Mathematica 11.3 Integration Test Results

on the problems in the test-suite directory "7 Inverse hyperbolic functions\7.1 Inverse hyperbolic sine"

Test results for the 156 problems in "7.1.2 (d x)^m (a+b arcsinh(c x))^n.m"

Problem 40: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{ArcSinh}[a x]^4}{x^3} \, dx$$

Optimal (type 4, 108 leaves, 8 steps):

$$-2 a^2 \text{ArcSinh}[a x]^3 - \frac{2 a \sqrt{1+a^2 x^2}\, \text{ArcSinh}[a x]^3}{x} - \frac{\text{ArcSinh}[a x]^4}{2 x^2} + 6 a^2 \text{ArcSinh}[a x]^2 \text{Log}\left[1-e^{2 \text{ArcSinh}[a x]}\right] + 6 a^2 \text{ArcSinh}[a x] \text{PolyLog}\left[2, e^{2 \text{ArcSinh}[a x]}\right] - 3 a^2 \text{PolyLog}\left[3, e^{2 \text{ArcSinh}[a x]}\right]$$

Result (type 4, 113 leaves):

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

Problem 119: Unable to integrate problem.

$$\int x^m \text{ArcSinh}[a x]^2 \, dx$$

Optimal (type 5, 137 leaves, 2 steps):

$$\frac{x^{1+m}\,\text{ArcSinh}[a\,x]^2}{1+m}-\frac{2\,a\,x^{2+m}\,\text{ArcSinh}[a\,x]\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},-a^2\,x^2\right]}{2+3\,m+m^2}+\frac{2\,a^2\,x^{3+m}\,\text{HypergeometricPFQ}\left[\left\{1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2}\right\},\left\{2+\frac{m}{2},\frac{5}{2}+\frac{m}{2}\right\},-a^2\,x^2\right]}{6+11\,m+6\,m^2+m^3}$$

Result (type 9, 133 leaves):

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

Test results for the 663 problems in "7.1.4 (f x)^m (d+e x^2)^p (a+b arcsinh(c x))^n.m"

Problem 29: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 135 leaves, 8 steps):

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

Result (type 4, 286 leaves):

$$\frac{1}{4\,c^4\,d}\Big(2\,a\,c^2\,x^2-b\,c\,x\,\sqrt{1+c^2\,x^2}+b\,\text{ArcSinh}[c\,x]-4\,i\,b\,\pi\,\text{ArcSinh}[c\,x]+2\,b\,c^2\,x^2\,\text{ArcSinh}[c\,x]-2\,b\,\text{ArcSinh}[c\,x]^2+2\,i\,b\,\pi\,\text{Log}\left[1-i\,e^{-\text{ArcSinh}[c\,x]}\right]-4\,b\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1-i\,e^{-\text{ArcSinh}[c\,x]}\right]-2\,i\,b\,\pi\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]-4\,b\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]+8\,i\,b\,\pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]-2\,a\,\text{Log}\left[1+c^2\,x^2\right]+2\,i\,b\,\pi\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]-8\,i\,b\,\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]-2\,i\,b\,\pi\,\text{Log}\left[\text{Sin}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]+4\,b\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]+4\,b\,\text{PolyLog}\left[2,i\,e^{-\text{ArcSinh}[c\,x]}\right]\Big)$$

Problem 30: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 108 leaves, 8 steps):

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

Result (type 4, 219 leaves):

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

Problem 31: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 73 leaves, 5 steps):

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

Result (type 4, 238 leaves):

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

Problem 32: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 70 leaves, 6 steps):

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

Result (type 4, 189 leaves):

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

Problem 33: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 61 leaves, 7 steps):

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

Result (type 4, 264 leaves):

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

Problem 34: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 101 leaves, 10 steps):

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

Result (type 4, 248 leaves):

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

Problem 35: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 113 leaves, 9 steps):

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

Result (type 4, 344 leaves):

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

Problem 36: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 156 leaves, 15 steps):

$$-\frac{b c \sqrt{1 + c^2 x^2}}{6 d x^2} - \frac{a + b \text{ArcSinh}[c x]}{3 d x^3} + \frac{c^2 \left(a + b \text{ArcSinh}[c x]\right)}{d x} + \frac{2 c^3 \left(a + b \text{ArcSinh}[c x]\right) \text{ArcTan}\left[e^{\text{ArcSinh}[c x]}\right]}{d} + \frac{7 b c^3 \text{ArcTanh}\left[\sqrt{1 + c^2 x^2}\right]}{6 d} - \frac{i b c^3 \text{PolyLog}\left[2, -i e^{\text{ArcSinh}[c x]}\right]}{d} + \frac{i b c^3 \text{PolyLog}\left[2, i e^{\text{ArcSinh}[c x]}\right]}{d}$$

Result (type 4, 337 leaves):

$$-\frac{1}{6 d x^3} \Big(2 a - 6 a c^2 x^2 + b c x \sqrt{1 + c^2 x^2} + 2 b \text{ArcSinh}[c x] - 6 b c^2 x^2 \text{ArcSinh}[c x] + 3 b c^3 \pi x^3 \text{ArcSinh}[c x] - 6 a c^3 x^3 \text{ArcTan}[c x] + 3 b c^3 \pi x^3 \text{Log}\left[1 - i e^{-\text{ArcSinh}[c x]}\right] + 6 i b c^3 x^3 \text{ArcSinh}[c x] \text{Log}\left[1 - i e^{-\text{ArcSinh}[c x]}\right] + 3 b c^3 \pi x^3 \text{Log}\left[1 + i e^{-\text{ArcSinh}[c x]}\right] - 6 i b c^3 x^3 \text{ArcSinh}[c x] \text{Log}\left[1 + i e^{-\text{ArcSinh}[c x]}\right] + 7 b c^3 x^3 \text{Log}[x] - 7 b c^3 x^3 \text{Log}\left[1 + \sqrt{1 + c^2 x^2}\right] - 3 b c^3 \pi x^3 \text{Log}\left[-\text{Cos}\left[\frac{1}{4} \left(\pi + 2 i \text{ArcSinh}[c x]\right)\right]\right] - 3 b c^3 \pi x^3 \text{Log}\left[\text{Sin}\left[\frac{1}{4} \left(\pi + 2 i \text{ArcSinh}[c x]\right)\right]\right] + 6 i b c^3 x^3 \text{PolyLog}\left[2, -i e^{-\text{ArcSinh}[c x]}\right] - 6 i b c^3 x^3 \text{PolyLog}\left[2, i e^{-\text{ArcSinh}[c x]}\right]\Big)$$

Problem 38: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 145 leaves, 8 steps):

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

Result (type 4, 291 leaves):

$$\frac{1}{2 d^2}\left(\frac{a}{c^4+c^6 x^2}+\frac{a \operatorname{Log}\left[1+c^2 x^2\right]}{c^4}+\frac{1}{2 c^4} b\left(-\frac{\sqrt{1+c^2 x^2}-\mathrm{i} \operatorname{ArcSinh}[c x]}{\mathrm{i}+c x}+\frac{\sqrt{1+c^2 x^2}+\mathrm{i} \operatorname{ArcSinh}[c x]}{\mathrm{i}-c x}+4 \mathrm{i} \pi \operatorname{ArcSinh}[c x]+\right.\right.$$
$$2 \operatorname{ArcSinh}[c x]^2+(-2 \mathrm{i} \pi+4 \operatorname{ArcSinh}[c x]) \operatorname{Log}\left[1-\mathrm{i} e^{-\operatorname{ArcSinh}[c x]}\right]+(2 \mathrm{i} \pi+4 \operatorname{ArcSinh}[c x]) \operatorname{Log}\left[1+\mathrm{i} e^{-\operatorname{ArcSinh}[c x]}\right]-$$
$$8 \mathrm{i} \pi \operatorname{Log}\left[1+e^{\operatorname{ArcSinh}[c x]}\right]-2 \mathrm{i} \pi \operatorname{Log}\left[-\operatorname{Cos}\left[\frac{1}{4}(\pi+2 \mathrm{i} \operatorname{ArcSinh}[c x])\right]\right]+8 \mathrm{i} \pi \operatorname{Log}\left[\operatorname{Cosh}\left[\frac{1}{2} \operatorname{ArcSinh}[c x]\right]\right]+$$
$$\left.\left.2 \mathrm{i} \pi \operatorname{Log}\left[\operatorname{Sin}\left[\frac{1}{4}(\pi+2 \mathrm{i} \operatorname{ArcSinh}[c x])\right]\right]-4 \operatorname{PolyLog}\left[2,-\mathrm{i} e^{-\operatorname{ArcSinh}[c x]}\right]-4 \operatorname{PolyLog}\left[2, \mathrm{i} e^{-\operatorname{ArcSinh}[c x]}\right]\right)\right)$$

Problem 39: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 127 leaves, 8 steps):

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

Result (type 4, 286 leaves):

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

Problem 41: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 124 leaves, 8 steps):

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

Result (type 4, 323 leaves):

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

Problem 42: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 110 leaves, 9 steps):

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

Result (type 4, 367 leaves):

$$\frac{1}{4\,d^2}\left(\frac{2\,a}{1+c^2x^2}+\frac{b\sqrt{1+c^2x^2}}{i-c\,x}-\frac{b\sqrt{1+c^2x^2}}{i+c\,x}-4\,i\,b\,\pi\,\text{ArcSinh}[c\,x]+\frac{i\,b\,\text{ArcSinh}[c\,x]}{i-c\,x}+\frac{i\,b\,\text{ArcSinh}[c\,x]}{i+c\,x}+4\,b\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1-e^{-2\,\text{ArcSinh}[c\,x]}\right]+2\,i\,b\,\pi\,\text{Log}\left[1-i\,e^{-\text{ArcSinh}[c\,x]}\right]-4\,b\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1-i\,e^{-\text{ArcSinh}[c\,x]}\right]-2\,i\,b\,\pi\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]-4\,b\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]+8\,i\,b\,\pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]+4\,a\,\text{Log}[x]-2\,a\,\text{Log}\left[1+c^2x^2\right]+2\,i\,b\,\pi\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]-8\,i\,b\,\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]-2\,i\,b\,\pi\,\text{Log}\left[\text{Sin}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]-2\,b\,\text{PolyLog}\left[2,e^{-2\,\text{ArcSinh}[c\,x]}\right]+4\,b\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]+4\,b\,\text{PolyLog}\left[2,i\,e^{-\text{ArcSinh}[c\,x]}\right]\right)$$

Problem 43: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 168 leaves, 13 steps):

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

Result (type 4, 348 leaves):

$$-\frac{1}{4\,d^2}\left(\frac{4\,a}{x}+\frac{2\,a\,c^2\,x}{1+c^2\,x^2}+\frac{i\,b\,c\,\sqrt{1+c^2\,x^2}}{i-c\,x}+\frac{i\,b\,c\,\sqrt{1+c^2\,x^2}}{i+c\,x}-3\,b\,c\,\pi\,\text{ArcSinh}[c\,x]+\frac{4\,b\,\text{ArcSinh}[c\,x]}{x}+\frac{b\,c\,\text{ArcSinh}[c\,x]}{-i+c\,x}+\frac{b\,c\,\text{ArcSinh}[c\,x]}{i+c\,x}+6\,a\,c\,\text{ArcTan}[c\,x]-3\,b\,c\,\pi\,\text{Log}\left[1-i\,e^{-\text{ArcSinh}[c\,x]}\right]-6\,i\,b\,c\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1-i\,e^{-\text{ArcSinh}[c\,x]}\right]-3\,b\,c\,\pi\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]+6\,i\,b\,c\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]-4\,b\,c\,\text{Log}[x]+4\,b\,c\,\text{Log}\left[1+\sqrt{1+c^2\,x^2}\right]+3\,b\,c\,\pi\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]\right]+3\,b\,c\,\pi\,\text{Log}\left[\text{Sin}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]\right]-6\,i\,b\,c\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]+6\,i\,b\,c\,\text{PolyLog}\left[2,i\,e^{-\text{ArcSinh}[c\,x]}\right]\right)$$

Problem 44: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 146 leaves, 12 steps):

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

Result (type 4, 420 leaves):

$$\frac{1}{2 d^2}\left(-\frac{a}{x^2}-\frac{a c^2}{1+c^2 x^2}+\frac{b c^2\left(\sqrt{1+c^2 x^2}-i\,\text{ArcSinh}[c x]\right)}{2 i+2 c x}+\frac{b c^2\left(\sqrt{1+c^2 x^2}+i\,\text{ArcSinh}[c x]\right)}{-2 i+2 c x}+4 i b c^2 \pi\,\text{ArcSinh}[c x]+\right.$$
$$2 b c^2\,\text{ArcSinh}[c x]^2-\frac{b\left(c x \sqrt{1+c^2 x^2}+\text{ArcSinh}[c x]\right)}{x^2}-2 b c^2\,\text{ArcSinh}[c x]\left(\text{ArcSinh}[c x]+2\,\text{Log}\left[1-e^{-2\,\text{ArcSinh}[c x]}\right]\right)+$$
$$b c^2\left(-2 i \pi+4\,\text{ArcSinh}[c x]\right)\text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]+b c^2\left(2 i \pi+4\,\text{ArcSinh}[c x]\right)\text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-$$
$$8 i b c^2 \pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]-4 a c^2\,\text{Log}[x]+2 a c^2\,\text{Log}\left[1+c^2 x^2\right]-2 i b c^2 \pi\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\left(\pi+2 i\,\text{ArcSinh}[c x]\right)\right]\right]+$$
$$8 i b c^2 \pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right]+2 i b c^2 \pi\,\text{Log}\left[\text{Sin}\left[\frac{1}{4}\left(\pi+2 i\,\text{ArcSinh}[c x]\right)\right]\right]+$$
$$\left.2 b c^2\,\text{PolyLog}\left[2, e^{-2\,\text{ArcSinh}[c x]}\right]-4 b c^2\,\text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]-4 b c^2\,\text{PolyLog}\left[2, i e^{-\text{ArcSinh}[c x]}\right]\right)$$

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

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

Optimal (type 4, 178 leaves, 10 steps):

$$\frac{b}{12 c d^3\left(1+c^2 x^2\right)^{3/2}}+\frac{3 b}{8 c d^3\sqrt{1+c^2 x^2}}+\frac{x\left(a+b\,\text{ArcSinh}[c x]\right)}{4 d^3\left(1+c^2 x^2\right)^2}+\frac{3 x\left(a+b\,\text{ArcSinh}[c x]\right)}{8 d^3\left(1+c^2 x^2\right)}+$$
$$\frac{3\left(a+b\,\text{ArcSinh}[c x]\right)\text{ArcTan}\left[e^{\text{ArcSinh}[c x]}\right]}{4 c d^3}-\frac{3 i b\,\text{PolyLog}\left[2,-i e^{\text{ArcSinh}[c x]}\right]}{8 c d^3}+\frac{3 i b\,\text{PolyLog}\left[2, i e^{\text{ArcSinh}[c x]}\right]}{8 c d^3}$$

Result (type 4, 403 leaves):

$$\frac{1}{48\,d^3}\left(\frac{12\,a\,x}{(1+c^2x^2)^2}+\frac{18\,a\,x}{1+c^2x^2}-\frac{i\,b\,(-2\,i+c\,x)\,\sqrt{1+c^2x^2}}{c\,(-i+c\,x)^2}+\frac{i\,b\,(2\,i+c\,x)\,\sqrt{1+c^2x^2}}{c\,(i+c\,x)^2}-\frac{9\,b\,\pi\,\text{ArcSinh}[c\,x]}{c}-\frac{3\,i\,b\,\text{ArcSinh}[c\,x]}{c\,(-i+c\,x)^2}+\frac{3\,i\,b\,\text{ArcSinh}[c\,x]}{c\,(i+c\,x)^2}+\right.$$
$$\frac{9\,b\left(-i\,\sqrt{1+c^2x^2}+\text{ArcSinh}[c\,x]\right)}{c\,(-i+c\,x)}+\frac{9\,b\left(i\,\sqrt{1+c^2x^2}+\text{ArcSinh}[c\,x]\right)}{c\,(i+c\,x)}+\frac{18\,a\,\text{ArcTan}[c\,x]}{c}-\frac{9\,b\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\,\text{Log}\left[1-i\,e^{-\text{ArcSinh}[c\,x]}\right]}{c}-$$
$$\frac{9\,b\,(\pi-2\,i\,\text{ArcSinh}[c\,x])\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]}{c}+\frac{9\,b\,\pi\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]}{c}+$$
$$\left.\frac{9\,b\,\pi\,\text{Log}\left[\text{Sin}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]}{c}-\frac{18\,i\,b\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]}{c}+\frac{18\,i\,b\,\text{PolyLog}\left[2,i\,e^{-\text{ArcSinh}[c\,x]}\right]}{c}\right)$$

Problem 51: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 159 leaves, 12 steps):

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

Result (type 4, 457 leaves):

$$-\frac{1}{4 d^3}\left(-\frac{a}{\left(1+c^2 x^2\right)^2}-\frac{2 a}{1+c^2 x^2}+\frac{b\left(-2 i+c x\right)\sqrt{1+c^2 x^2}}{12\left(-i+c x\right)^2}+\frac{b\left(2 i+c x\right)\sqrt{1+c^2 x^2}}{12\left(i+c x\right)^2}+\frac{5 b\left(\sqrt{1+c^2 x^2}-i\,\text{ArcSinh}[c x]\right)}{4 i+4 c x}+\right.$$
$$\frac{5 b\left(\sqrt{1+c^2 x^2}+i\,\text{ArcSinh}[c x]\right)}{-4 i+4 c x}+4 i b \pi\,\text{ArcSinh}[c x]+\frac{b\,\text{ArcSinh}[c x]}{4\left(-i+c x\right)^2}+\frac{b\,\text{ArcSinh}[c x]}{4\left(i+c x\right)^2}+2 b\,\text{ArcSinh}[c x]^2-$$
$$2 b\,\text{ArcSinh}[c x]\left(\text{ArcSinh}[c x]+2\,\text{Log}\left[1-e^{-2\,\text{ArcSinh}[c x]}\right]\right)+2 b\left(-i \pi+2\,\text{ArcSinh}[c x]\right)\text{Log}\left[1-i\,e^{-\text{ArcSinh}[c x]}\right]+$$
$$b\left(2 i \pi+4\,\text{ArcSinh}[c x]\right)\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c x]}\right]-8 i b \pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]-4 a\,\text{Log}[x]+2 a\,\text{Log}\left[1+c^2 x^2\right]-$$
$$2 i b \pi\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\left(\pi+2 i\,\text{ArcSinh}[c x]\right)\right]\right]+8 i b \pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right]+2 i b \pi\,\text{Log}\left[\text{Sin}\left[\frac{1}{4}\left(\pi+2 i\,\text{ArcSinh}[c x]\right)\right]\right]+$$
$$\left.2 b\,\text{PolyLog}\left[2,e^{-2\,\text{ArcSinh}[c x]}\right]-4 b\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c x]}\right]-4 b\,\text{PolyLog}\left[2,i\,e^{-\text{ArcSinh}[c x]}\right]\right)$$

Problem 53: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 232 leaves, 16 steps):

$$-\frac{b c}{2 d^3 x\left(1+c^2 x^2\right)^{3/2}}-\frac{5 b c^3 x}{12 d^3\left(1+c^2 x^2\right)^{3/2}}+\frac{2 b c^3 x}{3 d^3\sqrt{1+c^2 x^2}}-\frac{3 c^2\left(a+b\,\text{ArcSinh}[c x]\right)}{4 d^3\left(1+c^2 x^2\right)^2}-\frac{a+b\,\text{ArcSinh}[c x]}{2 d^3 x^2\left(1+c^2 x^2\right)^2}-\frac{3 c^2\left(a+b\,\text{ArcSinh}[c x]\right)}{2 d^3\left(1+c^2 x^2\right)}+$$
$$\frac{6 c^2\left(a+b\,\text{ArcSinh}[c x]\right)\text{ArcTanh}\left[e^{2\,\text{ArcSinh}[c x]}\right]}{d^3}+\frac{3 b c^2\,\text{PolyLog}\left[2,-e^{2\,\text{ArcSinh}[c x]}\right]}{2 d^3}-\frac{3 b c^2\,\text{PolyLog}\left[2,e^{2\,\text{ArcSinh}[c x]}\right]}{2 d^3}$$

Result (type 4, 543 leaves):

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

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

$$12 a c^2 \text{Log}[x]+6 a c^2 \text{Log}\left[1+c^2 x^2\right]-6 b c^2 \left(\text{ArcSinh}[c x] \left(\text{ArcSinh}[c x]+2 \text{Log}\left[1-e^{-2 \text{ArcSinh}[c x]}\right]\right)-\text{PolyLog}\left[2, e^{-2 \text{ArcSinh}[c x]}\right]\right)+$$

$$3 b c^2 \left(3 i \pi \text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+(2 i \pi+4 \text{ArcSinh}[c x]) \text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]-\right.$$

$$\left.2 i \pi \text{Log}\left[-\text{Cos}\left[\frac{1}{4} (\pi+2 i \text{ArcSinh}[c x])\right]\right]+4 i \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-4 \text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]\right)+$$

$$3 b c^2 \left(i \pi \text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+(-2 i \pi+4 \text{ArcSinh}[c x]) \text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]+\right.$$

$$\left.\left.4 i \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+2 i \pi \text{Log}\left[\text{Sin}\left[\frac{1}{4} (\pi+2 i \text{ArcSinh}[c x])\right]\right]-4 \text{PolyLog}\left[2, i e^{-\text{ArcSinh}[c x]}\right]\right)\right)$$

Problem 98: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 162 leaves, 11 steps):

$$-\frac{b c}{2 \pi^{3/2} x}-\frac{3 c^2 (a+b \text{ArcSinh}[c x])}{2 \pi \sqrt{\pi+c^2 \pi x^2}}-\frac{a+b \text{ArcSinh}[c x]}{2 \pi x^2 \sqrt{\pi+c^2 \pi x^2}}+\frac{b c^2 \text{ArcTan}[c x]}{\pi^{3/2}}+$$

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

Result (type 4, 378 leaves):

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

$$\frac{1}{8 \pi^{3/2} \sqrt{1+c^2 x^2}} b c^2 \left(-8 \text{ArcSinh}[c x]+16 \sqrt{1+c^2 x^2} \text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-2 \sqrt{1+c^2 x^2} \text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]-\right.$$

$$\sqrt{1+c^2 x^2} \text{ArcSinh}[c x] \text{Csch}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]^2-12 \sqrt{1+c^2 x^2} \text{ArcSinh}[c x] \text{Log}\left[1-e^{-\text{ArcSinh}[c x]}\right]+$$

$$12 \sqrt{1+c^2 x^2} \text{ArcSinh}[c x] \text{Log}\left[1+e^{-\text{ArcSinh}[c x]}\right]-12 \sqrt{1+c^2 x^2} \text{PolyLog}\left[2,-e^{-\text{ArcSinh}[c x]}\right]+$$

$$\left.12 \sqrt{1+c^2 x^2} \text{PolyLog}\left[2, e^{-\text{ArcSinh}[c x]}\right]-\sqrt{1+c^2 x^2} \text{ArcSinh}[c x] \text{Sech}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]^2+2 \sqrt{1+c^2 x^2} \text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right)$$

Problem 109: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 247 leaves, 15 steps):

$$-\frac{3\,b\,c}{4\,\pi^{5/2}\,x}+\frac{b\,c}{4\,\pi^{5/2}\,x\left(1+c^2x^2\right)}+\frac{5\,b\,c^3\,x}{12\,\pi^{5/2}\left(1+c^2x^2\right)}-\frac{5\,c^2\left(a+b\,\text{ArcSinh}[c\,x]\right)}{6\,\pi\left(\pi+c^2\pi x^2\right)^{3/2}}-\frac{a+b\,\text{ArcSinh}[c\,x]}{2\,\pi\,x^2\left(\pi+c^2\pi x^2\right)^{3/2}}-\frac{5\,c^2\left(a+b\,\text{ArcSinh}[c\,x]\right)}{2\,\pi^2\sqrt{\pi+c^2\pi x^2}}+$$
$$\frac{13\,b\,c^2\,\text{ArcTan}[c\,x]}{6\,\pi^{5/2}}+\frac{5\,c^2\left(a+b\,\text{ArcSinh}[c\,x]\right)\text{ArcTanh}\left[e^{\text{ArcSinh}[c\,x]}\right]}{\pi^{5/2}}+\frac{5\,b\,c^2\,\text{PolyLog}\left[2,-e^{\text{ArcSinh}[c\,x]}\right]}{2\,\pi^{5/2}}-\frac{5\,b\,c^2\,\text{PolyLog}\left[2,e^{\text{ArcSinh}[c\,x]}\right]}{2\,\pi^{5/2}}$$

Result (type 4, 510 leaves):

$$\sqrt{\pi}\,\sqrt{1+c^2x^2}\left(-\frac{a}{2\,\pi^3x^2}-\frac{a\,c^2}{3\,\pi^3\left(1+c^2x^2\right)^2}-\frac{2\,a\,c^2}{\pi^3\left(1+c^2x^2\right)}\right)-\frac{5\,a\,c^2\,\text{Log}[x]}{2\,\pi^{5/2}}+\frac{5\,a\,c^2\,\text{Log}\left[\pi+\pi\sqrt{1+c^2x^2}\right]}{2\,\pi^{5/2}}-\frac{1}{24\,\pi^{5/2}\left(1+c^2x^2\right)^{3/2}}$$
$$b\,c^2\left(-6\left(1+c^2x^2\right)^{3/2}+\frac{6\left(1+c^2x^2\right)^{3/2}\text{ArcSinh}[c\,x]}{c\,x}-8\sqrt{1+c^2x^2}\,\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]^2+8\,\text{ArcSinh}[c\,x]\,\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+\right.$$
$$48\left(1+c^2x^2\right)\text{ArcSinh}[c\,x]\,\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-104\left(1+c^2x^2\right)^{3/2}\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+$$
$$6\left(1+c^2x^2\right)^{3/2}\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]^2+3\left(1+c^2x^2\right)^{3/2}\text{ArcSinh}[c\,x]\,\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\text{Csch}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]^2+$$
$$60\left(1+c^2x^2\right)^{3/2}\text{ArcSinh}[c\,x]\,\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\text{Log}\left[1-e^{-\text{ArcSinh}[c\,x]}\right]-$$
$$60\left(1+c^2x^2\right)^{3/2}\text{ArcSinh}[c\,x]\,\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\text{Log}\left[1+e^{-\text{ArcSinh}[c\,x]}\right]+60\left(1+c^2x^2\right)^{3/2}\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\text{PolyLog}\left[2,-e^{-\text{ArcSinh}[c\,x]}\right]-$$
$$\left.60\left(1+c^2x^2\right)^{3/2}\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\text{PolyLog}\left[2,e^{-\text{ArcSinh}[c\,x]}\right]\right)\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]$$

Problem 191: Unable to integrate problem.

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

Optimal (type 5, 618 leaves, 9 steps):

$$-\frac{15\,b\,c\,d^2\,x^{2+m}\sqrt{d+c^2\,d\,x^2}}{(2+m)^2\,(4+m)\,(6+m)\,\sqrt{1+c^2\,x^2}}-\frac{5\,b\,c\,d^2\,x^{2+m}\sqrt{d+c^2\,d\,x^2}}{(6+m)\,\left(8+6\,m+m^2\right)\sqrt{1+c^2\,x^2}}-\frac{b\,c\,d^2\,x^{2+m}\sqrt{d+c^2\,d\,x^2}}{\left(12+8\,m+m^2\right)\sqrt{1+c^2\,x^2}}-\frac{5\,b\,c^3\,d^2\,x^{4+m}\sqrt{d+c^2\,d\,x^2}}{(4+m)^2\,(6+m)\,\sqrt{1+c^2\,x^2}}-$$

$$\frac{2\,b\,c^3\,d^2\,x^{4+m}\sqrt{d+c^2\,d\,x^2}}{(4+m)\,(6+m)\,\sqrt{1+c^2\,x^2}}-\frac{b\,c^5\,d^2\,x^{6+m}\sqrt{d+c^2\,d\,x^2}}{(6+m)^2\,\sqrt{1+c^2\,x^2}}+\frac{15\,d^2\,x^{1+m}\sqrt{d+c^2\,d\,x^2}\,(a+b\,\text{ArcSinh}[c\,x])}{(6+m)\,\left(8+6\,m+m^2\right)}+\frac{5\,d\,x^{1+m}\left(d+c^2\,d\,x^2\right)^{3/2}(a+b\,\text{ArcSinh}[c\,x])}{(4+m)\,(6+m)}+$$

$$\frac{x^{1+m}\left(d+c^2\,d\,x^2\right)^{5/2}(a+b\,\text{ArcSinh}[c\,x])}{6+m}+\frac{15\,d^2\,x^{1+m}\sqrt{d+c^2\,d\,x^2}\,(a+b\,\text{ArcSinh}[c\,x])\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},-c^2\,x^2\right]}{(6+m)\,\left(8+14\,m+7\,m^2+m^3\right)\sqrt{1+c^2\,x^2}}-$$

$$\frac{15\,b\,c\,d^2\,x^{2+m}\sqrt{d+c^2\,d\,x^2}\,\text{HypergeometricPFQ}\left[\left\{1,1+\frac{m}{2},1+\frac{m}{2}\right\},\left\{\frac{3}{2}+\frac{m}{2},2+\frac{m}{2}\right\},-c^2\,x^2\right]}{(1+m)\,(2+m)^2\,(4+m)\,(6+m)\,\sqrt{1+c^2\,x^2}}$$

Result (type 8, 28 leaves):

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

Problem 192: Unable to integrate problem.

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

Optimal (type 5, 390 leaves, 6 steps):

$$-\frac{3\,b\,c\,d\,x^{2+m}\sqrt{d+c^2\,d\,x^2}}{(2+m)^2\,(4+m)\,\sqrt{1+c^2\,x^2}}-\frac{b\,c\,d\,x^{2+m}\sqrt{d+c^2\,d\,x^2}}{\left(8+6\,m+m^2\right)\sqrt{1+c^2\,x^2}}-\frac{b\,c^3\,d\,x^{4+m}\sqrt{d+c^2\,d\,x^2}}{(4+m)^2\,\sqrt{1+c^2\,x^2}}+\frac{3\,d\,x^{1+m}\sqrt{d+c^2\,d\,x^2}\,(a+b\,\text{ArcSinh}[c\,x])}{8+6\,m+m^2}+$$

$$\frac{x^{1+m}\left(d+c^2\,d\,x^2\right)^{3/2}(a+b\,\text{ArcSinh}[c\,x])}{4+m}+\frac{3\,d\,x^{1+m}\sqrt{d+c^2\,d\,x^2}\,(a+b\,\text{ArcSinh}[c\,x])\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},-c^2\,x^2\right]}{\left(8+14\,m+7\,m^2+m^3\right)\sqrt{1+c^2\,x^2}}-$$

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

Result (type 8, 28 leaves):

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

Problem 193: Unable to integrate problem.

$$\int x^m\sqrt{d+c^2\,d\,x^2}\,(a+b\,\text{ArcSinh}[c\,x])\,dx$$

Optimal (type 5, 240 leaves, 3 steps):

$$-\frac{b c x^{2+m} \sqrt{d+c^2 d x^2}}{(2+m)^2 \sqrt{1+c^2 x^2}}+\frac{x^{1+m} \sqrt{d+c^2 d x^2} \, (a+b \operatorname{ArcSinh}[c x])}{2+m}+\frac{x^{1+m} \sqrt{d+c^2 d x^2} \, (a+b \operatorname{ArcSinh}[c x]) \operatorname{Hypergeometric2F1}\left[\frac{1}{2}, \frac{1+m}{2}, \frac{3+m}{2}, -c^2 x^2\right]}{(2+3 m+m^2) \sqrt{1+c^2 x^2}}-\frac{b c x^{2+m} \sqrt{d+c^2 d x^2} \operatorname{HypergeometricPFQ}\left[\left\{1, 1+\frac{m}{2}, 1+\frac{m}{2}\right\}, \left\{\frac{3}{2}+\frac{m}{2}, 2+\frac{m}{2}\right\}, -c^2 x^2\right]}{(1+m) (2+m)^2 \sqrt{1+c^2 x^2}}$$

Result (type 8, 28 leaves):

$$\int x^m \sqrt{d+c^2 d x^2} \, (a+b \operatorname{ArcSinh}[c x]) \, dx$$

Problem 194: Unable to integrate problem.

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

Optimal (type 5, 161 leaves, 1 step):

$$\frac{x^{1+m} \sqrt{1+c^2 x^2} \, (a+b \operatorname{ArcSinh}[c x]) \operatorname{Hypergeometric2F1}\left[\frac{1}{2}, \frac{1+m}{2}, \frac{3+m}{2}, -c^2 x^2\right]}{(1+m) \sqrt{d+c^2 d x^2}}-\frac{b c x^{2+m} \sqrt{1+c^2 x^2} \operatorname{HypergeometricPFQ}\left[\left\{1, 1+\frac{m}{2}, 1+\frac{m}{2}\right\}, \left\{\frac{3}{2}+\frac{m}{2}, 2+\frac{m}{2}\right\}, -c^2 x^2\right]}{(2+3 m+m^2) \sqrt{d+c^2 d x^2}}$$

Result (type 9, 181 leaves):

$$\frac{1}{(1+m) \sqrt{d+c^2 d x^2}} 2^{-2-m} x^{1+m} \sqrt{1+c^2 x^2} \left(2^{2+m} \left(a \operatorname{Hypergeometric2F1}\left[\frac{1}{2}, \frac{1+m}{2}, \frac{3+m}{2}, -c^2 x^2\right]+b \sqrt{1+c^2 x^2} \operatorname{ArcSinh}[c x] \operatorname{Hypergeometric2F1}\left[1, \frac{2+m}{2}, \frac{3+m}{2}, -c^2 x^2\right]\right)-b c (1+m) \sqrt{\pi} \, x \operatorname{Gamma}[1+m] \operatorname{HypergeometricPFQRegularized}\left[\left\{1, \frac{2+m}{2}, \frac{2+m}{2}\right\}, \left\{\frac{3+m}{2}, \frac{4+m}{2}\right\}, -c^2 x^2\right]\right)$$

Problem 195: Unable to integrate problem.

$$\int \frac{x^m (a+b \operatorname{ArcSinh}[c x])}{(d+c^2 d x^2)^{3/2}} \, dx$$

Optimal (type 5, 268 leaves, 3 steps):

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

Result (type 8, 28 leaves):

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

Problem 196: Unable to integrate problem.

