Mathematica 11.3 Integration Test Results

on the problems in the test-suite directory "5 Inverse trig functions\5.4 Inverse cotangent"

Test results for the 234 problems in "5.4.1 Inverse cotangent functions.m"

Problem 46: Result more than twice size of optimal antiderivative.

$$\int \frac{x^2 \text{ArcCot}[c\, x]}{1+x^2} \, dx$$

Optimal (type 4, 206 leaves, 28 steps):

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

Result (type 4, 626 leaves):

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

$$\frac{1}{4}\sqrt{-c^2}\left(2\,\text{ArcCos}\left[\frac{1+c^2}{-1+c^2}\right]\text{ArcTanh}\left[\frac{\sqrt{-c^2}}{c\,x}\right]-4\,\text{ArcCot}[c\,x]\,\text{ArcTanh}\left[\frac{c\,x}{\sqrt{-c^2}}\right]-\left(\text{ArcCos}\left[\frac{1+c^2}{-1+c^2}\right]-2\,i\,\text{ArcTanh}\left[\frac{\sqrt{-c^2}}{c\,x}\right]\right)\right.$$

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

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

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

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

Problem 48: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{ArcCot}[c\,x]}{1+x^2}\,dx$$

Optimal (type 4, 183 leaves, 25 steps):

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

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

Result (type 4, 592 leaves):

$$\frac{1}{4\sqrt{-c^2}} c \left(2 \text{ArcCos}\left[\frac{1+c^2}{-1+c^2}\right] \text{ArcTanh}\left[\frac{\sqrt{-c^2}}{c x}\right] - 4 \text{ArcCot}[c x] \text{ArcTanh}\left[\frac{c x}{\sqrt{-c^2}}\right] - \left(\text{ArcCos}\left[\frac{1+c^2}{-1+c^2}\right] - 2 i \text{ArcTanh}\left[\frac{\sqrt{-c^2}}{c x}\right]\right) \right.$$

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

$$\left(\text{ArcCos}\left[\frac{1+c^2}{-1+c^2}\right] - 2 i \text{ArcTanh}\left[\frac{\sqrt{-c^2}}{c x}\right] + 2 i \text{ArcTanh}\left[\frac{c x}{\sqrt{-c^2}}\right]\right) \text{Log}\left[\frac{\sqrt{2} \sqrt{-c^2} e^{-i \text{ArcCot}[c x]}}{\sqrt{-1+c^2} \sqrt{-1-c^2+\left(-1+c^2\right) \text{Cos}[2 \text{ArcCot}[c x]]}}\right] +$$

$$\left(\text{ArcCos}\left[\frac{1+c^2}{-1+c^2}\right] + 2 i \text{ArcTanh}\left[\frac{\sqrt{-c^2}}{c x}\right] - 2 i \text{ArcTanh}\left[\frac{c x}{\sqrt{-c^2}}\right]\right) \text{Log}\left[\frac{\sqrt{2} \sqrt{-c^2} e^{i \text{ArcCot}[c x]}}{\sqrt{-1+c^2} \sqrt{-1-c^2+\left(-1+c^2\right) \text{Cos}[2 \text{ArcCot}[c x]]}}\right] +$$

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

Problem 50: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{ArcCot}[c x]}{x^2 \left(1+x^2\right)} \, dx$$

Optimal (type 4, 212 leaves, 31 steps) :

$$-\frac{\text{ArcCot}[c x]}{x} - \frac{1}{2} i \text{ArcTan}[x] \text{Log}\left[1 - \frac{i}{c x}\right] + \frac{1}{2} i \text{ArcTan}[x] \text{Log}\left[1 + \frac{i}{c x}\right] - c \text{Log}[x] + \frac{1}{2} i \text{ArcTan}[x] \text{Log}\left[-\frac{2 i \left(i - c x\right)}{\left(1-c\right) \left(1 - i x\right)}\right] -$$

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

Result (type 4, 619 leaves) :

$$-\frac{\text{ArcCot}[c\,x]}{x}-c\,\text{Log}\left[\frac{1}{\sqrt{1+\frac{1}{c^2 x^2}}}\right]-$$

$$\frac{1}{4\sqrt{-c^2}}c\left(2\,\text{ArcCos}\left[\frac{1+c^2}{-1+c^2}\right]\text{ArcTanh}\left[\frac{\sqrt{-c^2}}{c\,x}\right]-4\,\text{ArcCot}[c\,x]\,\text{ArcTanh}\left[\frac{c\,x}{\sqrt{-c^2}}\right]-\left(\text{ArcCos}\left[\frac{1+c^2}{-1+c^2}\right]-2\,i\,\text{ArcTanh}\left[\frac{\sqrt{-c^2}}{c\,x}\right]\right)\right.$$

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

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

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

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

Problem 61: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 3, 66 leaves, 5 steps):

$$\frac{x\,\text{ArcCot}[a\,x]}{c\sqrt{c+d\,x^2}}-\frac{\text{ArcTanh}\left[\frac{a\sqrt{c+d\,x^2}}{\sqrt{a^2 c-d}}\right]}{c\sqrt{a^2 c-d}}$$

Result (type 3, 169 leaves):

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

Problem 62: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 3, 134 leaves, 7 steps):

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

Result (type 3, 262 leaves):

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

Problem 63: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{ArcCot}[a\,x]}{\left(c+d\,x^2\right)^{7/2}}\,dx$$

Optimal (type 3, 208 leaves, 8 steps):

$$\frac{a}{15\,c\,\left(a^2\,c-d\right)\,\left(c+d\,x^2\right)^{3/2}}+\frac{a\,\left(7\,a^2\,c-4\,d\right)}{15\,c^2\,\left(a^2\,c-d\right)^2\,\sqrt{c+d\,x^2}}+\frac{x\,\text{ArcCot}[a\,x]}{5\,c\,\left(c+d\,x^2\right)^{5/2}}+\frac{4\,x\,\text{ArcCot}[a\,x]}{15\,c^2\,\left(c+d\,x^2\right)^{3/2}}+\frac{8\,x\,\text{ArcCot}[a\,x]}{15\,c^3\,\sqrt{c+d\,x^2}}-\frac{\left(15\,a^4\,c^2-20\,a^2\,c\,d+8\,d^2\right)\,\text{ArcTanh}\left[\frac{a\,\sqrt{c+d\,x^2}}{\sqrt{a^2\,c-d}}\right]}{15\,c^3\,\left(a^2\,c-d\right)^{5/2}}$$

Result (type 3, 345 leaves):

$$-\frac{1}{30 c^3}\left(-\frac{2 a c \left(-d \left(5 c+4 d x^2\right)+a^2 c \left(8 c+7 d x^2\right)\right)}{\left(-a^2 c+d\right)^2 \left(c+d x^2\right)^{3/2}}-\frac{2 x \left(15 c^2+20 c d x^2+8 d^2 x^4\right) \text{ArcCot}[a x]}{\left(c+d x^2\right)^{5/2}}+\frac{\left(15 a^4 c^2-20 a^2 c d+8 d^2\right) \text{Log}\left[\frac{60 a c^3 \left(a^2 c-d\right)^{3/2} \left(a c-i d x+\sqrt{a^2 c-d} \sqrt{c+d x^2}\right)}{\left(15 a^4 c^2-20 a^2 c d+8 d^2\right) (i+a x)}\right]}{\left(a^2 c-d\right)^{5/2}}+\frac{\left(15 a^4 c^2-20 a^2 c d+8 d^2\right) \text{Log}\left[\frac{60 a c^3 \left(a^2 c-d\right)^{3/2} \left(a c+i d x+\sqrt{a^2 c-d} \sqrt{c+d x^2}\right)}{\left(15 a^4 c^2-20 a^2 c d+8 d^2\right) (-i+a x)}\right]}{\left(a^2 c-d\right)^{5/2}}\right)$$

