}\left[1 + \sqrt{2} \sqrt{c\,x^2} \right]} \right] - 10\,e^{i\,\text{ArcTan}[2+i] + \text{ArcTanh}[1+2\,i]}\,\text{ArcTan}[2+i]$

$\text{Log}\left[1 - e^{2\,i\,\left(-\text{ArcTan}[2+i] + \text{ArcTan}\left[1 + \sqrt{2} \sqrt{c\,x^2} \right] \right)} \right] + 10\,e^{i\,\text{ArcTan}[2+i] + \text{ArcTanh}[1+2\,i]}$

$\text{ArcTan}\left[1 + \sqrt{2} \sqrt{c\,x^2} \right]\,\text{Log}\left[1 - e^{2\,i\,\left(-\text{ArcTan}[2+i] + \text{ArcTan}\left[1 + \sqrt{2} \sqrt{c\,x^2} \right] \right)} \right] - 10$

$i\; e^{i\,\text{ArcTan}[2+i] + \text{ArcTanh}[1+2\,i]}\,\text{ArcTan}\left[1 + \sqrt{2} \sqrt{c\,x^2} \right]$

$\text{Log}\left[1 - e^{2\,i\,\text{ArcTan}\left[1 + \sqrt{2} \sqrt{c\,x^2} \right] - 2\,\text{ArcTanh}[1+2\,i]} \right] + 10\,e^{i\,\text{ArcTan}[2+i] + \text{ArcTanh}[1+2\,i]}$

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

$e^{i\,\text{ArcTan}[2+i] + \text{ArcTanh}[1+2\,i]}\,\pi\,\text{Log}\left[\dfrac{1}{\sqrt{1 + \left(1 + \sqrt{2} \sqrt{c\,x^2} \right)^2}} \right] + 10$

$e^{i\,\text{ArcTan}[2+i] + \text{ArcTanh}[1+2\,i]}\,\text{ArcTan}[2+i]$

$\text{Log}\left[-\text{Sin}\left[\text{ArcTan}[2+i] - \text{ArcTan}\left[1 + \sqrt{2} \sqrt{c\,x^2} \right] \right] \right] - 10\,e^{i\,\text{ArcTan}[2+i] + \text{ArcTanh}[1+2\,i]}$

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

$i\; e^{i\,\text{ArcTan}[2+i] + \text{ArcTanh}[1+2\,i]}\,\text{PolyLog}\left[2,\; e^{2\,i\,\left(-\text{ArcTan}[2+i] + \text{ArcTan}\left[1 + \sqrt{2} \sqrt{c\,x^2} \right] \right)} \right] \right] - 5$

$$e^{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}\,PolyLog\left[2,\,e^{2\,i\,ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]-2\,ArcTanh[1+2\,i]}\right]$$

$$\left(3+2\,Cos\left[2\,ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]\right]-2\,Sin\left[2\,ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]\right]\right)-$$

$$\left(\left(\frac{1}{40}+\frac{i}{40}\right)c\,e^{-i\,ArcTan[2+i]-ArcTanh[1+2\,i]}\,x^2\left(1+\left(1+\sqrt{2}\,\sqrt{c\,x^2}\right)^2\right)\right.$$

$$\left(5+5\,i\right)e^{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}\,\pi\,ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]+$$

$$10\,e^{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}\,ArcTan[2+i]\,ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]+$$

$$\left(4+2\,i\right)\sqrt{1-i}\,e^{i\,ArcTan[2+i]}\,ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]^2-$$

$$\left(2+4\,i\right)\sqrt{1+i}\,e^{ArcTanh[1+2\,i]}\,ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]^2+$$

$$\left(4-4\,i\right)e^{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}\,ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]^2+$$

$$10\,e^{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}\,ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]\,ArcTanh[1+2\,i]+$$

$$\left(5-5\,i\right)e^{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}\,\pi\,Log\left[1+e^{-2\,i\,ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]}\right]+$$

$$10\,i\,e^{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}\,ArcTan[2+i]$$

$$Log\left[1-e^{2\,i\left(-ArcTan[2+i]+ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]\right)}\right]-10\,i\,e^{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}$$

$$ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]\,Log\left[1-e^{2\,i\left(-ArcTan[2+i]+ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]\right)}\right]+$$

$$10\,e^{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}\,ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]$$

$$Log\left[1-e^{2\,i\,ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]-2\,ArcTanh[1+2\,i]}\right]+10\,i\,e^{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}$$

$$ArcTanh[1+2\,i]\,Log\left[1-e^{2\,i\,ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]-2\,ArcTanh[1+2\,i]}\right]-$$