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

Optimal (type 5, 402 leaves, 5 steps):

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

Result (type 8, 28 leaves):

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

Problem 197: Unable to integrate problem.

$$\int \frac{x^m\,\text{ArcSinh}[a\,x]}{\sqrt{1+a^2\,x^2}}\,dx$$

Optimal (type 5, 102 leaves, 1 step):

$$\frac{x^{1+m}\,\text{ArcSinh}[a\,x]\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},-a^2\,x^2\right]}{1+m}-\frac{a\,x^{2+m}\,\text{HypergeometricPFQ}\left[\left\{1,1+\frac{m}{2},1+\frac{m}{2}\right\},\left\{\frac{3}{2}+\frac{m}{2},2+\frac{m}{2}\right\},-a^2\,x^2\right]}{2+3\,m+m^2}$$

Result (type 9, 116 leaves):

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

Problem 203: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 166 leaves, 10 steps):

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

Result (type 4, 216 leaves):

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

Problem 205: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 180 leaves, 10 steps):

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

Result (type 4, 222 leaves):

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

Problem 212: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 257 leaves, 17 steps):

$$\frac{13}{32}b^2\,c^2\,d^2\,x^2+\frac{1}{32}b^2\,c^4\,d^2\,x^4-\frac{11}{16}b\,c\,d^2\,x\,\sqrt{1+c^2x^2}\,\left(a+b\,\text{ArcSinh}[c\,x]\right)-\frac{1}{8}b\,c\,d^2\,x\,\left(1+c^2x^2\right)^{3/2}\,\left(a+b\,\text{ArcSinh}[c\,x]\right)-\frac{11}{32}d^2\,\left(a+b\,\text{ArcSinh}[c\,x]\right)^2+\frac{1}{2}d^2\,\left(1+c^2x^2\right)\,\left(a+b\,\text{ArcSinh}[c\,x]\right)^2+\frac{1}{4}d^2\,\left(1+c^2x^2\right)^2\,\left(a+b\,\text{ArcSinh}[c\,x]\right)^2+\frac{d^2\,\left(a+b\,\text{ArcSinh}[c\,x]\right)^3}{3\,b}+d^2\,\left(a+b\,\text{ArcSinh}[c\,x]\right)^2\,\text{Log}\left[1-e^{-2\,\text{ArcSinh}[c\,x]}\right]-b\,d^2\,\left(a+b\,\text{ArcSinh}[c\,x]\right)\,\text{PolyLog}\left[2,\,e^{-2\,\text{ArcSinh}[c\,x]}\right]-\frac{1}{2}b^2\,d^2\,\text{PolyLog}\left[3,\,e^{-2\,\text{ArcSinh}[c\,x]}\right]$$

Result (type 4, 333 leaves):

$$\frac{1}{768}d^2\left(32\,i\,b^2\,\pi^3+768\,a^2\,c^2\,x^2+192\,a^2\,c^4\,x^4-624\,a\,b\,c\,x\,\sqrt{1+c^2x^2}-96\,a\,b\,c^3\,x^3\,\sqrt{1+c^2x^2}+624\,a\,b\,\text{ArcSinh}[c\,x]+1536\,a\,b\,c^2\,x^2\,\text{ArcSinh}[c\,x]+384\,a\,b\,c^4\,x^4\,\text{ArcSinh}[c\,x]+768\,a\,b\,\text{ArcSinh}[c\,x]^2-256\,b^2\,\text{ArcSinh}[c\,x]^3+144\,b^2\,\text{Cosh}[2\,\text{ArcSinh}[c\,x]]+288\,b^2\,\text{ArcSinh}[c\,x]^2\,\text{Cosh}[2\,\text{ArcSinh}[c\,x]]+3\,b^2\,\text{Cosh}[4\,\text{ArcSinh}[c\,x]]+24\,b^2\,\text{ArcSinh}[c\,x]^2\,\text{Cosh}[4\,\text{ArcSinh}[c\,x]]+1536\,a\,b\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1-e^{-2\,\text{ArcSinh}[c\,x]}\right]+768\,b^2\,\text{ArcSinh}[c\,x]^2\,\text{Log}\left[1-e^{2\,\text{ArcSinh}[c\,x]}\right]+768\,a^2\,\text{Log}[c\,x]-768\,a\,b\,\text{PolyLog}\left[2,\,e^{-2\,\text{ArcSinh}[c\,x]}\right]+768\,b^2\,\text{ArcSinh}[c\,x]\,\text{PolyLog}\left[2,\,e^{2\,\text{ArcSinh}[c\,x]}\right]-384\,b^2\,\text{PolyLog}\left[3,\,e^{2\,\text{ArcSinh}[c\,x]}\right]-288\,b^2\,\text{ArcSinh}[c\,x]\,\text{Sinh}[2\,\text{ArcSinh}[c\,x]]-12\,b^2\,\text{ArcSinh}[c\,x]\,\text{Sinh}[4\,\text{ArcSinh}[c\,x]]\right)$$

Problem 214: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 272 leaves, 17 steps):

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

Result (type 4, 313 leaves):

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

Problem 221: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 337 leaves, 26 steps):

$$\frac{71}{144} b^2 c^2 d^3 x^2 + \frac{7}{144} b^2 c^4 d^3 x^4 + \frac{1}{108} b^2 d^3 \left(1 + c^2 x^2\right)^3 - \frac{19}{24} b c d^3 x \sqrt{1 + c^2 x^2} \left(a + b \text{ArcSinh}[c x]\right) - \frac{7}{36} b c d^3 x \left(1 + c^2 x^2\right)^{3/2} \left(a + b \text{ArcSinh}[c x]\right) - \frac{1}{18} b c d^3 x \left(1 + c^2 x^2\right)^{5/2} \left(a + b \text{ArcSinh}[c x]\right) - \frac{19}{48} d^3 \left(a + b \text{ArcSinh}[c x]\right)^2 + \frac{1}{2} d^3 \left(1 + c^2 x^2\right) \left(a + b \text{ArcSinh}[c x]\right)^2 + \frac{1}{4} d^3 \left(1 + c^2 x^2\right)^2 \left(a + b \text{ArcSinh}[c x]\right)^2 + \frac{1}{6} d^3 \left(1 + c^2 x^2\right)^3 \left(a + b \text{ArcSinh}[c x]\right)^2 + \frac{d^3 \left(a + b \text{ArcSinh}[c x]\right)^3}{3 b} + d^3 \left(a + b \text{ArcSinh}[c x]\right)^2 \text{Log}\left[1 - e^{-2 \text{ArcSinh}[c x]}\right] - b d^3 \left(a + b \text{ArcSinh}[c x]\right) \text{PolyLog}\left[2, e^{-2 \text{ArcSinh}[c x]}\right] - \frac{1}{2} b^2 d^3 \text{PolyLog}\left[3, e^{-2 \text{ArcSinh}[c x]}\right]$$

Result (type 4, 426 leaves) :

$$\frac{1}{3456} d^3 \left(144 i b^2 \pi^3 + 5184 a^2 c^2 x^2 + 2592 a^2 c^4 x^4 + 576 a^2 c^6 x^6 - 3600 a b c x \sqrt{1 + c^2 x^2} - 1056 a b c^3 x^3 \sqrt{1 + c^2 x^2} - 192 a b c^5 x^5 \sqrt{1 + c^2 x^2} + 3600 a b \text{ArcSinh}[c x] + 10368 a b c^2 x^2 \text{ArcSinh}[c x] + 5184 a b c^4 x^4 \text{ArcSinh}[c x] + 1152 a b c^6 x^6 \text{ArcSinh}[c x] + 3456 a b \text{ArcSinh}[c x]^2 - 1152 b^2 \text{ArcSinh}[c x]^3 + 783 b^2 \text{Cosh}[2 \text{ArcSinh}[c x]] + 1566 b^2 \text{ArcSinh}[c x]^2 \text{Cosh}[2 \text{ArcSinh}[c x]] + 27 b^2 \text{Cosh}[4 \text{ArcSinh}[c x]] + 216 b^2 \text{ArcSinh}[c x]^2 \text{Cosh}[4 \text{ArcSinh}[c x]] + b^2 \text{Cosh}[6 \text{ArcSinh}[c x]] + 18 b^2 \text{ArcSinh}[c x]^2 \text{Cosh}[6 \text{ArcSinh}[c x]] + 6912 a b \text{ArcSinh}[c x] \text{Log}\left[1 - e^{-2 \text{ArcSinh}[c x]}\right] + 3456 b^2 \text{ArcSinh}[c x]^2 \text{Log}\left[1 - e^{2 \text{ArcSinh}[c x]}\right] + 3456 a^2 \text{Log}[c x] - 3456 a b \text{PolyLog}\left[2, e^{-2 \text{ArcSinh}[c x]}\right] + 3456 b^2 \text{ArcSinh}[c x] \text{PolyLog}\left[2, e^{2 \text{ArcSinh}[c x]}\right] - 1728 b^2 \text{PolyLog}\left[3, e^{2 \text{ArcSinh}[c x]}\right] - 1566 b^2 \text{ArcSinh}[c x] \text{Sinh}[2 \text{ArcSinh}[c x]] - 108 b^2 \text{ArcSinh}[c x] \text{Sinh}[4 \text{ArcSinh}[c x]] - 6 b^2 \text{ArcSinh}[c x] \text{Sinh}[6 \text{ArcSinh}[c x]]\right)$$

Problem 223: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 354 leaves, 28 steps) :

$$\frac{21}{32} b^2 c^4 d^3 x^2 + \frac{1}{32} b^2 c^6 d^3 x^4 - \frac{3}{16} b c^3 d^3 x \sqrt{1 + c^2 x^2} \left(a + b \text{ArcSinh}[c x]\right) + \frac{7}{8} b c^3 d^3 x \left(1 + c^2 x^2\right)^{3/2} \left(a + b \text{ArcSinh}[c x]\right) - \frac{b c d^3 \left(1 + c^2 x^2\right)^{5/2} \left(a + b \text{ArcSinh}[c x]\right)}{x} - \frac{3}{32} c^2 d^3 \left(a + b \text{ArcSinh}[c x]\right)^2 + \frac{3}{2} c^2 d^3 \left(1 + c^2 x^2\right) \left(a + b \text{ArcSinh}[c x]\right)^2 + \frac{3}{4} c^2 d^3 \left(1 + c^2 x^2\right)^2 \left(a + b \text{ArcSinh}[c x]\right)^2 - \frac{d^3 \left(1 + c^2 x^2\right)^3 \left(a + b \text{ArcSinh}[c x]\right)^2}{2 x^2} + \frac{c^2 d^3 \left(a + b \text{ArcSinh}[c x]\right)^3}{b} + 3 c^2 d^3 \left(a + b \text{ArcSinh}[c x]\right)^2 \text{Log}\left[1 - e^{-2 \text{ArcSinh}[c x]}\right] + b^2 c^2 d^3 \text{Log}[x] - 3 b c^2 d^3 \left(a + b \text{ArcSinh}[c x]\right) \text{PolyLog}\left[2, e^{-2 \text{ArcSinh}[c x]}\right] - \frac{3}{2} b^2 c^2 d^3 \text{PolyLog}\left[3, e^{-2 \text{ArcSinh}[c x]}\right]$$

Result (type 4, 472 leaves) :

$$\frac{1}{256} d^3 \left(32\, i\, b^2 c^2 \pi^3 - \frac{128 a^2}{x^2} + 384 a^2 c^4 x^2 + 64 a^2 c^6 x^4 - \frac{256 a b c \sqrt{1+c^2 x^2}}{x} - 336 a b c^3 x \sqrt{1+c^2 x^2} - 32 a b c^5 x^3 \sqrt{1+c^2 x^2} + 336 a b c^2 \text{ArcSinh}[c x] - \frac{256 a b \text{ArcSinh}[c x]}{x^2} + 768 a b c^4 x^2 \text{ArcSinh}[c x] + 128 a b c^6 x^4 \text{ArcSinh}[c x] - \frac{256 b^2 c \sqrt{1+c^2 x^2}\, \text{ArcSinh}[c x]}{x} + 768 a b c^2 \text{ArcSinh}[c x]^2 - \frac{128 b^2 \text{ArcSinh}[c x]^2}{x^2} - 256 b^2 c^2 \text{ArcSinh}[c x]^3 + 80 b^2 c^2 \text{Cosh}[2 \text{ArcSinh}[c x]] + 160 b^2 c^2 \text{ArcSinh}[c x]^2 \text{Cosh}[2 \text{ArcSinh}[c x]] + b^2 c^2 \text{Cosh}[4 \text{ArcSinh}[c x]] + 8 b^2 c^2 \text{ArcSinh}[c x]^2 \text{Cosh}[4 \text{ArcSinh}[c x]] + 1536 a b c^2 \text{ArcSinh}[c x] \text{Log}\left[1 - e^{-2 \text{ArcSinh}[c x]}\right] + 768 b^2 c^2 \text{ArcSinh}[c x]^2 \text{Log}\left[1 - e^{2 \text{ArcSinh}[c x]}\right] + 768 a^2 c^2 \text{Log}[x] + 256 b^2 c^2 \text{Log}[c x] - 768 a b c^2 \text{PolyLog}\left[2, e^{-2 \text{ArcSinh}[c x]}\right] + 768 b^2 c^2 \text{ArcSinh}[c x] \text{PolyLog}\left[2, e^{2 \text{ArcSinh}[c x]}\right] - 384 b^2 c^2 \text{PolyLog}\left[3, e^{2 \text{ArcSinh}[c x]}\right] - 160 b^2 c^2 \text{ArcSinh}[c x] \text{Sinh}[2 \text{ArcSinh}[c x]] - 4 b^2 c^2 \text{ArcSinh}[c x] \text{Sinh}[4 \text{ArcSinh}[c x]]\right)$$

Problem 226: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 199 leaves, 10 steps):

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

Result (type 4, 423 leaves):

$$\frac{1}{24 c^4 d} \left(12 a^2 c^2 x^2 - 12 a b c x \sqrt{1+c^2 x^2} + 12 a b \text{ArcSinh}[c x] - 48\, i\, a b \pi \text{ArcSinh}[c x] + 24 a b c^2 x^2 \text{ArcSinh}[c x] - 24 a b \text{ArcSinh}[c x]^2 - 8 b^2 \text{ArcSinh}[c x]^3 + 3 b^2 \text{Cosh}[2 \text{ArcSinh}[c x]] + 6 b^2 \text{ArcSinh}[c x]^2 \text{Cosh}[2 \text{ArcSinh}[c x]] - 24 b^2 \text{ArcSinh}[c x]^2 \text{Log}\left[1 + e^{-2 \text{ArcSinh}[c x]}\right] + 24\, i\, a b \pi \text{Log}\left[1 - i\, e^{-\text{ArcSinh}[c x]}\right] - 48 a b \text{ArcSinh}[c x] \text{Log}\left[1 - i\, e^{-\text{ArcSinh}[c x]}\right] - 24\, i\, a b \pi \text{Log}\left[1 + i\, e^{-\text{ArcSinh}[c x]}\right] - 48 a b \text{ArcSinh}[c x] \text{Log}\left[1 + i\, e^{-\text{ArcSinh}[c x]}\right] + 96\, i\, a b \pi \text{Log}\left[1 + e^{\text{ArcSinh}[c x]}\right] - 12 a^2 \text{Log}\left[1 + c^2 x^2\right] + 24\, i\, a b \pi \text{Log}\left[-\text{Cos}\left[\frac{1}{4} (\pi + 2\, i\, \text{ArcSinh}[c x])\right]\right] - 96\, i\, a b \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right] - 24\, i\, a b \pi \text{Log}\left[\text{Sin}\left[\frac{1}{4} (\pi + 2\, i\, \text{ArcSinh}[c x])\right]\right] + 24 b^2 \text{ArcSinh}[c x] \text{PolyLog}\left[2, -e^{-2 \text{ArcSinh}[c x]}\right] + 48 a b \text{PolyLog}\left[2, -i\, e^{-\text{ArcSinh}[c x]}\right] + 48 a b \text{PolyLog}\left[2, i\, e^{-\text{ArcSinh}[c x]}\right] + 12 b^2 \text{PolyLog}\left[3, -e^{-2 \text{ArcSinh}[c x]}\right] - 6 b^2 \text{ArcSinh}[c x] \text{Sinh}[2 \text{ArcSinh}[c x]]\right)$$

Problem 228: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 105 leaves, 6 steps):

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

Result (type 4, 325 leaves):

$$\frac{1}{6\,c^2\,d}\Big(12\,i\,a\,b\,\pi\,\text{ArcSinh}[c\,x]+6\,a\,b\,\text{ArcSinh}[c\,x]^2+2\,b^2\,\text{ArcSinh}[c\,x]^3+6\,b^2\,\text{ArcSinh}[c\,x]^2\,\text{Log}\left[1+e^{-2\,\text{ArcSinh}[c\,x]}\right]-6\,i\,a\,b\,\pi\,\text{Log}\left[1-i\,e^{-\text{ArcSinh}[c\,x]}\right]+12\,a\,b\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1-i\,e^{-\text{ArcSinh}[c\,x]}\right]+6\,i\,a\,b\,\pi\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]+12\,a\,b\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]-24\,i\,a\,b\,\pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]+3\,a^2\,\text{Log}\left[1+c^2\,x^2\right]-6\,i\,a\,b\,\pi\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]+24\,i\,a\,b\,\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+6\,i\,a\,b\,\pi\,\text{Log}\left[\text{Sin}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]-6\,b^2\,\text{ArcSinh}[c\,x]\,\text{PolyLog}\left[2,-e^{-2\,\text{ArcSinh}[c\,x]}\right]-12\,a\,b\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]-12\,a\,b\,\text{PolyLog}\left[2,i\,e^{-\text{ArcSinh}[c\,x]}\right]-3\,b^2\,\text{PolyLog}\left[3,-e^{-2\,\text{ArcSinh}[c\,x]}\right]\Big)$$

Problem 229: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 138 leaves, 8 steps):

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

Result (type 4, 309 leaves):

$$\frac{1}{c\,d}\Big(-a\,b\,\pi\,\text{ArcSinh}[c\,x]+a^2\,\text{ArcTan}[c\,x]-a\,b\,\pi\,\text{Log}\big[1-i\,e^{-\text{ArcSinh}[c\,x]}\big]-2\,i\,a\,b\,\text{ArcSinh}[c\,x]\,\text{Log}\big[1-i\,e^{-\text{ArcSinh}[c\,x]}\big]-i\,b^2\,\text{ArcSinh}[c\,x]^2\,\text{Log}\big[1-i\,e^{-\text{ArcSinh}[c\,x]}\big]-a\,b\,\pi\,\text{Log}\big[1+i\,e^{-\text{ArcSinh}[c\,x]}\big]+2\,i\,a\,b\,\text{ArcSinh}[c\,x]\,\text{Log}\big[1+i\,e^{-\text{ArcSinh}[c\,x]}\big]+i\,b^2\,\text{ArcSinh}[c\,x]^2\,\text{Log}\big[1+i\,e^{-\text{ArcSinh}[c\,x]}\big]+a\,b\,\pi\,\text{Log}\Big[-\text{Cos}\Big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\Big]\Big]+a\,b\,\pi\,\text{Log}\Big[\text{Sin}\Big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\Big]\Big]-2\,i\,b\,(a+b\,\text{ArcSinh}[c\,x])\,\text{PolyLog}\big[2,-i\,e^{-\text{ArcSinh}[c\,x]}\big]+2\,i\,b\,(a+b\,\text{ArcSinh}[c\,x])\,\text{PolyLog}\big[2,i\,e^{-\text{ArcSinh}[c\,x]}\big]-2\,i\,b^2\,\text{PolyLog}\big[3,-i\,e^{-\text{ArcSinh}[c\,x]}\big]+2\,i\,b^2\,\text{PolyLog}\big[3,i\,e^{-\text{ArcSinh}[c\,x]}\big]\Big)$$

Problem 230: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 116 leaves, 9 steps):

$$-\frac{2\,(a+b\,\text{ArcSinh}[c\,x])^2\,\text{ArcTanh}\big[e^{2\,\text{ArcSinh}[c\,x]}\big]}{d}-\frac{b\,(a+b\,\text{ArcSinh}[c\,x])\,\text{PolyLog}\big[2,-e^{2\,\text{ArcSinh}[c\,x]}\big]}{d}+\frac{b\,(a+b\,\text{ArcSinh}[c\,x])\,\text{PolyLog}\big[2,e^{2\,\text{ArcSinh}[c\,x]}\big]}{d}+\frac{b^2\,\text{PolyLog}\big[3,-e^{2\,\text{ArcSinh}[c\,x]}\big]}{2\,d}-\frac{b^2\,\text{PolyLog}\big[3,e^{2\,\text{ArcSinh}[c\,x]}\big]}{2\,d}$$

Result (type 4, 424 leaves):

$$\frac{1}{24\,d}\Big(i\,b^2\,\pi^3-48\,i\,a\,b\,\pi\,\text{ArcSinh}[c\,x]-16\,b^2\,\text{ArcSinh}[c\,x]^3+48\,a\,b\,\text{ArcSinh}[c\,x]\,\text{Log}\big[1-e^{-2\,\text{ArcSinh}[c\,x]}\big]-24\,b^2\,\text{ArcSinh}[c\,x]^2\,\text{Log}\big[1+e^{-2\,\text{ArcSinh}[c\,x]}\big]+24\,i\,a\,b\,\pi\,\text{Log}\big[1-i\,e^{-\text{ArcSinh}[c\,x]}\big]-48\,a\,b\,\text{ArcSinh}[c\,x]\,\text{Log}\big[1-i\,e^{-\text{ArcSinh}[c\,x]}\big]-24\,i\,a\,b\,\pi\,\text{Log}\big[1+i\,e^{-\text{ArcSinh}[c\,x]}\big]-48\,a\,b\,\text{ArcSinh}[c\,x]\,\text{Log}\big[1+i\,e^{-\text{ArcSinh}[c\,x]}\big]+96\,i\,a\,b\,\pi\,\text{Log}\big[1+e^{\text{ArcSinh}[c\,x]}\big]+24\,b^2\,\text{ArcSinh}[c\,x]^2\,\text{Log}\big[1-e^{2\,\text{ArcSinh}[c\,x]}\big]+24\,a^2\,\text{Log}[c\,x]-12\,a^2\,\text{Log}\big[1+c^2\,x^2\big]+24\,i\,a\,b\,\pi\,\text{Log}\Big[-\text{Cos}\Big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\Big]\Big]-96\,i\,a\,b\,\pi\,\text{Log}\Big[\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big]-24\,i\,a\,b\,\pi\,\text{Log}\Big[\text{Sin}\Big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\Big]\Big]+24\,b^2\,\text{ArcSinh}[c\,x]\,\text{PolyLog}\big[2,-e^{-2\,\text{ArcSinh}[c\,x]}\big]-24\,a\,b\,\text{PolyLog}\big[2,e^{-2\,\text{ArcSinh}[c\,x]}\big]+48\,a\,b\,\text{PolyLog}\big[2,-i\,e^{-\text{ArcSinh}[c\,x]}\big]+48\,a\,b\,\text{PolyLog}\big[2,i\,e^{-\text{ArcSinh}[c\,x]}\big]+24\,b^2\,\text{ArcSinh}[c\,x]\,\text{PolyLog}\big[2,e^{2\,\text{ArcSinh}[c\,x]}\big]+12\,b^2\,\text{PolyLog}\big[3,-e^{-2\,\text{ArcSinh}[c\,x]}\big]-12\,b^2\,\text{PolyLog}\big[3,e^{2\,\text{ArcSinh}[c\,x]}\big]\Big)$$

Problem 231: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 204 leaves, 15 steps):

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

Result (type 4, 493 leaves):

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

Problem 232: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 194 leaves, 12 steps):

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

Result (type 4, 523 leaves):

$$\frac{1}{2d}\left(-\frac{a^2}{x^2}+4 i a b c^2 \pi \text{ArcSinh}[c x]+2 a b c^2 \text{ArcSinh}[c x]^2-\frac{2 a b\left(c x\sqrt{1+c^2 x^2}+\text{ArcSinh}[c x]\right)}{x^2}-\right.$$
$$2 a b c^2 \text{ArcSinh}[c x]\left(\text{ArcSinh}[c x]+2 \text{Log}\left[1-e^{-2 \text{ArcSinh}[c x]}\right]\right)+a b c^2\left(-2 i \pi+4 \text{ArcSinh}[c x]\right) \text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]+$$
$$a b c^2\left(2 i \pi+4 \text{ArcSinh}[c x]\right) \text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-8 i a b c^2 \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]-2 a^2 c^2 \text{Log}[x]+$$
$$a^2 c^2 \text{Log}\left[1+c^2 x^2\right]-2 i a b c^2 \pi \text{Log}\left[-\text{Cos}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[c x]\right)\right]\right]+8 i a b c^2 \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right]+$$
$$2 i a b c^2 \pi \text{Log}\left[\text{Sin}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[c x]\right)\right]\right]+2 a b c^2 \text{PolyLog}\left[2, e^{-2 \text{ArcSinh}[c x]}\right]-4 a b c^2 \text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]-$$
$$4 a b c^2 \text{PolyLog}\left[2, i e^{-\text{ArcSinh}[c x]}\right]+2 b^2 c^2\left(-\frac{i \pi^3}{24}-\frac{\sqrt{1+c^2 x^2}\,\text{ArcSinh}[c x]}{c x}-\frac{\text{ArcSinh}[c x]^2}{2 c^2 x^2}+\frac{2}{3}\text{ArcSinh}[c x]^3+\right.$$
$$\text{ArcSinh}[c x]^2 \text{Log}\left[1+e^{-2 \text{ArcSinh}[c x]}\right]-\text{ArcSinh}[c x]^2 \text{Log}\left[1-e^{2 \text{ArcSinh}[c x]}\right]+\text{Log}[c x]-\text{ArcSinh}[c x] \text{PolyLog}\left[2,-e^{-2 \text{ArcSinh}[c x]}\right]-$$
$$\left.\left.\text{ArcSinh}[c x] \text{PolyLog}\left[2, e^{2 \text{ArcSinh}[c x]}\right]-\frac{1}{2}\text{PolyLog}\left[3,-e^{-2 \text{ArcSinh}[c x]}\right]+\frac{1}{2}\text{PolyLog}\left[3, e^{2 \text{ArcSinh}[c x]}\right]\right)\right)$$

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

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

Optimal (type 4, 297 leaves, 24 steps):

$$-\frac{b^2 c^2}{3 d x}-\frac{b c\sqrt{1+c^2 x^2}\left(a+b \text{ArcSinh}[c x]\right)}{3 d x^2}-\frac{\left(a+b \text{ArcSinh}[c x]\right)^2}{3 d x^3}+\frac{c^2\left(a+b \text{ArcSinh}[c x]\right)^2}{d x}+$$
$$\frac{2 c^3\left(a+b \text{ArcSinh}[c x]\right)^2 \text{ArcTan}\left[e^{\text{ArcSinh}[c x]}\right]}{d}+\frac{14 b c^3\left(a+b \text{ArcSinh}[c x]\right) \text{ArcTanh}\left[e^{\text{ArcSinh}[c x]}\right]}{3 d}+\frac{7 b^2 c^3 \text{PolyLog}\left[2,-e^{\text{ArcSinh}[c x]}\right]}{3 d}-$$
$$\frac{2 i b c^3\left(a+b \text{ArcSinh}[c x]\right) \text{PolyLog}\left[2,-i e^{\text{ArcSinh}[c x]}\right]}{d}+\frac{2 i b c^3\left(a+b \text{ArcSinh}[c x]\right) \text{PolyLog}\left[2, i e^{\text{ArcSinh}[c x]}\right]}{d}-$$
$$\frac{7 b^2 c^3 \text{PolyLog}\left[2, e^{\text{ArcSinh}[c x]}\right]}{3 d}+\frac{2 i b^2 c^3 \text{PolyLog}\left[3,-i e^{\text{ArcSinh}[c x]}\right]}{d}-\frac{2 i b^2 c^3 \text{PolyLog}\left[3, i e^{\text{ArcSinh}[c x]}\right]}{d}$$

Result (type 4, 735 leaves):

$$-\frac{a^2}{3\,d\,x^3}+\frac{a^2\,c^2}{d\,x}+\frac{a^2\,c^3\,\text{ArcTan}[c\,x]}{d}+$$

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

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

$$\left.2\,i\,\pi\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]+4\,i\,\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]-4\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]\right)-$$

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

$$\left.\left.4\,i\,\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+2\,i\,\pi\,\text{Log}\left[\text{Sin}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]-4\,\text{PolyLog}\left[2,i\,e^{-\text{ArcSinh}[c\,x]}\right]\right)\right)+$$

$$\frac{1}{24\,d}b^2\,c^3\left(-4\,\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+14\,\text{ArcSinh}[c\,x]^2\,\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-2\,\text{ArcSinh}[c\,x]\,\text{Csch}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]^2-\right.$$

$$\frac{1}{2}c\,x\,\text{ArcSinh}[c\,x]^2\,\text{Csch}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]^4-56\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1-e^{-\text{ArcSinh}[c\,x]}\right]-24\,i\,\text{ArcSinh}[c\,x]^2\,\text{Log}\left[1-i\,e^{-\text{ArcSinh}[c\,x]}\right]+$$

$$24\,i\,\text{ArcSinh}[c\,x]^2\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]+56\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1+e^{-\text{ArcSinh}[c\,x]}\right]-56\,\text{PolyLog}\left[2,-e^{-\text{ArcSinh}[c\,x]}\right]-$$

$$48\,i\,\text{ArcSinh}[c\,x]\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]+48\,i\,\text{ArcSinh}[c\,x]\,\text{PolyLog}\left[2,i\,e^{-\text{ArcSinh}[c\,x]}\right]+56\,\text{PolyLog}\left[2,e^{-\text{ArcSinh}[c\,x]}\right]-$$

$$48\,i\,\text{PolyLog}\left[3,-i\,e^{-\text{ArcSinh}[c\,x]}\right]+48\,i\,\text{PolyLog}\left[3,i\,e^{-\text{ArcSinh}[c\,x]}\right]-2\,\text{ArcSinh}[c\,x]\,\text{Sech}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]^2-$$

$$\left.\frac{8\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]^4}{c^3\,x^3}+4\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-14\,\text{ArcSinh}[c\,x]^2\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)$$

Problem 235: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 213 leaves, 10 steps):

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

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

Result (type 4, 430 leaves):

$$\frac{1}{2c^4 d^2}\left(\frac{a^2}{1+c^2x^2}-\frac{a b\left(\sqrt{1+c^2x^2}-i\,\text{ArcSinh}[c x]\right)}{i+c x}-\frac{a b\left(\sqrt{1+c^2x^2}+i\,\text{ArcSinh}[c x]\right)}{-i+c x}+4 i a b \pi\,\text{ArcSinh}[c x]+\right.$$
$$2 a b\,\text{ArcSinh}[c x]^2+a b\,(-2 i \pi+4\,\text{ArcSinh}[c x])\,\text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]+a b\,(2 i \pi+4\,\text{ArcSinh}[c x])\,\text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-$$
$$8 i a b \pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]+a^2\,\text{Log}\left[1+c^2x^2\right]-2 i a b \pi\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\left(\pi+2 i\,\text{ArcSinh}[c x]\right)\right]\right]+$$
$$8 i a b \pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right]+2 i a b \pi\,\text{Log}\left[\text{Sin}\left[\frac{1}{4}\left(\pi+2 i\,\text{ArcSinh}[c x]\right)\right]\right]-4 a b\,\text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]-$$
$$4 a b\,\text{PolyLog}\left[2,i e^{-\text{ArcSinh}[c x]}\right]+2 b^2\left(-\frac{c x\,\text{ArcSinh}[c x]}{\sqrt{1+c^2x^2}}+\frac{\text{ArcSinh}[c x]^2}{2+2c^2x^2}+\frac{1}{3}\text{ArcSinh}[c x]^3+\right.$$
$$\left.\left.\text{ArcSinh}[c x]^2\,\text{Log}\left[1+e^{-2\,\text{ArcSinh}[c x]}\right]+\frac{1}{2}\text{Log}\left[1+c^2x^2\right]-\text{ArcSinh}[c x]\,\text{PolyLog}\left[2,-e^{-2\,\text{ArcSinh}[c x]}\right]-\frac{1}{2}\text{PolyLog}\left[3,-e^{-2\,\text{ArcSinh}[c x]}\right]\right)\right)$$

Problem 236: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 213 leaves, 11 steps):

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

Result (type 4, 478 leaves):

$$-\frac{1}{2c^3d^2}\left(\frac{a^2 c x}{1+c^2x^2}+\frac{i a b\sqrt{1+c^2x^2}}{i-cx}+\frac{i a b\sqrt{1+c^2x^2}}{i+cx}+a b\pi\,\text{ArcSinh}[c x]+\frac{a b\,\text{ArcSinh}[c x]}{-i+cx}+\frac{a b\,\text{ArcSinh}[c x]}{i+cx}+\right.$$
$$\frac{2b^2\,\text{ArcSinh}[c x]}{\sqrt{1+c^2x^2}}+\frac{b^2 c x\,\text{ArcSinh}[c x]^2}{1+c^2x^2}-a^2\,\text{ArcTan}[c x]-4b^2\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right]+a b\pi\,\text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]+$$
$$2 i a b\,\text{ArcSinh}[c x]\,\text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]+i b^2\,\text{ArcSinh}[c x]^2\,\text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]+a b\pi\,\text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-$$
$$2 i a b\,\text{ArcSinh}[c x]\,\text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-i b^2\,\text{ArcSinh}[c x]^2\,\text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-a b\pi\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\left(\pi+2 i\,\text{ArcSinh}[c x]\right)\right]\right]-$$
$$a b\pi\,\text{Log}\left[\text{Sin}\left[\frac{1}{4}\left(\pi+2 i\,\text{ArcSinh}[c x]\right)\right]\right]+2 i b\left(a+b\,\text{ArcSinh}[c x]\right)\text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]-$$
$$\left.2 i b\left(a+b\,\text{ArcSinh}[c x]\right)\text{PolyLog}\left[2,i e^{-\text{ArcSinh}[c x]}\right]+2 i b^2\,\text{PolyLog}\left[3,-i e^{-\text{ArcSinh}[c x]}\right]-2 i b^2\,\text{PolyLog}\left[3,i e^{-\text{ArcSinh}[c x]}\right]\right)$$

Problem 238: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 210 leaves, 11 steps):

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

Result (type 4, 472 leaves):

$$\frac{1}{2 d^2}\left(\frac{a^2 x}{1+c^2 x^2}+\frac{a^2 \text{ArcTan}[c x]}{c}+\right.$$

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

$$\text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]-\pi \text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]+2 i \text{ArcSinh}[c x] \text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]+\pi \text{Log}\left[-\text{Cos}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right]+$$

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

$$\frac{1}{c} 2 b^2\left(\frac{\text{ArcSinh}[c x]}{\sqrt{1+c^2 x^2}}+\frac{c x \text{ArcSinh}[c x]^2}{2+2 c^2 x^2}-\frac{1}{2} i \left(-4 i \text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+\text{ArcSinh}[c x]^2 \text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]-\right.\right.$$

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

$$\left.\left.\left.2 \text{ArcSinh}[c x] \text{PolyLog}\left[2, i e^{-\text{ArcSinh}[c x]}\right]+2 \text{PolyLog}\left[3,-i e^{-\text{ArcSinh}[c x]}\right]-2 \text{PolyLog}\left[3, i e^{-\text{ArcSinh}[c x]}\right]\right)\right)\right)$$

Problem 239: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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

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

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

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

Result (type 4, 536 leaves):

$$-\frac{1}{2 d^2}\left(-\frac{a^2}{1+c^2 x^2}+\frac{a b\left(\sqrt{1+c^2 x^2}-i \text{ArcSinh}[c x]\right)}{i+c x}+\frac{a b\left(\sqrt{1+c^2 x^2}+i \text{ArcSinh}[c x]\right)}{-i+c x}+4 i a b \pi \text{ArcSinh}[c x]+2 a b \text{ArcSinh}[c x]^2-\right.$$
$$2 a b \text{ArcSinh}[c x]\left(\text{ArcSinh}[c x]+2 \text{Log}\left[1-e^{-2 \text{ArcSinh}[c x]}\right]\right)+2 a b(-i \pi+2 \text{ArcSinh}[c x]) \text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]+$$
$$a b(2 i \pi+4 \text{ArcSinh}[c x]) \text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-8 i a b \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]-2 a^2 \text{Log}[c x]+a^2 \text{Log}\left[1+c^2 x^2\right]-$$
$$2 i a b \pi \text{Log}\left[-\text{Cos}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right]+8 i a b \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+2 i a b \pi \text{Log}\left[\text{Sin}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right]+$$
$$2 a b \text{PolyLog}\left[2, e^{-2 \text{ArcSinh}[c x]}\right]-4 a b \text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]-4 a b \text{PolyLog}\left[2, i e^{-\text{ArcSinh}[c x]}\right]-$$
$$2 b^2\left(\frac{i \pi^3}{24}-\frac{c x \text{ArcSinh}[c x]}{\sqrt{1+c^2 x^2}}+\frac{\text{ArcSinh}[c x]^2}{2+2 c^2 x^2}-\frac{2}{3} \text{ArcSinh}[c x]^3-\text{ArcSinh}[c x]^2 \text{Log}\left[1+e^{-2 \text{ArcSinh}[c x]}\right]+\right.$$
$$\text{ArcSinh}[c x]^2 \text{Log}\left[1-e^{2 \text{ArcSinh}[c x]}\right]+\frac{1}{2} \text{Log}\left[1+c^2 x^2\right]+\text{ArcSinh}[c x] \text{PolyLog}\left[2,-e^{-2 \text{ArcSinh}[c x]}\right]+$$
$$\left.\left.\text{ArcSinh}[c x] \text{PolyLog}\left[2, e^{2 \text{ArcSinh}[c x]}\right]+\frac{1}{2} \text{PolyLog}\left[3,-e^{-2 \text{ArcSinh}[c x]}\right]-\frac{1}{2} \text{PolyLog}\left[3, e^{2 \text{ArcSinh}[c x]}\right]\right)\right)$$

Problem 240: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 287 leaves, 20 steps):

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

Result (type 4, 689 leaves):

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

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

$$\frac{3}{8} i \left(3 i \pi\,\text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+(2 i \pi+4\,\text{ArcSinh}[c x])\,\text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]-\right.$$

$$\left.2 i \pi\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4} (\pi+2 i\,\text{ArcSinh}[c x])\right]\right]+4 i \pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right]-4\,\text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]\right)+$$

$$\frac{3}{8} i \left(i \pi\,\text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+(-2 i \pi+4\,\text{ArcSinh}[c x])\,\text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]+\right.$$

$$\left.\left.4 i \pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right]+2 i \pi\,\text{Log}\left[\text{Sin}\left[\frac{1}{4} (\pi+2 i\,\text{ArcSinh}[c x])\right]\right]-4\,\text{PolyLog}\left[2,i e^{-\text{ArcSinh}[c x]}\right]\right)\right)+$$

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

$$4\,\text{ArcSinh}[c x]\,\text{Log}\left[1-e^{-\text{ArcSinh}[c x]}\right]+3 i\,\text{ArcSinh}[c x]^2\,\text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]-$$

$$3 i\,\text{ArcSinh}[c x]^2\,\text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-4\,\text{ArcSinh}[c x]\,\text{Log}\left[1+e^{-\text{ArcSinh}[c x]}\right]+4\,\text{PolyLog}\left[2,-e^{-\text{ArcSinh}[c x]}\right]+$$

$$6 i\,\text{ArcSinh}[c x]\,\text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]-6 i\,\text{ArcSinh}[c x]\,\text{PolyLog}\left[2,i e^{-\text{ArcSinh}[c x]}\right]-4\,\text{PolyLog}\left[2,e^{-\text{ArcSinh}[c x]}\right]+$$

$$\left.6 i\,\text{PolyLog}\left[3,-i e^{-\text{ArcSinh}[c x]}\right]-6 i\,\text{PolyLog}\left[3,i e^{-\text{ArcSinh}[c x]}\right]+\text{ArcSinh}[c x]^2\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right)$$

Problem 241: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 253 leaves, 17 steps):

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

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

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

Result (type 4, 649 leaves):

$$\frac{1}{2 d^2}\Bigg(-\frac{a^2}{x^2}-\frac{a^2 c^2}{1+c^2 x^2}+\frac{a b c^2\left(\sqrt{1+c^2 x^2}-i\,\text{ArcSinh}[c x]\right)}{i+c x}+\frac{a b c^2\left(\sqrt{1+c^2 x^2}+i\,\text{ArcSinh}[c x]\right)}{-i+c x}+8 i a b c^2 \pi\,\text{ArcSinh}[c x]+$$
$$4 a b c^2\,\text{ArcSinh}[c x]^2-\frac{2 a b\left(c x\sqrt{1+c^2 x^2}+\text{ArcSinh}[c x]\right)}{x^2}-4 a b c^2\,\text{ArcSinh}[c x]\left(\text{ArcSinh}[c x]+2\,\text{Log}\left[1-e^{-2\,\text{ArcSinh}[c x]}\right]\right)+$$
$$4 a b c^2\left(-i\pi+2\,\text{ArcSinh}[c x]\right)\text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]+4 a b c^2\left(i\pi+2\,\text{ArcSinh}[c x]\right)\text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-$$
$$16 i a b c^2\pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]-4 a^2 c^2\,\text{Log}[x]+2 a^2 c^2\,\text{Log}\left[1+c^2 x^2\right]-4 i a b c^2\pi\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\left(\pi+2 i\,\text{ArcSinh}[c x]\right)\right]\right]+$$
$$16 i a b c^2\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right]+4 i a b c^2\pi\,\text{Log}\left[\text{Sin}\left[\frac{1}{4}\left(\pi+2 i\,\text{ArcSinh}[c x]\right)\right]\right]+$$
$$4 a b c^2\,\text{PolyLog}\left[2,e^{-2\,\text{ArcSinh}[c x]}\right]-8 a b c^2\,\text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]-8 a b c^2\,\text{PolyLog}\left[2,i e^{-\text{ArcSinh}[c x]}\right]+$$
$$b^2 c^2\Bigg(\frac{2 c x\,\text{ArcSinh}[c x]}{\sqrt{1+c^2 x^2}}-\frac{2\sqrt{1+c^2 x^2}\,\text{ArcSinh}[c x]}{c x}-\frac{\text{ArcSinh}[c x]^2}{c^2 x^2}-\frac{\text{ArcSinh}[c x]^2}{1+c^2 x^2}-4\,\text{ArcSinh}[c x]^2\,\text{Log}\left[1-e^{-2\,\text{ArcSinh}[c x]}\right]+$$
$$4\,\text{ArcSinh}[c x]^2\,\text{Log}\left[1+e^{-2\,\text{ArcSinh}[c x]}\right]+2\,\text{Log}\left[\frac{c x}{\sqrt{1+c^2 x^2}}\right]-4\,\text{ArcSinh}[c x]\,\text{PolyLog}\left[2,-e^{-2\,\text{ArcSinh}[c x]}\right]+$$
$$4\,\text{ArcSinh}[c x]\,\text{PolyLog}\left[2,e^{-2\,\text{ArcSinh}[c x]}\right]-2\,\text{PolyLog}\left[3,-e^{-2\,\text{ArcSinh}[c x]}\right]+2\,\text{PolyLog}\left[3,e^{-2\,\text{ArcSinh}[c x]}\right]\Bigg)\Bigg)$$

Problem 242: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 401 leaves, 32 steps):

$$-\frac{b^2 c^2}{3 d^2 x}+\frac{2 b c^3\left(a+b\,\text{ArcSinh}[c x]\right)}{3 d^2\sqrt{1+c^2 x^2}}-\frac{b c\left(a+b\,\text{ArcSinh}[c x]\right)}{3 d^2 x^2\sqrt{1+c^2 x^2}}-\frac{\left(a+b\,\text{ArcSinh}[c x]\right)^2}{3 d^2 x^3\left(1+c^2 x^2\right)}+$$
$$\frac{5 c^2\left(a+b\,\text{ArcSinh}[c x]\right)^2}{3 d^2 x\left(1+c^2 x^2\right)}+\frac{5 c^4 x\left(a+b\,\text{ArcSinh}[c x]\right)^2}{2 d^2\left(1+c^2 x^2\right)}+\frac{5 c^3\left(a+b\,\text{ArcSinh}[c x]\right)^2\,\text{ArcTan}\left[e^{\text{ArcSinh}[c x]}\right]}{d^2}-$$
$$\frac{b^2 c^3\,\text{ArcTan}[c x]}{d^2}+\frac{26 b c^3\left(a+b\,\text{ArcSinh}[c x]\right)\text{ArcTanh}\left[e^{\text{ArcSinh}[c x]}\right]}{3 d^2}+\frac{13 b^2 c^3\,\text{PolyLog}\left[2,-e^{\text{ArcSinh}[c x]}\right]}{3 d^2}-$$
$$\frac{5 i b c^3\left(a+b\,\text{ArcSinh}[c x]\right)\text{PolyLog}\left[2,-i e^{\text{ArcSinh}[c x]}\right]}{d^2}+\frac{5 i b c^3\left(a+b\,\text{ArcSinh}[c x]\right)\text{PolyLog}\left[2,i e^{\text{ArcSinh}[c x]}\right]}{d^2}-$$
$$\frac{13 b^2 c^3\,\text{PolyLog}\left[2,e^{\text{ArcSinh}[c x]}\right]}{3 d^2}+\frac{5 i b^2 c^3\,\text{PolyLog}\left[3,-i e^{\text{ArcSinh}[c x]}\right]}{d^2}-\frac{5 i b^2 c^3\,\text{PolyLog}\left[3,i e^{\text{ArcSinh}[c x]}\right]}{d^2}$$