Problem 64: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{ArcCot}[a x]}{\left(c+d x^2\right)^{9/2}} \, dx$$

Optimal (type 3, 293 leaves, 8 steps):

$$\frac{a}{35 c \left(a^2 c-d\right) \left(c+d x^2\right)^{5/2}}+\frac{a \left(11 a^2 c-6 d\right)}{105 c^2 \left(a^2 c-d\right)^2 \left(c+d x^2\right)^{3/2}}+\frac{a \left(19 a^4 c^2-22 a^2 c d+8 d^2\right)}{35 c^3 \left(a^2 c-d\right)^3 \sqrt{c+d x^2}}+\frac{x \text{ArcCot}[a x]}{7 c \left(c+d x^2\right)^{7/2}}+\frac{6 x \text{ArcCot}[a x]}{35 c^2 \left(c+d x^2\right)^{5/2}}+\frac{8 x \text{ArcCot}[a x]}{35 c^3 \left(c+d x^2\right)^{3/2}}+\frac{16 x \text{ArcCot}[a x]}{35 c^4 \sqrt{c+d x^2}}-\frac{\left(35 a^6 c^3-70 a^4 c^2 d+56 a^2 c d^2-16 d^3\right) \text{ArcTanh}\left[\frac{a \sqrt{c+d x^2}}{\sqrt{a^2 c-d}}\right]}{35 c^4 \left(a^2 c-d\right)^{7/2}}$$

Result (type 3, 450 leaves):

$$\frac{1}{210 c^4}\left(\frac{2 a c \left(3 c^2 \left(-a^2 c+d\right)^2+c \left(11 a^2 c-6 d\right) \left(a^2 c-d\right) \left(c+d x^2\right)+3 \left(19 a^4 c^2-22 a^2 c d+8 d^2\right) \left(c+d x^2\right)^2\right)}{\left(a^2 c-d\right)^3 \left(c+d x^2\right)^{5/2}}+\frac{6 x \left(35 c^3+70 c^2 d x^2+56 c d^2 x^4+16 d^3 x^6\right) \text{ArcCot}[a x]}{\left(c+d x^2\right)^{7/2}}-\frac{3 \left(35 a^6 c^3-70 a^4 c^2 d+56 a^2 c d^2-16 d^3\right) \text{Log}\left[\frac{140 a c^4 \left(a^2 c-d\right)^{5/2} \left(a c-i d x+\sqrt{a^2 c-d} \sqrt{c+d x^2}\right)}{\left(35 a^6 c^3-70 a^4 c^2 d+56 a^2 c d^2-16 d^3\right) (i+a x)}\right]}{\left(a^2 c-d\right)^{7/2}}-\frac{3 \left(35 a^6 c^3-70 a^4 c^2 d+56 a^2 c d^2-16 d^3\right) \text{Log}\left[\frac{140 a c^4 \left(a^2 c-d\right)^{5/2} \left(a c+i d x+\sqrt{a^2 c-d} \sqrt{c+d x^2}\right)}{\left(35 a^6 c^3-70 a^4 c^2 d+56 a^2 c d^2-16 d^3\right) (-i+a x)}\right]}{\left(a^2 c-d\right)^{7/2}}\right)$$

Problem 97: Result unnecessarily involves higher level functions.

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

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

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

Result (type 5, 52 leaves):

$$-\frac{a\,x^n\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{2},\frac{1}{2},1\right\},\left\{\frac{3}{2},\frac{3}{2}\right\},-a^2\,x^{2\,n}\right]}{n}+\left(\text{ArcCot}\left[a\,x^n\right]+\text{ArcTan}\left[a\,x^n\right]\right)\,\text{Log}[x]$$

Problem 103: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{ArcCot}[a+b\,x]}{x}\,dx$$

Optimal (type 4, 120 leaves, 5 steps):

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

Result (type 4, 256 leaves):

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

Problem 107: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 642 leaves, 15 steps):

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

Result (type 4, 1530 leaves):

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

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

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

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

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

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

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

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

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

Problem 108: Result more than twice size of optimal antiderivative.

$$\int\frac{\mathrm{ArcCot}[a+b\,x]}{c+d\,x}\,dx$$

Optimal (type 4, 152 leaves, 5 steps):

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

Result (type 4, 325 leaves):

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

Problem 110: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 735 leaves, 57 steps):

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

Result (type 4, 16412 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\left.\left.\left.\mathrm{Sin}\left[\mathrm{ArcTan}\left[\frac{a\ c-\frac{a^2\ c+b^2\ d}{a+b\ x}}{b\sqrt{c}\ \sqrt{d}}\right]-\mathrm{i}\ \mathrm{ArcTanh}\left[\frac{-\mathrm{i}\ a\ c+a^2\ c+b^2\ d}{b\sqrt{c}\ \sqrt{d}}\right]\right]\right]\right)-\mathrm{PolyLog}\left[2,\ e^{2\left(\mathrm{i}\ \mathrm{ArcTan}\left[\frac{a\ c-\frac{a^2\ c+b^2\ d}{a+b\ x}}{b\sqrt{c}\ \sqrt{d}}\right]+\mathrm{ArcTanh}\left[\frac{-\mathrm{i}\ a\ c+a^2\ c+b^2\ d}{b\sqrt{c}\ \sqrt{d}}\right]\right)}\right]\right)\right)+$$

$$\frac{1}{4\ b^2\ d\left(-\mathrm{i}\ a\ c+a^2\ c+b^2\ d\right)\sqrt{1-\frac{\left(-\mathrm{i}\ a\ c+a^2\ c+b^2\ d\right)^2}{b^2\ c\ d}}}\ a^6\ c^2\left(e^{\mathrm{ArcTanh}\left[\frac{-\mathrm{i}\ a\ c+a^2\ c+b^2\ d}{b\sqrt{c}\ \sqrt{d}}\right]}\ \mathrm{ArcTan}\left[\frac{a\ c-\frac{a^2\ c+b^2\ d}{a+b\ x}}{b\sqrt{c}\ \sqrt{d}}\right]^2-\right.$$

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

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

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

$$\text{Sin}\Big[\text{ArcTan}\Big[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\Big]-i\,\text{ArcTanh}\Big[\frac{-i\,a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\Big]\Big]\Big]\Bigg)-\text{PolyLog}\Big[2,\,e^{2\left(i\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTanh}\left[\frac{-i\,a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\Big]\Bigg)\Bigg)-$$

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

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

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

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

$$\text{Sin}\Big[\text{ArcTan}\Big[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\Big]-\mathbb{i}\,\text{ArcTanh}\Big[\frac{-\mathbb{i}\,a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\Big]\Big]\Big]\Big]\Big)-\text{PolyLog}\Big[2,\,e^{2\left(\mathbb{i}\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTanh}\left[\frac{-\mathbb{i}\,a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\Big]\Big)\Big)-$$