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

$$10\,i\,e^{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}\,ArcTan[2+i]\,Log\left[$$

$$-Sin\left[ArcTan[2+i]-ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]\right]\right]-10\,i\,e^{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}$$

$$ArcTanh[1+2\,i]\,Log\left[Sin\left[ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]+i\,ArcTanh[1+2\,i]\right]\right]-$$

$$5\,e^{i\,ArcTan[2+i]+ArcTanh[1+2\,i]}\,PolyLog\left[2,\,e^{2\,i\left(-ArcTan[2+i]+ArcTan\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right]\right)}\right]-$$

$$5 \, \mathfrak{i} \, e^{\mathfrak{i} \, \text{ArcTan}[2+\mathfrak{i}] + \text{ArcTanh}[1+2\,\mathfrak{i}]} \, \text{PolyLog}\left[2, \, e^{2\,\mathfrak{i}\,\text{ArcTan}\left[1+\sqrt{2}\,\sqrt{c\,x^2}\right] - 2\,\text{ArcTanh}[1+2\,\mathfrak{i}]}\right]$$

$$\left(3 + 2\,\text{Cos}\left[2\,\text{ArcTan}\left[1 + \sqrt{2}\,\sqrt{c\,x^2}\right]\right] - 2\,\text{Sin}\left[2\,\text{ArcTan}\left[1 + \sqrt{2}\,\sqrt{c\,x^2}\right]\right]\right) \Big/$$

$$\left(\left(-1 - c\,x^2 + \sqrt{2}\,\sqrt{c\,x^2}\right)\left(1 + c\,x^2 + \sqrt{2}\,\sqrt{c\,x^2}\right)\right)$$

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

Problem 83: Attempted integration timed out after 120 seconds.

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

Optimal (type 4, 1164 leaves, 47 steps):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 1, 1 leaves) :

???

Problem 84: Unable to integrate problem.

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

Optimal (type 4, 1360 leaves, 64 steps) :

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

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

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

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

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

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

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

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

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

$$\frac{1}{3}\,(-1)^{1/4}\,b^2\,c^{3/2}\,\text{ArcTanh}\big[\,(-1)^{3/4}\,\sqrt{c}\;x\,\big]\,\text{Log}\Big[\,\frac{(1+\mathbb{i})\,\big(1+(-1)^{1/4}\,\sqrt{c}\;x\big)}{1+(-1)^{3/4}\,\sqrt{c}\;x}\,\Big] +$$

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

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

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

$$\frac{\big(2\,a+\mathbb{i}\,b\,\text{Log}\big[1-\mathbb{i}\,c\,x^2\big]\big)^2}{12\,x^3} + \frac{\mathbb{i}\,a\,b\,\text{Log}\big[1+\mathbb{i}\,c\,x^2\big]}{3\,x^3} + \frac{2\,\mathbb{i}\,b^2\,c\,\text{Log}\big[1+\mathbb{i}\,c\,x^2\big]}{3\,x} -$$

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

$$\frac{1}{3}\,(-1)^{1/4}\,b^2\,c^{3/2}\,\text{ArcTanh}\big[\,(-1)^{3/4}\,\sqrt{c}\;x\,\big]\,\text{Log}\big[1+\mathbb{i}\,c\,x^2\big] - \frac{b^2\,\text{Log}\big[1-\mathbb{i}\,c\,x^2\big]\,\text{Log}\big[1+\mathbb{i}\,c\,x^2\big]}{6\,x^3} +$$

$$\frac{b^2\,\text{Log}\big[1+\mathbb{i}\,c\,x^2\big]^2}{12\,x^3} + \frac{1}{3}\,(-1)^{3/4}\,b^2\,c^{3/2}\,\text{PolyLog}\Big[2,\,1-\frac{2}{1-(-1)^{1/4}\,\sqrt{c}\;x}\Big] +$$