Result (type 4, 897 leaves) :

$$-\frac{a^2}{3 d^2 x^3}+\frac{2 a^2 c^2}{d^2 x}+\frac{a^2 c^4 x}{2 d^2 \left(1+c^2 x^2\right)}+\frac{5 a^2 c^3 \text{ArcTan}[c x]}{2 d^2}+$$

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

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

$$\frac{5}{8} i c^3 \left(3 i \pi \text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+(2 i \pi+4 \text{ArcSinh}[c x]) \text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]-\right.$$

$$\left.2 i \pi \text{Log}\left[-\text{Cos}\left[\frac{1}{4} (\pi+2 i \text{ArcSinh}[c x])\right]\right]+4 i \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-4 \text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]\right)-$$

$$\frac{5}{8} i c^3 \left(i \pi \text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+(-2 i \pi+4 \text{ArcSinh}[c x]) \text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]+\right.$$

$$\left.\left.4 i \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+2 i \pi \text{Log}\left[\text{Sin}\left[\frac{1}{4} (\pi+2 i \text{ArcSinh}[c x])\right]\right]-4 \text{PolyLog}\left[2,i e^{-\text{ArcSinh}[c x]}\right]\right)\right)+$$

$$\frac{1}{24 d^2} b^2 c^3 \left(\frac{24 \text{ArcSinh}[c x]}{\sqrt{1+c^2 x^2}}+\frac{12 c x \text{ArcSinh}[c x]^2}{1+c^2 x^2}-48 \text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-4 \text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]+\right.$$

$$26 \text{ArcSinh}[c x]^2 \text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]-2 \text{ArcSinh}[c x] \text{Csch}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]^2-\frac{1}{2} c x \text{ArcSinh}[c x]^2 \text{Csch}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]^4-$$

$$104 \text{ArcSinh}[c x] \text{Log}\left[1-e^{-\text{ArcSinh}[c x]}\right]-60 i \text{ArcSinh}[c x]^2 \text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]+$$

$$60 i \text{ArcSinh}[c x]^2 \text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]+104 \text{ArcSinh}[c x] \text{Log}\left[1+e^{-\text{ArcSinh}[c x]}\right]-104 \text{PolyLog}\left[2,-e^{-\text{ArcSinh}[c x]}\right]-$$

$$120 i \text{ArcSinh}[c x] \text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]+120 i \text{ArcSinh}[c x] \text{PolyLog}\left[2,i e^{-\text{ArcSinh}[c x]}\right]+104 \text{PolyLog}\left[2,e^{-\text{ArcSinh}[c x]}\right]-$$

$$120 i \text{PolyLog}\left[3,-i e^{-\text{ArcSinh}[c x]}\right]+120 i \text{PolyLog}\left[3,i e^{-\text{ArcSinh}[c x]}\right]-2 \text{ArcSinh}[c x] \text{Sech}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]^2-$$

$$\left.\frac{8 \text{ArcSinh}[c x]^2 \text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]^4}{c^3 x^3}+4 \text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]-26 \text{ArcSinh}[c x]^2 \text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right)$$

Problem 248: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 275 leaves, 17 steps) :

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

Result (type 4, 752 leaves):

$$\frac{a^2}{4 d^3 \left(1+c^2 x^2\right)^2}+\frac{a^2}{2 d^3 \left(1+c^2 x^2\right)}+\frac{a^2 \text{Log}[c x]}{d^3}-\frac{a^2 \text{Log}\left[1+c^2 x^2\right]}{2 d^3}+$$
$$\frac{1}{d^3} 2 a b \left(\frac{5 i \left(\sqrt{1+c^2 x^2}+i \text{ArcSinh}[c x]\right)}{16 (-1-i c x)}+\frac{5 i \left(i \sqrt{1+c^2 x^2}+\text{ArcSinh}[c x]\right)}{16 (i+c x)}-\frac{(-2 i+c x) \sqrt{1+c^2 x^2}+3 \text{ArcSinh}[c x]}{48 (-i+c x)^2}-\right.$$
$$\frac{(2 i+c x) \sqrt{1+c^2 x^2}+3 \text{ArcSinh}[c x]}{48 (i+c x)^2}+\frac{1}{2} \left(\text{ArcSinh}[c x] \left(\text{ArcSinh}[c x]+2 \text{Log}\left[1-e^{-2 \text{ArcSinh}[c x]}\right]\right)-\text{PolyLog}\left[2,e^{-2 \text{ArcSinh}[c x]}\right]\right)+$$
$$\frac{1}{4} \left(-3 i \pi \text{ArcSinh}[c x]-\text{ArcSinh}[c x]^2-(2 i \pi+4 \text{ArcSinh}[c x]) \text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]+4 i \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]+\right.$$
$$\left.2 i \pi \text{Log}\left[-\text{Cos}\left[\frac{1}{4} (\pi+2 i \text{ArcSinh}[c x])\right]\right]-4 i \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+4 \text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]\right)+$$
$$\frac{1}{4} \left(-i \pi \text{ArcSinh}[c x]-\text{ArcSinh}[c x]^2-(-2 i \pi+4 \text{ArcSinh}[c x]) \text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]+4 i \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]-\right.$$
$$\left.\left.4 i \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-2 i \pi \text{Log}\left[\text{Sin}\left[\frac{1}{4} (\pi+2 i \text{ArcSinh}[c x])\right]\right]+4 \text{PolyLog}\left[2,i e^{-\text{ArcSinh}[c x]}\right]\right)\right)+$$
$$\frac{1}{24 d^3} b^2 \left(i \pi^3-\frac{2}{1+c^2 x^2}-\frac{4 c x \text{ArcSinh}[c x]}{\left(1+c^2 x^2\right)^{3/2}}-\frac{32 c x \text{ArcSinh}[c x]}{\sqrt{1+c^2 x^2}}+\frac{6 \text{ArcSinh}[c x]^2}{\left(1+c^2 x^2\right)^2}+\frac{12 \text{ArcSinh}[c x]^2}{1+c^2 x^2}-16 \text{ArcSinh}[c x]^3-\right.$$
$$24 \text{ArcSinh}[c x]^2 \text{Log}\left[1+e^{-2 \text{ArcSinh}[c x]}\right]+24 \text{ArcSinh}[c x]^2 \text{Log}\left[1-e^{2 \text{ArcSinh}[c x]}\right]+32 \text{Log}\left[\sqrt{1+c^2 x^2}\right]+24 \text{ArcSinh}[c x]$$
$$\left.\text{PolyLog}\left[2,-e^{-2 \text{ArcSinh}[c x]}\right]+24 \text{ArcSinh}[c x] \text{PolyLog}\left[2,e^{2 \text{ArcSinh}[c x]}\right]+12 \text{PolyLog}\left[3,-e^{-2 \text{ArcSinh}[c x]}\right]-12 \text{PolyLog}\left[3,e^{2 \text{ArcSinh}[c x]}\right]\right)$$

Problem 249: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 389 leaves, 27 steps):

$$\frac{b^2 c^2 x}{12 d^3 \left(1+c^2 x^2\right)}-\frac{b c \left(a+b \text{ArcSinh}[c x]\right)}{6 d^3 \left(1+c^2 x^2\right)^{3/2}}-\frac{7 b c \left(a+b \text{ArcSinh}[c x]\right)}{4 d^3 \sqrt{1+c^2 x^2}}-\frac{\left(a+b \text{ArcSinh}[c x]\right)^2}{d^3 x \left(1+c^2 x^2\right)^2}-$$
$$\frac{5 c^2 x \left(a+b \text{ArcSinh}[c x]\right)^2}{4 d^3 \left(1+c^2 x^2\right)^2}-\frac{15 c^2 x \left(a+b \text{ArcSinh}[c x]\right)^2}{8 d^3 \left(1+c^2 x^2\right)}-\frac{15 c \left(a+b \text{ArcSinh}[c x]\right)^2 \text{ArcTan}\left[e^{\text{ArcSinh}[c x]}\right]}{4 d^3}+$$
$$\frac{11 b^2 c \text{ArcTan}[c x]}{6 d^3}-\frac{4 b c \left(a+b \text{ArcSinh}[c x]\right) \text{ArcTanh}\left[e^{\text{ArcSinh}[c x]}\right]}{d^3}-\frac{2 b^2 c \text{PolyLog}\left[2,-e^{\text{ArcSinh}[c x]}\right]}{d^3}+$$
$$\frac{15 i b c \left(a+b \text{ArcSinh}[c x]\right) \text{PolyLog}\left[2,-i e^{\text{ArcSinh}[c x]}\right]}{4 d^3}-\frac{15 i b c \left(a+b \text{ArcSinh}[c x]\right) \text{PolyLog}\left[2,i e^{\text{ArcSinh}[c x]}\right]}{4 d^3}+$$
$$\frac{2 b^2 c \text{PolyLog}\left[2,e^{\text{ArcSinh}[c x]}\right]}{d^3}-\frac{15 i b^2 c \text{PolyLog}\left[3,-i e^{\text{ArcSinh}[c x]}\right]}{4 d^3}+\frac{15 i b^2 c \text{PolyLog}\left[3,i e^{\text{ArcSinh}[c x]}\right]}{4 d^3}$$

Result (type 4, 856 leaves):

$$-\frac{a^2}{d^3 x}-\frac{a^2 c^2 x}{4 d^3 \left(1+c^2 x^2\right)^2}-\frac{7 a^2 c^2 x}{8 d^3 \left(1+c^2 x^2\right)}-\frac{15 a^2 c \,\text{ArcTan}[c x]}{8 d^3}+$$

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

$$\frac{i \left((-2 i+c x) \sqrt{1+c^2 x^2}+3 \,\text{ArcSinh}[c x]\right)}{48 (-i+c x)^2}-\frac{i \left((2 i+c x) \sqrt{1+c^2 x^2}+3 \,\text{ArcSinh}[c x]\right)}{48 (i+c x)^2}+\text{Log}[c x]-\text{Log}\left[1+\sqrt{1+c^2 x^2}\right]-$$

$$\frac{15}{32} i \left(3 i \pi \,\text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+(2 i \pi+4 \,\text{ArcSinh}[c x]) \,\text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi \,\text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]-\right.$$

$$\left.2 i \pi \,\text{Log}\left[-\text{Cos}\left[\frac{1}{4} (\pi+2 i \,\text{ArcSinh}[c x])\right]\right]+4 i \pi \,\text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-4 \,\text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]\right)+$$

$$\frac{15}{32} i \left(i \pi \,\text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+(-2 i \pi+4 \,\text{ArcSinh}[c x]) \,\text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi \,\text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]+\right.$$

$$\left.\left.4 i \pi \,\text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+2 i \pi \,\text{Log}\left[\text{Sin}\left[\frac{1}{4} (\pi+2 i \,\text{ArcSinh}[c x])\right]\right]-4 \,\text{PolyLog}\left[2, i e^{-\text{ArcSinh}[c x]}\right]\right)\right)+$$

$$\frac{1}{24 d^3} b^2 c \left(\frac{2 c x}{1+c^2 x^2}-\frac{4 \,\text{ArcSinh}[c x]}{\left(1+c^2 x^2\right)^{3/2}}-\frac{42 \,\text{ArcSinh}[c x]}{\sqrt{1+c^2 x^2}}-\frac{6 c x \,\text{ArcSinh}[c x]^2}{\left(1+c^2 x^2\right)^2}-\frac{21 c x \,\text{ArcSinh}[c x]^2}{1+c^2 x^2}+88 \,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-\right.$$

$$12 \,\text{ArcSinh}[c x]^2 \,\text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]+48 \,\text{ArcSinh}[c x] \,\text{Log}\left[1-e^{-\text{ArcSinh}[c x]}\right]+45 i \,\text{ArcSinh}[c x]^2 \,\text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]-$$

$$45 i \,\text{ArcSinh}[c x]^2 \,\text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-48 \,\text{ArcSinh}[c x] \,\text{Log}\left[1+e^{-\text{ArcSinh}[c x]}\right]+48 \,\text{PolyLog}\left[2,-e^{-\text{ArcSinh}[c x]}\right]+$$

$$90 i \,\text{ArcSinh}[c x] \,\text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]-90 i \,\text{ArcSinh}[c x] \,\text{PolyLog}\left[2, i e^{-\text{ArcSinh}[c x]}\right]-48 \,\text{PolyLog}\left[2, e^{-\text{ArcSinh}[c x]}\right]+$$

$$\left.90 i \,\text{PolyLog}\left[3,-i e^{-\text{ArcSinh}[c x]}\right]-90 i \,\text{PolyLog}\left[3, i e^{-\text{ArcSinh}[c x]}\right]+12 \,\text{ArcSinh}[c x]^2 \,\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right)$$

Problem 250: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 381 leaves, 23 steps):

$$\frac{b^2 c^2}{12 d^3 \left(1+c^2 x^2\right)} - \frac{b c \left(a+b \text{ArcSinh}[c x]\right)}{d^3 x \left(1+c^2 x^2\right)^{3/2}} - \frac{5 b c^3 x \left(a+b \text{ArcSinh}[c x]\right)}{6 d^3 \left(1+c^2 x^2\right)^{3/2}} + \frac{4 b c^3 x \left(a+b \text{ArcSinh}[c x]\right)}{3 d^3 \sqrt{1+c^2 x^2}} - \frac{3 c^2 \left(a+b \text{ArcSinh}[c x]\right)^2}{4 d^3 \left(1+c^2 x^2\right)^2} - \frac{\left(a+b \text{ArcSinh}[c x]\right)^2}{2 d^3 x^2 \left(1+c^2 x^2\right)^2} - \frac{3 c^2 \left(a+b \text{ArcSinh}[c x]\right)^2}{2 d^3 \left(1+c^2 x^2\right)} + \frac{6 c^2 \left(a+b \text{ArcSinh}[c x]\right)^2 \text{ArcTanh}\left[e^{2 \text{ArcSinh}[c x]}\right]}{d^3} + \frac{b^2 c^2 \text{Log}[x]}{d^3} - \frac{7 b^2 c^2 \text{Log}\left[1+c^2 x^2\right]}{6 d^3} + \frac{3 b c^2 \left(a+b \text{ArcSinh}[c x]\right) \text{PolyLog}\left[2,-e^{2 \text{ArcSinh}[c x]}\right]}{d^3} - \frac{3 b c^2 \left(a+b \text{ArcSinh}[c x]\right) \text{PolyLog}\left[2,e^{2 \text{ArcSinh}[c x]}\right]}{d^3} - \frac{3 b^2 c^2 \text{PolyLog}\left[3,-e^{2 \text{ArcSinh}[c x]}\right]}{2 d^3} + \frac{3 b^2 c^2 \text{PolyLog}\left[3,e^{2 \text{ArcSinh}[c x]}\right]}{2 d^3}$$

Result (type 4, 872 leaves) :

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

$$\frac{1}{d^3} 2 a b \left(-\frac{c^2 \left(\left(2 i-c x\right) \sqrt{1+c^2 x^2}-3 \text{ArcSinh}[c x]\right)}{48 \left(-i+c x\right)^2}-\frac{9 i c^2 \left(\sqrt{1+c^2 x^2}+i \text{ArcSinh}[c x]\right)}{16 \left(-1-i c x\right)}-\right.$$

$$\frac{9 i c^3 \left(i \sqrt{1+c^2 x^2}+\text{ArcSinh}[c x]\right)}{16 \left(i c+c^2 x\right)}-\frac{c x \sqrt{1+c^2 x^2}+\text{ArcSinh}[c x]}{2 x^2}+\frac{c^2 \left(\left(2 i+c x\right) \sqrt{1+c^2 x^2}+3 \text{ArcSinh}[c x]\right)}{48 \left(i+c x\right)^2}-$$

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

$$\frac{3}{4} c^2 \left(3 i \pi \text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+\left(2 i \pi+4 \text{ArcSinh}[c x]\right) \text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]-\right.$$

$$\left.2 i \pi \text{Log}\left[-\text{Cos}\left[\frac{1}{4} \left(\pi+2 i \text{ArcSinh}[c x]\right)\right]\right]+4 i \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-4 \text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]\right)+$$

$$\frac{3}{4} c^2 \left(i \pi \text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+\left(-2 i \pi+4 \text{ArcSinh}[c x]\right) \text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]+\right.$$

$$\left.\left.4 i \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+2 i \pi \text{Log}\left[\text{Sin}\left[\frac{1}{4} \left(\pi+2 i \text{ArcSinh}[c x]\right)\right]\right]-4 \text{PolyLog}\left[2, i e^{-\text{ArcSinh}[c x]}\right]\right)\right)+$$

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

$$\frac{1}{24} \left(-3 i \pi^3+\frac{2}{1+c^2 x^2}+\frac{4 c x \text{ArcSinh}[c x]}{\left(1+c^2 x^2\right)^{3/2}}+\frac{56 c x \text{ArcSinh}[c x]}{\sqrt{1+c^2 x^2}}-\frac{24 \sqrt{1+c^2 x^2} \text{ArcSinh}[c x]}{c x}-\frac{12 \text{ArcSinh}[c x]^2}{c^2 x^2}-\frac{6 \text{ArcSinh}[c x]^2}{\left(1+c^2 x^2\right)^2}-\right.$$

$$\frac{24 \text{ArcSinh}[c x]^2}{1+c^2 x^2}+48 \text{ArcSinh}[c x]^3+72 \text{ArcSinh}[c x]^2 \text{Log}\left[1+e^{-2 \text{ArcSinh}[c x]}\right]-72 \text{ArcSinh}[c x]^2 \text{Log}\left[1-e^{2 \text{ArcSinh}[c x]}\right]+$$

$$\left.\left.24 \text{Log}[c x]-56 \text{Log}\left[\sqrt{1+c^2 x^2}\right]-36 \text{PolyLog}\left[3,-e^{-2 \text{ArcSinh}[c x]}\right]+36 \text{PolyLog}\left[3, e^{2 \text{ArcSinh}[c x]}\right]\right)\right)$$

Problem 251: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 529 leaves, 43 steps) :

$$-\frac{b^2 c^2}{2 d^3 x}+\frac{b^2 c^2}{6 d^3 x \left(1+c^2 x^2\right)}+\frac{b^2 c^4 x}{12 d^3 \left(1+c^2 x^2\right)}-\frac{b c^3 (a+b \text{ArcSinh}[c x])}{6 d^3 \left(1+c^2 x^2\right)^{3/2}}-$$
$$\frac{b c (a+b \text{ArcSinh}[c x])}{3 d^3 x^2 \left(1+c^2 x^2\right)^{3/2}}+\frac{29 b c^3 (a+b \text{ArcSinh}[c x])}{12 d^3 \sqrt{1+c^2 x^2}}-\frac{(a+b \text{ArcSinh}[c x])^2}{3 d^3 x^3 \left(1+c^2 x^2\right)^2}+\frac{7 c^2 (a+b \text{ArcSinh}[c x])^2}{3 d^3 x \left(1+c^2 x^2\right)^2}+$$
$$\frac{35 c^4 x (a+b \text{ArcSinh}[c x])^2}{12 d^3 \left(1+c^2 x^2\right)^2}+\frac{35 c^4 x (a+b \text{ArcSinh}[c x])^2}{8 d^3 \left(1+c^2 x^2\right)}+\frac{35 c^3 (a+b \text{ArcSinh}[c x])^2 \text{ArcTan}\left[e^{\text{ArcSinh}[c x]}\right]}{4 d^3}-$$
$$\frac{17 b^2 c^3 \text{ArcTan}[c x]}{6 d^3}+\frac{38 b c^3 (a+b \text{ArcSinh}[c x]) \text{ArcTanh}\left[e^{\text{ArcSinh}[c x]}\right]}{3 d^3}+\frac{19 b^2 c^3 \text{PolyLog}\left[2,-e^{\text{ArcSinh}[c x]}\right]}{3 d^3}-$$
$$\frac{35 i b c^3 (a+b \text{ArcSinh}[c x]) \text{PolyLog}\left[2,-i e^{\text{ArcSinh}[c x]}\right]}{4 d^3}+\frac{35 i b c^3 (a+b \text{ArcSinh}[c x]) \text{PolyLog}\left[2,i e^{\text{ArcSinh}[c x]}\right]}{4 d^3}-$$
$$\frac{19 b^2 c^3 \text{PolyLog}\left[2,e^{\text{ArcSinh}[c x]}\right]}{3 d^3}+\frac{35 i b^2 c^3 \text{PolyLog}\left[3,-i e^{\text{ArcSinh}[c x]}\right]}{4 d^3}-\frac{35 i b^2 c^3 \text{PolyLog}\left[3,i e^{\text{ArcSinh}[c x]}\right]}{4 d^3}$$

Result (type 4, 1161 leaves) :

$$-\frac{a^2}{3 d^3 x^3}+\frac{3 a^2 c^2}{d^3 x}+\frac{a^2 c^4 x}{4 d^3 \left(1+c^2 x^2\right)^2}+\frac{11 a^2 c^4 x}{8 d^3 \left(1+c^2 x^2\right)}+\frac{35 a^2 c^3 \text{ArcTan}[c x]}{8 d^3}+$$

$$\frac{1}{d^3} 2 a b \left(-\frac{c \sqrt{1+c^2 x^2}}{6 x^2}+\frac{i c^3 \left((2 i-c x) \sqrt{1+c^2 x^2}-3 \text{ArcSinh}[c x]\right)}{48 (-i+c x)^2}-\frac{11 c^3 \left(\sqrt{1+c^2 x^2}+i \text{ArcSinh}[c x]\right)}{16 (-1-i c x)}-\right.$$

$$\frac{\text{ArcSinh}[c x]}{3 x^3}+\frac{11 c^4 \left(i \sqrt{1+c^2 x^2}+\text{ArcSinh}[c x]\right)}{16 \left(i c+c^2 x\right)}+\frac{i c^3 \left((2 i+c x) \sqrt{1+c^2 x^2}+3 \text{ArcSinh}[c x]\right)}{48 (i+c x)^2}-$$

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

$$\frac{35}{32} i c^3 \left(3 i \pi \text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+(2 i \pi+4 \text{ArcSinh}[c x]) \text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]-\right.$$

$$\left.2 i \pi \text{Log}\left[-\text{Cos}\left[\frac{1}{4} (\pi+2 i \text{ArcSinh}[c x])\right]\right]+4 i \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-4 \text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]\right)-$$

$$\frac{35}{32} i c^3 \left(i \pi \text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+(-2 i \pi+4 \text{ArcSinh}[c x]) \text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]+\right.$$

$$\left.\left.4 i \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+2 i \pi \text{Log}\left[\text{Sin}\left[\frac{1}{4} (\pi+2 i \text{ArcSinh}[c x])\right]\right]-4 \text{PolyLog}\left[2,i e^{-\text{ArcSinh}[c x]}\right]\right)\right)+$$

$$\frac{1}{d^3} b^2 c^3 \left(\frac{\text{ArcSinh}[c x]}{6 \left(1+c^2 x^2\right)^{3/2}}+\frac{11 \text{ArcSinh}[c x]}{4 \sqrt{1+c^2 x^2}}+\frac{c x \text{ArcSinh}[c x]^2}{4 \left(1+c^2 x^2\right)^2}+\frac{-2 c x+33 c x \text{ArcSinh}[c x]^2}{24 \left(1+c^2 x^2\right)}+\right.$$

$$\frac{1}{12} \left(-2 \text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]+19 \text{ArcSinh}[c x]^2 \text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right) \text{Csch}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]-$$

$$\frac{1}{12} \text{ArcSinh}[c x] \text{Csch}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]^2-\frac{1}{24} \text{ArcSinh}[c x]^2 \text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c x]\right] \text{Csch}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]^2+$$

$$\frac{38}{3} i \left(-\frac{1}{8} i \text{ArcSinh}[c x]^2-\frac{1}{2} i \text{ArcSinh}[c x] \text{Log}\left[1+e^{-\text{ArcSinh}[c x]}\right]+\frac{1}{2} i \text{PolyLog}\left[2,-e^{-\text{ArcSinh}[c x]}\right]\right)+$$

$$\frac{38}{3} i \left(\frac{1}{2} i \text{ArcSinh}[c x] \text{Log}\left[1-e^{-\text{ArcSinh}[c x]}\right]-\frac{1}{2} i \left(-\frac{1}{4} \text{ArcSinh}[c x]^2+\text{PolyLog}\left[2,e^{-\text{ArcSinh}[c x]}\right]\right)\right)-$$

$$\frac{1}{24} i \left(-136 i \text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+105 \text{ArcSinh}[c x]^2 \text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]-\right.$$

$$105 \text{ArcSinh}[c x]^2 \text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]+210 \text{ArcSinh}[c x] \text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]-$$

$$\left.210 \text{ArcSinh}[c x] \text{PolyLog}\left[2,i e^{-\text{ArcSinh}[c x]}\right]+210 \text{PolyLog}\left[3,-i e^{-\text{ArcSinh}[c x]}\right]-210 \text{PolyLog}\left[3,i e^{-\text{ArcSinh}[c x]}\right]\right)-$$

$$\frac{1}{12} \text{ArcSinh}[c x] \text{Sech}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]^2+\frac{1}{12} \text{Sech}\left[\frac{1}{2} \text{ArcSinh}[c x]\right] \left(2 \text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]-19 \text{ArcSinh}[c x]^2 \text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right)-$$

$$\left.\frac{1}{24} \text{ArcSinh}[c x]^2 \text{Sech}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]^2 \text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right)$$

Problem 331: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{ArcSinh}[a x]^3}{c + a^2 c x^2} \, dx$$

Optimal (type 4, 174 leaves, 10 steps):

$$\frac{2 \text{ArcSinh}[a x]^3 \text{ArcTan}\left[e^{\text{ArcSinh}[a x]}\right]}{a c} - \frac{3 i \text{ArcSinh}[a x]^2 \text{PolyLog}\left[2, -i e^{\text{ArcSinh}[a x]}\right]}{a c} + \frac{3 i \text{ArcSinh}[a x]^2 \text{PolyLog}\left[2, i e^{\text{ArcSinh}[a x]}\right]}{a c} + \frac{6 i \text{ArcSinh}[a x] \text{PolyLog}\left[3, -i e^{\text{ArcSinh}[a x]}\right]}{a c} - \frac{6 i \text{ArcSinh}[a x] \text{PolyLog}\left[3, i e^{\text{ArcSinh}[a x]}\right]}{a c} - \frac{6 i \text{PolyLog}\left[4, -i e^{\text{ArcSinh}[a x]}\right]}{a c} + \frac{6 i \text{PolyLog}\left[4, i e^{\text{ArcSinh}[a x]}\right]}{a c}$$

Result (type 4, 454 leaves):

$$-\frac{1}{64 a c} i \Big(7 \pi^4 + 8 i \pi^3 \text{ArcSinh}[a x] + 24 \pi^2 \text{ArcSinh}[a x]^2 - 32 i \pi \text{ArcSinh}[a x]^3 - 16 \text{ArcSinh}[a x]^4 + 8 i \pi^3 \text{Log}\left[1 + i e^{-\text{ArcSinh}[a x]}\right] + 48 \pi^2 \text{ArcSinh}[a x] \text{Log}\left[1 + i e^{-\text{ArcSinh}[a x]}\right] - 96 i \pi \text{ArcSinh}[a x]^2 \text{Log}\left[1 + i e^{-\text{ArcSinh}[a x]}\right] - 64 \text{ArcSinh}[a x]^3 \text{Log}\left[1 + i e^{-\text{ArcSinh}[a x]}\right] - 48 \pi^2 \text{ArcSinh}[a x] \text{Log}\left[1 - i e^{\text{ArcSinh}[a x]}\right] + 96 i \pi \text{ArcSinh}[a x]^2 \text{Log}\left[1 - i e^{\text{ArcSinh}[a x]}\right] - 8 i \pi^3 \text{Log}\left[1 + i e^{\text{ArcSinh}[a x]}\right] + 64 \text{ArcSinh}[a x]^3 \text{Log}\left[1 + i e^{\text{ArcSinh}[a x]}\right] + 8 i \pi^3 \text{Log}\left[\text{Tan}\left[\frac{1}{4} (\pi + 2 i \text{ArcSinh}[a x])\right]\right] - 48 (\pi - 2 i \text{ArcSinh}[a x])^2 \text{PolyLog}\left[2, -i e^{-\text{ArcSinh}[a x]}\right] + 192 \text{ArcSinh}[a x]^2 \text{PolyLog}\left[2, -i e^{\text{ArcSinh}[a x]}\right] - 48 \pi^2 \text{PolyLog}\left[2, i e^{\text{ArcSinh}[a x]}\right] + 192 i \pi \text{ArcSinh}[a x] \text{PolyLog}\left[2, i e^{\text{ArcSinh}[a x]}\right] + 192 i \pi \text{PolyLog}\left[3, -i e^{-\text{ArcSinh}[a x]}\right] + 384 \text{ArcSinh}[a x] \text{PolyLog}\left[3, -i e^{-\text{ArcSinh}[a x]}\right] - 384 \text{ArcSinh}[a x] \text{PolyLog}\left[3, -i e^{\text{ArcSinh}[a x]}\right] - 192 i \pi \text{PolyLog}\left[3, i e^{\text{ArcSinh}[a x]}\right] + 384 \text{PolyLog}\left[4, -i e^{-\text{ArcSinh}[a x]}\right] + 384 \text{PolyLog}\left[4, -i e^{\text{ArcSinh}[a x]}\right]\Big)$$

Problem 348: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{ArcSinh}[a x]^3}{x^2 \sqrt{1 + a^2 x^2}} \, dx$$

Optimal (type 4, 88 leaves, 7 steps):

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

Result (type 4, 97 leaves):

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

Problem 445: Attempted integration timed out after 120 seconds.

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

Optimal (type 9, 27 leaves, 0 steps):

$$\text{Unintegrable}\left[\frac{x}{\left(1 + c^2 x^2\right)^{3/2} \left(a + b \text{ ArcSinh}[c x]\right)^2}, x\right]$$

Result (type 1, 1 leaves):

???

Problem 449: Attempted integration timed out after 120 seconds.

$$\int \frac{x^3}{\left(1 + c^2 x^2\right)^{5/2} \left(a + b \text{ ArcSinh}[c x]\right)^2} \, dx$$

Optimal (type 9, 29 leaves, 0 steps):

$$\text{Unintegrable}\left[\frac{x^3}{\left(1 + c^2 x^2\right)^{5/2} \left(a + b \text{ ArcSinh}[c x]\right)^2}, x\right]$$

Result (type 1, 1 leaves):

???

Problem 451: Attempted integration timed out after 120 seconds.

$$\int \frac{x}{\left(1 + c^2 x^2\right)^{5/2} \left(a + b \text{ ArcSinh}[c x]\right)^2} \, dx$$

Optimal (type 9, 27 leaves, 0 steps):

$$\text{Unintegrable}\left[\frac{x}{\left(1 + c^2 x^2\right)^{5/2} \left(a + b \text{ ArcSinh}[c x]\right)^2}, x\right]$$

Result (type 1, 1 leaves):

???

Problem 453: Attempted integration timed out after 120 seconds.

$$\int \frac{1}{x\left(1+c^2 x^2\right)^{5/2}\left(a+b\,\text{ArcSinh}[c\,x]\right)^2}\,dx$$

Optimal (type 9, 29 leaves, 0 steps):

$$\text{Unintegrable}\left[\frac{1}{x\left(1+c^2 x^2\right)^{5/2}\left(a+b\,\text{ArcSinh}[c\,x]\right)^2},x\right]$$

Result (type 1, 1 leaves):

???

Problem 545: Result more than twice size of optimal antiderivative.

$$\int \frac{\left(f-i\,c\,f\,x\right)^{3/2}\left(a+b\,\text{ArcSinh}[c\,x]\right)}{\left(d+i\,c\,d\,x\right)^{5/2}}\,dx$$

Optimal (type 3, 364 leaves, 9 steps):

$$\frac{4\,i\,b\,f^4\left(1+c^2x^2\right)^{5/2}}{3\,c\,(i-c\,x)\left(d+i\,c\,d\,x\right)^{5/2}\left(f-i\,c\,f\,x\right)^{5/2}}-\frac{b\,f^4\left(1+c^2x^2\right)^{5/2}\text{ArcSinh}[c\,x]^2}{2\,c\left(d+i\,c\,d\,x\right)^{5/2}\left(f-i\,c\,f\,x\right)^{5/2}}+\frac{2\,i\,f^4\left(1-i\,c\,x\right)^3\left(1+c^2x^2\right)\left(a+b\,\text{ArcSinh}[c\,x]\right)}{3\,c\left(d+i\,c\,d\,x\right)^{5/2}\left(f-i\,c\,f\,x\right)^{5/2}}-$$
$$\frac{2\,i\,f^4\left(1-i\,c\,x\right)\left(1+c^2x^2\right)^2\left(a+b\,\text{ArcSinh}[c\,x]\right)}{c\left(d+i\,c\,d\,x\right)^{5/2}\left(f-i\,c\,f\,x\right)^{5/2}}+\frac{f^4\left(1+c^2x^2\right)^{5/2}\text{ArcSinh}[c\,x]\left(a+b\,\text{ArcSinh}[c\,x]\right)}{c\left(d+i\,c\,d\,x\right)^{5/2}\left(f-i\,c\,f\,x\right)^{5/2}}+\frac{8\,b\,f^4\left(1+c^2x^2\right)^{5/2}\text{Log}[i-c\,x]}{3\,c\left(d+i\,c\,d\,x\right)^{5/2}\left(f-i\,c\,f\,x\right)^{5/2}}$$

Result (type 3, 876 leaves):

$$\frac{\sqrt{i d(-i+c x)}\sqrt{-i f(i+c x)}\left(-\frac{4 i a f}{3 d^3(-i+c x)^2}-\frac{8 a f}{3 d^3(-i+c x)}\right)}{c}+\frac{a f^{3/2}\,\text{Log}\left[c d f x+\sqrt{d}\sqrt{f}\sqrt{i d(-i+c x)}\sqrt{-i f(i+c x)}\right]}{c d^{5/2}}+$$

$$\Bigg(i b f\sqrt{i(-i d+c d x)}\sqrt{-i(i f+c f x)}\sqrt{-d f\left(1+c^2 x^2\right)}\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right)$$
$$\Bigg(-i\,\text{Cosh}\left[\frac{3}{2}\text{ArcSinh}[c x]\right]\left(\text{ArcSinh}[c x]-2\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right]-i\,\text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)+$$
$$\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\left(4+3 i\,\text{ArcSinh}[c x]-6 i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right]+3\,\text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)+$$
$$2\left(\sqrt{1+c^2 x^2}\left(\text{ArcSinh}[c x]+2\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right]+i\,\text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)+\right.$$
$$\left.2\left(i+\text{ArcSinh}[c x]+2\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right]+i\,\text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)\right)\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\Bigg)\Bigg)\Big/$$
$$\left(6 c d^3(i+c x)\sqrt{-(-i d+c d x)(i f+c f x)}\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right)^4\right)-$$
$$\Bigg(b f\sqrt{i(-i d+c d x)}\sqrt{-i(i f+c f x)}\sqrt{-d f\left(1+c^2 x^2\right)}\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right)$$
$$\Bigg(\text{Cosh}\left[\frac{3}{2}\text{ArcSinh}[c x]\right]\left((-14+3 i\,\text{ArcSinh}[c x])\,\text{ArcSinh}[c x]-28\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right]+14 i\,\text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)+$$
$$\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\left(84\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right]-i\left(8-6 i\,\text{ArcSinh}[c x]+9\,\text{ArcSinh}[c x]^2+42\,\text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)\right)+$$
$$2\left(4-4 i\,\text{ArcSinh}[c x]+6\,\text{ArcSinh}[c x]^2+56 i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right]+28\,\text{Log}\left[\sqrt{1+c^2 x^2}\right]+\sqrt{1+c^2 x^2}\right.$$
$$\left.\left(\text{ArcSinh}[c x](-14 i+3\,\text{ArcSinh}[c x])+28 i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right]+14\,\text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)\right)\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\Bigg)\Bigg)\Big/$$
$$\left(12 c d^3(i+c x)\sqrt{-(-i d+c d x)(i f+c f x)}\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\right)^4\right)$$

Problem 551: Result more than twice size of optimal antiderivative.

$$\int\frac{(f-i c f x)^{5/2}\,(a+b\,\text{ArcSinh}[c x])}{(d+i c d x)^{5/2}}\,dx$$

Optimal (type 3, 472 leaves, 10 steps):

$$\frac{i\, b f^5 x \left(1+c^2 x^2\right)^{5/2}}{(d+i c d x)^{5/2} (f-i c f x)^{5/2}}+\frac{8 i\, b f^5 \left(1+c^2 x^2\right)^{5/2}}{3 c (i-c x) (d+i c d x)^{5/2} (f-i c f x)^{5/2}}-\frac{5 b f^5 \left(1+c^2 x^2\right)^{5/2} \text{ArcSinh}[c x]^2}{2 c (d+i c d x)^{5/2} (f-i c f x)^{5/2}}+$$
$$\frac{2 i f^5 (1-i c x)^4 \left(1+c^2 x^2\right) (a+b \text{ArcSinh}[c x])}{3 c (d+i c d x)^{5/2} (f-i c f x)^{5/2}}-\frac{10 i f^5 (1-i c x)^2 \left(1+c^2 x^2\right)^2 (a+b \text{ArcSinh}[c x])}{3 c (d+i c d x)^{5/2} (f-i c f x)^{5/2}}-$$
$$\frac{5 i f^5 \left(1+c^2 x^2\right)^3 (a+b \text{ArcSinh}[c x])}{c (d+i c d x)^{5/2} (f-i c f x)^{5/2}}+\frac{5 f^5 \left(1+c^2 x^2\right)^{5/2} \text{ArcSinh}[c x] (a+b \text{ArcSinh}[c x])}{c (d+i c d x)^{5/2} (f-i c f x)^{5/2}}+\frac{28 b f^5 \left(1+c^2 x^2\right)^{5/2} \text{Log}[i-c x]}{3 c (d+i c d x)^{5/2} (f-i c f x)^{5/2}}$$