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

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

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

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

$$\text{Sin}\Big[\text{ArcTan}\Big[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\Big]-\mathbb{i}\,\text{ArcTanh}\Big[\frac{-\mathbb{i}\,a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\Big]\Big]\Big]\Big]\Big)-\text{PolyLog}\Big[2,\,e^{2\left(\mathbb{i}\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]+\text{ArcTanh}\left[\frac{-\mathbb{i}\,a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]\right)}\Big]\Big)\Big)+$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\frac{1}{\left(i a c+a^2 c+b^2 d\right) \sqrt{-\frac{-b^2 c d+\left(i a c+a^2 c+b^2 d\right)^2}{b^2 c d}}} i a^3 c \left(e^{-\text{ArcTanh}\left[\frac{i a c+a^2 c+b^2 d}{b \sqrt{c} \sqrt{d}}\right]} \text{ArcTan}\left[\frac{a c-\frac{a^2 c+b^2 d}{a+b x}}{b \sqrt{c} \sqrt{d}}\right]^2+\frac{1}{b \sqrt{c} \sqrt{d} \sqrt{1-\frac{\left(i a c+a^2 c+b^2 d\right)^2}{b^2 c d}}}\right.$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\frac{1}{2\,b^2 d\left(\mathrm{i}\,a\,c+a^2 c+b^2 d\right)\sqrt{-\frac{-b^2 c\,d+\left(\mathrm{i}\,a\,c+a^2 c+b^2 d\right)^2}{b^2 c\,d}}}\,\mathrm{i}\,a^5 c^2\left(e^{-\operatorname{ArcTanh}\left[\frac{\mathrm{i}\,a\,c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\right]}\operatorname{ArcTan}\left[\frac{a\,c-\frac{a^2 c+b^2 d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]^2+\right.$$

$$\frac{1}{b\sqrt{c}\,\sqrt{d}\sqrt{1-\frac{\left(\mathrm{i}\,a\,c+a^2 c+b^2 d\right)^2}{b^2 c\,d}}}\,\mathrm{i}\left(\mathrm{i}\,a\,c+a^2 c+b^2 d\right)\left(\mathrm{i}\operatorname{ArcTan}\left[\frac{a\,c-\frac{a^2 c+b^2 d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\left(-\pi+2\,\mathrm{i}\operatorname{ArcTanh}\left[\frac{\mathrm{i}\,a\,c+a^2 c+b^2 d}{b\sqrt{c}\,\sqrt{d}}\right]\right)-\right.$$

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

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

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

$$\frac{1}{4\,b^2\,d\,\left(\mathrm{i}\,a\,c+a^2\,c+b^2\,d\right)\sqrt{-\frac{-b^2\,c\,d+\left(\mathrm{i}\,a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\,a^6\,c^2\left(\mathrm{e}^{-\text{ArcTanh}\left[\frac{\mathrm{i}\,a\,c+a^2\,c+b^2\,d}{b\,\sqrt{c}\,\sqrt{d}}\right]}\,\text{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\,\sqrt{c}\,\sqrt{d}}\right]^2+\right.$$

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

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

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

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

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

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

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

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

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

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

$$\frac{1}{b\sqrt{c}\,\sqrt{d}\,\sqrt{1-\frac{\left(i\,a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\,i\,\left(i\,a\,c+a^2\,c+b^2\,d\right)\left(i\,\mathrm{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\left(-\pi+2\,i\,\mathrm{ArcTanh}\left[\frac{i\,a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]\right)-\right.$$

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

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

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

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

$$\frac{1}{b\sqrt{c}\,\sqrt{d}\,\sqrt{1-\frac{\left(i\,a\,c+a^2\,c+b^2\,d\right)^2}{b^2\,c\,d}}}\,i\,\left(i\,a\,c+a^2\,c+b^2\,d\right)\left(i\,\mathrm{ArcTan}\left[\frac{a\,c-\frac{a^2\,c+b^2\,d}{a+b\,x}}{b\sqrt{c}\,\sqrt{d}}\right]\left(-\pi+2\,i\,\mathrm{ArcTanh}\left[\frac{i\,a\,c+a^2\,c+b^2\,d}{b\sqrt{c}\,\sqrt{d}}\right]\right)-\right.$$

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

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

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

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

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

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

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

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

Problem 111: Result is not expressed in closed-form.

$$\int\frac{\text{ArcCot}[a+b\,x]}{c+d\sqrt{x}}\,dx$$

Optimal (type 4, 693 leaves, 55 steps):

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

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

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

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

Result (type 7, 313 leaves):

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

$$d\left(\frac{4\left(1+i\,a\right)\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{x}}{\sqrt{-i+a}}\right]}{\sqrt{-i+a}}+\frac{4\left(1-i\,a\right)\text{ArcTan}\left[\frac{\sqrt{b}\,\sqrt{x}}{\sqrt{i+a}}\right]}{\sqrt{i+a}}-\sqrt{b}\;c\,d\,\text{RootSum}\Big[b^2 c^4+2\,a\,b\,c^2 d^2+d^4+a^2 d^4-4\,b^2 c^3\,\#1-4\,a\,b\,c\,d^2\,\#1+\right.$$

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

Problem 112: Unable to integrate problem.

$$\int \frac{\text{ArcCot}[a+b\,x]}{c+\frac{d}{\sqrt{x}}}\,dx$$

Optimal (type 4, 830 leaves, 65 steps):

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

Result (type 8, 20 leaves):

$$\int \frac{\text{ArcCot}[a+b\,x]}{c+\frac{d}{\sqrt{x}}}\,dx$$

Problem 113: Attempted integration timed out after 120 seconds.

$$\int \frac{\text{ArcCot}[d+e\,x]}{a+b\,x+c\,x^2}\,dx$$

Optimal (type 4, 367 leaves, 12 steps):

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

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

Result (type 1, 1 leaves):

???

Problem 126: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{ArcCot}[1+x]}{2+2 x} \, dx$$

Optimal (type 4, 35 leaves, 5 steps):

$$-\frac{1}{4} i \text{PolyLog}\left[2, -\frac{i}{1+x}\right]+\frac{1}{4} i \text{PolyLog}\left[2, \frac{i}{1+x}\right]$$

Result (type 4, 157 leaves):

$$\frac{1}{16} \left(i \pi^2-4 i \pi \text{ArcTan}[1+x]+8 i \text{ArcTan}[1+x]^2+\pi \text{Log}[16]-4 \pi \text{Log}\left[1+e^{-2 i \text{ArcTan}[1+x]}\right]+\right.$$
$$8 \text{ArcTan}[1+x] \text{Log}\left[1+e^{-2 i \text{ArcTan}[1+x]}\right]-8 \text{ArcTan}[1+x] \text{Log}\left[1-e^{2 i \text{ArcTan}[1+x]}\right]+8 \text{ArcCot}[1+x] \text{Log}[1+x]+$$
$$\left.8 \text{ArcTan}[1+x] \text{Log}[1+x]-2 \pi \text{Log}\left[2+2 x+x^2\right]+4 i \text{PolyLog}\left[2, -e^{-2 i \text{ArcTan}[1+x]}\right]+4 i \text{PolyLog}\left[2, e^{2 i \text{ArcTan}[1+x]}\right]\right)$$

Problem 127: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{ArcCot}[a+b x]}{\frac{a d}{b}+d x} \, dx$$

Optimal (type 4, 45 leaves, 5 steps):

$$-\frac{i \text{PolyLog}\left[2, -\frac{i}{a+b x}\right]}{2 d}+\frac{i \text{PolyLog}\left[2, \frac{i}{a+b x}\right]}{2 d}$$