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

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

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

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

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

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

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

Result (type 8, 18 leaves) :

$$\int \frac{\left(a + b\,\text{ArcTan}\!\left[c\,x^2\right]\right)^2}{x^4}\ \mathbb{d}x$$

Problem 85: Unable to integrate problem.

$$\int \frac{\left(a + b\,\text{ArcTan}\!\left[c\,x^2\right]\right)^2}{x^6}\ \mathbb{d}x$$

Optimal (type 4, 1444 leaves, 77 steps) :

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

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

$$\frac{4}{15}\,(-1)^{3/4}\,b^2\,c^{5/2}\,\text{ArcTanh}\!\left[(-1)^{3/4}\,\sqrt{c}\ x\right] + \frac{1}{5}\,(-1)^{3/4}\,b^2\,c^{5/2}\,\text{ArcTanh}\!\left[(-1)^{3/4}\,\sqrt{c}\ x\right]^2 +$$

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

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

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

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

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

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

$$\frac{1}{5}\,(-1)^{3/4}\,b^2\,c^{5/2}\,\text{ArcTanh}\big[(-1)^{3/4}\,\sqrt{c}\;x\big]\,\text{Log}\Big[\frac{\big(1+\mathbb{i}\big)\,\big(1+(-1)^{1/4}\,\sqrt{c}\;x\big)}{1+(-1)^{3/4}\,\sqrt{c}\;x}\Big]+$$

$$\frac{1}{5}\,(-1)^{3/4}\,b^2\,c^{5/2}\,\text{ArcTan}\big[(-1)^{3/4}\,\sqrt{c}\;x\big]\,\text{Log}\Big[\frac{\big(1-\mathbb{i}\big)\,\big(1+(-1)^{3/4}\,\sqrt{c}\;x\big)}{1+(-1)^{1/4}\,\sqrt{c}\;x}\Big]-\frac{\mathbb{i}\,b^2\,c\,\text{Log}\big[1-\mathbb{i}\,c\,x^2\big]}{15\,x^3}-$$

$$\frac{b^2\,c^2\,\text{Log}\big[1-\mathbb{i}\,c\,x^2\big]}{5\,x}+\frac{1}{5}\,(-1)^{3/4}\,b^2\,c^{5/2}\,\text{ArcTanh}\big[(-1)^{3/4}\,\sqrt{c}\;x\big]\,\text{Log}\big[1-\mathbb{i}\,c\,x^2\big]-$$

$$\frac{b\,c\,\big(2\,a+\mathbb{i}\,b\,\text{Log}\big[1-\mathbb{i}\,c\,x^2\big]\big)}{15\,x^3}-\frac{\mathbb{i}\,b\,c^2\,\big(2\,a+\mathbb{i}\,b\,\text{Log}\big[1-\mathbb{i}\,c\,x^2\big]\big)}{5\,x}+$$

$$\frac{1}{5}\,(-1)^{1/4}\,b\,c^{5/2}\,\text{ArcTan}\big[(-1)^{3/4}\,\sqrt{c}\;x\big]\,\big(2\,a+\mathbb{i}\,b\,\text{Log}\big[1-\mathbb{i}\,c\,x^2\big]\big)-$$

$$\frac{\big(2\,a+\mathbb{i}\,b\,\text{Log}\big[1-\mathbb{i}\,c\,x^2\big]\big)^2}{20\,x^5}+\frac{\mathbb{i}\,a\,b\,\text{Log}\big[1+\mathbb{i}\,c\,x^2\big]}{5\,x^5}+\frac{2\,\mathbb{i}\,b^2\,c\,\text{Log}\big[1+\mathbb{i}\,c\,x^2\big]}{15\,x^3}-$$

$$\frac{1}{5}\,(-1)^{3/4}\,b^2\,c^{5/2}\,\text{ArcTan}\big[(-1)^{3/4}\,\sqrt{c}\;x\big]\,\text{Log}\big[1+\mathbb{i}\,c\,x^2\big]-$$