Result (type 3, 1412 leaves) :

$$\frac{\sqrt{i d (-i+c x)} \sqrt{-i f (i+c x)} \left(-\frac{i a f^2}{d^3}-\frac{8 i a f^2}{3 d^3 (-i+c x)^2}-\frac{28 a f^2}{3 d^3 (-i+c x)}\right)}{c}+\frac{5 a f^{5/2} \text{Log}\left[c d f x+\sqrt{d} \sqrt{f} \sqrt{i d (-i+c x)} \sqrt{-i f (i+c x)}\right]}{c d^{5/2}}+$$
$$\Bigg(i b f^2 \sqrt{i (-i d+c d x)} \sqrt{-i (i f+c f x)} \sqrt{-d f \left(1+c^2 x^2\right)} \left(\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]-i \text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right)$$
$$\Bigg(-i \text{Cosh}\left[\frac{3}{2} \text{ArcSinh}[c x]\right] \left(\text{ArcSinh}[c x]-2 \text{ArcTan}\left[\text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-i \text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)+$$
$$\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right] \left(4+3 i \text{ArcSinh}[c x]-6 i \text{ArcTan}\left[\text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+3 \text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)+$$
$$2 \Bigg(\sqrt{1+c^2 x^2} \left(\text{ArcSinh}[c x]+2 \text{ArcTan}\left[\text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+i \text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)+$$
$$2 \left(i+\text{ArcSinh}[c x]+2 \text{ArcTan}\left[\text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+i \text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)\Bigg) \text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\Bigg)\Bigg)\Bigg/$$
$$\left(6 c d^3 (i+c x) \sqrt{-(-i d+c d x) (i f+c f x)} \left(\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]+i \text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right)^4\right)-$$
$$\Bigg(b f^2 \sqrt{i (-i d+c d x)} \sqrt{-i (i f+c f x)} \sqrt{-d f \left(1+c^2 x^2\right)} \left(\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]-i \text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right)$$
$$\Bigg(\text{Cosh}\left[\frac{3}{2} \text{ArcSinh}[c x]\right] \left((-14+3 i \text{ArcSinh}[c x]) \text{ArcSinh}[c x]-28 \text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+14 i \text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)+$$
$$\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right] \left(84 \text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-i \left(8-6 i \text{ArcSinh}[c x]+9 \text{ArcSinh}[c x]^2+42 \text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)\right)+$$
$$2 \Bigg(4-4 i \text{ArcSinh}[c x]+6 \text{ArcSinh}[c x]^2+56 i \text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+28 \text{Log}\left[\sqrt{1+c^2 x^2}\right]+\sqrt{1+c^2 x^2}$$
$$\left(\text{ArcSinh}[c x] (-14 i+3 \text{ArcSinh}[c x])+28 i \text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+14 \text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)\Bigg) \text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\Bigg)\Bigg)\Bigg/$$
$$\left(6 c d^3 (i+c x) \sqrt{-(-i d+c d x) (i f+c f x)} \left(\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]+i \text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right)^4\right)+$$
$$\Bigg(i b f^2 \sqrt{i (-i d+c d x)} \sqrt{-i (i f+c f x)} \sqrt{-d f \left(1+c^2 x^2\right)} \left(\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]-i \text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right)$$

$$\left(-3\,\text{Cosh}\left[\frac{5}{2}\,\text{ArcSinh}[c\,x]\right]+3\,i\,\text{ArcSinh}[c\,x]\,\text{Cosh}\left[\frac{5}{2}\,\text{ArcSinh}[c\,x]\right]-\right.$$
$$\text{Cosh}\left[\frac{3}{2}\,\text{ArcSinh}[c\,x]\right]\left(9+35\,i\,\text{ArcSinh}[c\,x]+9\,\text{ArcSinh}[c\,x]^2-52\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+26\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\right)+$$
$$\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\left(20-24\,i\,\text{ArcSinh}[c\,x]+27\,\text{ArcSinh}[c\,x]^2-156\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+78\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\right)+$$
$$20\,i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]-24\,\text{ArcSinh}[c\,x]\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+27\,i\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+$$
$$156\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+78\,i\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+9\,i\,\text{Sinh}\left[\frac{3}{2}\,\text{ArcSinh}[c\,x]\right]+35$$
$$\text{ArcSinh}[c\,x]\,\text{Sinh}\left[\frac{3}{2}\,\text{ArcSinh}[c\,x]\right]+9\,i\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{3}{2}\,\text{ArcSinh}[c\,x]\right]+52\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]\,\text{Sinh}\left[\frac{3}{2}\,\text{ArcSinh}[c\,x]\right]+$$
$$\left.26\,i\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\,\text{Sinh}\left[\frac{3}{2}\,\text{ArcSinh}[c\,x]\right]-3\,i\,\text{Sinh}\left[\frac{5}{2}\,\text{ArcSinh}[c\,x]\right]+3\,\text{ArcSinh}[c\,x]\,\text{Sinh}\left[\frac{5}{2}\,\text{ArcSinh}[c\,x]\right]\right)\Bigg/$$
$$\left(12\,c\,d^3\,(i+c\,x)\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^4\right)$$

Problem 564: Result more than twice size of optimal antiderivative.

$$\int\frac{(d+i\,c\,d\,x)^{5/2}\,(a+b\,\text{ArcSinh}[c\,x])}{(f-i\,c\,f\,x)^{5/2}}\,dx$$

Optimal (type 3, 470 leaves, 10 steps):

$$-\frac{i\,b\,d^5\,x\,(1+c^2\,x^2)^{5/2}}{(d+i\,c\,d\,x)^{5/2}\,(f-i\,c\,f\,x)^{5/2}}+\frac{8\,i\,b\,d^5\,(1+c^2\,x^2)^{5/2}}{3\,c\,(i+c\,x)\,(d+i\,c\,d\,x)^{5/2}\,(f-i\,c\,f\,x)^{5/2}}-\frac{5\,b\,d^5\,(1+c^2\,x^2)^{5/2}\,\text{ArcSinh}[c\,x]^2}{2\,c\,(d+i\,c\,d\,x)^{5/2}\,(f-i\,c\,f\,x)^{5/2}}-$$
$$\frac{2\,i\,d^5\,(1+i\,c\,x)^4\,(1+c^2\,x^2)\,(a+b\,\text{ArcSinh}[c\,x])}{3\,c\,(d+i\,c\,d\,x)^{5/2}\,(f-i\,c\,f\,x)^{5/2}}+\frac{10\,i\,d^5\,(1+i\,c\,x)^2\,(1+c^2\,x^2)^2\,(a+b\,\text{ArcSinh}[c\,x])}{3\,c\,(d+i\,c\,d\,x)^{5/2}\,(f-i\,c\,f\,x)^{5/2}}+$$
$$\frac{5\,i\,d^5\,(1+c^2\,x^2)^3\,(a+b\,\text{ArcSinh}[c\,x])}{c\,(d+i\,c\,d\,x)^{5/2}\,(f-i\,c\,f\,x)^{5/2}}+\frac{5\,d^5\,(1+c^2\,x^2)^{5/2}\,\text{ArcSinh}[c\,x]\,(a+b\,\text{ArcSinh}[c\,x])}{c\,(d+i\,c\,d\,x)^{5/2}\,(f-i\,c\,f\,x)^{5/2}}+\frac{28\,b\,d^5\,(1+c^2\,x^2)^{5/2}\,\text{Log}[i+c\,x]}{3\,c\,(d+i\,c\,d\,x)^{5/2}\,(f-i\,c\,f\,x)^{5/2}}$$

Result (type 3, 1331 leaves):

$$\frac{\sqrt{i\,d\,(-i+c\,x)}\,\sqrt{-i\,f\,(i+c\,x)}\,\left(\frac{i\,a\,d^2}{f^3}+\frac{8\,i\,a\,d^2}{3\,f^3\,(i+c\,x)^2}-\frac{28\,a\,d^2}{3\,f^3\,(i+c\,x)}\right)}{c}+\frac{5\,a\,d^{5/2}\,\text{Log}\left[c\,d\,f\,x+\sqrt{d}\,\sqrt{f}\,\sqrt{i\,d\,(-i+c\,x)}\,\sqrt{-i\,f\,(i+c\,x)}\right]}{c\,f^{5/2}}-$$
$$\left(i\,b\,d^2\,\sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2\,x^2)}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)\right.$$
$$\left(-\text{Cosh}\left[\frac{3}{2}\,\text{ArcSinh}[c\,x]\right]\left(\text{ArcSinh}[c\,x]-2\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+i\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\right)+\right.$$

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

$$2\left(\sqrt{1+c^2x^2}\left(i\,\mathrm{ArcSinh}[c\,x]+2\,i\,\mathrm{ArcTan}\left[\mathrm{Coth}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]+\mathrm{Log}\left[\sqrt{1+c^2x^2}\right]\right)+\right.$$

$$\left.2\left(1+i\,\mathrm{ArcSinh}[c\,x]+2\,i\,\mathrm{ArcTan}\left[\mathrm{Coth}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]+\mathrm{Log}\left[\sqrt{1+c^2x^2}\right]\right)\right)\mathrm{Sinh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\Big)\Big)\Big/$$

$$\left(6\,c\,f^3\,(1+i\,c\,x)\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\left(\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]-i\,\mathrm{Sinh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)^4\right)+$$

$$\left(b\,d^2\sqrt{i\,(-i\,d+c\,d\,x)}\sqrt{-i\,(i\,f+c\,f\,x)}\sqrt{-d\,f\,(1+c^2x^2)}\left(\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]+i\,\mathrm{Sinh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)\right.$$

$$\left(\mathrm{Cosh}\left[\frac{3}{2}\mathrm{ArcSinh}[c\,x]\right]\left((14\,i-3\,\mathrm{ArcSinh}[c\,x])\,\mathrm{ArcSinh}[c\,x]+28\,i\,\mathrm{ArcTan}\left[\mathrm{Tanh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]-14\,\mathrm{Log}\left[\sqrt{1+c^2x^2}\right]\right)+\right.$$

$$\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\left(8+6\,i\,\mathrm{ArcSinh}[c\,x]+9\,\mathrm{ArcSinh}[c\,x]^2-84\,i\,\mathrm{ArcTan}\left[\mathrm{Tanh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]+42\,\mathrm{Log}\left[\sqrt{1+c^2x^2}\right]\right)-$$

$$2\,i\left(4+4\,i\,\mathrm{ArcSinh}[c\,x]+6\,\mathrm{ArcSinh}[c\,x]^2-56\,i\,\mathrm{ArcTan}\left[\mathrm{Tanh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]+28\,\mathrm{Log}\left[\sqrt{1+c^2x^2}\right]+\sqrt{1+c^2x^2}\right.$$

$$\left.\left.\left(\mathrm{ArcSinh}[c\,x]\,(14\,i+3\,\mathrm{ArcSinh}[c\,x])-28\,i\,\mathrm{ArcTan}\left[\mathrm{Tanh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]+14\,\mathrm{Log}\left[\sqrt{1+c^2x^2}\right]\right)\right)\mathrm{Sinh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)\right)\Big/$$

$$\left(6\,c\,f^3\,(1+i\,c\,x)\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\left(\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]-i\,\mathrm{Sinh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)^4\right)-$$

$$\left(i\,b\,d^2\sqrt{i\,(-i\,d+c\,d\,x)}\sqrt{-i\,(i\,f+c\,f\,x)}\sqrt{-d\,f\,(1+c^2x^2)}\left(\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]+i\,\mathrm{Sinh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)\right.$$

$$\left(-\mathrm{Cosh}\left[\frac{3}{2}\mathrm{ArcSinh}[c\,x]\right]\left(9-35\,i\,\mathrm{ArcSinh}[c\,x]+9\,\mathrm{ArcSinh}[c\,x]^2+52\,i\,\mathrm{ArcTan}\left[\mathrm{Coth}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]+26\,\mathrm{Log}\left[\sqrt{1+c^2x^2}\right]\right)+\right.$$

$$\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\left(20+24\,i\,\mathrm{ArcSinh}[c\,x]+27\,\mathrm{ArcSinh}[c\,x]^2+156\,i\,\mathrm{ArcTan}\left[\mathrm{Coth}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]+78\,\mathrm{Log}\left[\sqrt{1+c^2x^2}\right]\right)-$$

$$i\left(3\,(-i+\mathrm{ArcSinh}[c\,x])\,\mathrm{Cosh}\left[\frac{5}{2}\mathrm{ArcSinh}[c\,x]\right]+2\left(13+7\,i\,\mathrm{ArcSinh}[c\,x]+18\,\mathrm{ArcSinh}[c\,x]^2+\right.\right.$$

$$104\,i\,\mathrm{ArcTan}\left[\mathrm{Coth}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]+3\,i\,(i+\mathrm{ArcSinh}[c\,x])\,\mathrm{Cosh}[2\,\mathrm{ArcSinh}[c\,x]]+52\,\mathrm{Log}\left[\sqrt{1+c^2x^2}\right]+\sqrt{1+c^2x^2}$$

$$\left.\left.\left.\left(6+38\,i\,\mathrm{ArcSinh}[c\,x]+9\,\mathrm{ArcSinh}[c\,x]^2+52\,i\,\mathrm{ArcTan}\left[\mathrm{Coth}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]+26\,\mathrm{Log}\left[\sqrt{1+c^2x^2}\right]\right)\right)\mathrm{Sinh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)\right)\right)\Big/$$

$$\left(12\,c\,f^3\,(-i+c\,x)\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\left(\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]-i\,\mathrm{Sinh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)^4\right)$$

Problem 565: Result more than twice size of optimal antiderivative.

$$\int\frac{(d+i\,c\,d\,x)^{3/2}\,(a+b\,\mathrm{ArcSinh}[c\,x])}{(f-i\,c\,f\,x)^{5/2}}\,dx$$

Optimal (type 3, 362 leaves, 9 steps):

$$\frac{4\,i\,b\,d^4\,\left(1+c^2\,x^2\right)^{5/2}}{3\,c\,\left(i+c\,x\right)\,\left(d+i\,c\,d\,x\right)^{5/2}\,\left(f-i\,c\,f\,x\right)^{5/2}}-\frac{b\,d^4\,\left(1+c^2\,x^2\right)^{5/2}\,\text{ArcSinh}[c\,x]^2}{2\,c\,\left(d+i\,c\,d\,x\right)^{5/2}\,\left(f-i\,c\,f\,x\right)^{5/2}}-\frac{2\,i\,d^4\,\left(1+i\,c\,x\right)^3\,\left(1+c^2\,x^2\right)\,\left(a+b\,\text{ArcSinh}[c\,x]\right)}{3\,c\,\left(d+i\,c\,d\,x\right)^{5/2}\,\left(f-i\,c\,f\,x\right)^{5/2}}+\frac{2\,i\,d^4\,\left(1+i\,c\,x\right)\,\left(1+c^2\,x^2\right)^2\,\left(a+b\,\text{ArcSinh}[c\,x]\right)}{c\,\left(d+i\,c\,d\,x\right)^{5/2}\,\left(f-i\,c\,f\,x\right)^{5/2}}+\frac{d^4\,\left(1+c^2\,x^2\right)^{5/2}\,\text{ArcSinh}[c\,x]\,\left(a+b\,\text{ArcSinh}[c\,x]\right)}{c\,\left(d+i\,c\,d\,x\right)^{5/2}\,\left(f-i\,c\,f\,x\right)^{5/2}}+\frac{8\,b\,d^4\,\left(1+c^2\,x^2\right)^{5/2}\,\text{Log}[i+c\,x]}{3\,c\,\left(d+i\,c\,d\,x\right)^{5/2}\,\left(f-i\,c\,f\,x\right)^{5/2}}$$

Result (type 3, 877 leaves):

$$\frac{\sqrt{i\,d\,\left(-i+c\,x\right)}\,\sqrt{-i\,f\,\left(i+c\,x\right)}\,\left(\frac{4\,i\,a\,d}{3\,f^3\,\left(i+c\,x\right)^2}-\frac{8\,a\,d}{3\,f^3\,\left(i+c\,x\right)}\right)}{c}+\frac{a\,d^{3/2}\,\text{Log}\left[c\,d\,f\,x+\sqrt{d}\,\sqrt{f}\,\sqrt{i\,d\,\left(-i+c\,x\right)}\,\sqrt{-i\,f\,\left(i+c\,x\right)}\right]}{c\,f^{5/2}}-$$

$$\Bigg(i\,b\,d\,\sqrt{i\,\left(-i\,d+c\,d\,x\right)}\,\sqrt{-i\,\left(i\,f+c\,f\,x\right)}\,\sqrt{-d\,f\,\left(1+c^2\,x^2\right)}\,\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)$$
$$\Bigg(-\text{Cosh}\left[\frac{3}{2}\text{ArcSinh}[c\,x]\right]\left(\text{ArcSinh}[c\,x]-2\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+i\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\right)+$$
$$\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\left(4\,i+3\,\text{ArcSinh}[c\,x]-6\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+3\,i\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\right)+$$
$$2\left(\sqrt{1+c^2\,x^2}\left(i\,\text{ArcSinh}[c\,x]+2\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\right)+\right.$$
$$\left.2\left(1+i\,\text{ArcSinh}[c\,x]+2\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\right)\right)\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\Bigg)\Bigg)\Bigg/$$
$$\left(6\,c\,f^3\,\left(1+i\,c\,x\right)\,\sqrt{-\left(-i\,d+c\,d\,x\right)\,\left(i\,f+c\,f\,x\right)}\,\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)^4\right)+$$
$$\Bigg(b\,d\,\sqrt{i\,\left(-i\,d+c\,d\,x\right)}\,\sqrt{-i\,\left(i\,f+c\,f\,x\right)}\,\sqrt{-d\,f\,\left(1+c^2\,x^2\right)}\,\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)$$
$$\Bigg(\text{Cosh}\left[\frac{3}{2}\text{ArcSinh}[c\,x]\right]\left(\left(14\,i-3\,\text{ArcSinh}[c\,x]\right)\text{ArcSinh}[c\,x]+28\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]-14\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\right)+$$
$$\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\left(8+6\,i\,\text{ArcSinh}[c\,x]+9\,\text{ArcSinh}[c\,x]^2-84\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+42\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\right)-$$
$$2\,i\left(4+4\,i\,\text{ArcSinh}[c\,x]+6\,\text{ArcSinh}[c\,x]^2-56\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+28\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]+\sqrt{1+c^2\,x^2}\right.$$
$$\left.\left(\text{ArcSinh}[c\,x]\,\left(14\,i+3\,\text{ArcSinh}[c\,x]\right)-28\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+14\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\right)\right)\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\Bigg)\Bigg)\Bigg/$$
$$\left(12\,c\,f^3\,\left(1+i\,c\,x\right)\,\sqrt{-\left(-i\,d+c\,d\,x\right)\,\left(i\,f+c\,f\,x\right)}\,\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)^4\right)$$

Problem 580: Result more than twice size of optimal antiderivative.

$$\int \frac{(f - i c f x)^{3/2} (a + b \text{ArcSinh}[c x])^2}{(d + i c d x)^{3/2}} \, dx$$

Optimal (type 4, 752 leaves, 23 steps):

$$-\frac{2 i a b f^3 x (1 + c^2 x^2)^{3/2}}{(d + i c d x)^{3/2} (f - i c f x)^{3/2}} + \frac{2 i b^2 f^3 (1 + c^2 x^2)^2}{c (d + i c d x)^{3/2} (f - i c f x)^{3/2}} - \frac{2 i b^2 f^3 x (1 + c^2 x^2)^{3/2} \text{ArcSinh}[c x]}{(d + i c d x)^{3/2} (f - i c f x)^{3/2}} + \frac{4 i f^3 (1 + c^2 x^2) (a + b \text{ArcSinh}[c x])^2}{c (d + i c d x)^{3/2} (f - i c f x)^{3/2}} + \frac{4 f^3 x (1 + c^2 x^2) (a + b \text{ArcSinh}[c x])^2}{(d + i c d x)^{3/2} (f - i c f x)^{3/2}} + \frac{4 f^3 (1 + c^2 x^2)^{3/2} (a + b \text{ArcSinh}[c x])^2}{c (d + i c d x)^{3/2} (f - i c f x)^{3/2}} + \frac{i f^3 (1 + c^2 x^2)^2 (a + b \text{ArcSinh}[c x])^2}{c (d + i c d x)^{3/2} (f - i c f x)^{3/2}} - \frac{f^3 (1 + c^2 x^2)^{3/2} (a + b \text{ArcSinh}[c x])^3}{b c (d + i c d x)^{3/2} (f - i c f x)^{3/2}} - \frac{16 i b f^3 (1 + c^2 x^2)^{3/2} (a + b \text{ArcSinh}[c x]) \text{ArcTan}[e^{\text{ArcSinh}[c x]}]}{c (d + i c d x)^{3/2} (f - i c f x)^{3/2}} - \frac{8 b f^3 (1 + c^2 x^2)^{3/2} (a + b \text{ArcSinh}[c x]) \text{Log}[1 + e^{2 \text{ArcSinh}[c x]}]}{c (d + i c d x)^{3/2} (f - i c f x)^{3/2}} - \frac{8 b^2 f^3 (1 + c^2 x^2)^{3/2} \text{PolyLog}[2, -i e^{\text{ArcSinh}[c x]}]}{c (d + i c d x)^{3/2} (f - i c f x)^{3/2}} + \frac{8 b^2 f^3 (1 + c^2 x^2)^{3/2} \text{PolyLog}[2, i e^{\text{ArcSinh}[c x]}]}{c (d + i c d x)^{3/2} (f - i c f x)^{3/2}} - \frac{4 b^2 f^3 (1 + c^2 x^2)^{3/2} \text{PolyLog}[2, -e^{2 \text{ArcSinh}[c x]}]}{c (d + i c d x)^{3/2} (f - i c f x)^{3/2}}$$

Result (type 4, 1546 leaves):

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

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

$$\left(c d^2 \sqrt{-(-i d + c d x) (i f + c f x)} \sqrt{1 + c^2 x^2} \left(\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right] + i \text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right)\right) -$$

$$\left(a b f \sqrt{i (-i d + c d x)} \sqrt{-i (i f + c f x)} \sqrt{-d f (1 + c^2 x^2)} \left(\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right] \left(\text{ArcSinh}[c x] (-4 i + \text{ArcSinh}[c x]) + 8 i \text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right] + 4 \text{Log}\left[\sqrt{1 + c^2 x^2}\right]\right) + \right.\right.$$

$$\left.\left.\left.\mathrm{i}\left(\mathrm{ArcSinh}[c\,x]\,(4\,\mathrm{i}+\mathrm{ArcSinh}[c\,x])+8\,\mathrm{i}\,\mathrm{ArcTan}\left[\mathrm{Tanh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]+4\,\mathrm{Log}\left[\sqrt{1+c^2x^2}\right]\right)\mathrm{Sinh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)\right)\right/$$

$$\left(c\,d^2\sqrt{-(-\mathrm{i}\,d+c\,d\,x)\,(\mathrm{i}\,f+c\,f\,x)}\,\sqrt{1+c^2x^2}\,\left(\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]+\mathrm{i}\,\mathrm{Sinh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)\right)-$$

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

$$\left(\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\left(6\,\mathrm{i}\,\pi\,\mathrm{ArcSinh}[c\,x]+(6-6\,\mathrm{i})\,\mathrm{ArcSinh}[c\,x]^2+\mathrm{ArcSinh}[c\,x]^3+12\,(-\mathrm{i}\,\pi+2\,\mathrm{ArcSinh}[c\,x])\,\mathrm{Log}\left[1-\mathrm{i}\,e^{-\mathrm{ArcSinh}[c\,x]}\right]-\right.\right.$$

$$\left.24\,\mathrm{i}\,\pi\,\mathrm{Log}\left[1+e^{\mathrm{ArcSinh}[c\,x]}\right]+24\,\mathrm{i}\,\pi\,\mathrm{Log}\left[\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]+12\,\mathrm{i}\,\pi\,\mathrm{Log}\left[\mathrm{Sin}\left[\frac{1}{4}(\pi+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x])\right]\right]\right)-$$

$$24\,\mathrm{PolyLog}\left[2,\,\mathrm{i}\,e^{-\mathrm{ArcSinh}[c\,x]}\right]\left(\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]+\mathrm{i}\,\mathrm{Sinh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)+$$

$$\left(-6\,\pi\,\mathrm{ArcSinh}[c\,x]-(6-6\,\mathrm{i})\,\mathrm{ArcSinh}[c\,x]^2+\mathrm{i}\,\mathrm{ArcSinh}[c\,x]^3+12\,(\pi+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x])\,\mathrm{Log}\left[1-\mathrm{i}\,e^{-\mathrm{ArcSinh}[c\,x]}\right]+\right.$$

$$\left.\left.\left.24\,\pi\,\mathrm{Log}\left[1+e^{\mathrm{ArcSinh}[c\,x]}\right]-24\,\pi\,\mathrm{Log}\left[\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]-12\,\pi\,\mathrm{Log}\left[\mathrm{Sin}\left[\frac{1}{4}(\pi+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x])\right]\right]\right)\mathrm{Sinh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)\right)\right/$$

$$\left(3\,c\,d^2\sqrt{-(-\mathrm{i}\,d+c\,d\,x)\,(\mathrm{i}\,f+c\,f\,x)}\,\sqrt{1+c^2x^2}\,\left(\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]+\mathrm{i}\,\mathrm{Sinh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)\right)+$$

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

$$\left(\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\left(-6\,\pi\,\mathrm{ArcSinh}[c\,x]-6\,c\,x\,\mathrm{ArcSinh}[c\,x]+(6+6\,\mathrm{i})\,\mathrm{ArcSinh}[c\,x]^2+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]^3+\right.\right.$$

$$3\sqrt{1+c^2x^2}\,\left(2+\mathrm{ArcSinh}[c\,x]^2\right)+12\,\pi\,\mathrm{Log}\left[1-\mathrm{i}\,e^{-\mathrm{ArcSinh}[c\,x]}\right]+24\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]\,\mathrm{Log}\left[1-\mathrm{i}\,e^{-\mathrm{ArcSinh}[c\,x]}\right]+$$

$$\left.24\,\pi\,\mathrm{Log}\left[1+e^{\mathrm{ArcSinh}[c\,x]}\right]-24\,\pi\,\mathrm{Log}\left[\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]-12\,\pi\,\mathrm{Log}\left[\mathrm{Sin}\left[\frac{1}{4}(\pi+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x])\right]\right]\right)+$$

$$\mathrm{i}\left(-6\,\pi\,\mathrm{ArcSinh}[c\,x]-6\,c\,x\,\mathrm{ArcSinh}[c\,x]-(6-6\,\mathrm{i})\,\mathrm{ArcSinh}[c\,x]^2+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]^3+3\sqrt{1+c^2x^2}\,\left(2+\mathrm{ArcSinh}[c\,x]^2\right)+\right.$$

$$12\,\pi\,\mathrm{Log}\left[1-\mathrm{i}\,e^{-\mathrm{ArcSinh}[c\,x]}\right]+24\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]\,\mathrm{Log}\left[1-\mathrm{i}\,e^{-\mathrm{ArcSinh}[c\,x]}\right]+24\,\pi\,\mathrm{Log}\left[1+e^{\mathrm{ArcSinh}[c\,x]}\right]-$$

$$\left.24\,\pi\,\mathrm{Log}\left[\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]-12\,\pi\,\mathrm{Log}\left[\mathrm{Sin}\left[\frac{1}{4}(\pi+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x])\right]\right]\right)\mathrm{Sinh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]+$$

$$\left.\left.\left.24\,\mathrm{PolyLog}\left[2,\,\mathrm{i}\,e^{-\mathrm{ArcSinh}[c\,x]}\right]\left(-\mathrm{i}\,\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]+\mathrm{Sinh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)\right)\right)\right/$$

$$\left(3\,c\,d^2\sqrt{-(-\mathrm{i}\,d+c\,d\,x)\,(\mathrm{i}\,f+c\,f\,x)}\,\sqrt{1+c^2x^2}\,\left(\mathrm{Cosh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]+\mathrm{i}\,\mathrm{Sinh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)\right)$$

Problem 581: Result more than twice size of optimal antiderivative.

$$\int\frac{(f-\mathrm{i}\,c\,f\,x)^{3/2}\,(a+b\,\mathrm{ArcSinh}[c\,x])^2}{(d+\mathrm{i}\,c\,d\,x)^{5/2}}\,dx$$

Optimal (type 4, 580 leaves, 21 steps):

$$-\frac{8 f^4 \left(1+c^2 x^2\right)^{5/2} (a+b\,\text{ArcSinh}[c x])^2}{3 c (d+i c d x)^{5/2} (f-i c f x)^{5/2}}+\frac{f^4 \left(1+c^2 x^2\right)^{5/2} (a+b\,\text{ArcSinh}[c x])^3}{3 b c (d+i c d x)^{5/2} (f-i c f x)^{5/2}}-\frac{8 i b^2 f^4 \left(1+c^2 x^2\right)^{5/2} \text{Cot}\left[\frac{\pi}{4}+\frac{1}{2} i\,\text{ArcSinh}[c x]\right]}{3 c (d+i c d x)^{5/2} (f-i c f x)^{5/2}}-$$

$$\frac{8 i f^4 \left(1+c^2 x^2\right)^{5/2} (a+b\,\text{ArcSinh}[c x])^2 \text{Cot}\left[\frac{\pi}{4}+\frac{1}{2} i\,\text{ArcSinh}[c x]\right]}{3 c (d+i c d x)^{5/2} (f-i c f x)^{5/2}}+\frac{4 b f^4 \left(1+c^2 x^2\right)^{5/2} (a+b\,\text{ArcSinh}[c x]) \text{Csc}\left[\frac{\pi}{4}+\frac{1}{2} i\,\text{ArcSinh}[c x]\right]^2}{3 c (d+i c d x)^{5/2} (f-i c f x)^{5/2}}+$$

$$\frac{2 i f^4 \left(1+c^2 x^2\right)^{5/2} (a+b\,\text{ArcSinh}[c x])^2 \text{Cot}\left[\frac{\pi}{4}+\frac{1}{2} i\,\text{ArcSinh}[c x]\right] \text{Csc}\left[\frac{\pi}{4}+\frac{1}{2} i\,\text{ArcSinh}[c x]\right]^2}{3 c (d+i c d x)^{5/2} (f-i c f x)^{5/2}}+$$

$$\frac{32 b f^4 \left(1+c^2 x^2\right)^{5/2} (a+b\,\text{ArcSinh}[c x]) \text{Log}\left[1+i e^{\text{ArcSinh}[c x]}\right]}{3 c (d+i c d x)^{5/2} (f-i c f x)^{5/2}}+\frac{32 b^2 f^4 \left(1+c^2 x^2\right)^{5/2} \text{PolyLog}\left[2,-i e^{\text{ArcSinh}[c x]}\right]}{3 c (d+i c d x)^{5/2} (f-i c f x)^{5/2}}$$

Result (type 4, 1609 leaves):

$$\frac{\sqrt{i d (-i+c x)} \sqrt{-i f (i+c x)} \left(-\frac{4 i a^2 f}{3 d^3 (-i+c x)^2}-\frac{8 a^2 f}{3 d^3 (-i+c x)}\right)}{c}+\frac{a^2 f^{3/2} \text{Log}\left[c d f x+\sqrt{d} \sqrt{f} \sqrt{i d (-i+c x)} \sqrt{-i f (i+c x)}\right]}{c d^{5/2}}+$$

$$\Bigg(i a b f \sqrt{i (-i d+c d x)} \sqrt{-i (i f+c f x)} \sqrt{-d f \left(1+c^2 x^2\right)} \left(\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]-i \,\text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right)$$
$$\Bigg(-i \,\text{Cosh}\left[\frac{3}{2} \text{ArcSinh}[c x]\right] \left(\text{ArcSinh}[c x]-2 \,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-i \,\text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)+$$
$$\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right] \left(4+3 i \,\text{ArcSinh}[c x]-6 i \,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+3 \,\text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)+$$
$$2 \Bigg(\sqrt{1+c^2 x^2} \left(\text{ArcSinh}[c x]+2 \,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+i \,\text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)+$$
$$2 \left(i+\text{ArcSinh}[c x]+2 \,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+i \,\text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)\Bigg) \text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\Bigg)\Bigg) \Bigg/$$
$$\left(3 c d^3 (i+c x) \sqrt{-(-i d+c d x) (i f+c f x)} \left(\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]+i \,\text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right)^4\right)-$$

$$\Bigg(a b f \sqrt{i (-i d+c d x)} \sqrt{-i (i f+c f x)} \sqrt{-d f \left(1+c^2 x^2\right)} \left(\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]-i \,\text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right)$$
$$\Bigg(\text{Cosh}\left[\frac{3}{2} \text{ArcSinh}[c x]\right] \left((-14+3 i \,\text{ArcSinh}[c x]) \text{ArcSinh}[c x]-28 \,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+14 i \,\text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)+$$
$$\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right] \left(84 \,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-i \left(8-6 i \,\text{ArcSinh}[c x]+9 \,\text{ArcSinh}[c x]^2+42 \,\text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)\right)+$$
$$2 \Bigg(4-4 i \,\text{ArcSinh}[c x]+6 \,\text{ArcSinh}[c x]^2+56 i \,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+28 \,\text{Log}\left[\sqrt{1+c^2 x^2}\right]+\sqrt{1+c^2 x^2}$$
$$\left(\text{ArcSinh}[c x] (-14 i+3 \,\text{ArcSinh}[c x])+28 i \,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+14 \,\text{Log}\left[\sqrt{1+c^2 x^2}\right]\right)\Bigg) \text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\Bigg)\Bigg) \Bigg/$$

$$\left(6\,c\,d^3\,(i+c\,x)\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^4\right)+$$

$$\Bigg(i\,b^2\,f\,(i+c\,x)\,\sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2\,x^2)}$$

$$\Bigg((-1+i)\,\text{ArcSinh}[c\,x]^2-\frac{2\,\text{ArcSinh}[c\,x]\,(-2\,i+\text{ArcSinh}[c\,x])}{-i+c\,x}+2\,i\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\,\text{Log}\left[1-i\,e^{-\text{ArcSinh}[c\,x]}\right]-$$

$$i\,\pi\left(\text{ArcSinh}[c\,x]-4\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]+4\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+2\,\text{Log}\left[\text{Sin}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]\right)+$$

$$4\,\text{PolyLog}\left[2,\,i\,e^{-\text{ArcSinh}[c\,x]}\right]-\frac{4\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}{\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^3}+\frac{2\,(4+\text{ArcSinh}[c\,x]^2)\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}{\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}\Bigg)\Bigg)\Big/$$

$$\left(3\,c\,d^3\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\sqrt{1+c^2\,x^2}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^2\right)+$$

$$\Bigg(b^2\,f\,(i+c\,x)\,\sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2\,x^2)}\,\Bigg(7\,\pi\,\text{ArcSinh}[c\,x]-(7+7\,i)\,\text{ArcSinh}[c\,x]^2-i\,\text{ArcSinh}[c\,x]^3+$$

$$\frac{2\,\text{ArcSinh}[c\,x]\,(-2\,i+\text{ArcSinh}[c\,x])}{1+i\,c\,x}-14\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\,\text{Log}\left[1-i\,e^{-\text{ArcSinh}[c\,x]}\right]-28\,\pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]+$$

$$28\,\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+14\,\pi\,\text{Log}\left[\text{Sin}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]+28\,i\,\text{PolyLog}\left[2,\,i\,e^{-\text{ArcSinh}[c\,x]}\right]-$$

$$\frac{4\,i\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}{\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^3}+\frac{2\,(4+7\,\text{ArcSinh}[c\,x]^2)\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}{-i\,\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}\Bigg)\Bigg)\Big/$$

$$\left(3\,c\,d^3\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\sqrt{1+c^2\,x^2}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^2\right)$$

Problem 586: Result more than twice size of optimal antiderivative.

$$\int\frac{(f-i\,c\,f\,x)^{5/2}\,(a+b\,\text{ArcSinh}[c\,x])^2}{(d+i\,c\,d\,x)^{3/2}}\,dx$$

Optimal (type 4, 972 leaves, 28 steps):

$$-\frac{8\,i\,a\,b\,f^4\,x\,(1+c^2x^2)^{3/2}}{(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}+\frac{8\,i\,b^2\,f^4\,(1+c^2x^2)^2}{c\,(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}+\frac{b^2\,f^4\,x\,(1+c^2x^2)^2}{4\,(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}-$$
$$\frac{b^2\,f^4\,(1+c^2x^2)^{3/2}\,\text{ArcSinh}[c\,x]}{4\,c\,(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}-\frac{8\,i\,b^2\,f^4\,x\,(1+c^2x^2)^{3/2}\,\text{ArcSinh}[c\,x]}{(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}-\frac{b\,c\,f^4\,x^2\,(1+c^2x^2)^{3/2}\,(a+b\,\text{ArcSinh}[c\,x])}{2\,(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}+$$
$$\frac{8\,i\,f^4\,(1+c^2x^2)\,(a+b\,\text{ArcSinh}[c\,x])^2}{c\,(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}+\frac{8\,f^4\,x\,(1+c^2x^2)\,(a+b\,\text{ArcSinh}[c\,x])^2}{(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}+\frac{8\,f^4\,(1+c^2x^2)^{3/2}\,(a+b\,\text{ArcSinh}[c\,x])^2}{c\,(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}+$$
$$\frac{4\,i\,f^4\,(1+c^2x^2)^2\,(a+b\,\text{ArcSinh}[c\,x])^2}{c\,(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}+\frac{f^4\,x\,(1+c^2x^2)^2\,(a+b\,\text{ArcSinh}[c\,x])^2}{2\,(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}-\frac{5\,f^4\,(1+c^2x^2)^{3/2}\,(a+b\,\text{ArcSinh}[c\,x])^3}{2\,b\,c\,(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}-$$
$$\frac{32\,i\,b\,f^4\,(1+c^2x^2)^{3/2}\,(a+b\,\text{ArcSinh}[c\,x])\,\text{ArcTan}\left[e^{\text{ArcSinh}[c\,x]}\right]}{c\,(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}-\frac{16\,b\,f^4\,(1+c^2x^2)^{3/2}\,(a+b\,\text{ArcSinh}[c\,x])\,\text{Log}\left[1+e^{2\,\text{ArcSinh}[c\,x]}\right]}{c\,(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}-$$
$$\frac{16\,b^2\,f^4\,(1+c^2x^2)^{3/2}\,\text{PolyLog}\left[2,-i\,e^{\text{ArcSinh}[c\,x]}\right]}{c\,(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}+\frac{16\,b^2\,f^4\,(1+c^2x^2)^{3/2}\,\text{PolyLog}\left[2,i\,e^{\text{ArcSinh}[c\,x]}\right]}{c\,(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}-\frac{8\,b^2\,f^4\,(1+c^2x^2)^{3/2}\,\text{PolyLog}\left[2,-e^{2\,\text{ArcSinh}[c\,x]}\right]}{c\,(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}$$