Result (type 4, 195 leaves):

$$\frac{1}{8 d}\Big(i \pi^2 - 4 i \pi \text{ArcTan}[a+b x] + 8 i \text{ArcTan}[a+b x]^2 + \pi \text{Log}[16] - 4 \pi \text{Log}\left[1+e^{-2 i \text{ArcTan}[a+b x]}\right] + 8 \text{ArcTan}[a+b x] \text{Log}\left[1+e^{-2 i \text{ArcTan}[a+b x]}\right] - 8 \text{ArcTan}[a+b x] \text{Log}\left[1-e^{2 i \text{ArcTan}[a+b x]}\right] + 8 \text{ArcCot}[a+b x] \text{Log}[a+b x] + 8 \text{ArcTan}[a+b x] \text{Log}[a+b x] - 2 \pi \text{Log}\left[1+a^2+2 a b x+b^2 x^2\right] + 4 i \text{PolyLog}\left[2,-e^{-2 i \text{ArcTan}[a+b x]}\right] + 4 i \text{PolyLog}\left[2,e^{2 i \text{ArcTan}[a+b x]}\right]\Big)$$

Problem 133: Result more than twice size of optimal antiderivative.

$$\int \frac{a+b \text{ArcCot}[c+d x]}{e+f x} \, dx$$

Optimal (type 4, 162 leaves, 5 steps):

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

Result (type 4, 336 leaves):

$$\frac{1}{f}\Bigg(a \text{Log}[e+f x] + b \Bigg((\text{ArcCot}[c+d x] + \text{ArcTan}[c+d x]) \text{Log}[e+f x] + \text{ArcTan}[c+d x] \left(\text{Log}\left[\frac{1}{\sqrt{1+(c+d x)^2}}\right] - \text{Log}\left[\text{Sin}\left[\text{ArcTan}\left[\frac{d e-c f}{f}\right] + \text{ArcTan}[c+d x]\right]\right]\right) + \frac{1}{2}\Bigg(\frac{1}{4} i (\pi - 2 \text{ArcTan}[c+d x])^2 + i \left(\text{ArcTan}\left[\frac{d e-c f}{f}\right] + \text{ArcTan}[c+d x]\right)^2 - (\pi - 2 \text{ArcTan}[c+d x]) \text{Log}\left[1+e^{-2 i \text{ArcTan}[c+d x]}\right] - 2 \left(\text{ArcTan}\left[\frac{d e-c f}{f}\right] + \text{ArcTan}[c+d x]\right) \text{Log}\left[1-e^{2 i \left(\text{ArcTan}\left[\frac{d e-c f}{f}\right]+\text{ArcTan}[c+d x]\right)}\right] + (\pi - 2 \text{ArcTan}[c+d x]) \text{Log}\left[\frac{2}{\sqrt{1+(c+d x)^2}}\right] + 2 \left(\text{ArcTan}\left[\frac{d e-c f}{f}\right] + \text{ArcTan}[c+d x]\right) \text{Log}\left[2 \text{Sin}\left[\text{ArcTan}\left[\frac{d e-c f}{f}\right] + \text{ArcTan}[c+d x]\right]\right] + i \text{PolyLog}\left[2,-e^{-2 i \text{ArcTan}[c+d x]}\right] + i \text{PolyLog}\left[2,e^{2 i \left(\text{ArcTan}\left[\frac{d e-c f}{f}\right]+\text{ArcTan}[c+d x]\right)}\right]\Bigg)\Bigg)\Bigg)$$

Problem 139: Attempted integration timed out after 120 seconds.

$$\int \frac{(a+b\,\text{ArcCot}[c+d\,x])^2}{e+f\,x}\,dx$$

Optimal (type 4, 261 leaves, 2 steps):

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

Result (type 1, 1 leaves):

???

Problem 140: Result more than twice size of optimal antiderivative.

$$\int \frac{(a+b\,\text{ArcCot}[c+d\,x])^2}{(e+f\,x)^2}\,dx$$

Optimal (type 4, 567 leaves, 25 steps):

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

Result (type 4, 1188 leaves):

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

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

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

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

$$\frac{i\,f\,\text{ArcCot}[c+d\,x]^2}{2\,\left(d^2\,e^2-2\,c\,d\,e\,f+f^2+c^2\,f^2\right)}-\frac{c\,f\,\text{ArcCot}[c+d\,x]^2}{2\,\left(d^2\,e^2-2\,c\,d\,e\,f+f^2+c^2\,f^2\right)}-\left(\text{ArcCot}[c+d\,x]\,\left(2\,(d\,e-i\,f-c\,f)\,\text{ArcCot}[c+d\,x]+2\,i\,f\,\text{ArcTan}\left[\right.\right.\right.$$

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

$$\frac{1}{2\left(d^2 e^2-2 c d e f+\left(1+c^2\right) f^2\right)} f \Bigg(-i \pi \text{ArcCot}[c+d x]+c \text{ArcCot}[c+d x]^2-\frac{d e \text{ArcCot}[c+d x]^2}{f}-c e^{i \text{ArcTan}\left[\frac{f}{d e-c f}\right]}$$

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

$$\pi \text{Log}\left[1+e^{-2 i \text{ArcCot}[c+d x]}\right]-2 \text{ArcCot}[c+d x] \text{Log}\left[1-e^{2 i \left(\text{ArcCot}[c+d x]+\text{ArcTan}\left[\frac{f}{d e-c f}\right]\right)}\right]+2 \text{ArcTan}\left[\frac{f}{-d e+c f}\right] \text{Log}\Big[1-$$

$$e^{2 i \left(\text{ArcCot}[c+d x]+\text{ArcTan}\left[\frac{f}{d e-c f}\right]\right)}\Big]+\pi \text{Log}\left[\frac{1}{\sqrt{1+\frac{1}{(c+d x)^2}}}\right]+\text{ArcCot}[c+d x] \text{Log}\left[\left(\frac{f}{\sqrt{1+\frac{1}{(c+d x)^2}}}+\frac{d e-c f}{(c+d x) \sqrt{1+\frac{1}{(c+d x)^2}}}\right)^2\right]+2 \text{ArcTan}\Big[$$

$$\frac{f}{d e-c f}\Big] \left(i \text{ArcCot}[c+d x]+\text{Log}\left[\text{Sin}\left[\text{ArcCot}[c+d x]+\text{ArcTan}\left[\frac{f}{d e-c f}\right]\right]\right]\right)+i \text{PolyLog}\left[2, e^{2 i \left(\text{ArcCot}[c+d x]+\text{ArcTan}\left[\frac{f}{d e-c f}\right]\right)}\right]\Bigg)$$

Problem 141: Result more than twice size of optimal antiderivative.

$$\int (e+f x)^2 (a+b \text{ArcCot}[c+d x])^3 \, dx$$

Optimal (type 4, 565 leaves, 21 steps) :