$$\frac{1}{5}\,(-1)^{3/4}\,b^2\,c^{5/2}\,\text{ArcTanh}\big[(-1)^{3/4}\,\sqrt{c}\;x\big]\,\text{Log}\big[1+\mathbb{i}\,c\,x^2\big]-\frac{b^2\,\text{Log}\big[1-\mathbb{i}\,c\,x^2\big]\,\text{Log}\big[1+\mathbb{i}\,c\,x^2\big]}{10\,x^5}+$$

$$\frac{b^2\,\text{Log}\big[1+\mathbb{i}\,c\,x^2\big]^2}{20\,x^5}-\frac{1}{5}\,(-1)^{1/4}\,b^2\,c^{5/2}\,\text{PolyLog}\Big[2,\,1-\frac{2}{1-(-1)^{1/4}\,\sqrt{c}\;x}\Big]-$$

$$\frac{1}{5}\,(-1)^{1/4}\,b^2\,c^{5/2}\,\text{PolyLog}\Big[2,\,1-\frac{2}{1+(-1)^{1/4}\,\sqrt{c}\;x}\Big]+$$

$$\frac{1}{10}\,(-1)^{1/4}\,b^2\,c^{5/2}\,\text{PolyLog}\Big[2,\,1-\frac{\sqrt{2}\,\big((-1)^{1/4}+\sqrt{c}\;x\big)}{1+(-1)^{1/4}\,\sqrt{c}\;x}\Big]-$$

$$\frac{1}{5}\,(-1)^{3/4}\,b^2\,c^{5/2}\,\text{PolyLog}\Big[2,\,1-\frac{2}{1-(-1)^{3/4}\,\sqrt{c}\;x}\Big]-$$

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

$$\frac{1}{10}\,(-1)^{3/4}\,b^2\,c^{5/2}\,\text{PolyLog}\Big[2,\,1+\frac{\sqrt{2}\,\big((-1)^{3/4}+\sqrt{c}\;x\big)}{1+(-1)^{3/4}\,\sqrt{c}\;x}\Big]+$$

$$\frac{1}{10}\,(-1)^{3/4}\,b^2\,c^{5/2}\,\text{PolyLog}\Big[2,\,1-\frac{\big(1+\mathbb{i}\big)\,\big(1+(-1)^{1/4}\,\sqrt{c}\;x\big)}{1+(-1)^{3/4}\,\sqrt{c}\;x}\Big]+$$

$$\frac{1}{10}\,(-1)^{1/4}\,b^2\,c^{5/2}\,\text{PolyLog}\!\left[2,\,1-\frac{(1-i)\,\left(1+(-1)^{3/4}\,\sqrt{c}\;x\right)}{1+(-1)^{1/4}\,\sqrt{c}\;x}\right]$$

Result (type 8, 18 leaves):

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

Problem 166: Result unnecessarily involves higher level functions.

$$\int \frac{\text{ArcTan}\!\left[a\,x^n\right]}{x}\,dx$$
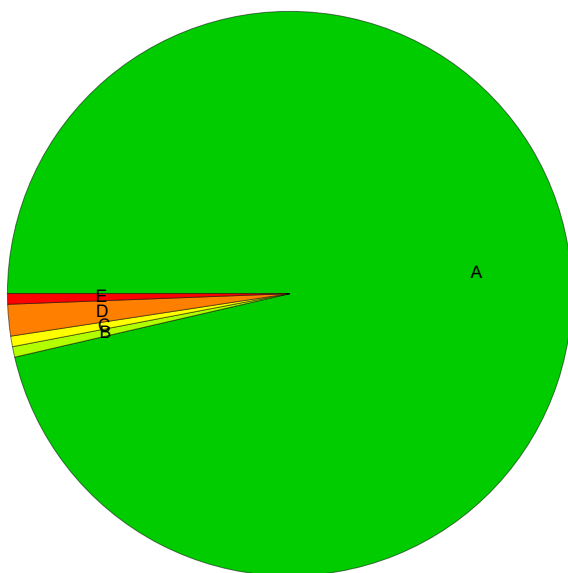
Optimal (type 4, 39 leaves, 4 steps):

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

Result (type 5, 34 leaves):

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

Summary of Integration Test Results

166 integration problems

A - 160 optimal antiderivatives

B - 1 more than twice size of optimal antiderivatives

C - 1 unnecessarily complex antiderivatives

D - 3 unable to integrate problems

E - 1 integration timeouts