Result (type 4, 2492 leaves):

$$\frac{\sqrt{i\,d\,(-i+c\,x)}\,\sqrt{-i\,f\,(i+c\,x)}\,\left(\frac{4\,i\,a^2\,f^2}{d^2}+\frac{a^2\,c\,f^2\,x}{2\,d^2}+\frac{8\,a^2\,f^2}{d^2\,(-i+c\,x)}\right)}{c}-\frac{15\,a^2\,f^{5/2}\,\text{Log}\left[c\,d\,f\,x+\sqrt{d}\,\sqrt{f}\,\sqrt{i\,d\,(-i+c\,x)}\,\sqrt{-i\,f\,(i+c\,x)}\right]}{2\,c\,d^{3/2}}+$$
$$\Bigg(4\,i\,a\,b\,f^2\,\sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2x^2)}\,\Bigg(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]$$
$$\left(-c\,x+2\,\text{ArcSinh}[c\,x]+\sqrt{1+c^2x^2}\,\text{ArcSinh}[c\,x]+i\,\text{ArcSinh}[c\,x]^2+4\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+2\,i\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)+$$
$$i\left(-c\,x-2\,\text{ArcSinh}[c\,x]+\sqrt{1+c^2x^2}\,\text{ArcSinh}[c\,x]+i\,\text{ArcSinh}[c\,x]^2+4\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+2\,i\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)$$
$$\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\Bigg)\Bigg)\Bigg/$$
$$\left(c\,d^2\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\sqrt{1+c^2x^2}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)\right)-$$
$$\Bigg(a\,b\,f^2\,\sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2x^2)}$$
$$\Bigg(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\left(\text{ArcSinh}[c\,x]\,(-4\,i+\text{ArcSinh}[c\,x])+8\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+4\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)+$$
$$i\left(\text{ArcSinh}[c\,x]\,(4\,i+\text{ArcSinh}[c\,x])+8\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+4\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\Bigg)\Bigg)\Bigg/$$
$$\left(c\,d^2\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\sqrt{1+c^2x^2}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)\right)-$$

$$\Big(b^2 f^2 \sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2 x^2)}$$

$$\Big(\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\,\Big(6\,i\,\pi\,\text{ArcSinh}[c\,x]+(6-6\,i)\,\text{ArcSinh}[c\,x]^2+\text{ArcSinh}[c\,x]^3+12\,(-i\,\pi+2\,\text{ArcSinh}[c\,x])\,\text{Log}\big[1-i\,e^{-\text{ArcSinh}[c\,x]}\big]-$$

$$24\,i\,\pi\,\text{Log}\big[1+e^{\text{ArcSinh}[c\,x]}\big]+24\,i\,\pi\,\text{Log}\Big[\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big]+12\,i\,\pi\,\text{Log}\Big[\text{Sin}\Big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\Big]\Big]\Big)-$$

$$24\,\text{PolyLog}\big[2,\,i\,e^{-\text{ArcSinh}[c\,x]}\big]\,\Big(\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]+i\,\text{Sinh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big)+$$

$$\Big(-6\,\pi\,\text{ArcSinh}[c\,x]-(6-6\,i)\,\text{ArcSinh}[c\,x]^2+i\,\text{ArcSinh}[c\,x]^3+12\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\,\text{Log}\big[1-i\,e^{-\text{ArcSinh}[c\,x]}\big]+$$

$$24\,\pi\,\text{Log}\big[1+e^{\text{ArcSinh}[c\,x]}\big]-24\,\pi\,\text{Log}\Big[\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big]-12\,\pi\,\text{Log}\Big[\text{Sin}\Big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\Big]\Big]\Big)\,\text{Sinh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big)\Big)\Big/$$

$$\Big(3\,c\,d^2\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\sqrt{1+c^2 x^2}\,\Big(\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]+i\,\text{Sinh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big)\Big)+$$

$$\Big(2\,i\,b^2 f^2 \sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2 x^2)}$$

$$\Big(\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\,\Big(-6\,\pi\,\text{ArcSinh}[c\,x]-6\,c\,x\,\text{ArcSinh}[c\,x]+(6+6\,i)\,\text{ArcSinh}[c\,x]^2+2\,i\,\text{ArcSinh}[c\,x]^3+$$

$$3\sqrt{1+c^2 x^2}\,\big(2+\text{ArcSinh}[c\,x]^2\big)+12\,\pi\,\text{Log}\big[1-i\,e^{-\text{ArcSinh}[c\,x]}\big]+24\,i\,\text{ArcSinh}[c\,x]\,\text{Log}\big[1-i\,e^{-\text{ArcSinh}[c\,x]}\big]+$$

$$24\,\pi\,\text{Log}\big[1+e^{\text{ArcSinh}[c\,x]}\big]-24\,\pi\,\text{Log}\Big[\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big]-12\,\pi\,\text{Log}\Big[\text{Sin}\Big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\Big]\Big]\Big)+$$

$$i\,\Big(-6\,\pi\,\text{ArcSinh}[c\,x]-6\,c\,x\,\text{ArcSinh}[c\,x]-(6-6\,i)\,\text{ArcSinh}[c\,x]^2+2\,i\,\text{ArcSinh}[c\,x]^3+3\sqrt{1+c^2 x^2}\,\big(2+\text{ArcSinh}[c\,x]^2\big)+$$

$$12\,\pi\,\text{Log}\big[1-i\,e^{-\text{ArcSinh}[c\,x]}\big]+24\,i\,\text{ArcSinh}[c\,x]\,\text{Log}\big[1-i\,e^{-\text{ArcSinh}[c\,x]}\big]+24\,\pi\,\text{Log}\big[1+e^{\text{ArcSinh}[c\,x]}\big]-$$

$$24\,\pi\,\text{Log}\Big[\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big]-12\,\pi\,\text{Log}\Big[\text{Sin}\Big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\Big]\Big]\Big)\,\text{Sinh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]+$$

$$24\,\text{PolyLog}\big[2,\,i\,e^{-\text{ArcSinh}[c\,x]}\big]\,\Big(-i\,\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]+\text{Sinh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big)\Big)\Big)\Big/$$

$$\Big(3\,c\,d^2\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\sqrt{1+c^2 x^2}\,\Big(\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]+i\,\text{Sinh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big)\Big)+$$

$$\Big(b^2 f^2 \sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2 x^2)}$$

$$\Big(96\,\text{PolyLog}\big[2,\,i\,e^{-\text{ArcSinh}[c\,x]}\big]\,\Big(\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]+i\,\text{Sinh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big)+\text{Sinh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]$$

$$\Big(24\,\pi\,\text{ArcSinh}[c\,x]+48\,c\,x\,\text{ArcSinh}[c\,x]+(24-24\,i)\,\text{ArcSinh}[c\,x]^2-10\,i\,\text{ArcSinh}[c\,x]^3+3\,i\sqrt{1+c^2 x^2}\,\big(c\,x+8\,i\,\big(2+\text{ArcSinh}[c\,x]^2\big)\big)-3$$

$$i\,\text{ArcSinh}[c\,x]\,\text{Cosh}[2\,\text{ArcSinh}[c\,x]]-48\,\pi\,\text{Log}\big[1-i\,e^{-\text{ArcSinh}[c\,x]}\big]-96\,i\,\text{ArcSinh}[c\,x]\,\text{Log}\big[1-i\,e^{-\text{ArcSinh}[c\,x]}\big]-96\,\pi\,\text{Log}\big[1+e^{\text{ArcSinh}[c\,x]}\big]+$$

$$96\,\pi\,\text{Log}\Big[\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big]+48\,\pi\,\text{Log}\Big[\text{Sin}\Big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\Big]\Big]+3\,i\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}[2\,\text{ArcSinh}[c\,x]]\Big)+$$

$$\operatorname{Cosh}\left[\frac{1}{2}\operatorname{ArcSinh}[c\,x]\right]\Big(3\sqrt{1+c^2x^2}\,\big(c\,x+8\,i\,(2+\operatorname{ArcSinh}[c\,x]^2)\big)-3\operatorname{ArcSinh}[c\,x]\operatorname{Cosh}[2\operatorname{ArcSinh}[c\,x]]-$$

$$i\,\Big(24\,\pi\operatorname{ArcSinh}[c\,x]+48\,c\,x\operatorname{ArcSinh}[c\,x]-(24+24\,i)\operatorname{ArcSinh}[c\,x]^2-10\,i\operatorname{ArcSinh}[c\,x]^3-48\,\pi\operatorname{Log}\left[1-i\,e^{-\operatorname{ArcSinh}[c\,x]}\right]-$$

$$96\,i\operatorname{ArcSinh}[c\,x]\operatorname{Log}\left[1-i\,e^{-\operatorname{ArcSinh}[c\,x]}\right]-96\,\pi\operatorname{Log}\left[1+e^{\operatorname{ArcSinh}[c\,x]}\right]+96\,\pi\operatorname{Log}\left[\operatorname{Cosh}\left[\frac{1}{2}\operatorname{ArcSinh}[c\,x]\right]\right]+$$

$$48\,\pi\operatorname{Log}\left[\operatorname{Sin}\left[\frac{1}{4}(\pi+2\,i\operatorname{ArcSinh}[c\,x])\right]\right]+3\,i\operatorname{ArcSinh}[c\,x]^2\operatorname{Sinh}[2\operatorname{ArcSinh}[c\,x]]\Big)\Big)\Big)\Big)\Big/$$

$$\left(12\,c\,d^2\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\sqrt{1+c^2x^2}\,\left(\operatorname{Cosh}\left[\frac{1}{2}\operatorname{ArcSinh}[c\,x]\right]+i\operatorname{Sinh}\left[\frac{1}{2}\operatorname{ArcSinh}[c\,x]\right]\right)\right)+$$

$$\Big(a\,b\,f^2\sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2x^2)}$$

$$\Big(-\operatorname{Sinh}\left[\frac{1}{2}\operatorname{ArcSinh}[c\,x]\right]\Big(-16\,i\sqrt{1+c^2x^2}\operatorname{ArcSinh}[c\,x]+\operatorname{Cosh}[2\operatorname{ArcSinh}[c\,x]]+2\,\Big(8\,i\,c\,x+8\,i\operatorname{ArcSinh}[c\,x]+$$

$$5\operatorname{ArcSinh}[c\,x]^2+16\,i\operatorname{ArcTan}\left[\operatorname{Tanh}\left[\frac{1}{2}\operatorname{ArcSinh}[c\,x]\right]\right]+8\operatorname{Log}\left[\sqrt{1+c^2x^2}\right]-\operatorname{ArcSinh}[c\,x]\operatorname{Sinh}[2\operatorname{ArcSinh}[c\,x]]\Big)\Big)+$$

$$\operatorname{Cosh}\left[\frac{1}{2}\operatorname{ArcSinh}[c\,x]\right]\Big(16\sqrt{1+c^2x^2}\operatorname{ArcSinh}[c\,x]+i\,\Big(\operatorname{Cosh}[2\operatorname{ArcSinh}[c\,x]]+2\,\Big(8\,i\,c\,x-8\,i\operatorname{ArcSinh}[c\,x]+5$$

$$\operatorname{ArcSinh}[c\,x]^2+16\,i\operatorname{ArcTan}\left[\operatorname{Tanh}\left[\frac{1}{2}\operatorname{ArcSinh}[c\,x]\right]\right]+8\operatorname{Log}\left[\sqrt{1+c^2x^2}\right]-\operatorname{ArcSinh}[c\,x]\operatorname{Sinh}[2\operatorname{ArcSinh}[c\,x]]\Big)\Big)\Big)\Big)\Big)\Big/$$

$$\left(4\,c\,d^2\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\sqrt{1+c^2x^2}\,\left(-i\operatorname{Cosh}\left[\frac{1}{2}\operatorname{ArcSinh}[c\,x]\right]+\operatorname{Sinh}\left[\frac{1}{2}\operatorname{ArcSinh}[c\,x]\right]\right)\right)$$

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

$$\int\frac{(f-i\,c\,f\,x)^{5/2}\,(a+b\operatorname{ArcSinh}[c\,x])^2}{(d+i\,c\,d\,x)^{5/2}}\,dx$$

Optimal (type 4, 790 leaves, 25 steps):

$$\frac{2 i a b f^5 x (1+c^2x^2)^{5/2}}{(d+icdx)^{5/2}(f-icfx)^{5/2}} - \frac{2 i b^2 f^5 (1+c^2x^2)^3}{c(d+icdx)^{5/2}(f-icfx)^{5/2}} + \frac{2 i b^2 f^5 x (1+c^2x^2)^{5/2}\text{ArcSinh}[c x]}{(d+icdx)^{5/2}(f-icfx)^{5/2}} - \frac{28 f^5 (1+c^2x^2)^{5/2}(a+b\,\text{ArcSinh}[c x])^2}{3c(d+icdx)^{5/2}(f-icfx)^{5/2}} -$$

$$\frac{i f^5 (1+c^2x^2)^3 (a+b\,\text{ArcSinh}[c x])^2}{c(d+icdx)^{5/2}(f-icfx)^{5/2}} + \frac{5 f^5 (1+c^2x^2)^{5/2}(a+b\,\text{ArcSinh}[c x])^3}{3bc(d+icdx)^{5/2}(f-icfx)^{5/2}} - \frac{16 i b^2 f^5 (1+c^2x^2)^{5/2}\text{Cot}\left[\frac{\pi}{4}+\frac{1}{2} i\,\text{ArcSinh}[c x]\right]}{3c(d+icdx)^{5/2}(f-icfx)^{5/2}} -$$

$$\frac{28 i f^5 (1+c^2x^2)^{5/2}(a+b\,\text{ArcSinh}[c x])^2\text{Cot}\left[\frac{\pi}{4}+\frac{1}{2} i\,\text{ArcSinh}[c x]\right]}{3c(d+icdx)^{5/2}(f-icfx)^{5/2}} + \frac{8 b f^5 (1+c^2x^2)^{5/2}(a+b\,\text{ArcSinh}[c x])\text{Csc}\left[\frac{\pi}{4}+\frac{1}{2} i\,\text{ArcSinh}[c x]\right]^2}{3c(d+icdx)^{5/2}(f-icfx)^{5/2}} +$$

$$\frac{4 i f^5 (1+c^2x^2)^{5/2}(a+b\,\text{ArcSinh}[c x])^2\text{Cot}\left[\frac{\pi}{4}+\frac{1}{2} i\,\text{ArcSinh}[c x]\right]\text{Csc}\left[\frac{\pi}{4}+\frac{1}{2} i\,\text{ArcSinh}[c x]\right]^2}{3c(d+icdx)^{5/2}(f-icfx)^{5/2}} +$$

$$\frac{112 b f^5 (1+c^2x^2)^{5/2}(a+b\,\text{ArcSinh}[c x])\text{Log}\left[1+i e^{\text{ArcSinh}[c x]}\right]}{3c(d+icdx)^{5/2}(f-icfx)^{5/2}} + \frac{112 b^2 f^5 (1+c^2x^2)^{5/2}\text{PolyLog}\left[2,-i e^{\text{ArcSinh}[c x]}\right]}{3c(d+icdx)^{5/2}(f-icfx)^{5/2}}$$

Result (type 4, 2622 leaves) :

$$\frac{\sqrt{i d(-i+cx)}\sqrt{-i f(i+cx)}\left(-\frac{i a^2 f^2}{d^3}-\frac{8 i a^2 f^2}{3d^3(-i+cx)^2}-\frac{28 a^2 f^2}{3d^3(-i+cx)}\right)}{c} + \frac{5 a^2 f^{5/2}\text{Log}\left[c d f x+\sqrt{d}\sqrt{f}\sqrt{i d(-i+cx)}\sqrt{-i f(i+cx)}\right]}{c d^{5/2}} +$$

$$\Big(i a b f^2\sqrt{i(-id+cdx)}\sqrt{-i(if+cfx)}\sqrt{-df(1+c^2x^2)}\left(\text{Cosh}\left[\tfrac{1}{2}\text{ArcSinh}[c x]\right]-i\,\text{Sinh}\left[\tfrac{1}{2}\text{ArcSinh}[c x]\right]\right)$$
$$\Big(-i\,\text{Cosh}\left[\tfrac{3}{2}\text{ArcSinh}[c x]\right]\left(\text{ArcSinh}[c x]-2\,\text{ArcTan}\left[\text{Coth}\left[\tfrac{1}{2}\text{ArcSinh}[c x]\right]\right]-i\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)+$$
$$\text{Cosh}\left[\tfrac{1}{2}\text{ArcSinh}[c x]\right]\left(4+3i\,\text{ArcSinh}[c x]-6i\,\text{ArcTan}\left[\text{Coth}\left[\tfrac{1}{2}\text{ArcSinh}[c x]\right]\right]+3\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)+$$
$$2\Big(\sqrt{1+c^2x^2}\left(\text{ArcSinh}[c x]+2\,\text{ArcTan}\left[\text{Coth}\left[\tfrac{1}{2}\text{ArcSinh}[c x]\right]\right]+i\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)+$$
$$2\left(i+\text{ArcSinh}[c x]+2\,\text{ArcTan}\left[\text{Coth}\left[\tfrac{1}{2}\text{ArcSinh}[c x]\right]\right]+i\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)\Big)\text{Sinh}\left[\tfrac{1}{2}\text{ArcSinh}[c x]\right]\Big)\Big)\Big/$$
$$\left(3 c d^3(i+cx)\sqrt{-(-id+cdx)(if+cfx)}\left(\text{Cosh}\left[\tfrac{1}{2}\text{ArcSinh}[c x]\right]+i\,\text{Sinh}\left[\tfrac{1}{2}\text{ArcSinh}[c x]\right]\right)^4\right)-$$
$$\Big(a b f^2\sqrt{i(-id+cdx)}\sqrt{-i(if+cfx)}\sqrt{-df(1+c^2x^2)}\left(\text{Cosh}\left[\tfrac{1}{2}\text{ArcSinh}[c x]\right]-i\,\text{Sinh}\left[\tfrac{1}{2}\text{ArcSinh}[c x]\right]\right)$$
$$\Big(\text{Cosh}\left[\tfrac{3}{2}\text{ArcSinh}[c x]\right]\left((-14+3i\,\text{ArcSinh}[c x])\text{ArcSinh}[c x]-28\,\text{ArcTan}\left[\text{Tanh}\left[\tfrac{1}{2}\text{ArcSinh}[c x]\right]\right]+14i\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)+$$
$$\text{Cosh}\left[\tfrac{1}{2}\text{ArcSinh}[c x]\right]\left(84\,\text{ArcTan}\left[\text{Tanh}\left[\tfrac{1}{2}\text{ArcSinh}[c x]\right]\right]-i\left(8-6i\,\text{ArcSinh}[c x]+9\,\text{ArcSinh}[c x]^2+42\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)\right)+$$
$$2\Big(4-4i\,\text{ArcSinh}[c x]+6\,\text{ArcSinh}[c x]^2+56i\,\text{ArcTan}\left[\text{Tanh}\left[\tfrac{1}{2}\text{ArcSinh}[c x]\right]\right]+28\,\text{Log}\left[\sqrt{1+c^2x^2}\right]+\sqrt{1+c^2x^2}$$

$$\Big(\text{ArcSinh}[c\,x]\,\big(-14\,i+3\,\text{ArcSinh}[c\,x]\big)+28\,i\,\text{ArcTan}\Big[\text{Tanh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big]+14\,\text{Log}\Big[\sqrt{1+c^2\,x^2}\,\Big]\Big)\Big)\,\text{Sinh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big)\Big)\Big/$$

$$\Big(3\,c\,d^3\,(i+c\,x)\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\Big(\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]+i\,\text{Sinh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big)^4\Big)+$$

$$\Big(i\,b^2\,f^2\,(i+c\,x)\,\sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2\,x^2)}$$

$$\Big((-1+i)\,\text{ArcSinh}[c\,x]^2-\frac{2\,\text{ArcSinh}[c\,x]\,(-2\,i+\text{ArcSinh}[c\,x])}{-i+c\,x}+2\,i\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\,\text{Log}\big[1-i\,e^{-\text{ArcSinh}[c\,x]}\big]-$$

$$i\,\pi\,\Big(\text{ArcSinh}[c\,x]-4\,\text{Log}\big[1+e^{\text{ArcSinh}[c\,x]}\big]+4\,\text{Log}\Big[\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big]+2\,\text{Log}\Big[\text{Sin}\Big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\Big]\Big]\Big)+$$

$$4\,\text{PolyLog}\big[2,\,i\,e^{-\text{ArcSinh}[c\,x]}\big]-\frac{4\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]}{\big(\text{Cosh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]+i\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]\big)^3}+\frac{2\,(4+\text{ArcSinh}[c\,x]^2)\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]}{\text{Cosh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]+i\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]}\Big)\Big)\Big/$$

$$\Big(3\,c\,d^3\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\sqrt{1+c^2\,x^2}\,\Big(\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]-i\,\text{Sinh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big)^2\Big)-$$

$$\Big(i\,b^2\,f^2\,(i+c\,x)\,\sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2\,x^2)}$$

$$\Big(\frac{6\,i\,c\,x\,\text{ArcSinh}[c\,x]}{\sqrt{1+c^2\,x^2}}+\frac{(13-13\,i)\,\text{ArcSinh}[c\,x]^2}{\sqrt{1+c^2\,x^2}}+\frac{3\,\text{ArcSinh}[c\,x]^3}{\sqrt{1+c^2\,x^2}}+\frac{2\,\text{ArcSinh}[c\,x]\,(-2\,i+\text{ArcSinh}[c\,x])}{(-i+c\,x)\,\sqrt{1+c^2\,x^2}}-3\,i\,(2+\text{ArcSinh}[c\,x]^2)+$$

$$\frac{1}{\sqrt{1+c^2\,x^2}}13\,i\,\Big(-2\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\,\text{Log}\big[1-i\,e^{-\text{ArcSinh}[c\,x]}\big]+\pi\,\Big(\text{ArcSinh}[c\,x]-4\,\text{Log}\big[1+e^{\text{ArcSinh}[c\,x]}\big]+$$

$$4\,\text{Log}\Big[\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big]+2\,\text{Log}\Big[\text{Sin}\Big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\Big]\Big]\Big)+4\,i\,\text{PolyLog}\big[2,\,i\,e^{-\text{ArcSinh}[c\,x]}\big]\Big)+$$

$$\frac{4\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]}{\sqrt{1+c^2\,x^2}\,\big(\text{Cosh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]+i\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]\big)^3}-\frac{2\,(4+13\,\text{ArcSinh}[c\,x]^2)\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]}{\sqrt{1+c^2\,x^2}\,\big(\text{Cosh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]+i\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]\big)}\Big)\Big)\Big/$$

$$\Big(3\,c\,d^3\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\Big(\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]-i\,\text{Sinh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big)^2\Big)+$$

$$\Big(2\,b^2\,f^2\,(i+c\,x)\,\sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2\,x^2)}\,\Big(7\,\pi\,\text{ArcSinh}[c\,x]-(7+7\,i)\,\text{ArcSinh}[c\,x]^2-i\,\text{ArcSinh}[c\,x]^3+$$

$$\frac{2\,\text{ArcSinh}[c\,x]\,(-2\,i+\text{ArcSinh}[c\,x])}{1+i\,c\,x}-14\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\,\text{Log}\big[1-i\,e^{-\text{ArcSinh}[c\,x]}\big]-28\,\pi\,\text{Log}\big[1+e^{\text{ArcSinh}[c\,x]}\big]+$$

$$28\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+14\pi\,\text{Log}\left[\text{Sin}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]\right]+28\,i\,\text{PolyLog}\left[2,\,i\,e^{-\text{ArcSinh}[c\,x]}\right]-$$

$$\left.\left.\frac{4\,i\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)^3}+\frac{2\left(4+7\,\text{ArcSinh}[c\,x]^2\right)\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{-i\,\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}\right)\right)\Big/$$

$$\left(3\,c\,d^3\sqrt{-\left(-i\,d+c\,d\,x\right)\left(i\,f+c\,f\,x\right)}\,\sqrt{1+c^2\,x^2}\,\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)^2\right)+$$

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

$$\left(-3\,\text{Cosh}\left[\frac{5}{2}\text{ArcSinh}[c\,x]\right]+3\,i\,\text{ArcSinh}[c\,x]\,\text{Cosh}\left[\frac{5}{2}\text{ArcSinh}[c\,x]\right]-\right.$$

$$\text{Cosh}\left[\frac{3}{2}\text{ArcSinh}[c\,x]\right]\left(9+35\,i\,\text{ArcSinh}[c\,x]+9\,\text{ArcSinh}[c\,x]^2-52\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+26\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\right)+$$

$$\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\left(20-24\,i\,\text{ArcSinh}[c\,x]+27\,\text{ArcSinh}[c\,x]^2-156\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+78\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\right)+$$

$$20\,i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-24\,\text{ArcSinh}[c\,x]\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+27\,i\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+$$

$$156\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+78\,i\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+9\,i\,\text{Sinh}\left[\frac{3}{2}\text{ArcSinh}[c\,x]\right]+35$$

$$\text{ArcSinh}[c\,x]\,\text{Sinh}\left[\frac{3}{2}\text{ArcSinh}[c\,x]\right]+9\,i\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{3}{2}\text{ArcSinh}[c\,x]\right]+52\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]\text{Sinh}\left[\frac{3}{2}\text{ArcSinh}[c\,x]\right]+$$

$$\left.\left.26\,i\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\text{Sinh}\left[\frac{3}{2}\text{ArcSinh}[c\,x]\right]-3\,i\,\text{Sinh}\left[\frac{5}{2}\text{ArcSinh}[c\,x]\right]+3\,\text{ArcSinh}[c\,x]\,\text{Sinh}\left[\frac{5}{2}\text{ArcSinh}[c\,x]\right]\right)\right)\Big/$$

$$\left(6\,c\,d^3\left(i+c\,x\right)\sqrt{-\left(-i\,d+c\,d\,x\right)\left(i\,f+c\,f\,x\right)}\,\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)^4\right)$$

Problem 591: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 59 leaves, 2 steps):

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

Result (type 3, 168 leaves):

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

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

$$\int \frac{(d+i c d x)^{5/2} (a+b \text{ArcSinh}[c x])^2}{(f-i c f x)^{3/2}} \, dx$$

Optimal (type 4, 972 leaves, 28 steps):

$$\frac{8 i a b d^4 x (1+c^2 x^2)^{3/2}}{(d+i c d x)^{3/2} (f-i c f x)^{3/2}}-\frac{8 i b^2 d^4 (1+c^2 x^2)^2}{c (d+i c d x)^{3/2} (f-i c f x)^{3/2}}+\frac{b^2 d^4 x (1+c^2 x^2)^2}{4 (d+i c d x)^{3/2} (f-i c f x)^{3/2}}-\frac{b^2 d^4 (1+c^2 x^2)^{3/2} \text{ArcSinh}[c x]}{4 c (d+i c d x)^{3/2} (f-i c f x)^{3/2}}+\frac{8 i b^2 d^4 x (1+c^2 x^2)^{3/2} \text{ArcSinh}[c x]}{(d+i c d x)^{3/2} (f-i c f x)^{3/2}}-\frac{b c d^4 x^2 (1+c^2 x^2)^{3/2} (a+b \text{ArcSinh}[c x])}{2 (d+i c d x)^{3/2} (f-i c f x)^{3/2}}-\frac{8 i d^4 (1+c^2 x^2) (a+b \text{ArcSinh}[c x])^2}{c (d+i c d x)^{3/2} (f-i c f x)^{3/2}}+\frac{8 d^4 x (1+c^2 x^2) (a+b \text{ArcSinh}[c x])^2}{(d+i c d x)^{3/2} (f-i c f x)^{3/2}}+\frac{8 d^4 (1+c^2 x^2)^{3/2} (a+b \text{ArcSinh}[c x])^2}{c (d+i c d x)^{3/2} (f-i c f x)^{3/2}}-\frac{4 i d^4 (1+c^2 x^2)^2 (a+b \text{ArcSinh}[c x])^2}{c (d+i c d x)^{3/2} (f-i c f x)^{3/2}}+\frac{d^4 x (1+c^2 x^2)^2 (a+b \text{ArcSinh}[c x])^2}{2 (d+i c d x)^{3/2} (f-i c f x)^{3/2}}-\frac{5 d^4 (1+c^2 x^2)^{3/2} (a+b \text{ArcSinh}[c x])^3}{2 b c (d+i c d x)^{3/2} (f-i c f x)^{3/2}}+\frac{32 i b d^4 (1+c^2 x^2)^{3/2} (a+b \text{ArcSinh}[c x]) \text{ArcTan}[e^{\text{ArcSinh}[c x]}]}{c (d+i c d x)^{3/2} (f-i c f x)^{3/2}}-\frac{16 b d^4 (1+c^2 x^2)^{3/2} (a+b \text{ArcSinh}[c x]) \text{Log}[1+e^{2 \text{ArcSinh}[c x]}]}{c (d+i c d x)^{3/2} (f-i c f x)^{3/2}}+\frac{16 b^2 d^4 (1+c^2 x^2)^{3/2} \text{PolyLog}[2,-i e^{\text{ArcSinh}[c x]}]}{c (d+i c d x)^{3/2} (f-i c f x)^{3/2}}-\frac{16 b^2 d^4 (1+c^2 x^2)^{3/2} \text{PolyLog}[2,i e^{\text{ArcSinh}[c x]}]}{c (d+i c d x)^{3/2} (f-i c f x)^{3/2}}-\frac{8 b^2 d^4 (1+c^2 x^2)^{3/2} \text{PolyLog}[2,-e^{2 \text{ArcSinh}[c x]}]}{c (d+i c d x)^{3/2} (f-i c f x)^{3/2}}$$

Result (type 4, 2143 leaves):

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

$$\Bigg(4 i a b d^2 \sqrt{i (-i d+c d x)} \sqrt{-i (i f+c f x)} \sqrt{-d f (1+c^2 x^2)} \Bigg(\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]$$

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

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

$$\text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\Bigg)\Bigg)\Bigg/$$

$$\left(c f^2 \sqrt{-(-i d+c d x) (i f+c f x)} \sqrt{1+c^2 x^2} \left(\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]-i \text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right)\right)-$$

$$\Bigg(a b d^2 \sqrt{i (-i d+c d x)} \sqrt{-i (i f+c f x)} \sqrt{-d f (1+c^2 x^2)}$$

$$\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\left(8\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+i\left(\text{ArcSinh}[c\,x]\,(4\,i+\text{ArcSinh}[c\,x])+4\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)\right)+\right.$$

$$\left.\left(\text{ArcSinh}[c\,x]\,(-4\,i+\text{ArcSinh}[c\,x])-8\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+4\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)\Big/$$

$$\left(c\,f^2\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\sqrt{1+c^2x^2}\left(i\,\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)\right)-$$

$$\left(b^2d^2\,(-i+c\,x)\sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2x^2)}\left(-18\,\pi\,\text{ArcSinh}[c\,x]-(6-6\,i)\,\text{ArcSinh}[c\,x]^2+i\,\text{ArcSinh}[c\,x]^3-\right.\right.$$

$$12\,(\pi-2\,i\,\text{ArcSinh}[c\,x])\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]+24\,\pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]+12\,\pi\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]-$$

$$\left.\left.24\,\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]-24\,i\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]-\frac{12\,i\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}\right)\right)\Big/$$

$$\left(3\,c\,f^2\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\sqrt{1+c^2x^2}\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)^2\right)-$$

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

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

$$6\,i\left(2\,(\pi-2\,i\,\text{ArcSinh}[c\,x])\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]+\pi\left(3\,\text{ArcSinh}[c\,x]-4\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]-2\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]+4\right.\right.$$

$$\left.\left.\left.\left.\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]\right)+4\,i\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]\right)-\frac{12\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{\sqrt{1+c^2x^2}\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)}\right)\right)\Big/$$

$$\left(3\,c\,f^2\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)^2\right)+$$

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

$$\left(-\frac{96\,c\,x\,\text{ArcSinh}[c\,x]}{\sqrt{1+c^2x^2}}+\frac{(48-48\,i)\,\text{ArcSinh}[c\,x]^2}{\sqrt{1+c^2x^2}}-\frac{20\,i\,\text{ArcSinh}[c\,x]^3}{\sqrt{1+c^2x^2}}+48\,(2+\text{ArcSinh}[c\,x]^2)+6\,i\,c\,x\,(1+2\,\text{ArcSinh}[c\,x]^2)-\right.$$

$$\frac{6\,i\,\text{ArcSinh}[c\,x]\,\text{Cosh}[2\,\text{ArcSinh}[c\,x]]}{\sqrt{1+c^2x^2}}+\frac{1}{\sqrt{1+c^2x^2}}48\left(2\,(\pi-2\,i\,\text{ArcSinh}[c\,x])\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]+\right.$$

$$\pi\left(3\,\text{ArcSinh}[c\,x]-4\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]-2\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]\right]+4\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]\right)+$$

$$4\,i\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]\Big)+\frac{96\,i\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}{\sqrt{1+c^2\,x^2}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)}\Big)\Big)\Big/$$

$$\left(24\,c\,f^2\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^2\right)+$$

$$\Big(a\,b\,d^2\,\sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2\,x^2)}$$

$$\Big(\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\Big(-16\,\sqrt{1+c^2\,x^2}\,\text{ArcSinh}[c\,x]+i\,\text{Cosh}[2\,\text{ArcSinh}[c\,x]]+2\,\Big(8\,c\,x+8\,\text{ArcSinh}[c\,x]+5\,i\,\text{ArcSinh}[c\,x]^2+$$

$$16\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+8\,i\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]-i\,\text{ArcSinh}[c\,x]\,\text{Sinh}[2\,\text{ArcSinh}[c\,x]]\Big)\Big)-$$

$$\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\Big(16\,i\,\sqrt{1+c^2\,x^2}\,\text{ArcSinh}[c\,x]+\text{Cosh}[2\,\text{ArcSinh}[c\,x]]-2\,\Big(8\,i\,c\,x-8\,i\,\text{ArcSinh}[c\,x]-5\,\text{ArcSinh}[c\,x]^2+$$

$$16\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]-8\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]+\text{ArcSinh}[c\,x]\,\text{Sinh}[2\,\text{ArcSinh}[c\,x]]\Big)\Big)\Big)\Big)\Big/$$

$$\left(4\,c\,f^2\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\sqrt{1+c^2\,x^2}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)\right)$$

Problem 598: Result more than twice size of optimal antiderivative.

$$\int\frac{(a+b\,\text{ArcSinh}[c\,x])^2}{(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}\,dx$$

Optimal (type 4, 224 leaves, 7 steps):

$$\frac{x\,(1+c^2\,x^2)\,(a+b\,\text{ArcSinh}[c\,x])^2}{(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}+\frac{(1+c^2\,x^2)^{3/2}\,(a+b\,\text{ArcSinh}[c\,x])^2}{c\,(d+i\,c\,d\,x)^{3/2}\,(f-i\,c\,f\,x)^{3/2}}-$$

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

Result (type 4, 488 leaves):

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

Problem 600: Result more than twice size of optimal antiderivative.

$$\int\frac{(d+i c d x)^{5/2}\,(a+b\,\text{ArcSinh}[c x])^2}{(f-i c f x)^{5/2}}\,dx$$

Optimal (type 4, 794 leaves, 25 steps):

$$-\frac{2 i a b d^5 x\left(1+c^2x^2\right)^{5/2}}{(d+i c d x)^{5/2}(f-i c f x)^{5/2}}+\frac{2 i b^2 d^5\left(1+c^2x^2\right)^3}{c\,(d+i c d x)^{5/2}(f-i c f x)^{5/2}}-\frac{2 i b^2 d^5 x\left(1+c^2x^2\right)^{5/2}\text{ArcSinh}[c x]}{(d+i c d x)^{5/2}(f-i c f x)^{5/2}}+\frac{28 d^5\left(1+c^2x^2\right)^{5/2}(a+b\,\text{ArcSinh}[c x])^2}{3 c\,(d+i c d x)^{5/2}(f-i c f x)^{5/2}}+\frac{i d^5\left(1+c^2x^2\right)^3(a+b\,\text{ArcSinh}[c x])^2}{c\,(d+i c d x)^{5/2}(f-i c f x)^{5/2}}+\frac{5 d^5\left(1+c^2x^2\right)^{5/2}(a+b\,\text{ArcSinh}[c x])^3}{3 b c\,(d+i c d x)^{5/2}(f-i c f x)^{5/2}}+\frac{112 b d^5\left(1+c^2x^2\right)^{5/2}(a+b\,\text{ArcSinh}[c x])\,\text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]}{3 c\,(d+i c d x)^{5/2}(f-i c f x)^{5/2}}-\frac{112 b^2 d^5\left(1+c^2x^2\right)^{5/2}\text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]}{3 c\,(d+i c d x)^{5/2}(f-i c f x)^{5/2}}+\frac{8 b d^5\left(1+c^2x^2\right)^{5/2}(a+b\,\text{ArcSinh}[c x])\,\text{Sec}\left[\frac{\pi}{4}+\frac{1}{2} i \text{ArcSinh}[c x]\right]^2}{3 c\,(d+i c d x)^{5/2}(f-i c f x)^{5/2}}+\frac{16 i b^2 d^5\left(1+c^2x^2\right)^{5/2}\text{Tan}\left[\frac{\pi}{4}+\frac{1}{2} i \text{ArcSinh}[c x]\right]}{3 c\,(d+i c d x)^{5/2}(f-i c f x)^{5/2}}+\frac{28 i d^5\left(1+c^2x^2\right)^{5/2}(a+b\,\text{ArcSinh}[c x])^2\,\text{Tan}\left[\frac{\pi}{4}+\frac{1}{2} i \text{ArcSinh}[c x]\right]}{3 c\,(d+i c d x)^{5/2}(f-i c f x)^{5/2}}-\frac{4 i d^5\left(1+c^2x^2\right)^{5/2}(a+b\,\text{ArcSinh}[c x])^2\,\text{Sec}\left[\frac{\pi}{4}+\frac{1}{2} i \text{ArcSinh}[c x]\right]^2\,\text{Tan}\left[\frac{\pi}{4}+\frac{1}{2} i \text{ArcSinh}[c x]\right]}{3 c\,(d+i c d x)^{5/2}(f-i c f x)^{5/2}}$$

Result (type 4, 2552 leaves):

$$\frac{\sqrt{i d\,(-i+c x)}\,\sqrt{-i f\,(i+c x)}\,\left(\frac{i a^2 d^2}{f^3}+\frac{8 i a^2 d^2}{3 f^3 (i+c x)^2}-\frac{28 a^2 d^2}{3 f^3 (i+c x)}\right)}{c}+\frac{5 a^2 d^{5/2}\,\text{Log}\left[c d f x+\sqrt{d}\,\sqrt{f}\,\sqrt{i d\,(-i+c x)}\,\sqrt{-i f\,(i+c x)}\right]}{c f^{5/2}}-$$

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

$$\left(-\text{Cosh}\left[\frac{3}{2}\,\text{ArcSinh}[c\,x]\right]\left(\text{ArcSinh}[c\,x]-2\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+i\,\text{Log}\left[\sqrt{1+c^2\,x^2}\,\right]\right)+\right.$$

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

$$2\left(\sqrt{1+c^2\,x^2}\,\left(i\,\text{ArcSinh}[c\,x]+2\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+\text{Log}\left[\sqrt{1+c^2\,x^2}\,\right]\right)+\right.$$

$$\left.\left.2\left(1+i\,\text{ArcSinh}[c\,x]+2\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+\text{Log}\left[\sqrt{1+c^2\,x^2}\,\right]\right)\right)\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)\right)\Big/$$

$$\left(3\,c\,f^3\,(1+i\,c\,x)\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^4\right)+$$

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

$$\left(\text{Cosh}\left[\frac{3}{2}\,\text{ArcSinh}[c\,x]\right]\left((14\,i-3\,\text{ArcSinh}[c\,x])\,\text{ArcSinh}[c\,x]+28\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]-14\,\text{Log}\left[\sqrt{1+c^2\,x^2}\,\right]\right)+\right.$$

$$\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\left(8+6\,i\,\text{ArcSinh}[c\,x]+9\,\text{ArcSinh}[c\,x]^2-84\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+42\,\text{Log}\left[\sqrt{1+c^2\,x^2}\,\right]\right)-$$

$$2\,i\left(4+4\,i\,\text{ArcSinh}[c\,x]+6\,\text{ArcSinh}[c\,x]^2-56\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+28\,\text{Log}\left[\sqrt{1+c^2\,x^2}\,\right]+\sqrt{1+c^2\,x^2}\right.$$

$$\left.\left.\left.\left(\text{ArcSinh}[c\,x]\,(14\,i+3\,\text{ArcSinh}[c\,x])-28\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+14\,\text{Log}\left[\sqrt{1+c^2\,x^2}\,\right]\right)\right)\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)\right)\Big/$$

$$\left(3\,c\,f^3\,(1+i\,c\,x)\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^4\right)-$$

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

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

$$i\,\pi\left(3\,\text{ArcSinh}[c\,x]-4\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]-2\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]+4\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]\right)+$$

$$\left.\left.4\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]-\frac{4\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}{\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^3}+\frac{2\,(4+\text{ArcSinh}[c\,x]^2)\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}{\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}\right)\right)\Big/$$

$$\left(3\,c\,f^3\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\sqrt{1+c^2\,x^2}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^2\right)+$$