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

Result (type 4, 2336 leaves):

$$\frac{a^2 \left(a d^2 e^2+3 b d e f-2 b c f^2\right) x}{d^2}+\frac{a^2 f (2 a d e+b f) x^2}{2 d}+\frac{1}{3} a^3 f^2 x^3+$$
$$a^2 b x \left(3 e^2+3 e f x+f^2 x^2\right) \text{ArcCot}[c+d x]+\frac{\left(-3 a^2 b c d^2 e^2-3 a^2 b d e f+3 a^2 b c^2 d e f+3 a^2 b c f^2-a^2 b c^3 f^2\right) \text{ArcTan}[c+d x]}{d^3}+$$
$$\frac{\left(3 a^2 b d^2 e^2-6 a^2 b c d e f-a^2 b f^2+3 a^2 b c^2 f^2\right) \text{Log}\left[1+c^2+2 c d x+d^2 x^2\right]}{2 d^3}+\frac{1}{4 d (c+d x)^2 \left(1+\frac{1}{(c+d x)^2}\right) \left(\frac{1}{\sqrt{1+\frac{1}{(c+d x)^2}}}-\frac{c}{(c+d x) \sqrt{1+\frac{1}{(c+d x)^2}}}\right)^2}$$
$$a b^2 f^2 x^2 \left(1+(c+d x)^2\right) \Bigg((c+d x) \left(1-6 c \text{ArcCot}[c+d x]+3 \text{ArcCot}[c+d x]^2+3 c^2 \text{ArcCot}[c+d x]^2\right)-$$
$$(c+d x) \sqrt{1+\frac{1}{(c+d x)^2}} \left(1-6 c \text{ArcCot}[c+d x]-\text{ArcCot}[c+d x]^2+3 c^2 \text{ArcCot}[c+d x]^2\right) \text{Cos}[3 \text{ArcCot}[c+d x]]-$$

$$2\Bigg(-2\,\text{ArcCot}[c+d\,x]+i\,\text{ArcCot}[c+d\,x]^2+6\,c\,\text{ArcCot}[c+d\,x]^2-3\,i\,c^2\,\text{ArcCot}[c+d\,x]^2+$$

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

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

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

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

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

$$6\,a\,b^2\,e\,f\left(1+(c+d\,x)^2\right)$$

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

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

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

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

$$b^3\,e\,f\left(1+(c+d\,x)^2\right)\Big(-\mathrm{i}\,c\,\pi^3+12\,\mathrm{i}\,\mathrm{ArcCot}[c+d\,x]^2+12\,(c+d\,x)\,\mathrm{ArcCot}[c+d\,x]^2+8\,\mathrm{i}\,c\,\mathrm{ArcCot}[c+d\,x]^3-8\,c\,(c+d\,x)\,\mathrm{ArcCot}[c+d\,x]^3+$$

$$4\,(c+d\,x)^2\left(1+\frac{1}{(c+d\,x)^2}\right)\mathrm{ArcCot}[c+d\,x]^3+24\,c\,\mathrm{ArcCot}[c+d\,x]^2\,\mathrm{Log}\left[1-e^{-2\,\mathrm{i}\,\mathrm{ArcCot}[c+d\,x]}\right]-24\,\mathrm{ArcCot}[c+d\,x]\,\mathrm{Log}\left[1-e^{2\,\mathrm{i}\,\mathrm{ArcCot}[c+d\,x]}\right]+$$

$$24\,\mathrm{i}\,c\,\mathrm{ArcCot}[c+d\,x]\,\mathrm{PolyLog}\left[2,\,e^{-2\,\mathrm{i}\,\mathrm{ArcCot}[c+d\,x]}\right]+12\,\mathrm{i}\,\mathrm{PolyLog}\left[2,\,e^{2\,\mathrm{i}\,\mathrm{ArcCot}[c+d\,x]}\right]+12\,c\,\mathrm{PolyLog}\left[3,\,e^{-2\,\mathrm{i}\,\mathrm{ArcCot}[c+d\,x]}\right]\Big)-$$

$$\frac{1}{d^3\,(c+d\,x)^2\left(1+\frac{1}{(c+d\,x)^2}\right)}\,b^3\,f^2\left(1+(c+d\,x)^2\right)\Bigg(\mathrm{i}\left(-1+3\,c^2\right)\mathrm{ArcCot}[c+d\,x]\,\mathrm{PolyLog}\left[2,\,e^{-2\,\mathrm{i}\,\mathrm{ArcCot}[c+d\,x]}\right]+$$

$$\frac{1}{96}\,(c+d\,x)^3\left(1+\frac{1}{(c+d\,x)^2}\right)^{3/2}\Bigg(\frac{3\,\mathrm{i}\,\pi^3}{(c+d\,x)\sqrt{1+\frac{1}{(c+d\,x)^2}}}-\frac{9\,\mathrm{i}\,c^2\,\pi^3}{(c+d\,x)\sqrt{1+\frac{1}{(c+d\,x)^2}}}-\frac{24\,\mathrm{ArcCot}[c+d\,x]}{\sqrt{1+\frac{1}{(c+d\,x)^2}}}+$$

$$\frac{72\,c\,\mathrm{ArcCot}[c+d\,x]^2}{\sqrt{1+\frac{1}{(c+d\,x)^2}}}-\frac{48\,\mathrm{ArcCot}[c+d\,x]^2}{(c+d\,x)\sqrt{1+\frac{1}{(c+d\,x)^2}}}+\frac{216\,\mathrm{i}\,c\,\mathrm{ArcCot}[c+d\,x]^2}{(c+d\,x)\sqrt{1+\frac{1}{(c+d\,x)^2}}}-\frac{24\,\mathrm{ArcCot}[c+d\,x]^3}{\sqrt{1+\frac{1}{(c+d\,x)^2}}}-\frac{24\,c^2\,\mathrm{ArcCot}[c+d\,x]^3}{\sqrt{1+\frac{1}{(c+d\,x)^2}}}-$$

$$\frac{24\,\mathrm{i}\,\mathrm{ArcCot}[c+d\,x]^3}{(c+d\,x)\sqrt{1+\frac{1}{(c+d\,x)^2}}}+\frac{96\,c\,\mathrm{ArcCot}[c+d\,x]^3}{(c+d\,x)\sqrt{1+\frac{1}{(c+d\,x)^2}}}+\frac{72\,\mathrm{i}\,c^2\,\mathrm{ArcCot}[c+d\,x]^3}{(c+d\,x)\sqrt{1+\frac{1}{(c+d\,x)^2}}}+24\,\mathrm{ArcCot}[c+d\,x]\,\mathrm{Cos}[3\,\mathrm{ArcCot}[c+d\,x]]-$$

$$72\,c\,\mathrm{ArcCot}[c+d\,x]^2\,\mathrm{Cos}[3\,\mathrm{ArcCot}[c+d\,x]]-8\,\mathrm{ArcCot}[c+d\,x]^3\,\mathrm{Cos}[3\,\mathrm{ArcCot}[c+d\,x]]+24\,c^2\,\mathrm{ArcCot}[c+d\,x]^3\,\mathrm{Cos}[3\,\mathrm{ArcCot}[c+d\,x]]-$$

$$\frac{72\,\mathrm{ArcCot}[c+d\,x]^2\,\mathrm{Log}\left[1-e^{-2\,\mathrm{i}\,\mathrm{ArcCot}[c+d\,x]}\right]}{(c+d\,x)\sqrt{1+\frac{1}{(c+d\,x)^2}}}+\frac{216\,c^2\,\mathrm{ArcCot}[c+d\,x]^2\,\mathrm{Log}\left[1-e^{-2\,\mathrm{i}\,\mathrm{ArcCot}[c+d\,x]}\right]}{(c+d\,x)\sqrt{1+\frac{1}{(c+d\,x)^2}}}-$$

$$\frac{432\,c\,\mathrm{ArcCot}[c+d\,x]\,\mathrm{Log}\left[1-e^{2\,\mathrm{i}\,\mathrm{ArcCot}[c+d\,x]}\right]}{(c+d\,x)\sqrt{1+\frac{1}{(c+d\,x)^2}}}+\frac{72\,\mathrm{Log}\left[\frac{1}{(c+d\,x)\sqrt{1+\frac{1}{(c+d\,x)^2}}}\right]}{(c+d\,x)\sqrt{1+\frac{1}{(c+d\,x)^2}}}+\frac{288\,\mathrm{i}\,c\,\mathrm{PolyLog}\left[2,\,e^{2\,\mathrm{i}\,\mathrm{ArcCot}[c+d\,x]}\right]}{(c+d\,x)^3\left(1+\frac{1}{(c+d\,x)^2}\right)^{3/2}}+$$