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

$$\left(-\frac{6\,i\,c\,x\,\text{ArcSinh}[c\,x]}{\sqrt{1+c^2x^2}}+\frac{(13+13\,i)\,\text{ArcSinh}[c\,x]^2}{\sqrt{1+c^2x^2}}+\frac{3\,\text{ArcSinh}[c\,x]^3}{\sqrt{1+c^2x^2}}+\frac{2\,\text{ArcSinh}[c\,x]\,(2\,i+\text{ArcSinh}[c\,x])}{(i+c\,x)\,\sqrt{1+c^2x^2}}+3\,i\,\left(2+\text{ArcSinh}[c\,x]^2\right)+\right.$$

$$\frac{1}{\sqrt{1+c^2x^2}}13\,i\,\Big(2\,(\pi-2\,i\,\text{ArcSinh}[c\,x])\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]+\pi\,\Big(3\,\text{ArcSinh}[c\,x]-4\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]-$$

$$2\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]+4\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]\Big)+4\,i\,\text{PolyLog}\left[2,\,-i\,e^{-\text{ArcSinh}[c\,x]}\right]\Big)+$$

$$\left.\frac{4\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}{\sqrt{1+c^2x^2}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^3}-\frac{2\,\left(4+13\,\text{ArcSinh}[c\,x]^2\right)\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}{\sqrt{1+c^2x^2}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)}\right)\right)\Big/$$

$$\left(3\,c\,f^3\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^2\right)+$$

$$\Big(2\,b^2\,d^2\,(-i+c\,x)\,\sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,\left(1+c^2x^2\right)}\,\Big(-21\,\pi\,\text{ArcSinh}[c\,x]-(7-7\,i)\,\text{ArcSinh}[c\,x]^2+i\,\text{ArcSinh}[c\,x]^3+$$

$$\frac{2\,i\,\text{ArcSinh}[c\,x]\,(2\,i+\text{ArcSinh}[c\,x])}{i+c\,x}-14\,(\pi-2\,i\,\text{ArcSinh}[c\,x])\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]+28\,\pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]+$$

$$14\,\pi\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]-28\,\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]-28\,i\,\text{PolyLog}\left[2,\,-i\,e^{-\text{ArcSinh}[c\,x]}\right]-$$

$$\left.\frac{2\,i\,\left(4+7\,\text{ArcSinh}[c\,x]^2\right)\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}{\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}+\frac{4\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}{\left(i\,\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^3}\Big)\Big)\right/$$

$$\left(3\,c\,f^3\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\sqrt{1+c^2x^2}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^2\right)-$$

$$\Big(i\,a\,b\,d^2\,\sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,\left(1+c^2x^2\right)}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)$$

$$\Big(-\text{Cosh}\left[\frac{3}{2}\,\text{ArcSinh}[c\,x]\right]\,\left(9-35\,i\,\text{ArcSinh}[c\,x]+9\,\text{ArcSinh}[c\,x]^2+52\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+26\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)+$$

$$\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\,\left(20+24\,i\,\text{ArcSinh}[c\,x]+27\,\text{ArcSinh}[c\,x]^2+156\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+78\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)-$$

$$i\,\Big(3\,(-i+\text{ArcSinh}[c\,x])\,\text{Cosh}\left[\frac{5}{2}\,\text{ArcSinh}[c\,x]\right]+2\,\Big(13+7\,i\,\text{ArcSinh}[c\,x]+18\,\text{ArcSinh}[c\,x]^2+$$

$$104\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+3\,i\,(i+\text{ArcSinh}[c\,x])\,\text{Cosh}[2\,\text{ArcSinh}[c\,x]]+52\,\text{Log}\left[\sqrt{1+c^2x^2}\right]+\sqrt{1+c^2x^2}$$

$$\left.\left(6+38\,i\,\text{ArcSinh}[c\,x]+9\,\text{ArcSinh}[c\,x]^2+52\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+26\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)\Big)\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\Big)\Big)\Big)\right/$$

$$\left(6\,c\,f^3\,(-i+c\,x)\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^4\right)$$

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

$$\int \frac{(d+i\,c\,d\,x)^{3/2}\,(a+b\,\text{ArcSinh}[c\,x])^2}{(f-i\,c\,f\,x)^{5/2}}\,dx$$

Optimal (type 4, 584 leaves, 21 steps):

$$\frac{8\,d^4\,(1+c^2\,x^2)^{5/2}\,(a+b\,\text{ArcSinh}[c\,x])^2}{3\,c\,(d+i\,c\,d\,x)^{5/2}\,(f-i\,c\,f\,x)^{5/2}}+\frac{d^4\,(1+c^2\,x^2)^{5/2}\,(a+b\,\text{ArcSinh}[c\,x])^3}{3\,b\,c\,(d+i\,c\,d\,x)^{5/2}\,(f-i\,c\,f\,x)^{5/2}}+\frac{32\,b\,d^4\,(1+c^2\,x^2)^{5/2}\,(a+b\,\text{ArcSinh}[c\,x])\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]}{3\,c\,(d+i\,c\,d\,x)^{5/2}\,(f-i\,c\,f\,x)^{5/2}}-$$
$$\frac{32\,b^2\,d^4\,(1+c^2\,x^2)^{5/2}\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]}{3\,c\,(d+i\,c\,d\,x)^{5/2}\,(f-i\,c\,f\,x)^{5/2}}+\frac{4\,b\,d^4\,(1+c^2\,x^2)^{5/2}\,(a+b\,\text{ArcSinh}[c\,x])\,\text{Sec}\left[\frac{\pi}{4}+\frac{1}{2}\,i\,\text{ArcSinh}[c\,x]\right]^2}{3\,c\,(d+i\,c\,d\,x)^{5/2}\,(f-i\,c\,f\,x)^{5/2}}+$$
$$\frac{8\,i\,b^2\,d^4\,(1+c^2\,x^2)^{5/2}\,\text{Tan}\left[\frac{\pi}{4}+\frac{1}{2}\,i\,\text{ArcSinh}[c\,x]\right]}{3\,c\,(d+i\,c\,d\,x)^{5/2}\,(f-i\,c\,f\,x)^{5/2}}+\frac{8\,i\,d^4\,(1+c^2\,x^2)^{5/2}\,(a+b\,\text{ArcSinh}[c\,x])^2\,\text{Tan}\left[\frac{\pi}{4}+\frac{1}{2}\,i\,\text{ArcSinh}[c\,x]\right]}{3\,c\,(d+i\,c\,d\,x)^{5/2}\,(f-i\,c\,f\,x)^{5/2}}-$$
$$\frac{2\,i\,d^4\,(1+c^2\,x^2)^{5/2}\,(a+b\,\text{ArcSinh}[c\,x])^2\,\text{Sec}\left[\frac{\pi}{4}+\frac{1}{2}\,i\,\text{ArcSinh}[c\,x]\right]^2\,\text{Tan}\left[\frac{\pi}{4}+\frac{1}{2}\,i\,\text{ArcSinh}[c\,x]\right]}{3\,c\,(d+i\,c\,d\,x)^{5/2}\,(f-i\,c\,f\,x)^{5/2}}$$

Result (type 4, 1617 leaves):

$$\frac{\sqrt{i\,d\,(-i+c\,x)}\,\sqrt{-i\,f\,(i+c\,x)}\,\left(\frac{4\,i\,a^2\,d}{3\,f^3\,(i+c\,x)^2}-\frac{8\,a^2\,d}{3\,f^3\,(i+c\,x)}\right)}{c}+\frac{a^2\,d^{3/2}\,\text{Log}\left[c\,d\,f\,x+\sqrt{d}\,\sqrt{f}\,\sqrt{i\,d\,(-i+c\,x)}\,\sqrt{-i\,f\,(i+c\,x)}\right]}{c\,f^{5/2}}-$$
$$\left(i\,a\,b\,d\,\sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2\,x^2)}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)\right.$$
$$\left(-\text{Cosh}\left[\frac{3}{2}\,\text{ArcSinh}[c\,x]\right]\,\left(\text{ArcSinh}[c\,x]-2\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+i\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\right)+\right.$$
$$\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\,\left(4\,i+3\,\text{ArcSinh}[c\,x]-6\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+3\,i\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\right)+$$
$$2\,\left(\sqrt{1+c^2\,x^2}\,\left(i\,\text{ArcSinh}[c\,x]+2\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\right)+\right.$$
$$\left.\left.\left.2\,\left(1+i\,\text{ArcSinh}[c\,x]+2\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\right)\right)\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)\right)\Big/$$
$$\left(3\,c\,f^3\,(1+i\,c\,x)\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^4\right)+$$
$$\left(a\,b\,d\,\sqrt{i\,(-i\,d+c\,d\,x)}\,\sqrt{-i\,(i\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2\,x^2)}\,\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)\right.$$

$$\left(\text{Cosh}\left[\frac{3}{2}\text{ArcSinh}[c\,x]\right]\left(\left(14\,i-3\,\text{ArcSinh}[c\,x]\right)\text{ArcSinh}[c\,x]+28\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]-14\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)+\right.$$

$$\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\left(8+6\,i\,\text{ArcSinh}[c\,x]+9\,\text{ArcSinh}[c\,x]^2-84\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+42\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)-$$

$$2\,i\left(4+4\,i\,\text{ArcSinh}[c\,x]+6\,\text{ArcSinh}[c\,x]^2-56\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+28\,\text{Log}\left[\sqrt{1+c^2x^2}\right]+\sqrt{1+c^2x^2}\right.$$

$$\left.\left.\left(\text{ArcSinh}[c\,x]\left(14\,i+3\,\text{ArcSinh}[c\,x]\right)-28\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+14\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)\right)\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)\Big/$$

$$\left(6\,c\,f^3\left(1+i\,c\,x\right)\sqrt{-\left(-i\,d+c\,d\,x\right)\left(i\,f+c\,f\,x\right)}\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)^4\right)-$$

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

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

$$i\,\pi\left(3\,\text{ArcSinh}[c\,x]-4\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]-2\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]\right]+4\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]\right)+$$

$$\left.\left.4\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]-\frac{4\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)^3}+\frac{2\left(4+\text{ArcSinh}[c\,x]^2\right)\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}\right)\right)\Big/$$

$$\left(3\,c\,f^3\sqrt{-\left(-i\,d+c\,d\,x\right)\left(i\,f+c\,f\,x\right)}\sqrt{1+c^2x^2}\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)^2\right)+$$

$$\left(b^2\,d\left(-i+c\,x\right)\sqrt{i\left(-i\,d+c\,d\,x\right)}\sqrt{-i\left(i\,f+c\,f\,x\right)}\sqrt{-d\,f\left(1+c^2x^2\right)}\left(-21\,\pi\,\text{ArcSinh}[c\,x]-\left(7-7\,i\right)\text{ArcSinh}[c\,x]^2+i\,\text{ArcSinh}[c\,x]^3+\right.\right.$$

$$\frac{2\,i\,\text{ArcSinh}[c\,x]\left(2\,i+\text{ArcSinh}[c\,x]\right)}{i+c\,x}-14\left(\pi-2\,i\,\text{ArcSinh}[c\,x]\right)\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]+28\,\pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]+$$

$$14\,\pi\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]\right]-28\,\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]-28\,i\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]-$$

$$\left.\left.\frac{2\,i\left(4+7\,\text{ArcSinh}[c\,x]^2\right)\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}+\frac{4\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{\left(i\,\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)^3}\right)\right)\Big/$$

$$\left(3\,c\,f^3\sqrt{-\left(-i\,d+c\,d\,x\right)\left(i\,f+c\,f\,x\right)}\sqrt{1+c^2x^2}\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)^2\right)$$

Problem 605: Result more than twice size of optimal antiderivative.

$$\int \frac{(a + b\,\text{ArcSinh}[c\,x])^2}{(d + i\,c\,d\,x)^{5/2}\,(f - i\,c\,f\,x)^{5/2}}\,dx$$

Optimal (type 4, 386 leaves, 10 steps):

$$-\frac{b^2\,x\,(1 + c^2 x^2)^2}{3\,(d + i\,c\,d\,x)^{5/2}\,(f - i\,c\,f\,x)^{5/2}} + \frac{b\,(1 + c^2 x^2)^{3/2}\,(a + b\,\text{ArcSinh}[c\,x])}{3\,c\,(d + i\,c\,d\,x)^{5/2}\,(f - i\,c\,f\,x)^{5/2}} + \frac{x\,(1 + c^2 x^2)\,(a + b\,\text{ArcSinh}[c\,x])^2}{3\,(d + i\,c\,d\,x)^{5/2}\,(f - i\,c\,f\,x)^{5/2}} + \frac{2\,x\,(1 + c^2 x^2)^2\,(a + b\,\text{ArcSinh}[c\,x])^2}{3\,(d + i\,c\,d\,x)^{5/2}\,(f - i\,c\,f\,x)^{5/2}} + \frac{2\,(1 + c^2 x^2)^{5/2}\,(a + b\,\text{ArcSinh}[c\,x])^2}{3\,c\,(d + i\,c\,d\,x)^{5/2}\,(f - i\,c\,f\,x)^{5/2}} - \frac{4\,b\,(1 + c^2 x^2)^{5/2}\,(a + b\,\text{ArcSinh}[c\,x])\,\text{Log}\left[1 + e^{2\,\text{ArcSinh}[c\,x]}\right]}{3\,c\,(d + i\,c\,d\,x)^{5/2}\,(f - i\,c\,f\,x)^{5/2}} - \frac{2\,b^2\,(1 + c^2 x^2)^{5/2}\,\text{PolyLog}\left[2, -e^{2\,\text{ArcSinh}[c\,x]}\right]}{3\,c\,(d + i\,c\,d\,x)^{5/2}\,(f - i\,c\,f\,x)^{5/2}}$$

Result (type 4, 993 leaves):

$$\frac{\sqrt{i\, d\,(-i+c\,x)}\;\sqrt{-i\, f\,(i+c\,x)}\;\left(-\frac{i\,a^2}{12\,d^3\,f^3\,(-i+c\,x)^2}+\frac{a^2}{3\,d^3\,f^3\,(-i+c\,x)}+\frac{i\,a^2}{12\,d^3\,f^3\,(i+c\,x)^2}+\frac{a^2}{3\,d^3\,f^3\,(i+c\,x)}\right)}{c}+$$

$$\frac{1}{12\,c\,d^2\,f^2\,\sqrt{d+i\,c\,d\,x}\;\sqrt{f-i\,c\,f\,x}}\,b^2\left(\frac{(2-i\,\text{ArcSinh}[c\,x])\,\text{ArcSinh}[c\,x]\,\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)}{\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}+(2+2\,i)\,(-1)^{3/4}\right.$$

$$\sqrt{2}\,\Big(i\,\Big(3\,\pi\,\text{ArcSinh}[c\,x]+(1-i)\,\text{ArcSinh}[c\,x]^2+\pi\,\text{Log}[2]+2\,(\pi-2\,i\,\text{ArcSinh}[c\,x])\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]-4\,\pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]+$$

$$4\,\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]-2\,\pi\,\text{Log}\left[-\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]\Big)-4\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]\Big)$$

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

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

$$4\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+2\,\text{Log}\left[\text{Sin}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]\Big)+4\,i\,\text{PolyLog}\left[2,i\,e^{-\text{ArcSinh}[c\,x]}\right]\Big)\Big)$$

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

$$\frac{2\,\text{ArcSinh}[c\,x]^2\,\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{1+i\,c\,x}+$$

$$4\,\left(-1+2\,\text{ArcSinh}[c\,x]^2\right)\,\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+$$

$$\frac{2\,i\,\text{ArcSinh}[c\,x]^2\,\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{i+c\,x}+$$

$$4\,\left(-1+2\,\text{ArcSinh}[c\,x]^2\right)\,\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+$$

$$\left.\frac{\text{ArcSinh}[c\,x]\,(-2\,i+\text{ArcSinh}[c\,x])\,\left(i\,\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)}{\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}\right)+$$

$$\frac{a\,b\,\left(1+\frac{3\,c\,x\,\text{ArcSinh}[c\,x]}{\sqrt{1+c^2\,x^2}}-3\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]-\frac{\text{Cosh}[3\,\text{ArcSinh}[c\,x]]\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]}{\sqrt{1+c^2\,x^2}}+\frac{\text{ArcSinh}[c\,x]\,\text{Sinh}[3\,\text{ArcSinh}[c\,x]]}{\sqrt{1+c^2\,x^2}}\right)}{3\,c\,d^2\,f^2\,\sqrt{d+i\,c\,d\,x}\;\sqrt{f-i\,c\,f\,x}\;\sqrt{1+c^2\,x^2}}$$

Problem 611: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 485 leaves, 18 steps):

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

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

$$\frac{b\,\text{PolyLog}\left[2,\frac{\sqrt{e}\,e^{\text{ArcSinh}[c\,x]}}{c\sqrt{-d}-\sqrt{-c^2\,d+e}}\right]}{2\sqrt{-d}\,\sqrt{e}}-\frac{b\,\text{PolyLog}\left[2,-\frac{\sqrt{e}\,e^{\text{ArcSinh}[c\,x]}}{c\sqrt{-d}+\sqrt{-c^2\,d+e}}\right]}{2\sqrt{-d}\,\sqrt{e}}+\frac{b\,\text{PolyLog}\left[2,\frac{\sqrt{e}\,e^{\text{ArcSinh}[c\,x]}}{c\sqrt{-d}+\sqrt{-c^2\,d+e}}\right]}{2\sqrt{-d}\,\sqrt{e}}$$

Result (type 4, 775 leaves):

$$\frac{1}{16\sqrt{d}\,\sqrt{e}}\left(16\,a\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]+4\,b\left(8\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{c\sqrt{d}}{\sqrt{e}}}}{\sqrt{2}}\right]\text{ArcTan}\left[\frac{\left(c\sqrt{d}-\sqrt{e}\right)\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{c^2 d-e}}\right]-\right.\right.$$

$$8\,i\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{c\sqrt{d}}{\sqrt{e}}}}{\sqrt{2}}\right]\text{ArcTan}\left[\frac{\left(c\sqrt{d}+\sqrt{e}\right)\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{c^2 d-e}}\right]+\left(\pi+4\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{c\sqrt{d}}{\sqrt{e}}}}{\sqrt{2}}\right]-2\,i\,\text{ArcSinh}[c\,x]\right)$$

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

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

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

$$2\,i\,\text{ArcSinh}[c\,x]\,\text{Log}\left[c\left(\sqrt{d}-i\sqrt{e}\,x\right)\right]-\left(\pi-2\,i\,\text{ArcSinh}[c\,x]\right)\text{Log}\left[c\left(\sqrt{d}+i\sqrt{e}\,x\right)\right]-2\,i\,\text{ArcSinh}[c\,x]\,\text{Log}\left[c\left(\sqrt{d}+i\sqrt{e}\,x\right)\right]-$$

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

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

Problem 612: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 707 leaves, 26 steps):

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

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

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

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

Result (type 4, 1129 leaves):

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

$$b\left(-\frac{-\frac{\text{ArcSinh}[c\,x]}{i\sqrt{d}+\sqrt{e}\,x}-\frac{c\,\text{Log}\left[\frac{2\,e\left(\sqrt{e}-i\,c^2\sqrt{d}\,x+\sqrt{-c^2 d+e}\,\sqrt{1+c^2x^2}\right)}{c\sqrt{-c^2 d+e}\,\left(i\sqrt{d}+\sqrt{e}\,x\right)}\right]}{\sqrt{-c^2 d+e}}}{4\,d\,\sqrt{e}}+\frac{\frac{\text{ArcSinh}[c\,x]}{-i\sqrt{d}+\sqrt{e}\,x}+\frac{c\,\text{Log}\left[-\frac{2\,e\left(\sqrt{e}+i\,c^2\sqrt{d}\,x+\sqrt{-c^2 d+e}\,\sqrt{1+c^2x^2}\right)}{c\sqrt{-c^2 d+e}\,\left(-i\sqrt{d}+\sqrt{e}\,x\right)}\right]}{\sqrt{-c^2 d+e}}}{4\,d\,\sqrt{e}}+\frac{1}{32\,d^{3/2}\,\sqrt{e}}\left(-i\,\left(\pi-2\,i\,\text{ArcSinh}[c\,x]\right)^2+\right.\right.$$

$$32\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{c\sqrt{d}}{\sqrt{e}}}}{\sqrt{2}}\right]\,\text{ArcTan}\left[\frac{\left(c\sqrt{d}-\sqrt{e}\right)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{c^2 d-e}}\right]+4\left(\pi+4\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{c\sqrt{d}}{\sqrt{e}}}}{\sqrt{2}}\right]-2\,i\,\text{ArcSinh}[c\,x]\right)$$

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

$$4\left(\pi-2\,i\,\text{ArcSinh}[c x]\right)\text{Log}\left[c\sqrt{d}+i\,c\sqrt{e}\,x\right]-8\,i\,\text{ArcSinh}[c x]\,\text{Log}\left[c\sqrt{d}+i\,c\sqrt{e}\,x\right]-$$

$$8\,i\left(\text{PolyLog}\left[2,\frac{i\left(-c\sqrt{d}+\sqrt{c^2 d-e}\right)e^{\text{ArcSinh}[c x]}}{\sqrt{e}}\right]+\text{PolyLog}\left[2,-\frac{i\left(c\sqrt{d}+\sqrt{c^2 d-e}\right)e^{\text{ArcSinh}[c x]}}{\sqrt{e}}\right]\right)\Bigg)+$$

$$\frac{1}{32\,d^{3/2}\sqrt{e}}\left(i\left(\pi-2\,i\,\text{ArcSinh}[c x]\right)^2-32\,i\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{c\sqrt{d}}{\sqrt{e}}}}{\sqrt{2}}\right]\text{ArcTan}\left[\frac{\left(c\sqrt{d}+\sqrt{e}\right)\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c x]\right)\right]}{\sqrt{c^2 d-e}}\right]-\right.$$

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

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

$$4\left(\pi-2\,i\,\text{ArcSinh}[c x]\right)\text{Log}\left[c\sqrt{d}-i\,c\sqrt{e}\,x\right]+8\,i\,\text{ArcSinh}[c x]\,\text{Log}\left[c\sqrt{d}-i\,c\sqrt{e}\,x\right]+$$

$$\left.8\,i\left(\text{PolyLog}\left[2,-\frac{i\left(-c\sqrt{d}+\sqrt{c^2 d-e}\right)e^{\text{ArcSinh}[c x]}}{\sqrt{e}}\right]+\text{PolyLog}\left[2,\frac{i\left(c\sqrt{d}+\sqrt{c^2 d-e}\right)e^{\text{ArcSinh}[c x]}}{\sqrt{e}}\right]\right)\right)\Bigg)$$

Problem 617: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 739 leaves, 22 steps):

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

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

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

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

$$\frac{b^2\,\text{PolyLog}\left[3,-\frac{\sqrt{e}\,e^{\text{ArcSinh}[c\,x]}}{c\sqrt{-d}-\sqrt{-c^2 d+e}}\right]}{\sqrt{-d}\,\sqrt{e}}-\frac{b^2\,\text{PolyLog}\left[3,\frac{\sqrt{e}\,e^{\text{ArcSinh}[c\,x]}}{c\sqrt{-d}-\sqrt{-c^2 d+e}}\right]}{\sqrt{-d}\,\sqrt{e}}+\frac{b^2\,\text{PolyLog}\left[3,-\frac{\sqrt{e}\,e^{\text{ArcSinh}[c\,x]}}{c\sqrt{-d}+\sqrt{-c^2 d+e}}\right]}{\sqrt{-d}\,\sqrt{e}}-\frac{b^2\,\text{PolyLog}\left[3,\frac{\sqrt{e}\,e^{\text{ArcSinh}[c\,x]}}{c\sqrt{-d}+\sqrt{-c^2 d+e}}\right]}{\sqrt{-d}\,\sqrt{e}}$$

Result (type 4, 3196 leaves):

$$\frac{1}{8\sqrt{d}\,\sqrt{e}}\left(8\,a^2\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]+4\,a\,b\left(8\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{c\sqrt{d}}{\sqrt{e}}}}{\sqrt{2}}\right]\text{ArcTan}\left[\frac{\left(c\sqrt{d}-\sqrt{e}\right)\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{c^2 d-e}}\right]-\right.\right.$$

$$8\,i\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{c\sqrt{d}}{\sqrt{e}}}}{\sqrt{2}}\right]\text{ArcTan}\left[\frac{\left(c\sqrt{d}+\sqrt{e}\right)\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{c^2 d-e}}\right]+\left(\pi+4\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{c\sqrt{d}}{\sqrt{e}}}}{\sqrt{2}}\right]-2\,i\,\text{ArcSinh}[c\,x]\right)$$

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

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

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

$$2\,i\,\text{ArcSinh}[c\,x]\,\text{Log}\left[c\left(\sqrt{d}-i\sqrt{e}\,x\right)\right]-(\pi-2\,i\,\text{ArcSinh}[c\,x])\,\text{Log}\left[c\left(\sqrt{d}+i\sqrt{e}\,x\right)\right]-2\,i\,\text{ArcSinh}[c\,x]\,\text{Log}\left[c\left(\sqrt{d}+i\sqrt{e}\,x\right)\right]-$$

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

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

$$4\,b^2\left(8\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{c\sqrt{d}}{\sqrt{e}}}}{\sqrt{2}}\right]\text{ArcSinh}[c\,x]\,\text{ArcTan}\left[\frac{\left(c\sqrt{d}-\sqrt{e}\right)\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{c^2 d-e}}\right]-\right.$$

$$8\,i\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{c\sqrt{d}}{\sqrt{e}}}}{\sqrt{2}}\right]\text{ArcSinh}[c\,x]\,\text{ArcTan}\left[\frac{\left(c\sqrt{d}+\sqrt{e}\right)\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{c^2 d-e}}\right]-$$

$$8\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{c\sqrt{d}}{\sqrt{e}}}}{\sqrt{2}}\right]\text{ArcSinh}[c\,x]\,\text{ArcTan}\left[\frac{\left(c\sqrt{d}-\sqrt{e}\right)\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)}{\sqrt{c^2 d-e}\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)}\right]+$$

$$8\,i\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{c\sqrt{d}}{\sqrt{e}}}}{\sqrt{2}}\right]\text{ArcSinh}[c\,x]\,\text{ArcTan}\left[\frac{\left(c\sqrt{d}+\sqrt{e}\right)\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)}{\sqrt{c^2 d-e}\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)}\right]+\pi\,\text{ArcSinh}[c\,x]$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Problem 649: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 70 leaves, 6 steps) :

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

Result (type 6, 166 leaves):

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

Problem 650: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 146 leaves, 7 steps):

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

Result (type 6, 235 leaves):

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

Problem 651: Result unnecessarily involves higher level functions.

$$\int\frac{a+b\,\text{ArcSinh}[c\,x]}{(d+e\,x^2)^{7/2}}\,dx$$

Optimal (type 3, 227 leaves, 8 steps):

$$-\frac{b c \sqrt{1+c^2 x^2}}{15 d \left(c^2 d-e\right) \left(d+e x^2\right)^{3/2}}-\frac{2 b c \left(3 c^2 d-2 e\right) \sqrt{1+c^2 x^2}}{15 d^2 \left(c^2 d-e\right)^2 \sqrt{d+e x^2}}+$$

$$\frac{x \left(a+b \operatorname{ArcSinh}[c x]\right)}{5 d \left(d+e x^2\right)^{5/2}}+\frac{4 x \left(a+b \operatorname{ArcSinh}[c x]\right)}{15 d^2 \left(d+e x^2\right)^{3/2}}+\frac{8 x \left(a+b \operatorname{ArcSinh}[c x]\right)}{15 d^3 \sqrt{d+e x^2}}-\frac{8 b \operatorname{ArcTanh}\left[\frac{\sqrt{e} \sqrt{1+c^2 x^2}}{c \sqrt{d+e x^2}}\right]}{15 d^3 \sqrt{e}}$$

Result (type 6, 308 leaves) :

$$\frac{1}{15 d^3 \left(d+e x^2\right)^{5/2}}\left(-\frac{b c d^2 \sqrt{1+c^2 x^2} \left(d+e x^2\right)}{c^2 d-e}-\frac{2 b c d \left(3 c^2 d-2 e\right) \sqrt{1+c^2 x^2} \left(d+e x^2\right)^2}{\left(-c^2 d+e\right)^2}+a x \left(15 d^2+20 d e x^2+8 e^2 x^4\right)+\right.$$

$$\left(16 b c d x^2 \left(d+e x^2\right)^2 \operatorname{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-c^2 x^2,-\frac{e x^2}{d}\right]\right) \Big/ \left(\sqrt{1+c^2 x^2} \left(-4 d \operatorname{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,-c^2 x^2,-\frac{e x^2}{d}\right]+\right.\right.$$

$$\left.\left.\left.x^2 \left(e \operatorname{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,-c^2 x^2,-\frac{e x^2}{d}\right]+c^2 d \operatorname{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,-c^2 x^2,-\frac{e x^2}{d}\right]\right)\right)\right)+b x \left(15 d^2+20 d e x^2+8 e^2 x^4\right) \operatorname{ArcSinh}[c x]\right)$$

Test results for the 371 problems in "7.1.5 Inverse hyperbolic sine functions.m"

Problem 1: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\operatorname{ArcSinh}[c x]}{d+e x} \, dx$$

Optimal (type 4, 170 leaves, 8 steps) :

$$-\frac{\operatorname{ArcSinh}[c x]^2}{2 e}+\frac{\operatorname{ArcSinh}[c x] \operatorname{Log}\left[1+\frac{e e^{\operatorname{ArcSinh}[c x]}}{c d-\sqrt{c^2 d^2+e^2}}\right]}{e}+\frac{\operatorname{ArcSinh}[c x] \operatorname{Log}\left[1+\frac{e e^{\operatorname{ArcSinh}[c x]}}{c d+\sqrt{c^2 d^2+e^2}}\right]}{e}+\frac{\operatorname{PolyLog}\left[2,-\frac{e e^{\operatorname{ArcSinh}[c x]}}{c d-\sqrt{c^2 d^2+e^2}}\right]}{e}+\frac{\operatorname{PolyLog}\left[2,-\frac{e e^{\operatorname{ArcSinh}[c x]}}{c d+\sqrt{c^2 d^2+e^2}}\right]}{e}$$

Result (type 4, 447 leaves) :

$$\frac{1}{8\,e}\left(\pi^2 - 4\,i\,\pi\,\text{ArcSinh}[c\,x] - 4\,\text{ArcSinh}[c\,x]^2 - 32\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\right]\text{ArcTan}\left[\frac{(c\,d+i\,e)\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{c^2\,d^2+e^2}}\right] + \right.$$

$$4\,i\,\pi\,\text{Log}\left[1+\frac{\left(-c\,d+\sqrt{c^2\,d^2+e^2}\right)\,e^{\text{ArcSinh}[c\,x]}}{e}\right] + 16\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\right]\text{Log}\left[1+\frac{\left(-c\,d+\sqrt{c^2\,d^2+e^2}\right)\,e^{\text{ArcSinh}[c\,x]}}{e}\right] +$$

$$8\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1+\frac{\left(-c\,d+\sqrt{c^2\,d^2+e^2}\right)\,e^{\text{ArcSinh}[c\,x]}}{e}\right] + 4\,i\,\pi\,\text{Log}\left[1-\frac{\left(c\,d+\sqrt{c^2\,d^2+e^2}\right)\,e^{\text{ArcSinh}[c\,x]}}{e}\right] -$$

$$16\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\right]\text{Log}\left[1-\frac{\left(c\,d+\sqrt{c^2\,d^2+e^2}\right)\,e^{\text{ArcSinh}[c\,x]}}{e}\right] + 8\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1-\frac{\left(c\,d+\sqrt{c^2\,d^2+e^2}\right)\,e^{\text{ArcSinh}[c\,x]}}{e}\right] -$$

$$\left.4\,i\,\pi\,\text{Log}[c\,d+c\,e\,x] + 8\,\text{PolyLog}\left[2,\frac{\left(c\,d-\sqrt{c^2\,d^2+e^2}\right)\,e^{\text{ArcSinh}[c\,x]}}{e}\right] + 8\,\text{PolyLog}\left[2,\frac{\left(c\,d+\sqrt{c^2\,d^2+e^2}\right)\,e^{\text{ArcSinh}[c\,x]}}{e}\right]\right)$$

Problem 2: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 260 leaves, 10 steps) :

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

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

Result (type 4, 1061 leaves) :

$$-\frac{1}{3\,e}\Bigg(\text{ArcSinh}[c\,x]^3+24\,\text{ArcSin}\Big[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\Big]\,\text{ArcSinh}[c\,x]\,\text{ArcTan}\Big[\frac{(c\,d+i\,e)\,\text{Cot}\big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\big]}{\sqrt{c^2\,d^2+e^2}}\Big]-$$

$$24\,\text{ArcSin}\Big[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\Big]\,\text{ArcSinh}[c\,x]\,\text{ArcTan}\Big[\frac{(c\,d+i\,e)\,\big(\text{Cosh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]-i\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]\big)}{\sqrt{c^2\,d^2+e^2}\,\big(\text{Cosh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]+i\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]\big)}\Big]-$$

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

$$12\,i\,\text{ArcSin}\Big[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\Big]\,\text{ArcSinh}[c\,x]\,\text{Log}\Big[1+\frac{\big(-c\,d+\sqrt{c^2\,d^2+e^2}\big)\,e^{\text{ArcSinh}[c\,x]}}{e}\Big]-$$

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

$$3\,i\,\pi\,\text{ArcSinh}[c\,x]\,\text{Log}\Big[1-\frac{\big(c\,d+\sqrt{c^2\,d^2+e^2}\big)\,e^{\text{ArcSinh}[c\,x]}}{e}\Big]+12\,i\,\text{ArcSin}\Big[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\Big]\,\text{ArcSinh}[c\,x]\,\text{Log}\Big[1-\frac{\big(c\,d+\sqrt{c^2\,d^2+e^2}\big)\,e^{\text{ArcSinh}[c\,x]}}{e}\Big]-$$

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

$$12\,i\,\text{ArcSin}\Big[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\Big]\,\text{ArcSinh}[c\,x]\,\text{Log}\Big[1+\frac{\big(-c\,d+\sqrt{c^2\,d^2+e^2}\big)\,\big(c\,x+\sqrt{1+c^2\,x^2}\big)}{e}\Big]+$$

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

$$12\,i\,\text{ArcSin}\Big[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\Big]\,\text{ArcSinh}[c\,x]\,\text{Log}\Big[1-\frac{\big(c\,d+\sqrt{c^2\,d^2+e^2}\big)\,\big(c\,x+\sqrt{1+c^2\,x^2}\big)}{e}\Big]+$$

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

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

Problem 3: Unable to integrate problem.

$$\int\frac{\text{ArcSinh}[c\,x]^3}{d+e\,x}\,dx$$

Optimal (type 4, 348 leaves, 12 steps):

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

Result (type 8, 16 leaves):

$$\int\frac{\text{ArcSinh}[c\,x]^3}{d+e\,x}\,dx$$

Problem 8: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 187 leaves, 8 steps):

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

Result (type 4, 460 leaves):

$$\frac{a\,\text{Log}[d+e\,x]}{e}+\frac{1}{8\,e}b\left(\pi^2-4\,i\,\pi\,\text{ArcSinh}[c\,x]-4\,\text{ArcSinh}[c\,x]^2-32\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\right]\text{ArcTan}\left[\frac{(c\,d+i\,e)\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{c^2\,d^2+e^2}}\right]+\right.$$

$$4\,i\,\pi\,\text{Log}\left[1+\frac{\left(-c\,d+\sqrt{c^2\,d^2+e^2}\right)e^{\text{ArcSinh}[c\,x]}}{e}\right]+16\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\right]\text{Log}\left[1+\frac{\left(-c\,d+\sqrt{c^2\,d^2+e^2}\right)e^{\text{ArcSinh}[c\,x]}}{e}\right]+$$

$$8\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1+\frac{\left(-c\,d+\sqrt{c^2\,d^2+e^2}\right)e^{\text{ArcSinh}[c\,x]}}{e}\right]+4\,i\,\pi\,\text{Log}\left[1-\frac{\left(c\,d+\sqrt{c^2\,d^2+e^2}\right)e^{\text{ArcSinh}[c\,x]}}{e}\right]-$$

$$16\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\right]\text{Log}\left[1-\frac{\left(c\,d+\sqrt{c^2\,d^2+e^2}\right)e^{\text{ArcSinh}[c\,x]}}{e}\right]+8\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1-\frac{\left(c\,d+\sqrt{c^2\,d^2+e^2}\right)e^{\text{ArcSinh}[c\,x]}}{e}\right]-$$

$$\left.4\,i\,\pi\,\text{Log}[c\,d+c\,e\,x]+8\,\text{PolyLog}\left[2,\frac{\left(c\,d-\sqrt{c^2\,d^2+e^2}\right)e^{\text{ArcSinh}[c\,x]}}{e}\right]+8\,\text{PolyLog}\left[2,\frac{\left(c\,d+\sqrt{c^2\,d^2+e^2}\right)e^{\text{ArcSinh}[c\,x]}}{e}\right]\right)$$

Problem 16: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 291 leaves, 10 steps):

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

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

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

Result (type 4, 1521 leaves):

$$\frac{1}{12\,e}\Bigg(12\,a^2\,\text{Log}[d+e\,x]+3\,a\,b\,\Bigg(\pi^2-4\,i\,\pi\,\text{ArcSinh}[c\,x]-4\,\text{ArcSinh}[c\,x]^2-32\,\text{ArcSin}\Big[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\Big]\,\text{ArcTan}\Big[\frac{(c\,d+i\,e)\,\text{Cot}\big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\big]}{\sqrt{c^2\,d^2+e^2}}\Big]+$$

$$4\,i\,\pi\,\text{Log}\Big[1+\frac{\big(-c\,d+\sqrt{c^2\,d^2+e^2}\big)\,e^{\text{ArcSinh}[c\,x]}}{e}\Big]+16\,i\,\text{ArcSin}\Big[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\Big]\,\text{Log}\Big[1+\frac{\big(-c\,d+\sqrt{c^2\,d^2+e^2}\big)\,e^{\text{ArcSinh}[c\,x]}}{e}\Big]+$$

$$8\,\text{ArcSinh}[c\,x]\,\text{Log}\Big[1+\frac{\big(-c\,d+\sqrt{c^2\,d^2+e^2}\big)\,e^{\text{ArcSinh}[c\,x]}}{e}\Big]+4\,i\,\pi\,\text{Log}\Big[1-\frac{\big(c\,d+\sqrt{c^2\,d^2+e^2}\big)\,e^{\text{ArcSinh}[c\,x]}}{e}\Big]-$$

$$16\,i\,\text{ArcSin}\Big[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\Big]\,\text{Log}\Big[1-\frac{\big(c\,d+\sqrt{c^2\,d^2+e^2}\big)\,e^{\text{ArcSinh}[c\,x]}}{e}\Big]+8\,\text{ArcSinh}[c\,x]\,\text{Log}\Big[1-\frac{\big(c\,d+\sqrt{c^2\,d^2+e^2}\big)\,e^{\text{ArcSinh}[c\,x]}}{e}\Big]-$$

$$4\,i\,\pi\,\text{Log}[c\,(d+e\,x)]+8\,\text{PolyLog}\Big[2,\frac{\big(c\,d-\sqrt{c^2\,d^2+e^2}\big)\,e^{\text{ArcSinh}[c\,x]}}{e}\Big]+8\,\text{PolyLog}\Big[2,\frac{\big(c\,d+\sqrt{c^2\,d^2+e^2}\big)\,e^{\text{ArcSinh}[c\,x]}}{e}\Big]\Bigg)-$$

$$4\,b^2\,\Bigg(\text{ArcSinh}[c\,x]^3+24\,\text{ArcSin}\Big[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\Big]\,\text{ArcSinh}[c\,x]\,\text{ArcTan}\Big[\frac{(c\,d+i\,e)\,\text{Cot}\big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\big]}{\sqrt{c^2\,d^2+e^2}}\Big]-$$

$$24\,\text{ArcSin}\Big[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\Big]\,\text{ArcSinh}[c\,x]\,\text{ArcTan}\Big[\frac{(c\,d+i\,e)\,\big(\text{Cosh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]-i\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]\big)}{\sqrt{c^2\,d^2+e^2}\,\big(\text{Cosh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]+i\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]\big)}\Big]-$$

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

$$12\,i\,\text{ArcSin}\Big[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\Big]\,\text{ArcSinh}[c\,x]\,\text{Log}\Big[1+\frac{\big(-c\,d+\sqrt{c^2\,d^2+e^2}\big)\,e^{\text{ArcSinh}[c\,x]}}{e}\Big]-$$

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

$$3\,i\,\pi\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1-\frac{\left(c\,d+\sqrt{c^2\,d^2+e^2}\right)\,e^{\text{ArcSinh}[c\,x]}}{e}\right]+12\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\right]\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1-\frac{\left(c\,d+\sqrt{c^2\,d^2+e^2}\right)\,e^{\text{ArcSinh}[c\,x]}}{e}\right]-$$

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

$$12\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\right]\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1+\frac{\left(-c\,d+\sqrt{c^2\,d^2+e^2}\right)\,\left(c\,x+\sqrt{1+c^2\,x^2}\right)}{e}\right]+$$

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

$$12\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\right]\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1-\frac{\left(c\,d+\sqrt{c^2\,d^2+e^2}\right)\,\left(c\,x+\sqrt{1+c^2\,x^2}\right)}{e}\right]+$$

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

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

Problem 17: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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

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

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

Result (type 4, 1381 leaves):

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

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

$$\frac{1}{\sqrt{-c^2\,d^2-e^2}}\left(2\,\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\,\text{ArcTanh}\left[\frac{(c\,d-i\,e)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,d^2-e^2}}\right]-2\,\text{ArcCos}\left[-\frac{i\,c\,d}{e}\right]\right.$$

$$\text{ArcTanh}\left[\frac{(-c\,d-i\,e)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,d^2-e^2}}\right]+\left(\text{ArcCos}\left[-\frac{i\,c\,d}{e}\right]-2\,i\,\left(\text{ArcTanh}\left[\frac{(c\,d-i\,e)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,d^2-e^2}}\right]-\right.\right.$$

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

$$\left(\text{ArcCos}\left[-\frac{i\,c\,d}{e}\right]+2\,i\,\left(\text{ArcTanh}\left[\frac{(c\,d-i\,e)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,d^2-e^2}}\right]-\text{ArcTanh}\left[\frac{(-c\,d-i\,e)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,d^2-e^2}}\right]\right)\right)$$

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

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

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

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

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

$$\left.\text{PolyLog}\Big[2,\frac{i\left(c\,d+i\sqrt{-c^2d^2-e^2}\right)\left(c\,d-i\,e-\sqrt{-c^2d^2-e^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)}{e\left(c\,d-i\,e+\sqrt{-c^2d^2-e^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)}\Big]\right)\Bigg)\Bigg)\Bigg)$$

Problem 18: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 349 leaves, 13 steps):

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

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

Result (type 4, 1558 leaves):

$$-\frac{a^2}{2\,e\,(d+e\,x)^2}+2\,a\,b\,c^2$$

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

$$\left.\left(2\,e\,(-i\,c\,d+e)\,(i\,c\,d+e)\sqrt{c^2d^2+e^2}\,(c\,d+c\,e\,x)\right)\right)+$$

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

$$\frac{1}{\sqrt{-c^2 d^2-e^2}}\left(2\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\text{ArcTanh}\left[\frac{(c\,d-i\,e)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 d^2-e^2}}\right]-2\,\text{ArcCos}\left[-\frac{i\,c\,d}{e}\right]\right.$$

$$\text{ArcTanh}\left[\frac{(-c\,d-i\,e)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 d^2-e^2}}\right]+\left(\text{ArcCos}\left[-\frac{i\,c\,d}{e}\right]-2\,i\left(\text{ArcTanh}\left[\frac{(c\,d-i\,e)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 d^2-e^2}}\right]-\right.\right.$$

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

$$\left(\text{ArcCos}\left[-\frac{i\,c\,d}{e}\right]+2\,i\left(\text{ArcTanh}\left[\frac{(c\,d-i\,e)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 d^2-e^2}}\right]-\text{ArcTanh}\left[\frac{(-c\,d-i\,e)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 d^2-e^2}}\right]\right)\right)$$

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

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

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

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

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

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

Problem 31: Unable to integrate problem.

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

Optimal (type 6, 179 leaves, 3 steps):

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

Result (type 8, 18 leaves):

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

Problem 37: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 664 leaves, 22 steps):

$$\frac{a\sqrt{d+c^2\,d\,x^2}}{g}-\frac{b\,c\,x\sqrt{d+c^2\,d\,x^2}}{g\sqrt{1+c^2\,x^2}}+\frac{b\sqrt{d+c^2\,d\,x^2}\,\text{ArcSinh}[c\,x]}{g}-$$

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

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

$$\frac{b\sqrt{c^2\,f^2+g^2}\sqrt{d+c^2\,d\,x^2}\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1+\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f-\sqrt{c^2\,f^2+g^2}}\right]}{g^2\sqrt{1+c^2\,x^2}}-\frac{b\sqrt{c^2\,f^2+g^2}\sqrt{d+c^2\,d\,x^2}\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1+\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f+\sqrt{c^2\,f^2+g^2}}\right]}{g^2\sqrt{1+c^2\,x^2}}+$$

$$\frac{b\sqrt{c^2\,f^2+g^2}\sqrt{d+c^2\,d\,x^2}\,\text{PolyLog}\left[2,-\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f-\sqrt{c^2\,f^2+g^2}}\right]}{g^2\sqrt{1+c^2\,x^2}}-\frac{b\sqrt{c^2\,f^2+g^2}\sqrt{d+c^2\,d\,x^2}\,\text{PolyLog}\left[2,-\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f+\sqrt{c^2\,f^2+g^2}}\right]}{g^2\sqrt{1+c^2\,x^2}}$$

Result (type 4, 1552 leaves):

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

$$\frac{a \sqrt{d} \sqrt{c^2 f^2+g^2} \operatorname{Log}\left[d g-c^2 d f x+\sqrt{d} \sqrt{c^2 f^2+g^2} \sqrt{d\left(1+c^2 x^2\right)}\right]}{g^2}+$$

$$b\left(-\frac{c x \sqrt{d\left(1+c^2 x^2\right)}}{g \sqrt{1+c^2 x^2}}+\frac{\sqrt{d\left(1+c^2 x^2\right)} \operatorname{ArcSinh}[c x]}{g}-\frac{c f \sqrt{d\left(1+c^2 x^2\right)} \operatorname{ArcSinh}[c x]^2}{2 g^2 \sqrt{1+c^2 x^2}}+\right.$$

$$\frac{1}{g^2 \sqrt{1+c^2 x^2}}\left(c^2 f^2+g^2\right) \sqrt{d\left(1+c^2 x^2\right)}\left(-\frac{i \pi \operatorname{ArcTanh}\left[\frac{-g+c f \operatorname{Tanh}\left[\frac{1}{2} \operatorname{ArcSinh}[c x]\right]}{\sqrt{c^2 f^2+g^2}}\right]}{\sqrt{c^2 f^2+g^2}}-\right.$$

$$\frac{1}{\sqrt{-c^2 f^2-g^2}}\left(2\left(\frac{\pi}{2}-i \operatorname{ArcSinh}[c x]\right) \operatorname{ArcTanh}\left[\frac{(c f-i g) \operatorname{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i \operatorname{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]-2 \operatorname{ArcCos}\left[-\frac{i c f}{g}\right]\right.$$

$$\operatorname{ArcTanh}\left[\frac{(-c f-i g) \operatorname{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i \operatorname{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\left(\operatorname{ArcCos}\left[-\frac{i c f}{g}\right]-2 i\left(\operatorname{ArcTanh}\left[\frac{(c f-i g) \operatorname{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i \operatorname{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]-\right.\right.$$

$$\left.\left.\operatorname{ArcTanh}\left[\frac{(-c f-i g) \operatorname{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i \operatorname{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\right) \operatorname{Log}\left[\frac{e^{-\frac{1}{2} i\left(\frac{\pi}{2}-i \operatorname{ArcSinh}[c x]\right)} \sqrt{-c^2 f^2-g^2}}{\sqrt{2} \sqrt{-i g} \sqrt{c f+c g x}}\right]+$$

$$\left(\operatorname{ArcCos}\left[-\frac{i c f}{g}\right]+2 i\left(\operatorname{ArcTanh}\left[\frac{(c f-i g) \operatorname{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i \operatorname{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]-\operatorname{ArcTanh}\left[\frac{(-c f-i g) \operatorname{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i \operatorname{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\right)$$

$$\operatorname{Log}\left[\frac{e^{\frac{1}{2} i\left(\frac{\pi}{2}-i \operatorname{ArcSinh}[c x]\right)} \sqrt{-c^2 f^2-g^2}}{\sqrt{2} \sqrt{-i g} \sqrt{c f+c g x}}\right]-\left(\operatorname{ArcCos}\left[-\frac{i c f}{g}\right]+2 i \operatorname{ArcTanh}\left[\frac{(-c f-i g) \operatorname{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i \operatorname{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$

$$\operatorname{Log}\left[1-\frac{i\left(c f-i \sqrt{-c^2 f^2-g^2}\right)\left(c f-i g-\sqrt{-c^2 f^2-g^2} \operatorname{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i \operatorname{ArcSinh}[c x]\right)\right]\right)}{g\left(c f-i g+\sqrt{-c^2 f^2-g^2} \operatorname{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i \operatorname{ArcSinh}[c x]\right)\right]\right)}\right]+$$

$$\left(-\operatorname{ArcCos}\left[-\frac{i c f}{g}\right]+2 i \operatorname{ArcTanh}\left[\frac{(-c f-i g) \operatorname{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i \operatorname{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$

$$\text{Log}\left[1-\frac{i\left(c f+i\sqrt{-c^2 f^2-g^2}\right)\left(c f-i g-\sqrt{-c^2 f^2-g^2}\ \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c x]\right)\right]\right)}{g\left(c f-i g+\sqrt{-c^2 f^2-g^2}\ \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c x]\right)\right]\right)}\right]+$$

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

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

Problem 38: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 781 leaves, 35 steps):

$$-\frac{a\sqrt{d+c^2 d x^2}}{g\,(f+g x)}-\frac{b\sqrt{d+c^2 d x^2}\ \text{ArcSinh}[c x]}{g\,(f+g x)}+\frac{a c^3 f^2\sqrt{d+c^2 d x^2}\ \text{ArcSinh}[c x]}{g^2\left(c^2 f^2+g^2\right)\sqrt{1+c^2 x^2}}+\frac{b c^3 f^2\sqrt{d+c^2 d x^2}\ \text{ArcSinh}[c x]^2}{2 g^2\left(c^2 f^2+g^2\right)\sqrt{1+c^2 x^2}}-$$

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

$$\frac{b c^2 f\sqrt{d+c^2 d x^2}\ \text{ArcSinh}[c x]\ \text{Log}\left[1+\frac{e^{\text{ArcSinh}[c x]}\,g}{c f-\sqrt{c^2 f^2+g^2}}\right]}{g^2\sqrt{c^2 f^2+g^2}\ \sqrt{1+c^2 x^2}}+\frac{b c^2 f\sqrt{d+c^2 d x^2}\ \text{ArcSinh}[c x]\ \text{Log}\left[1+\frac{e^{\text{ArcSinh}[c x]}\,g}{c f+\sqrt{c^2 f^2+g^2}}\right]}{g^2\sqrt{c^2 f^2+g^2}\ \sqrt{1+c^2 x^2}}+$$

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

Result (type 4, 1574 leaves):

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

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

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

$$\frac{1}{g^2\,\sqrt{1+c^2\,x^2}}\,c\,f\,\sqrt{d\,\left(1+c^2\,x^2\right)}\left(-\frac{i\,\pi\,\text{ArcTanh}\left[\frac{-g+c\,f\,\text{Tanh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}{\sqrt{c^2\,f^2+g^2}}\right]}{\sqrt{c^2\,f^2+g^2}}-\right.$$

$$\frac{1}{\sqrt{-c^2\,f^2-g^2}}\left(2\,\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\,\text{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\,\text{Cot}\left[\frac{1}{2}\,\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2-g^2}}\right]-2\,\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]\right.$$

$$\text{ArcTanh}\left[\frac{\left(-c\,f-i\,g\right)\,\text{Tan}\left[\frac{1}{2}\,\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2-g^2}}\right]+\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\,\left(\text{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\,\text{Cot}\left[\frac{1}{2}\,\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2-g^2}}\right]-\right.\right.$$

$$\left.\left.\text{ArcTanh}\left[\frac{\left(-c\,f-i\,g\right)\,\text{Tan}\left[\frac{1}{2}\,\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2-g^2}}\right]\right)\right)\,\text{Log}\left[\frac{e^{-\frac{1}{2}\,i\,\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)}\,\sqrt{-c^2\,f^2-g^2}}{\sqrt{2}\,\sqrt{-i\,g}\,\sqrt{c\,f+c\,g\,x}}\right]+$$

$$\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+2\,i\,\left(\text{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\,\text{Cot}\left[\frac{1}{2}\,\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2-g^2}}\right]-\text{ArcTanh}\left[\frac{\left(-c\,f-i\,g\right)\,\text{Tan}\left[\frac{1}{2}\,\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2-g^2}}\right]\right)\right)$$

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

$$\text{Log}\left[1-\frac{i\,\left(c\,f-i\,\sqrt{-c^2\,f^2-g^2}\right)\,\left(c\,f-i\,g-\sqrt{-c^2\,f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\,\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)}{g\,\left(c\,f-i\,g+\sqrt{-c^2\,f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\,\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)}\right]+$$

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

$$\text{Log}\left[1-\frac{i\left(c f+i\sqrt{-c^2 f^2-g^2}\right)\left(c f-i g-\sqrt{-c^2 f^2-g^2}\ \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c x]\right)\right]\right)}{g\left(c f-i g+\sqrt{-c^2 f^2-g^2}\ \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c x]\right)\right]\right)}\right]+$$

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

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

Problem 42: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 984 leaves, 29 steps):

$$\frac{a d\left(c^2 f^2+g^2\right)\sqrt{d+c^2 d x^2}}{g^3}-\frac{b c d x\sqrt{d+c^2 d x^2}}{3 g\sqrt{1+c^2 x^2}}-\frac{b c d\left(c^2 f^2+g^2\right)x\sqrt{d+c^2 d x^2}}{g^3\sqrt{1+c^2 x^2}}+\frac{b c^3 d f x^2\sqrt{d+c^2 d x^2}}{4 g^2\sqrt{1+c^2 x^2}}-\frac{b c^3 d x^3\sqrt{d+c^2 d x^2}}{9 g\sqrt{1+c^2 x^2}}+$$

$$\frac{b d\left(c^2 f^2+g^2\right)\sqrt{d+c^2 d x^2}\ \text{ArcSinh}[c x]}{g^3}-\frac{c^2 d f x\sqrt{d+c^2 d x^2}\left(a+b\,\text{ArcSinh}[c x]\right)}{2 g^2}+\frac{d\left(1+c^2 x^2\right)\sqrt{d+c^2 d x^2}\left(a+b\,\text{ArcSinh}[c x]\right)}{3 g}-$$

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

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

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

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

Result (type 4, 4049 leaves):

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

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

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

$$\frac{c\,f\sqrt{d\left(1+c^2x^2\right)}\,\text{ArcSinh}[c\,x]^2}{2g^2\sqrt{1+c^2x^2}}+\frac{1}{g^2\sqrt{1+c^2x^2}}\left(c^2f^2+g^2\right)\sqrt{d\left(1+c^2x^2\right)}\left(-\frac{i\,\pi\,\text{ArcTanh}\left[\frac{-g+c\,f\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{\sqrt{c^2f^2+g^2}}\right]}{\sqrt{c^2f^2+g^2}}-\right.$$

$$\frac{1}{\sqrt{-c^2f^2-g^2}}\left(2\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\text{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]-2\,\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]\right.$$

$$\text{ArcTanh}\left[\frac{\left(-c\,f-i\,g\right)\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]+\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\left(\text{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]-\right.\right.$$

$$\left.\left.\text{ArcTanh}\left[\frac{\left(-c\,f-i\,g\right)\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)\right)\text{Log}\left[\frac{e^{-\frac{1}{2}i\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)}\sqrt{-c^2f^2-g^2}}{\sqrt{2}\sqrt{-i\,g}\sqrt{c\,f+c\,g\,x}}\right]+$$

$$\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+2\,i\left(\text{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]-\text{ArcTanh}\left[\frac{\left(-c\,f-i\,g\right)\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)\right)$$

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

$$\text{Log}\left[1-\frac{i\left(c\,f-i\sqrt{-c^2f^2-g^2}\right)\left(c\,f-i\,g-\sqrt{-c^2f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)}{g\left(c\,f-i\,g+\sqrt{-c^2f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)}\right]+$$

$$\left(-\text{ArcCos}\left[-\frac{\mathrm{i}\,c\,f}{g}\right]+2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{\left(-c\,f-\mathrm{i}\,g\right)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$

$$\text{Log}\left[1-\frac{\mathrm{i}\left(c\,f+\mathrm{i}\sqrt{-c^2 f^2-g^2}\right)\left(c\,f-\mathrm{i}\,g-\sqrt{-c^2 f^2-g^2}\;\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)}{g\left(c\,f-\mathrm{i}\,g+\sqrt{-c^2 f^2-g^2}\;\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)}\right]+$$

$$\mathrm{i}\left(\text{PolyLog}\left[2,\frac{\mathrm{i}\left(c\,f-\mathrm{i}\sqrt{-c^2 f^2-g^2}\right)\left(c\,f-\mathrm{i}\,g-\sqrt{-c^2 f^2-g^2}\;\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)}{g\left(c\,f-\mathrm{i}\,g+\sqrt{-c^2 f^2-g^2}\;\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)}\right]-\right.$$

$$\left.\text{PolyLog}\left[2,\frac{\mathrm{i}\left(c\,f+\mathrm{i}\sqrt{-c^2 f^2-g^2}\right)\left(c\,f-\mathrm{i}\,g-\sqrt{-c^2 f^2-g^2}\;\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)}{g\left(c\,f-\mathrm{i}\,g+\sqrt{-c^2 f^2-g^2}\;\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)}\right]\right)\Bigg)\Bigg)\Bigg)\Bigg)+$$

$$b\,d\left(\frac{1}{8\sqrt{1+c^2 x^2}}\sqrt{d\left(1+c^2 x^2\right)}\left(\frac{\mathrm{i}\,\pi\,\text{ArcTanh}\left[\frac{-g+c\,f\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{\sqrt{c^2 f^2+g^2}}\right]}{\sqrt{c^2 f^2+g^2}}+\frac{1}{\sqrt{-c^2 f^2-g^2}}\left(2\,\text{ArcCos}\left[-\frac{\mathrm{i}\,c\,f}{g}\right]\right.\right.\right.$$

$$\text{ArcTanh}\left[\frac{\left(c\,f+\mathrm{i}\,g\right)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\left(\pi-2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\text{ArcTanh}\left[\frac{\left(c\,f-\mathrm{i}\,g\right)\,\text{Tan}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+$$

$$\left(\text{ArcCos}\left[-\frac{\mathrm{i}\,c\,f}{g}\right]-2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{\left(c\,f+\mathrm{i}\,g\right)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]-2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{\left(c\,f-\mathrm{i}\,g\right)\,\text{Tan}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$

$$\text{Log}\left[\frac{\left(\frac{1}{2}-\frac{\mathrm{i}}{2}\right)e^{-\frac{1}{2}\text{ArcSinh}[c\,x]}\sqrt{-c^2 f^2-g^2}}{\sqrt{-\mathrm{i}\,g}\;\sqrt{c\,f+c\,g\,x}}\right]+$$

$$\left(\text{ArcCos}\left[-\frac{\mathrm{i}\,c\,f}{g}\right]+2\,\mathrm{i}\left(\text{ArcTanh}\left[\frac{\left(c\,f+\mathrm{i}\,g\right)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\text{ArcTanh}\left[\frac{\left(c\,f-\mathrm{i}\,g\right)\,\text{Tan}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\right)$$

$$\text{Log}\left[\frac{\left(\frac{1}{2}+\frac{\mathrm{i}}{2}\right)e^{\frac{1}{2}\text{ArcSinh}[c\,x]}\sqrt{-c^2 f^2-g^2}}{\sqrt{-\mathrm{i}\,g}\;\sqrt{c\,f+c\,g\,x}}\right]-\left(\text{ArcCos}\left[-\frac{\mathrm{i}\,c\,f}{g}\right]+2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{\left(c\,f+\mathrm{i}\,g\right)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$

$$\text{Log}\left[\frac{(i c f+g)\left(-i c f+g+\sqrt{-c^2 f^2-g^2}\right)\left(1+i \text{Cot}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right)}{g\left(i c f+g+i\sqrt{-c^2 f^2-g^2}\ \text{Cot}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right)}\right]-\left(\text{ArcCos}\left[-\frac{i c f}{g}\right]-2 i \text{ArcTanh}\left[\right.\right.$$

$$\left.\left.\frac{(c f+i g)\text{Cot}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\text{Log}\left[\frac{(i c f+g)\left(i c f-g+\sqrt{-c^2 f^2-g^2}\right)\left(i+\text{Cot}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right)}{g\left(c f-i g+\sqrt{-c^2 f^2-g^2}\ \text{Cot}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right)}\right]+$$

$$i\left(\text{PolyLog}\left[2,\frac{\left(i c f+\sqrt{-c^2 f^2-g^2}\right)\left(i c f+g-i\sqrt{-c^2 f^2-g^2}\ \text{Cot}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right)}{g\left(i c f+g+i\sqrt{-c^2 f^2-g^2}\ \text{Cot}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right)}\right]-\right.$$

$$\left.\left.\left.\text{PolyLog}\left[2,\frac{\left(c f+i\sqrt{-c^2 f^2-g^2}\right)\left(-c f+i g+\sqrt{-c^2 f^2-g^2}\ \text{Cot}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right)}{g\left(i c f+g+i\sqrt{-c^2 f^2-g^2}\ \text{Cot}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right)}\right]\right)\right)\right)+$$

$$\frac{1}{72 g^4\sqrt{1+c^2 x^2}}\sqrt{d\left(1+c^2 x^2\right)}\left(-18 c g\left(4 c^2 f^2+g^2\right)x+18 g\left(4 c^2 f^2+g^2\right)\sqrt{1+c^2 x^2}\ \text{ArcSinh}[c x]-18 c f\left(2 c^2 f^2+g^2\right)\text{ArcSinh}[c x]^2+\right.$$

$$9 c f g^2\,\text{Cosh}[2\,\text{ArcSinh}[c x]]+6 g^3\,\text{ArcSinh}[c x]\,\text{Cosh}[3\,\text{ArcSinh}[c x]]+$$

$$9\left(8 c^4 f^4+8 c^2 f^2 g^2+g^4\right)\left(-\frac{i\pi\,\text{ArcTanh}\left[\frac{-g+c f \text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]}{\sqrt{c^2 f^2+g^2}}\right]}{\sqrt{c^2 f^2+g^2}}-\right.$$

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

$$\left.\frac{(c f-i g)\text{Tan}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\left(\text{ArcCos}\left[-\frac{i c f}{g}\right]-2 i\,\text{ArcTanh}\left[\frac{(c f+i g)\text{Cot}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]-\right.$$

$$2\,i\,\mathrm{ArcTanh}\left[\frac{(c\,f-i\,g)\,\mathrm{Tan}\left[\frac{1}{4}\,(\pi+2\,i\,\mathrm{ArcSinh}[c\,x])\right]}{\sqrt{-c^2\,f^2-g^2}}\right]\Bigg)\,\mathrm{Log}\left[\frac{\left(\frac{1}{2}-\frac{i}{2}\right)\,e^{-\frac{1}{2}\mathrm{ArcSinh}[c\,x]}\,\sqrt{-c^2\,f^2-g^2}}{\sqrt{-i\,g}\,\sqrt{c\,f+c\,g\,x}}\right]+\Bigg(\mathrm{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+$$

$$2\,i\,\Bigg(\mathrm{ArcTanh}\left[\frac{(c\,f+i\,g)\,\mathrm{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\mathrm{ArcSinh}[c\,x])\right]}{\sqrt{-c^2\,f^2-g^2}}\right]+\mathrm{ArcTanh}\left[\frac{(c\,f-i\,g)\,\mathrm{Tan}\left[\frac{1}{4}\,(\pi+2\,i\,\mathrm{ArcSinh}[c\,x])\right]}{\sqrt{-c^2\,f^2-g^2}}\right]\Bigg)\Bigg)\,\mathrm{Log}\Bigg[$$

$$\frac{\left(\frac{1}{2}+\frac{i}{2}\right)\,e^{\frac{1}{2}\mathrm{ArcSinh}[c\,x]}\,\sqrt{-c^2\,f^2-g^2}}{\sqrt{-i\,g}\,\sqrt{c\,f+c\,g\,x}}\Bigg]-\Bigg(\mathrm{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+2\,i\,\mathrm{ArcTanh}\left[\frac{(c\,f+i\,g)\,\mathrm{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\mathrm{ArcSinh}[c\,x])\right]}{\sqrt{-c^2\,f^2-g^2}}\right]\Bigg)\,\mathrm{Log}\Bigg[$$

$$\frac{(i\,c\,f+g)\,\left(-i\,c\,f+g+\sqrt{-c^2\,f^2-g^2}\right)\,\left(1+i\,\mathrm{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\mathrm{ArcSinh}[c\,x])\right]\right)}{g\,\left(i\,c\,f+g+i\,\sqrt{-c^2\,f^2-g^2}\,\mathrm{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\mathrm{ArcSinh}[c\,x])\right]\right)}\Bigg]-\Bigg(\mathrm{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\,\mathrm{ArcTanh}\Bigg[$$

$$\frac{(c\,f+i\,g)\,\mathrm{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\mathrm{ArcSinh}[c\,x])\right]}{\sqrt{-c^2\,f^2-g^2}}\Bigg]\Bigg)\,\mathrm{Log}\left[\frac{(i\,c\,f+g)\,\left(i\,c\,f-g+\sqrt{-c^2\,f^2-g^2}\right)\,\left(i+\mathrm{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\mathrm{ArcSinh}[c\,x])\right]\right)}{g\,\left(c\,f-i\,g+\sqrt{-c^2\,f^2-g^2}\,\mathrm{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\mathrm{ArcSinh}[c\,x])\right]\right)}\right]+$$

$$i\,\Bigg(\mathrm{PolyLog}\left[2,\frac{\left(i\,c\,f+\sqrt{-c^2\,f^2-g^2}\right)\,\left(i\,c\,f+g-i\,\sqrt{-c^2\,f^2-g^2}\,\mathrm{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\mathrm{ArcSinh}[c\,x])\right]\right)}{g\,\left(i\,c\,f+g+i\,\sqrt{-c^2\,f^2-g^2}\,\mathrm{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\mathrm{ArcSinh}[c\,x])\right]\right)}\right]-$$

$$\mathrm{PolyLog}\left[2,\frac{\left(c\,f+i\,\sqrt{-c^2\,f^2-g^2}\right)\,\left(-c\,f+i\,g+\sqrt{-c^2\,f^2-g^2}\,\mathrm{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\mathrm{ArcSinh}[c\,x])\right]\right)}{g\,\left(i\,c\,f+g+i\,\sqrt{-c^2\,f^2-g^2}\,\mathrm{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\mathrm{ArcSinh}[c\,x])\right]\right)}\right]\Bigg)\Bigg)\Bigg)-$$

$$18\,c\,f\,g^2\,\mathrm{ArcSinh}[c\,x]\,\mathrm{Sinh}[2\,\mathrm{ArcSinh}[c\,x]]-2\,g^3\,\mathrm{Sinh}[3\,\mathrm{ArcSinh}[c\,x]]\Bigg)\Bigg)$$

Problem 46: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 1536 leaves, 37 steps):

$$\frac{a d^2 \left(c^2 f^2+g^2\right)^2 \sqrt{d+c^2 d x^2}}{g^5}+\frac{2 b c d^2 x \sqrt{d+c^2 d x^2}}{15 g \sqrt{1+c^2 x^2}}-\frac{b c d^2 \left(c^2 f^2+g^2\right)^2 x \sqrt{d+c^2 d x^2}}{g^5 \sqrt{1+c^2 x^2}}-\frac{b c d^2 \left(c^2 f^2+2 g^2\right) x \sqrt{d+c^2 d x^2}}{3 g^3 \sqrt{1+c^2 x^2}}+$$
$$\frac{b c^3 d^2 f x^2 \sqrt{d+c^2 d x^2}}{16 g^2 \sqrt{1+c^2 x^2}}+\frac{b c^3 d^2 f \left(c^2 f^2+2 g^2\right) x^2 \sqrt{d+c^2 d x^2}}{4 g^4 \sqrt{1+c^2 x^2}}-\frac{b c^3 d^2 x^3 \sqrt{d+c^2 d x^2}}{45 g \sqrt{1+c^2 x^2}}-\frac{b c^3 d^2 \left(c^2 f^2+2 g^2\right) x^3 \sqrt{d+c^2 d x^2}}{9 g^3 \sqrt{1+c^2 x^2}}+$$
$$\frac{b c^5 d^2 f x^4 \sqrt{d+c^2 d x^2}}{16 g^2 \sqrt{1+c^2 x^2}}-\frac{b c^5 d^2 x^5 \sqrt{d+c^2 d x^2}}{25 g \sqrt{1+c^2 x^2}}+\frac{b d^2 \left(c^2 f^2+g^2\right)^2 \sqrt{d+c^2 d x^2}\, \text{ArcSinh}[c x]}{g^5}-\frac{c^2 d^2 f x \sqrt{d+c^2 d x^2} \left(a+b\, \text{ArcSinh}[c x]\right)}{8 g^2}-$$
$$\frac{c^2 d^2 f \left(c^2 f^2+2 g^2\right) x \sqrt{d+c^2 d x^2} \left(a+b\, \text{ArcSinh}[c x]\right)}{2 g^4}-\frac{c^4 d^2 f x^3 \sqrt{d+c^2 d x^2} \left(a+b\, \text{ArcSinh}[c x]\right)}{4 g^2}-$$
$$\frac{d^2 \left(1+c^2 x^2\right) \sqrt{d+c^2 d x^2} \left(a+b\, \text{ArcSinh}[c x]\right)}{3 g}+\frac{d^2 \left(c^2 f^2+2 g^2\right) \left(1+c^2 x^2\right) \sqrt{d+c^2 d x^2} \left(a+b\, \text{ArcSinh}[c x]\right)}{3 g^3}+$$
$$\frac{d^2 \left(1+c^2 x^2\right)^2 \sqrt{d+c^2 d x^2} \left(a+b\, \text{ArcSinh}[c x]\right)}{5 g}+\frac{c d^2 f \sqrt{d+c^2 d x^2} \left(a+b\, \text{ArcSinh}[c x]\right)^2}{16 b g^2 \sqrt{1+c^2 x^2}}-\frac{c d^2 f \left(c^2 f^2+2 g^2\right) \sqrt{d+c^2 d x^2} \left(a+b\, \text{ArcSinh}[c x]\right)^2}{4 b g^4 \sqrt{1+c^2 x^2}}-$$
$$\frac{c d^2 \left(c^2 f^2+g^2\right)^2 x \sqrt{d+c^2 d x^2} \left(a+b\, \text{ArcSinh}[c x]\right)^2}{2 b g^5 \sqrt{1+c^2 x^2}}-\frac{d^2 \left(c^2 f^2+g^2\right)^3 \sqrt{d+c^2 d x^2} \left(a+b\, \text{ArcSinh}[c x]\right)^2}{2 b c g^6 (f+g x) \sqrt{1+c^2 x^2}}+$$
$$\frac{d^2 \left(c^2 f^2+g^2\right)^2 \sqrt{1+c^2 x^2} \sqrt{d+c^2 d x^2} \left(a+b\, \text{ArcSinh}[c x]\right)^2}{2 b c g^4 (f+g x)}-\frac{a d^2 \left(c^2 f^2+g^2\right)^{5/2} \sqrt{d+c^2 d x^2}\, \text{ArcTanh}\left[\frac{g-c^2 f x}{\sqrt{c^2 f^2+g^2} \sqrt{1+c^2 x^2}}\right]}{g^6 \sqrt{1+c^2 x^2}}+$$
$$\frac{b d^2 \left(c^2 f^2+g^2\right)^{5/2} \sqrt{d+c^2 d x^2}\, \text{ArcSinh}[c x]\, \text{Log}\left[1+\frac{e^{\text{ArcSinh}[c x]} g}{c f-\sqrt{c^2 f^2+g^2}}\right]}{g^6 \sqrt{1+c^2 x^2}}-\frac{b d^2 \left(c^2 f^2+g^2\right)^{5/2} \sqrt{d+c^2 d x^2}\, \text{ArcSinh}[c x]\, \text{Log}\left[1+\frac{e^{\text{ArcSinh}[c x]} g}{c f+\sqrt{c^2 f^2+g^2}}\right]}{g^6 \sqrt{1+c^2 x^2}}+$$
$$\frac{b d^2 \left(c^2 f^2+g^2\right)^{5/2} \sqrt{d+c^2 d x^2}\, \text{PolyLog}\left[2,-\frac{e^{\text{ArcSinh}[c x]} g}{c f-\sqrt{c^2 f^2+g^2}}\right]}{g^6 \sqrt{1+c^2 x^2}}-\frac{b d^2 \left(c^2 f^2+g^2\right)^{5/2} \sqrt{d+c^2 d x^2}\, \text{PolyLog}\left[2,-\frac{e^{\text{ArcSinh}[c x]} g}{c f+\sqrt{c^2 f^2+g^2}}\right]}{g^6 \sqrt{1+c^2 x^2}}$$

Result (type 4, 9270 leaves):

$$\sqrt{d \left(1+c^2 x^2\right)} \left(\frac{a d^2 \left(15 c^4 f^4+35 c^2 f^2 g^2+23 g^4\right)}{15 g^5}-\frac{a c^2 d^2 f \left(4 c^2 f^2+9 g^2\right) x}{8 g^4}+\frac{a c^2 d^2 \left(5 c^2 f^2+11 g^2\right) x^2}{15 g^3}-\frac{a c^4 d^2 f x^3}{4 g^2}+\frac{a c^4 d^2 x^4}{5 g}\right)+$$
$$\frac{a d^{5/2} \left(c^2 f^2+g^2\right)^{5/2} \text{Log}[f+g x]}{g^6}-\frac{a c d^{5/2} f \left(8 c^4 f^4+20 c^2 f^2 g^2+15 g^4\right) \text{Log}\left[c d x+\sqrt{d} \sqrt{d \left(1+c^2 x^2\right)}\right]}{8 g^6}-$$
$$\frac{a d^{5/2} \left(c^2 f^2+g^2\right)^{5/2} \text{Log}\left[d g-c^2 d f x+\sqrt{d} \sqrt{c^2 f^2+g^2} \sqrt{d \left(1+c^2 x^2\right)}\right]}{g^6}+$$

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

$$\frac{1}{g^2\sqrt{1+c^2x^2}}\left(c^2f^2+g^2\right)\sqrt{d\left(1+c^2x^2\right)}\left(-\frac{i\,\pi\,\text{ArcTanh}\left[\frac{-g+c\,f\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{\sqrt{c^2f^2+g^2}}\right]}{\sqrt{c^2f^2+g^2}}-\frac{1}{\sqrt{-c^2f^2-g^2}}\right.$$

$$\left(2\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]-2\,\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]\right.$$

$$\text{ArcTanh}\left[\frac{(-c\,f-i\,g)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]+\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\left(\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]-\right.\right.$$

$$\left.\left.\text{ArcTanh}\left[\frac{(-c\,f-i\,g)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)\right)\text{Log}\left[\frac{e^{-\frac{1}{2}i\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)}\sqrt{-c^2f^2-g^2}}{\sqrt{2}\sqrt{-i\,g}\sqrt{c\,f+c\,g\,x}}\right]+$$

$$\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+2\,i\left(\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]-\text{ArcTanh}\left[\frac{(-c\,f-i\,g)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)\right)$$

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

$$\text{Log}\left[1-\frac{i\left(c\,f-i\sqrt{-c^2f^2-g^2}\right)\left(c\,f-i\,g-\sqrt{-c^2f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)}{g\left(c\,f-i\,g+\sqrt{-c^2f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)}\right]+$$

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

$$\text{Log}\left[1-\frac{i\left(c\,f+i\sqrt{-c^2f^2-g^2}\right)\left(c\,f-i\,g-\sqrt{-c^2f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)}{g\left(c\,f-i\,g+\sqrt{-c^2f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)}\right]+$$

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

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

$$2 b d^2 \left(\frac{1}{8 \sqrt{1 + c^2 x^2}} \sqrt{d \left(1 + c^2 x^2\right)} \left(\frac{i \pi\,\text{ArcTanh}\left[\frac{-g + c f\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]}{\sqrt{c^2 f^2 + g^2}}\right]}{\sqrt{c^2 f^2 + g^2}} + \frac{1}{\sqrt{-c^2 f^2 - g^2}}\right.\right.$$