$$\frac{48\left(-1+3c^2\right)\text{PolyLog}\left[3,e^{-2 i \text{ArcCot}[c+d x]}\right]}{(c+d x)^3\left(1+\frac{1}{(c+d x)^2}\right)^{3/2}}-i \pi^3 \text{Sin}[3 \text{ArcCot}[c+d x]]+3 i c^2 \pi^3 \text{Sin}[3 \text{ArcCot}[c+d x]]-72 i c \text{ArcCot}[c+d x]^2$$
$$\text{Sin}[3 \text{ArcCot}[c+d x]]+8 i \text{ArcCot}[c+d x]^3 \text{Sin}[3 \text{ArcCot}[c+d x]]-24 i c^2 \text{ArcCot}[c+d x]^3 \text{Sin}[3 \text{ArcCot}[c+d x]]+$$
$$24 \text{ArcCot}[c+d x]^2 \text{Log}\left[1-e^{-2 i \text{ArcCot}[c+d x]}\right] \text{Sin}[3 \text{ArcCot}[c+d x]]-72 c^2 \text{ArcCot}[c+d x]^2 \text{Log}\left[1-e^{-2 i \text{ArcCot}[c+d x]}\right] \text{Sin}[3 \text{ArcCot}[c+d x]]+$$
$$\left.\left.144 c \text{ArcCot}[c+d x] \text{Log}\left[1-e^{2 i \text{ArcCot}[c+d x]}\right] \text{Sin}[3 \text{ArcCot}[c+d x]]-24 \text{Log}\left[\frac{1}{(c+d x)\sqrt{1+\frac{1}{(c+d x)^2}}}\right] \text{Sin}[3 \text{ArcCot}[c+d x]]\right)\right)$$

Problem 144: Attempted integration timed out after 120 seconds.

$$\int \frac{(a+b \text{ArcCot}[c+d x])^3}{e+f x} \, dx$$

Optimal (type 4, 372 leaves, 2 steps):

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

Result (type 1, 1 leaves):

???

Problem 145: Attempted integration timed out after 120 seconds.

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

Optimal (type 4, 1233 leaves, 35 steps):

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

Result (type 1, 1 leaves):

???

Problem 146: Unable to integrate problem.

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

Optimal (type 5, 177 leaves, 6 steps):

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

Result (type 8, 20 leaves):

$$\int (e+f x)^m (a+b \text{ArcCot}[c+d x]) \, dx$$

Problem 152: Unable to integrate problem.

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

Optimal (type 4, 488 leaves, 9 steps):

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

Result (type 8, 42 leaves):

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

Problem 153: Unable to integrate problem.

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

Optimal (type 4, 321 leaves, 7 steps):

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

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

Result (type 8, 42 leaves):

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

Problem 160: Result more than twice size of optimal antiderivative.

$$\int\text{ArcCot}[c+d\,\text{Tan}[a+b x]]\,dx$$

Optimal (type 4, 198 leaves, 7 steps):

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

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

Result (type 4, 418 leaves):

$$x\,\text{ArcCot}[c+d\,\text{Tan}[a+b x]]-$$

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

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

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

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

Problem 173: Result more than twice size of optimal antiderivative.

$$\int \text{ArcCot}[c+d\,\text{Cot}[a+b\,x]]\,dx$$

Optimal (type 4, 198 leaves, 7 steps):

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

Result (type 4, 416 leaves):

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

Problem 183: Result more than twice size of optimal antiderivative.

$$\int (e+f\,x)^3\,\text{ArcCot}[\text{Tanh}[a+b\,x]]\,dx$$

Optimal (type 4, 299 leaves, 12 steps):

$$\frac{(e+f\,x)^4\,\text{ArcCot}[\text{Tanh}[a+b\,x]]}{4\,f}+\frac{(e+f\,x)^4\,\text{ArcTan}\left[e^{2\,a+2\,b\,x}\right]}{4\,f}-\frac{i\,(e+f\,x)^3\,\text{PolyLog}\left[2,-i\,e^{2\,a+2\,b\,x}\right]}{4\,b}+\frac{i\,(e+f\,x)^3\,\text{PolyLog}\left[2,i\,e^{2\,a+2\,b\,x}\right]}{4\,b}+\frac{3\,i\,f\,(e+f\,x)^2\,\text{PolyLog}\left[3,-i\,e^{2\,a+2\,b\,x}\right]}{8\,b^2}-\frac{3\,i\,f\,(e+f\,x)^2\,\text{PolyLog}\left[3,i\,e^{2\,a+2\,b\,x}\right]}{8\,b^2}-\frac{3\,i\,f^2\,(e+f\,x)\,\text{PolyLog}\left[4,-i\,e^{2\,a+2\,b\,x}\right]}{8\,b^3}+\frac{3\,i\,f^2\,(e+f\,x)\,\text{PolyLog}\left[4,i\,e^{2\,a+2\,b\,x}\right]}{8\,b^3}+\frac{3\,i\,f^3\,\text{PolyLog}\left[5,-i\,e^{2\,a+2\,b\,x}\right]}{16\,b^4}-\frac{3\,i\,f^3\,\text{PolyLog}\left[5,i\,e^{2\,a+2\,b\,x}\right]}{16\,b^4}$$

Result (type 4, 600 leaves):

$$\frac{1}{4} x \left(4 e^3 + 6 e^2 f x + 4 e f^2 x^2 + f^3 x^3\right) \text{ArcCot}[\text{Tanh}[a + b x]] + \frac{1}{16 b^4} i \left(8 b^4 e^3 x \text{Log}\left[1 - i e^{2 (a+b x)}\right] + 12 b^4 e^2 f x^2 \text{Log}\left[1 - i e^{2 (a+b x)}\right] + 8 b^4 e f^2 x^3 \text{Log}\left[1 - i e^{2 (a+b x)}\right] + 2 b^4 f^3 x^4 \text{Log}\left[1 - i e^{2 (a+b x)}\right] - 8 b^4 e^3 x \text{Log}\left[1 + i e^{2 (a+b x)}\right] - 12 b^4 e^2 f x^2 \text{Log}\left[1 + i e^{2 (a+b x)}\right] - 8 b^4 e f^2 x^3 \text{Log}\left[1 + i e^{2 (a+b x)}\right] - 2 b^4 f^3 x^4 \text{Log}\left[1 + i e^{2 (a+b x)}\right] - 4 b^3 (e + f x)^3 \text{PolyLog}\left[2, -i e^{2 (a+b x)}\right] + 4 b^3 (e + f x)^3 \text{PolyLog}\left[2, i e^{2 (a+b x)}\right] + 6 b^2 e^2 f \text{PolyLog}\left[3, -i e^{2 (a+b x)}\right] + 12 b^2 e f^2 x \text{PolyLog}\left[3, -i e^{2 (a+b x)}\right] + 6 b^2 f^3 x^2 \text{PolyLog}\left[3, -i e^{2 (a+b x)}\right] - 6 b^2 e^2 f \text{PolyLog}\left[3, i e^{2 (a+b x)}\right] - 12 b^2 e f^2 x \text{PolyLog}\left[3, i e^{2 (a+b x)}\right] - 6 b^2 f^3 x^2 \text{PolyLog}\left[3, i e^{2 (a+b x)}\right] - 6 b e f^2 \text{PolyLog}\left[4, -i e^{2 (a+b x)}\right] - 6 b f^3 x \text{PolyLog}\left[4, -i e^{2 (a+b x)}\right] + 6 b e f^2 \text{PolyLog}\left[4, i e^{2 (a+b x)}\right] + 6 b f^3 x \text{PolyLog}\left[4, i e^{2 (a+b x)}\right] + 3 f^3 \text{PolyLog}\left[5, -i e^{2 (a+b x)}\right] - 3 f^3 \text{PolyLog}\left[5, i e^{2 (a+b x)}\right]\right)$$

Problem 190: Result more than twice size of optimal antiderivative.

$$\int \text{ArcCot}[c + d \text{Tanh}[a + b x]] \, dx$$

Optimal (type 4, 174 leaves, 7 steps):

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

Result (type 4, 365 leaves):

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

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

$$\int (e + f x)^3 \text{ArcCot}[\text{Coth}[a + b x]] \, dx$$

Optimal (type 4, 299 leaves, 12 steps):

$$\frac{(e+f x)^4 \operatorname{ArcCot}[\operatorname{Coth}[a+b x]]}{4 f}-\frac{(e+f x)^4 \operatorname{ArcTan}\left[e^{2 a+2 b x}\right]}{4 f}+\frac{i (e+f x)^3 \operatorname{PolyLog}\left[2,-i e^{2 a+2 b x}\right]}{4 b}-\frac{i (e+f x)^3 \operatorname{PolyLog}\left[2, i e^{2 a+2 b x}\right]}{4 b}-\frac{3 i f (e+f x)^2 \operatorname{PolyLog}\left[3,-i e^{2 a+2 b x}\right]}{8 b^2}+\frac{3 i f (e+f x)^2 \operatorname{PolyLog}\left[3, i e^{2 a+2 b x}\right]}{8 b^2}+\frac{3 i f^2 (e+f x) \operatorname{PolyLog}\left[4,-i e^{2 a+2 b x}\right]}{8 b^3}-\frac{3 i f^2 (e+f x) \operatorname{PolyLog}\left[4, i e^{2 a+2 b x}\right]}{8 b^3}-\frac{3 i f^3 \operatorname{PolyLog}\left[5,-i e^{2 a+2 b x}\right]}{16 b^4}+\frac{3 i f^3 \operatorname{PolyLog}\left[5, i e^{2 a+2 b x}\right]}{16 b^4}$$

Result (type 4, 600 leaves):

$$\frac{1}{4} x \left(4 e^3+6 e^2 f x+4 e f^2 x^2+f^3 x^3\right) \operatorname{ArcCot}[\operatorname{Coth}[a+b x]]-\frac{1}{16 b^4} i \left(8 b^4 e^3 x \operatorname{Log}\left[1-i e^{2 (a+b x)}\right]+12 b^4 e^2 f x^2 \operatorname{Log}\left[1-i e^{2 (a+b x)}\right]+8 b^4 e f^2 x^3 \operatorname{Log}\left[1-i e^{2 (a+b x)}\right]+2 b^4 f^3 x^4 \operatorname{Log}\left[1-i e^{2 (a+b x)}\right]-8 b^4 e^3 x \operatorname{Log}\left[1+i e^{2 (a+b x)}\right]-12 b^4 e^2 f x^2 \operatorname{Log}\left[1+i e^{2 (a+b x)}\right]-8 b^4 e f^2 x^3 \operatorname{Log}\left[1+i e^{2 (a+b x)}\right]-2 b^4 f^3 x^4 \operatorname{Log}\left[1+i e^{2 (a+b x)}\right]-4 b^3 (e+f x)^3 \operatorname{PolyLog}\left[2,-i e^{2 (a+b x)}\right]+4 b^3 (e+f x)^3 \operatorname{PolyLog}\left[2, i e^{2 (a+b x)}\right]+6 b^2 e^2 f \operatorname{PolyLog}\left[3,-i e^{2 (a+b x)}\right]+12 b^2 e f^2 x \operatorname{PolyLog}\left[3,-i e^{2 (a+b x)}\right]+6 b^2 f^3 x^2 \operatorname{PolyLog}\left[3,-i e^{2 (a+b x)}\right]-6 b^2 e^2 f \operatorname{PolyLog}\left[3, i e^{2 (a+b x)}\right]-12 b^2 e f^2 x \operatorname{PolyLog}\left[3, i e^{2 (a+b x)}\right]-6 b^2 f^3 x^2 \operatorname{PolyLog}\left[3, i e^{2 (a+b x)}\right]-6 b e f^2 \operatorname{PolyLog}\left[4,-i e^{2 (a+b x)}\right]-6 b f^3 x \operatorname{PolyLog}\left[4,-i e^{2 (a+b x)}\right]+6 b e f^2 \operatorname{PolyLog}\left[4, i e^{2 (a+b x)}\right]+6 b f^3 x \operatorname{PolyLog}\left[4, i e^{2 (a+b x)}\right]+3 f^3 \operatorname{PolyLog}\left[5,-i e^{2 (a+b x)}\right]-3 f^3 \operatorname{PolyLog}\left[5, i e^{2 (a+b x)}\right]\right)$$

Problem 207: Result more than twice size of optimal antiderivative.

$$\int \operatorname{ArcCot}[c+d \operatorname{Coth}[a+b x]] \, dx$$

Optimal (type 4, 174 leaves, 7 steps):

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

Result (type 4, 365 leaves):

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

Problem 217: Result unnecessarily involves higher level functions.

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

Optimal (type 4, 187 leaves, 13 steps):

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

Result (type 5, 132 leaves):

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

Problem 224: Attempted integration timed out after 120 seconds.

$$\int \text{ArcCot}\left[a + b\,f^{c+d\,x}\right]\,dx$$

Optimal (type 4, 196 leaves, 6 steps):

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

Result (type 1, 1 leaves):

???

Problem 225: Unable to integrate problem.

$$\int x\,\text{ArcCot}\left[a + b\,f^{c+d\,x}\right]\,dx$$

Optimal (type 4, 250 leaves, 25 steps):

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

Result (type 8, 16 leaves):

$$\int x\,\text{ArcCot}\left[a+b\,f^{c+d\,x}\right]\,dx$$

Problem 226: Unable to integrate problem.

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

Optimal (type 4, 313 leaves, 29 steps):

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

Result (type 8, 18 leaves):

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

Problem 230: Result is not expressed in closed-form.

$$\int e^{c\,(a+b\,x)}\,\text{ArcCot}[\text{Cosh}[a\,c+b\,c\,x]]\,dx$$

Optimal (type 3, 103 leaves, 8 steps):

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

Result (type 7, 146 leaves):

$$\frac{1}{2\,b\,c}\left(4\,c\,(a+b\,x)+2\,e^{c\,(a+b\,x)}\,\text{ArcCot}\left[\frac{1}{2}\,e^{-c\,(a+b\,x)}\,\left(1+e^{2\,c\,(a+b\,x)}\right)\right]+\right.$$
$$\left.\text{RootSum}\left[1+6\,\#1^2+\#1^4\,\&,\frac{-a\,c-b\,c\,x+\text{Log}\left[e^{c\,(a+b\,x)}-\#1\right]-7\,a\,c\,\#1^2-7\,b\,c\,x\,\#1^2+7\,\text{Log}\left[e^{c\,(a+b\,x)}-\#1\right]\,\#1^2}{1+3\,\#1^2}\,\&\right]\right)$$

Problem 231: Result is not expressed in closed-form.

$$\int e^{c (a+b x)} \text{ArcCot}[\text{Tanh}[a c + b c x]] \, dx$$

Optimal (type 3, 180 leaves, 13 steps):

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

Result (type 7, 89 leaves):

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

Problem 232: Result is not expressed in closed-form.

$$\int e^{c (a+b x)} \text{ArcCot}[\text{Coth}[a c + b c x]] \, dx$$

Optimal (type 3, 180 leaves, 13 steps):

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

Result (type 7, 89 leaves):

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

Problem 233: Result is not expressed in closed-form.

$$\int e^{c (a+b x)} \text{ArcCot}[\text{Sech}[a c + b c x]] \, dx$$

Optimal (type 3, 103 leaves, 8 steps):

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

Result (type 7, 145 leaves):

$$\frac{1}{2 b c}\left(-4 c (a+b x)+2 e^{c (a+b x)} \text{ArcCot}\left[\frac{2 e^{c (a+b x)}}{1+e^{2 c (a+b x)}}\right]+\right.$$
$$\left.\text{RootSum}\left[1+6 \#1^2+\#1^4 \&, \frac{a c+b c x-\text{Log}\left[e^{c (a+b x)}-\#1\right]+7 a c \#1^2+7 b c x \#1^2-7 \text{Log}\left[e^{c (a+b x)}-\#1\right] \#1^2}{1+3 \#1^2} \&\right]\right)$$

Test results for the 12 problems in "5.4.2 Exponentials of inverse cotangent.m"

Problem 8: Unable to integrate problem.

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

Optimal (type 5, 147 leaves, 3 steps):

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

Result (type 8, 25 leaves):

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

Problem 9: Unable to integrate problem.

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

Optimal (type 5, 147 leaves, 3 steps):

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

Result (type 8, 25 leaves):

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

Problem 10: Unable to integrate problem.

$$\int \frac{e^{n \text{ArcCot}[a x]}}{\left(c + a^2 c x^2\right)^{4/3}} \, dx$$

Optimal (type 5, 207 leaves, 4 steps):

$$-\frac{3 e^{n \text{ArcCot}[a x]} (3 n - 2 a x)}{a c \left(4 + 9 n^2\right) \left(c + a^2 c x^2\right)^{1/3}} - \left(6 \left(1 + \frac{1}{a^2 x^2}\right)^{1/3} \left(\frac{a - \frac{i}{x}}{a + \frac{i}{x}}\right)^{\frac{1}{6}(2-3 i n)} \left(1 - \frac{i}{a x}\right)^{\frac{1}{6}(-2+3 i n)} \left(1 + \frac{i}{a x}\right)^{\frac{1}{6}(4-3 i n)} x \,\text{Hypergeometric2F1}\left[-\frac{1}{3}, \frac{1}{6}(2 - 3 i n), \frac{2}{3}, \frac{2 i}{\left(a + \frac{i}{x}\right) x}\right]\right) \Big/ \left(c \left(4 + 9 n^2\right) \left(c + a^2 c x^2\right)^{1/3}\right)$$

Result (type 8, 25 leaves):

$$\int \frac{e^{n \text{ArcCot}[a x]}}{\left(c + a^2 c x^2\right)^{4/3}} \, dx$$

Problem 11: Unable to integrate problem.

$$\int \frac{e^{n \text{ArcCot}[a x]}}{\left(c + a^2 c x^2\right)^{5/3}} \, dx$$

Optimal (type 5, 207 leaves, 4 steps):

$$-\frac{3 e^{n \text{ArcCot}[a x]} (3 n - 4 a x)}{a c \left(16 + 9 n^2\right) \left(c + a^2 c x^2\right)^{2/3}} - \left(12 \left(1 + \frac{1}{a^2 x^2}\right)^{2/3} \left(\frac{a - \frac{i}{x}}{a + \frac{i}{x}}\right)^{\frac{1}{6}(4-3 i n)} \left(1 - \frac{i}{a x}\right)^{\frac{1}{6}(-4+3 i n)} \left(1 + \frac{i}{a x}\right)^{\frac{1}{6}(2-3 i n)} x \,\text{Hypergeometric2F1}\left[\frac{1}{3}, \frac{1}{6}(4 - 3 i n), \frac{4}{3}, \frac{2 i}{\left(a + \frac{i}{x}\right) x}\right]\right) \Big/ \left(c \left(16 + 9 n^2\right) \left(c + a^2 c x^2\right)^{2/3}\right)$$

Result (type 8, 25 leaves):

$$\int \frac{e^{n \text{ArcCot}[a x]}}{\left(c + a^2 c x^2\right)^{5/3}} \, dx$$

Problem 12: Unable to integrate problem.

$$\int \frac{e^{n \text{ArcCot}[a x]}}{\left(c + a^2 c x^2\right)^{7/3}} \, dx$$

Optimal (type 5, 272 leaves, 5 steps):

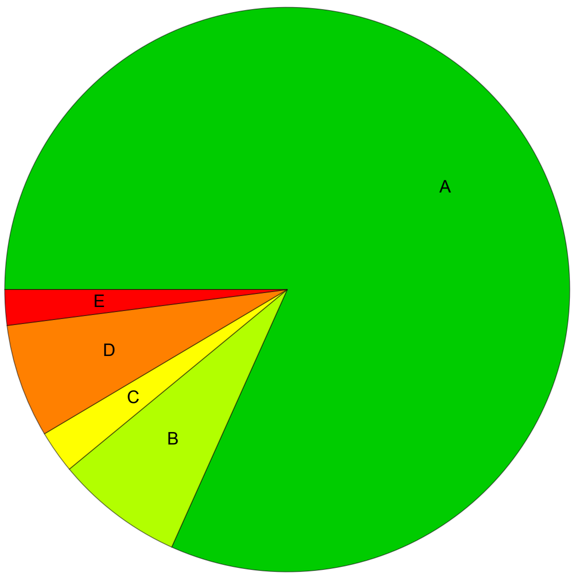
$$-\frac{3 e^{n \text{ArcCot}[a x]} (3 n - 8 a x)}{a c \left(64 + 9 n^2\right) \left(c + a^2 c x^2\right)^{4/3}} - \frac{120 e^{n \text{ArcCot}[a x]} (3 n - 2 a x)}{a c^2 \left(4 + 9 n^2\right) \left(64 + 9 n^2\right) \left(c + a^2 c x^2\right)^{1/3}} - \left(240 \left(1 + \frac{1}{a^2 x^2}\right)^{1/3} \left(\frac{a - \frac{i}{x}}{a + \frac{i}{x}}\right)^{\frac{1}{6} (2 - 3 i n)} \left(1 - \frac{i}{a x}\right)^{\frac{1}{6} (-2 + 3 i n)} \left(1 + \frac{i}{a x}\right)^{\frac{1}{6} (4 - 3 i n)} x \, \text{Hypergeometric2F1}\left[-\frac{1}{3}, \frac{1}{6} (2 - 3 i n), \frac{2}{3}, \frac{2 i}{\left(a + \frac{i}{x}\right) x}\right]\right) \Big/ \left(c^2 \left(4 + 9 n^2\right) \left(64 + 9 n^2\right) \left(c + a^2 c x^2\right)^{1/3}\right)$$

Result (type 8, 25 leaves):

$$\int \frac{e^{n \text{ArcCot}[a x]}}{\left(c + a^2 c x^2\right)^{7/3}} \, dx$$

Summary of Integration Test Results

246 integration problems



A - 201 optimal antiderivatives

B - 18 more than twice size of optimal antiderivatives

C - 6 unnecessarily complex antiderivatives

D - 16 unable to integrate problems

E - 5 integration timeouts