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

$$\text{ArcTanh}\left[\frac{(c f - i g)\ \text{Tan}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2 - g^2}}\right] + \left(\text{ArcCos}\left[-\frac{i c f}{g}\right] - 2 i\,\text{ArcTanh}\left[\frac{(c f + i g)\ \text{Cot}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2 - g^2}}\right] - \right.$$

$$\left. 2 i\,\text{ArcTanh}\left[\frac{(c f - i g)\ \text{Tan}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2 - g^2}}\right]\right) \text{Log}\left[\frac{\left(\frac{1}{2} - \frac{i}{2}\right) e^{-\frac{1}{2}\text{ArcSinh}[c x]} \sqrt{-c^2 f^2 - g^2}}{\sqrt{-i g}\ \sqrt{c f + c g x}}\right] +$$

$$\left(\text{ArcCos}\left[-\frac{i c f}{g}\right] + 2 i \left(\text{ArcTanh}\left[\frac{(c f + i g)\ \text{Cot}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2 - g^2}}\right] + \text{ArcTanh}\left[\frac{(c f - i g)\ \text{Tan}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2 - g^2}}\right]\right)\right)$$

$$\text{Log}\left[\frac{\left(\frac{1}{2} + \frac{i}{2}\right) e^{\frac{1}{2}\text{ArcSinh}[c x]} \sqrt{-c^2 f^2 - g^2}}{\sqrt{-i g}\ \sqrt{c f + c g x}}\right] - \left(\text{ArcCos}\left[-\frac{i c f}{g}\right] + 2 i\,\text{ArcTanh}\left[\frac{(c f + i g)\ \text{Cot}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2 - g^2}}\right]\right)$$

$$\text{Log}\left[\frac{(i c f + g) \left(-i c f + g + \sqrt{-c^2 f^2 - g^2}\right) \left(1 + i\,\text{Cot}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]\right)}{g \left(i c f + g + i \sqrt{-c^2 f^2 - g^2}\ \text{Cot}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]\right)}\right] - \left(\text{ArcCos}\left[-\frac{i c f}{g}\right] - 2 i\,\text{ArcTanh}\right[$$

$$\left.\left.\frac{(c f+i g) \operatorname{Cot}\left[\frac{1}{4}(\pi+2 i \operatorname{ArcSinh}[c x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right) \operatorname{Log}\left[\frac{(i c f+g)\left(i c f-g+\sqrt{-c^2 f^2-g^2}\right)\left(i+\operatorname{Cot}\left[\frac{1}{4}(\pi+2 i \operatorname{ArcSinh}[c x])\right]\right)}{g\left(c f-i g+\sqrt{-c^2 f^2-g^2} \operatorname{Cot}\left[\frac{1}{4}(\pi+2 i \operatorname{ArcSinh}[c x])\right]\right)}\right]+$$

$$i\left(\operatorname{PolyLog}\left[2, \frac{\left(i c f+\sqrt{-c^2 f^2-g^2}\right)\left(i c f+g-i \sqrt{-c^2 f^2-g^2} \operatorname{Cot}\left[\frac{1}{4}(\pi+2 i \operatorname{ArcSinh}[c x])\right]\right)}{g\left(i c f+g+i \sqrt{-c^2 f^2-g^2} \operatorname{Cot}\left[\frac{1}{4}(\pi+2 i \operatorname{ArcSinh}[c x])\right]\right)}\right]-\right.$$

$$\left.\left.\left.\operatorname{PolyLog}\left[2, \frac{\left(c f+i \sqrt{-c^2 f^2-g^2}\right)\left(-c f+i g+\sqrt{-c^2 f^2-g^2} \operatorname{Cot}\left[\frac{1}{4}(\pi+2 i \operatorname{ArcSinh}[c x])\right]\right)}{g\left(i c f+g+i \sqrt{-c^2 f^2-g^2} \operatorname{Cot}\left[\frac{1}{4}(\pi+2 i \operatorname{ArcSinh}[c x])\right]\right)}\right]\right)\right)\right)+$$

$$\frac{1}{72 g^4 \sqrt{1+c^2 x^2}} \sqrt{d\left(1+c^2 x^2\right)}\left(-18 c g\left(4 c^2 f^2+g^2\right) x+18 g\left(4 c^2 f^2+g^2\right) \sqrt{1+c^2 x^2} \operatorname{ArcSinh}[c x]-18 c f\left(2 c^2 f^2+g^2\right) \operatorname{ArcSinh}[c x]^2+\right.$$

$$9 c f g^2 \operatorname{Cosh}[2 \operatorname{ArcSinh}[c x]]+6 g^3 \operatorname{ArcSinh}[c x] \operatorname{Cosh}[3 \operatorname{ArcSinh}[c x]]+9\left(8 c^4 f^4+8 c^2 f^2 g^2+g^4\right)\left(-\frac{i \pi \operatorname{ArcTanh}\left[\frac{-g+c f \operatorname{Tanh}\left[\frac{1}{2} \operatorname{ArcSinh}[c x]\right]}{\sqrt{c^2 f^2+g^2}}\right]}{\sqrt{c^2 f^2+g^2}}-\right.$$

$$\frac{1}{\sqrt{-c^2 f^2-g^2}}\left(2 \operatorname{ArcCos}\left[-\frac{i c f}{g}\right] \operatorname{ArcTanh}\left[\frac{(c f+i g) \operatorname{Cot}\left[\frac{1}{4}(\pi+2 i \operatorname{ArcSinh}[c x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]+(\pi-2 i \operatorname{ArcSinh}[c x]) \operatorname{ArcTanh}\left[\right.\right.$$

$$\left.\frac{(c f-i g) \operatorname{Tan}\left[\frac{1}{4}(\pi+2 i \operatorname{ArcSinh}[c x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\left(\operatorname{ArcCos}\left[-\frac{i c f}{g}\right]-2 i \operatorname{ArcTanh}\left[\frac{(c f+i g) \operatorname{Cot}\left[\frac{1}{4}(\pi+2 i \operatorname{ArcSinh}[c x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]-\right.$$

$$\left.2 i \operatorname{ArcTanh}\left[\frac{(c f-i g) \operatorname{Tan}\left[\frac{1}{4}(\pi+2 i \operatorname{ArcSinh}[c x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right) \operatorname{Log}\left[\frac{\left(\frac{1}{2}-\frac{i}{2}\right) e^{-\frac{1}{2} \operatorname{ArcSinh}[c x]} \sqrt{-c^2 f^2-g^2}}{\sqrt{-i g} \sqrt{c f+c g x}}\right]+\left(\operatorname{ArcCos}\left[-\frac{i c f}{g}\right]+\right.$$

$$\left.2 i\left(\operatorname{ArcTanh}\left[\frac{(c f+i g) \operatorname{Cot}\left[\frac{1}{4}(\pi+2 i \operatorname{ArcSinh}[c x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\operatorname{ArcTanh}\left[\frac{(c f-i g) \operatorname{Tan}\left[\frac{1}{4}(\pi+2 i \operatorname{ArcSinh}[c x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\right) \operatorname{Log}\left[\right.$$

$$\frac{\left(\frac{1}{2}+\frac{i}{2}\right) e^{\frac{1}{2}\text{ArcSinh}[c\,x]} \sqrt{-c^2 f^2-g^2}}{\sqrt{-i\,g}\,\sqrt{c\,f+c\,g\,x}}\Bigg] - \Bigg(\text{ArcCos}\Big[-\frac{i\,c\,f}{g}\Big] + 2\,i\,\text{ArcTanh}\Big[\frac{(c\,f+i\,g)\,\text{Cot}\big[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[c\,x])\big]}{\sqrt{-c^2 f^2-g^2}}\Big]\Bigg)\,\text{Log}\Bigg[$$

$$\frac{(i\,c\,f+g)\left(-i\,c\,f+g+\sqrt{-c^2 f^2-g^2}\right)\left(1+i\,\text{Cot}\big[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[c\,x])\big]\right)}{g\left(i\,c\,f+g+i\sqrt{-c^2 f^2-g^2}\,\text{Cot}\big[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[c\,x])\big]\right)}\Bigg] - \Bigg(\text{ArcCos}\Big[-\frac{i\,c\,f}{g}\Big] - 2\,i\,\text{ArcTanh}\Big[$$

$$\frac{(c\,f+i\,g)\,\text{Cot}\big[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[c\,x])\big]}{\sqrt{-c^2 f^2-g^2}}\Big]\Bigg)\,\text{Log}\Bigg[\frac{(i\,c\,f+g)\left(i\,c\,f-g+\sqrt{-c^2 f^2-g^2}\right)\left(i+\text{Cot}\big[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[c\,x])\big]\right)}{g\left(c\,f-i\,g+\sqrt{-c^2 f^2-g^2}\,\text{Cot}\big[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[c\,x])\big]\right)}\Bigg] +$$

$$i\,\Bigg(\text{PolyLog}\Bigg[2,\ \frac{\left(i\,c\,f+\sqrt{-c^2 f^2-g^2}\right)\left(i\,c\,f+g-i\sqrt{-c^2 f^2-g^2}\,\text{Cot}\big[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[c\,x])\big]\right)}{g\left(i\,c\,f+g+i\sqrt{-c^2 f^2-g^2}\,\text{Cot}\big[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[c\,x])\big]\right)}\Bigg] -$$

$$\text{PolyLog}\Bigg[2,\ \frac{\left(c\,f+i\sqrt{-c^2 f^2-g^2}\right)\left(-c\,f+i\,g+\sqrt{-c^2 f^2-g^2}\,\text{Cot}\big[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[c\,x])\big]\right)}{g\left(i\,c\,f+g+i\sqrt{-c^2 f^2-g^2}\,\text{Cot}\big[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[c\,x])\big]\right)}\Bigg]\Bigg)\Bigg)\Bigg) -$$

$$18\,c\,f\,g^2\,\text{ArcSinh}[c\,x]\,\text{Sinh}[2\,\text{ArcSinh}[c\,x]] - 2\,g^3\,\text{Sinh}[3\,\text{ArcSinh}[c\,x]]\Bigg)\Bigg) + b\,d^2$$

$$\Bigg(-\frac{1}{32\,g^2\sqrt{1+c^2 x^2}}\sqrt{d\,(1+c^2 x^2)}\,\Bigg(-2\,c\,g\,x + 2\,g\sqrt{1+c^2 x^2}\,\text{ArcSinh}[c\,x] - c\,f\,\text{ArcSinh}[c\,x]^2 +$$

$$(2\,c^2 f^2+g^2)\,\Bigg(-\frac{i\,\pi\,\text{ArcTanh}\Big[\frac{-g+c\,f\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{\sqrt{c^2 f^2+g^2}}\Big]}{\sqrt{c^2 f^2+g^2}} -$$

$$\frac{1}{\sqrt{-c^2 f^2-g^2}}\left(2\,\mathrm{ArcCos}\left[-\frac{i\,c\,f}{g}\right]\mathrm{ArcTanh}\left[\frac{(c\,f+i\,g)\,\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\left(\pi-2\,i\,\mathrm{ArcSinh}[c\,x]\right)\mathrm{ArcTanh}\left[\right.\right.$$

$$\left.\frac{(c\,f-i\,g)\,\mathrm{Tan}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\left(\mathrm{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\,\mathrm{ArcTanh}\left[\frac{(c\,f+i\,g)\,\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]-\right.$$

$$\left.2\,i\,\mathrm{ArcTanh}\left[\frac{(c\,f-i\,g)\,\mathrm{Tan}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\mathrm{Log}\left[\frac{\left(\frac{1}{2}-\frac{i}{2}\right)e^{-\frac{1}{2}\mathrm{ArcSinh}[c\,x]}\sqrt{-c^2 f^2-g^2}}{\sqrt{-i\,g}\,\sqrt{c\,f+c\,g\,x}}\right]+\left(\mathrm{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+\right.$$

$$\left.2\,i\left(\mathrm{ArcTanh}\left[\frac{(c\,f+i\,g)\,\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\mathrm{ArcTanh}\left[\frac{(c\,f-i\,g)\,\mathrm{Tan}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\right)$$

$$\mathrm{Log}\left[\frac{\left(\frac{1}{2}+\frac{i}{2}\right)e^{\frac{1}{2}\mathrm{ArcSinh}[c\,x]}\sqrt{-c^2 f^2-g^2}}{\sqrt{-i\,g}\,\sqrt{c\,f+c\,g\,x}}\right]-\left(\mathrm{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+2\,i\,\mathrm{ArcTanh}\left[\frac{(c\,f+i\,g)\,\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$

$$\mathrm{Log}\left[\frac{(i\,c\,f+g)\left(-i\,c\,f+g+\sqrt{-c^2 f^2-g^2}\right)\left(1+i\,\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]\right)}{g\left(i\,c\,f+g+i\,\sqrt{-c^2 f^2-g^2}\,\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]\right)}\right]-$$

$$\left(\mathrm{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\,\mathrm{ArcTanh}\left[\frac{(c\,f+i\,g)\,\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$

$$\mathrm{Log}\left[\frac{(i\,c\,f+g)\left(i\,c\,f-g+\sqrt{-c^2 f^2-g^2}\right)\left(i+\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]\right)}{g\left(c\,f-i\,g+\sqrt{-c^2 f^2-g^2}\,\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]\right)}\right]+i$$

$$\left(\mathrm{PolyLog}\left[2,\frac{\left(i\,c\,f+\sqrt{-c^2 f^2-g^2}\right)\left(i\,c\,f+g-i\,\sqrt{-c^2 f^2-g^2}\,\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]\right)}{g\left(i\,c\,f+g+i\,\sqrt{-c^2 f^2-g^2}\,\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]\right)}\right]-\right.$$

$$\left.\left.\mathrm{PolyLog}\left[2,\frac{\left(c\,f+i\,\sqrt{-c^2 f^2-g^2}\right)\left(-c\,f+i\,g+\sqrt{-c^2 f^2-g^2}\,\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]\right)}{g\left(i\,c\,f+g+i\,\sqrt{-c^2 f^2-g^2}\,\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]\right)}\right]\right)\right)\Bigg)\Bigg)+$$

$$\frac{1}{16\sqrt{1+c^2x^2}}\sqrt{d\left(1+c^2x^2\right)}\left(-\frac{i\,\pi\,\text{ArcTanh}\left[\frac{-g+c\,f\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{\sqrt{c^2f^2+g^2}}\right]}{\sqrt{c^2f^2+g^2}}-\frac{1}{\sqrt{-c^2f^2-g^2}}\left(2\,\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]\right.\right.$$

$$\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]+\left(\pi-2\,i\,\text{ArcSinh}[c\,x]\right)\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Tan}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]+$$

$$\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\,\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]-2\,i\,\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Tan}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)$$

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

$$\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+2\,i\left(\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]+\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Tan}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)\right)$$

$$\text{Log}\left[\frac{\left(\frac{1}{2}+\frac{i}{2}\right)e^{\frac{1}{2}\text{ArcSinh}[c\,x]}\sqrt{-c^2f^2-g^2}}{\sqrt{-i\,g}\,\sqrt{c\,f+c\,g\,x}}\right]-\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+2\,i\,\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)$$

$$\text{Log}\left[\frac{(i\,c\,f+g)\left(-i\,c\,f+g+\sqrt{-c^2f^2-g^2}\right)\left(1+i\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]\right)}{g\left(i\,c\,f+g+i\sqrt{-c^2f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]\right)}\right]-$$

$$\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\,\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)$$

$$\text{Log}\left[\frac{(i\,c\,f+g)\left(i\,c\,f-g+\sqrt{-c^2f^2-g^2}\right)\left(i+\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]\right)}{g\left(c\,f-i\,g+\sqrt{-c^2f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]\right)}\right]+$$

$$i\left(\text{PolyLog}\left[2,\frac{\left(i\,c\,f+\sqrt{-c^2f^2-g^2}\right)\left(i\,c\,f+g-i\sqrt{-c^2f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]\right)}{g\left(i\,c\,f+g+i\sqrt{-c^2f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]\right)}\right]-\right.$$

$$\text{PolyLog}\Big[2, \frac{\left(c f + i\sqrt{-c^2 f^2 - g^2}\right)\left(-c f + i g + \sqrt{-c^2 f^2 - g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]\right)}{g\left(i c f + g + i\sqrt{-c^2 f^2 - g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]\right)}\Big]\Bigg)\Bigg)\Bigg) -$$

$$\frac{1}{144 g^4\sqrt{1 + c^2 x^2}}\sqrt{d\left(1 + c^2 x^2\right)}\Bigg(-18 c g\left(4 c^2 f^2 + g^2\right) x + 18 g\left(4 c^2 f^2 + g^2\right)\sqrt{1 + c^2 x^2}\,\text{ArcSinh}[c x] -$$

$$18 c f\left(2 c^2 f^2 + g^2\right)\text{ArcSinh}[c x]^2 + 9 c f g^2\,\text{Cosh}[2\,\text{ArcSinh}[c x]] +$$

$$6 g^3\,\text{ArcSinh}[c x]\,\text{Cosh}[3\,\text{ArcSinh}[c x]] +$$

$$9\left(8 c^4 f^4 + 8 c^2 f^2 g^2 + g^4\right)\Bigg(-\frac{i\pi\,\text{ArcTanh}\left[\frac{-g + c f\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]}{\sqrt{c^2 f^2 + g^2}}\right]}{\sqrt{c^2 f^2 + g^2}} -$$

$$\frac{1}{\sqrt{-c^2 f^2 - g^2}}\Bigg(2\,\text{ArcCos}\left[-\frac{i c f}{g}\right]\text{ArcTanh}\left[\frac{(c f + i g)\,\text{Cot}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2 - g^2}}\right] + \left(\pi - 2 i\,\text{ArcSinh}[c x]\right)\text{ArcTanh}\Big[$$

$$\frac{(c f - i g)\,\text{Tan}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2 - g^2}}\Big] + \Bigg(\text{ArcCos}\left[-\frac{i c f}{g}\right] - 2 i\,\text{ArcTanh}\left[\frac{(c f + i g)\,\text{Cot}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2 - g^2}}\right] -$$

$$2 i\,\text{ArcTanh}\left[\frac{(c f - i g)\,\text{Tan}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2 - g^2}}\right]\Bigg)\text{Log}\left[\frac{\left(\frac{1}{2} - \frac{i}{2}\right) e^{-\frac{1}{2}\text{ArcSinh}[c x]}\sqrt{-c^2 f^2 - g^2}}{\sqrt{-i g}\,\sqrt{c f + c g x}}\right] + \Bigg(\text{ArcCos}\left[-\frac{i c f}{g}\right] +$$

$$2 i\Bigg(\text{ArcTanh}\left[\frac{(c f + i g)\,\text{Cot}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2 - g^2}}\right] + \text{ArcTanh}\left[\frac{(c f - i g)\,\text{Tan}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2 - g^2}}\right]\Bigg)\Bigg)\text{Log}\Big[$$

$$\frac{\left(\frac{1}{2} + \frac{i}{2}\right) e^{\frac{1}{2}\text{ArcSinh}[c x]}\sqrt{-c^2 f^2 - g^2}}{\sqrt{-i g}\,\sqrt{c f + c g x}}\Big] - \Bigg(\text{ArcCos}\left[-\frac{i c f}{g}\right] + 2 i\,\text{ArcTanh}\left[\frac{(c f + i g)\,\text{Cot}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2 - g^2}}\right]\Bigg)\text{Log}\Big[$$

$$\frac{(i c f + g)\left(-i c f + g + \sqrt{-c^2 f^2 - g^2}\right)\left(1 + i\,\text{Cot}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]\right)}{g\left(i c f + g + i\sqrt{-c^2 f^2 - g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi + 2 i\,\text{ArcSinh}[c x]\right)\right]\right)}\Big] - \Bigg(\text{ArcCos}\left[-\frac{i c f}{g}\right] - 2 i\,\text{ArcTanh}\Big[$$

$$\frac{\left(c f+i g\right) \operatorname{Cot}\left[\frac{1}{4}\left(\pi+2 i \operatorname{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\Bigg]\Bigg) \operatorname{Log}\left[\frac{\left(i c f+g\right)\left(i c f-g+\sqrt{-c^2 f^2-g^2}\right)\left(i+\operatorname{Cot}\left[\frac{1}{4}\left(\pi+2 i \operatorname{ArcSinh}[c x]\right)\right]\right)}{g\left(c f-i g+\sqrt{-c^2 f^2-g^2} \operatorname{Cot}\left[\frac{1}{4}\left(\pi+2 i \operatorname{ArcSinh}[c x]\right)\right]\right)}\right]+$$

$$i\left(\operatorname{PolyLog}\left[2, \frac{\left(i c f+\sqrt{-c^2 f^2-g^2}\right)\left(i c f+g-i \sqrt{-c^2 f^2-g^2} \operatorname{Cot}\left[\frac{1}{4}\left(\pi+2 i \operatorname{ArcSinh}[c x]\right)\right]\right)}{g\left(i c f+g+i \sqrt{-c^2 f^2-g^2} \operatorname{Cot}\left[\frac{1}{4}\left(\pi+2 i \operatorname{ArcSinh}[c x]\right)\right]\right)}\right]-\right.$$

$$\left.\left.\left.\operatorname{PolyLog}\left[2, \frac{\left(c f+i \sqrt{-c^2 f^2-g^2}\right)\left(-c f+i g+\sqrt{-c^2 f^2-g^2} \operatorname{Cot}\left[\frac{1}{4}\left(\pi+2 i \operatorname{ArcSinh}[c x]\right)\right]\right)}{g\left(i c f+g+i \sqrt{-c^2 f^2-g^2} \operatorname{Cot}\left[\frac{1}{4}\left(\pi+2 i \operatorname{ArcSinh}[c x]\right)\right]\right)}\right]\right)\right)\right)-$$

$$\left.18 c f g^2 \operatorname{ArcSinh}[c x] \operatorname{Sinh}[2 \operatorname{ArcSinh}[c x]]-2 g^3 \operatorname{Sinh}[3 \operatorname{ArcSinh}[c x]]\right)+\frac{1}{32 \sqrt{1+c^2 x^2}} \sqrt{d\left(1+c^2 x^2\right)}$$

$$\left(-\frac{32 c^5 f^4 x}{g^5}-\frac{24 c^3 f^2 x}{g^3}-\frac{2 c x}{g}+\frac{2\left(16 c^4 f^4+12 c^2 f^2 g^2+g^4\right) \sqrt{1+c^2 x^2} \operatorname{ArcSinh}[c x]}{g^5}-\right.$$

$$\frac{16 c^5 f^5 \operatorname{ArcSinh}[c x]^2}{g^6}-\frac{16 c^3 f^3 \operatorname{ArcSinh}[c x]^2}{g^4}-$$

$$\frac{3 c f \operatorname{ArcSinh}[c x]^2}{g^2}+\frac{2 c f\left(2 c^2 f^2+g^2\right) \operatorname{Cosh}[2 \operatorname{ArcSinh}[c x]]}{g^4}+$$

$$\frac{8 c^2 f^2 \operatorname{ArcSinh}[c x] \operatorname{Cosh}[3 \operatorname{ArcSinh}[c x]]}{3 g^3}+$$

$$\frac{2 \operatorname{ArcSinh}[c x] \operatorname{Cosh}[3 \operatorname{ArcSinh}[c x]]}{3 g}+$$

$$\frac{c f \operatorname{Cosh}[4 \operatorname{ArcSinh}[c x]]}{4 g^2}+\frac{2 \operatorname{ArcSinh}[c x] \operatorname{Cosh}[5 \operatorname{ArcSinh}[c x]]}{5 g}+$$

$$\frac{1}{g^6}\left(2 c^2 f^2+g^2\right)\left(16 c^4 f^4+16 c^2 f^2 g^2+g^4\right)\left(-\frac{i \pi \operatorname{ArcTanh}\left[\frac{-g+c f \operatorname{Tanh}\left[\frac{1}{2} \operatorname{ArcSinh}[c x]\right]}{\sqrt{c^2 f^2+g^2}}\right]}{\sqrt{c^2 f^2+g^2}}-\right.$$

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

$$\left.\frac{(c\,f-i\,g)\,\text{Tan}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\,\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]-\right.$$

$$\left.2\,i\,\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Tan}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\text{Log}\left[\frac{\left(\frac{1}{2}-\frac{i}{2}\right)e^{-\frac{1}{2}\text{ArcSinh}[c\,x]}\sqrt{-c^2 f^2-g^2}}{\sqrt{-i\,g}\,\sqrt{c\,f+c\,g\,x}}\right]+\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+\right.$$

$$\left.2\,i\left(\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Tan}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\right)$$

$$\text{Log}\left[\frac{\left(\frac{1}{2}+\frac{i}{2}\right)e^{\frac{1}{2}\text{ArcSinh}[c\,x]}\sqrt{-c^2 f^2-g^2}}{\sqrt{-i\,g}\,\sqrt{c\,f+c\,g\,x}}\right]-\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+2\,i\,\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$

$$\text{Log}\left[\frac{(i\,c\,f+g)\left(-i\,c\,f+g+\sqrt{-c^2 f^2-g^2}\right)\left(1+i\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right)}{g\left(i\,c\,f+g+i\,\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right)}\right]-$$

$$\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\,\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$

$$\text{Log}\left[\frac{(i\,c\,f+g)\left(i\,c\,f-g+\sqrt{-c^2 f^2-g^2}\right)\left(i+\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right)}{g\left(c\,f-i\,g+\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right)}\right]+i$$

$$\left(\text{PolyLog}\left[2,\frac{\left(i\,c\,f+\sqrt{-c^2 f^2-g^2}\right)\left(i\,c\,f+g-i\,\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right)}{g\left(i\,c\,f+g+i\,\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right)}\right]-\right.$$

$$\left.\left.\left.\left.\text{PolyLog}\left[2,\frac{\left(c\,f+i\,\sqrt{-c^2 f^2-g^2}\right)\left(-c\,f+i\,g+\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right)}{g\left(i\,c\,f+g+i\,\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right)}\right]\right)\right)\right)\right)-$$

$$\frac{8 c^3 f^3 \text{ArcSinh}[c x] \text{Sinh}[2 \text{ArcSinh}[c x]]}{g^4} - \frac{4 c f \text{ArcSinh}[c x] \text{Sinh}[2 \text{ArcSinh}[c x]]}{g^2} - \frac{8 c^2 f^2 \text{Sinh}[3 \text{ArcSinh}[c x]]}{9 g^3} - \frac{2 \text{Sinh}[3 \text{ArcSinh}[c x]]}{9 g} - \frac{c f \text{ArcSinh}[c x] \text{Sinh}[4 \text{ArcSinh}[c x]]}{g^2} - \frac{2 \text{Sinh}[5 \text{ArcSinh}[c x]]}{25 g}\Bigg)\Bigg)$$

Problem 51: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 325 leaves, 10 steps):

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

Result (type 4, 1229 leaves):

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

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

$$\text{ArcTanh}\left[\frac{(c\,f-\mathrm{i}\,g)\,\text{Tan}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\left(\text{ArcCos}\left[-\frac{\mathrm{i}\,c\,f}{g}\right]-2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{(c\,f+\mathrm{i}\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]-\right.$$

$$\left.2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{(c\,f-\mathrm{i}\,g)\,\text{Tan}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\text{Log}\left[\frac{\left(\frac{1}{2}-\frac{\mathrm{i}}{2}\right)e^{-\frac{1}{2}\text{ArcSinh}[c\,x]}\sqrt{-c^2 f^2-g^2}}{\sqrt{-\mathrm{i}\,g}\,\sqrt{c\,(f+g\,x)}}\right]+$$

$$\left(\text{ArcCos}\left[-\frac{\mathrm{i}\,c\,f}{g}\right]+2\,\mathrm{i}\left(\text{ArcTanh}\left[\frac{(c\,f+\mathrm{i}\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\text{ArcTanh}\left[\frac{(c\,f-\mathrm{i}\,g)\,\text{Tan}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\right)$$

$$\text{Log}\left[\frac{\left(\frac{1}{2}+\frac{\mathrm{i}}{2}\right)e^{\frac{1}{2}\text{ArcSinh}[c\,x]}\sqrt{-c^2 f^2-g^2}}{\sqrt{-\mathrm{i}\,g}\,\sqrt{c\,(f+g\,x)}}\right]-\left(\text{ArcCos}\left[-\frac{\mathrm{i}\,c\,f}{g}\right]+2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{(c\,f+\mathrm{i}\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$

$$\text{Log}\left[\frac{(\mathrm{i}\,c\,f+g)\left(-\mathrm{i}\,c\,f+g+\sqrt{-c^2 f^2-g^2}\right)\left(1+\mathrm{i}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)}{g\left(\mathrm{i}\,c\,f+g+\mathrm{i}\,\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)}\right]-$$

$$\left(\text{ArcCos}\left[-\frac{\mathrm{i}\,c\,f}{g}\right]-2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{(c\,f+\mathrm{i}\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$

$$\text{Log}\left[\frac{(\mathrm{i}\,c\,f+g)\left(\mathrm{i}\,c\,f-g+\sqrt{-c^2 f^2-g^2}\right)\left(\mathrm{i}+\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)}{g\left(c\,f-\mathrm{i}\,g+\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)}\right]+$$

$$\mathrm{i}\left(\text{PolyLog}\left[2,\frac{\left(\mathrm{i}\,c\,f+\sqrt{-c^2 f^2-g^2}\right)\left(\mathrm{i}\,c\,f+g-\mathrm{i}\,\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)}{g\left(\mathrm{i}\,c\,f+g+\mathrm{i}\,\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)}\right]-\right.$$

$$\left.\left.\left.\text{PolyLog}\left[2,\frac{\left(c\,f+\mathrm{i}\,\sqrt{-c^2 f^2-g^2}\right)\left(-c\,f+\mathrm{i}\,g+\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)}{g\left(\mathrm{i}\,c\,f+g+\mathrm{i}\,\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)}\right]\right)\right)\right)$$

Problem 52: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 444 leaves, 13 steps):

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

Result (type 4, 1586 leaves):

$$-\frac{a\,g\,\sqrt{d\,(1+c^2 x^2)}}{d\,(c^2 f^2+g^2)\,(f+g\,x)}+\frac{a\,c^2 f\,\text{Log}[f+g\,x]}{\sqrt{d}\,(c\,f-i\,g)\,(c\,f+i\,g)\,\sqrt{c^2 f^2+g^2}}-$$

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

$$\frac{\sqrt{1+c^2 x^2}\,\text{Log}\left[1+\frac{g\,x}{f}\right]}{(c^2 f^2+g^2)\,\sqrt{d\,(1+c^2 x^2)}}+\frac{1}{(c^2 f^2+g^2)\,\sqrt{d\,(1+c^2 x^2)}}\,c\,f\,\sqrt{1+c^2 x^2}\left(-\frac{i\,\pi\,\text{ArcTanh}\left[\frac{-g+c\,f\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{\sqrt{c^2 f^2+g^2}}\right]}{\sqrt{c^2 f^2+g^2}}-\right.$$

$$\frac{1}{\sqrt{-c^2 f^2-g^2}}\left(2\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]-2\,\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]\right.$$

$$\text{ArcTanh}\left[\frac{(-c\,f-i\,g)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\left(\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]-\right.\right.$$

$$\text{ArcTanh}\left[\frac{(-c f-i g)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\Bigg)\Bigg)\,\text{Log}\left[\frac{e^{-\frac{1}{2} i \left(\frac{\pi}{2}-i\,\text{ArcSinh}[c x]\right)}\sqrt{-c^2 f^2-g^2}}{\sqrt{2}\,\sqrt{-i g}\,\sqrt{c f+c g x}}\right]+$$

$$\left(\text{ArcCos}\left[-\frac{i c f}{g}\right]+2 i\left(\text{ArcTanh}\left[\frac{(c f-i g)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]-\text{ArcTanh}\left[\frac{(-c f-i g)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\right)$$

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

$$\text{Log}\left[1-\frac{i\left(c f-i\sqrt{-c^2 f^2-g^2}\right)\left(c f-i g-\sqrt{-c^2 f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c x]\right)\right]\right)}{g\left(c f-i g+\sqrt{-c^2 f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c x]\right)\right]\right)}\right]+$$

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

$$\text{Log}\left[1-\frac{i\left(c f+i\sqrt{-c^2 f^2-g^2}\right)\left(c f-i g-\sqrt{-c^2 f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c x]\right)\right]\right)}{g\left(c f-i g+\sqrt{-c^2 f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c x]\right)\right]\right)}\right]+$$

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

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

Problem 54: Attempted integration timed out after 120 seconds.

$$\int\frac{(a+b\,\text{ArcSinh}[c x])^2\,\text{Log}\left[h\,(f+g x)^m\right]}{\sqrt{1+c^2 x^2}}\,dx$$

Optimal (type 4, 438 leaves, 13 steps):

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

Result (type 1, 1 leaves):

???

Problem 55: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\left(a+b\,\text{ArcSinh}[c\,x]\right)\,\text{Log}\left[h\,(f+g\,x)^m\right]}{\sqrt{1+c^2\,x^2}}\,dx$$

Optimal (type 4, 332 leaves, 11 steps):

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

Result (type 4, 1547 leaves):

$$-\frac{1}{24\,c}\left(3\,a\,m\,\pi^2-12\,i\,a\,m\,\pi\,\text{ArcSinh}[c\,x]-12\,a\,m\,\text{ArcSinh}[c\,x]^2-4\,b\,m\,\text{ArcSinh}[c\,x]^3-\right.$$

$$96\,a\,m\,\mathrm{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,f}{g}}}{\sqrt{2}}\right]\mathrm{ArcTan}\left[\frac{(c\,f+i\,g)\,\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{c^2 f^2+g^2}}\right]+12\,b\,m\,\mathrm{ArcSinh}[c\,x]^2\,\mathrm{Log}\left[\frac{-c\,f-e^{\mathrm{ArcSinh}[c\,x]}\,g+\sqrt{c^2 f^2+g^2}}{-c\,f+\sqrt{c^2 f^2+g^2}}\right]+$$

$$12\,b\,m\,\mathrm{ArcSinh}[c\,x]^2\,\mathrm{Log}\left[\frac{c\,f+e^{\mathrm{ArcSinh}[c\,x]}\,g+\sqrt{c^2 f^2+g^2}}{c\,f+\sqrt{c^2 f^2+g^2}}\right]+12\,i\,a\,m\,\pi\,\mathrm{Log}\left[\frac{-c\,e^{\mathrm{ArcSinh}[c\,x]}\,f+g-e^{\mathrm{ArcSinh}[c\,x]}\sqrt{c^2 f^2+g^2}}{g}\right]-$$

$$48\,i\,a\,m\,\mathrm{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,f}{g}}}{\sqrt{2}}\right]\mathrm{Log}\left[\frac{-c\,e^{\mathrm{ArcSinh}[c\,x]}\,f+g-e^{\mathrm{ArcSinh}[c\,x]}\sqrt{c^2 f^2+g^2}}{g}\right]+24\,a\,m\,\mathrm{ArcSinh}[c\,x]$$

$$\mathrm{Log}\left[\frac{-c\,e^{\mathrm{ArcSinh}[c\,x]}\,f+g-e^{\mathrm{ArcSinh}[c\,x]}\sqrt{c^2 f^2+g^2}}{g}\right]+12\,i\,b\,m\,\pi\,\mathrm{ArcSinh}[c\,x]\,\mathrm{Log}\left[\frac{-c\,e^{\mathrm{ArcSinh}[c\,x]}\,f+g-e^{\mathrm{ArcSinh}[c\,x]}\sqrt{c^2 f^2+g^2}}{g}\right]-$$

$$48\,i\,b\,m\,\mathrm{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,f}{g}}}{\sqrt{2}}\right]\mathrm{ArcSinh}[c\,x]\,\mathrm{Log}\left[\frac{-c\,e^{\mathrm{ArcSinh}[c\,x]}\,f+g-e^{\mathrm{ArcSinh}[c\,x]}\sqrt{c^2 f^2+g^2}}{g}\right]+$$

$$12\,b\,m\,\mathrm{ArcSinh}[c\,x]^2\,\mathrm{Log}\left[\frac{-c\,e^{\mathrm{ArcSinh}[c\,x]}\,f+g-e^{\mathrm{ArcSinh}[c\,x]}\sqrt{c^2 f^2+g^2}}{g}\right]+12\,i\,a\,m\,\pi\,\mathrm{Log}\left[\frac{-c\,e^{\mathrm{ArcSinh}[c\,x]}\,f+g+e^{\mathrm{ArcSinh}[c\,x]}\sqrt{c^2 f^2+g^2}}{g}\right]+$$

$$48\,i\,a\,m\,\mathrm{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,f}{g}}}{\sqrt{2}}\right]\mathrm{Log}\left[\frac{-c\,e^{\mathrm{ArcSinh}[c\,x]}\,f+g+e^{\mathrm{ArcSinh}[c\,x]}\sqrt{c^2 f^2+g^2}}{g}\right]+24\,a\,m\,\mathrm{ArcSinh}[c\,x]$$

$$\mathrm{Log}\left[\frac{-c\,e^{\mathrm{ArcSinh}[c\,x]}\,f+g+e^{\mathrm{ArcSinh}[c\,x]}\sqrt{c^2 f^2+g^2}}{g}\right]+12\,i\,b\,m\,\pi\,\mathrm{ArcSinh}[c\,x]\,\mathrm{Log}\left[\frac{-c\,e^{\mathrm{ArcSinh}[c\,x]}\,f+g+e^{\mathrm{ArcSinh}[c\,x]}\sqrt{c^2 f^2+g^2}}{g}\right]+$$

$$48\,i\,b\,m\,\mathrm{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,f}{g}}}{\sqrt{2}}\right]\mathrm{ArcSinh}[c\,x]\,\mathrm{Log}\left[\frac{-c\,e^{\mathrm{ArcSinh}[c\,x]}\,f+g+e^{\mathrm{ArcSinh}[c\,x]}\sqrt{c^2 f^2+g^2}}{g}\right]+$$

$$12\,b\,m\,\mathrm{ArcSinh}[c\,x]^2\,\mathrm{Log}\left[\frac{-c\,e^{\mathrm{ArcSinh}[c\,x]}\,f+g+e^{\mathrm{ArcSinh}[c\,x]}\sqrt{c^2 f^2+g^2}}{g}\right]-12\,i\,a\,m\,\pi\,\mathrm{Log}[c\,(f+g\,x)]-24\,a\,\mathrm{ArcSinh}[c\,x]\,\mathrm{Log}\left[h\,(f+g\,x)^m\right]-$$

$$12\,b\,\mathrm{ArcSinh}[c\,x]^2\,\mathrm{Log}\left[h\,(f+g\,x)^m\right]-12\,i\,b\,m\,\pi\,\mathrm{ArcSinh}[c\,x]\,\mathrm{Log}\left[1+\frac{\left(-c\,f+\sqrt{c^2 f^2+g^2}\right)\left(c\,x+\sqrt{1+c^2 x^2}\right)}{g}\right]-$$

$$48\,i\,b\,m\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i c f}{g}}}{\sqrt{2}}\right]\text{ArcSinh}[c\,x]\,\text{Log}\left[1+\frac{\left(-c f+\sqrt{c^2 f^2+g^2}\right)\left(c x+\sqrt{1+c^2 x^2}\right)}{g}\right]-$$

$$12\,b\,m\,\text{ArcSinh}[c\,x]^2\,\text{Log}\left[1+\frac{\left(-c f+\sqrt{c^2 f^2+g^2}\right)\left(c x+\sqrt{1+c^2 x^2}\right)}{g}\right]-12\,i\,b\,m\,\pi\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1-\frac{\left(c f+\sqrt{c^2 f^2+g^2}\right)\left(c x+\sqrt{1+c^2 x^2}\right)}{g}\right]+$$

$$48\,i\,b\,m\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i c f}{g}}}{\sqrt{2}}\right]\text{ArcSinh}[c\,x]\,\text{Log}\left[1-\frac{\left(c f+\sqrt{c^2 f^2+g^2}\right)\left(c x+\sqrt{1+c^2 x^2}\right)}{g}\right]-$$

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

$$24\,b\,m\,\text{ArcSinh}[c\,x]\,\text{PolyLog}\left[2,\frac{e^{\text{ArcSinh}[c x]}\,g}{-c f+\sqrt{c^2 f^2+g^2}}\right]+24\,b\,m\,\text{ArcSinh}[c\,x]\,\text{PolyLog}\left[2,-\frac{e^{\text{ArcSinh}[c x]}\,g}{c f+\sqrt{c^2 f^2+g^2}}\right]+$$

$$\left.24\,a\,m\,\text{PolyLog}\left[2,\frac{e^{\text{ArcSinh}[c x]}\left(c f+\sqrt{c^2 f^2+g^2}\right)}{g}\right]-24\,b\,m\,\text{PolyLog}\left[3,\frac{e^{\text{ArcSinh}[c x]}\,g}{-c f+\sqrt{c^2 f^2+g^2}}\right]-24\,b\,m\,\text{PolyLog}\left[3,-\frac{e^{\text{ArcSinh}[c x]}\,g}{c f+\sqrt{c^2 f^2+g^2}}\right]\right)$$

Problem 56: Attempted integration timed out after 120 seconds.

$$\int \frac{\text{Log}\left[h\,(f+g\,x)^m\right]}{\sqrt{1+c^2 x^2}}\,dx$$

Optimal (type 4, 197 leaves, 9 steps):

$$\frac{m\,\text{ArcSinh}[c\,x]^2}{2 c}-\frac{m\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1+\frac{e^{\text{ArcSinh}[c x]}\,g}{c f-\sqrt{c^2 f^2+g^2}}\right]}{c}-\frac{m\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1+\frac{e^{\text{ArcSinh}[c x]}\,g}{c f+\sqrt{c^2 f^2+g^2}}\right]}{c}+$$

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

Result (type 1, 1 leaves):

???

Problem 62: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 131 leaves, 9 steps):

$$-\frac{1}{2}\text{ArcSinh}[a+b x]^2+\text{ArcSinh}[a+b x]\,\text{Log}\left[1-\frac{e^{\text{ArcSinh}[a+b x]}}{a-\sqrt{1+a^2}}\right]+\text{ArcSinh}[a+b x]\,\text{Log}\left[1-\frac{e^{\text{ArcSinh}[a+b x]}}{a+\sqrt{1+a^2}}\right]+\text{PolyLog}\left[2,\frac{e^{\text{ArcSinh}[a+b x]}}{a-\sqrt{1+a^2}}\right]+\text{PolyLog}\left[2,\frac{e^{\text{ArcSinh}[a+b x]}}{a+\sqrt{1+a^2}}\right]$$

Result (type 4, 290 leaves):

$$\frac{1}{8}\left((\pi-2 i\,\text{ArcSinh}[a+b x])^2+32\,\text{ArcSin}\left[\frac{\sqrt{1-i a}}{\sqrt{2}}\right]\text{ArcTan}\left[\frac{(-i+a)\,\text{Cot}\left[\frac{1}{4}(\pi+2 i\,\text{ArcSinh}[a+b x])\right]}{\sqrt{1+a^2}}\right]+4 i\left(\pi-4\,\text{ArcSin}\left[\frac{\sqrt{1-i a}}{\sqrt{2}}\right]-2 i\,\text{ArcSinh}[a+b x]\right)\text{Log}\left[1+a\, e^{\text{ArcSinh}[a+b x]}-\sqrt{1+a^2}\; e^{\text{ArcSinh}[a+b x]}\right]+4 i\left(\pi+4\,\text{ArcSin}\left[\frac{\sqrt{1-i a}}{\sqrt{2}}\right]-2 i\,\text{ArcSinh}[a+b x]\right)\text{Log}\left[1+a\, e^{\text{ArcSinh}[a+b x]}+\sqrt{1+a^2}\; e^{\text{ArcSinh}[a+b x]}\right]+8\,\text{ArcSinh}[a+b x]\,\text{Log}[b x]-4\,(i\pi+2\,\text{ArcSinh}[a+b x])\,\text{Log}[b x]+8\,\text{PolyLog}\left[2,\left(-a+\sqrt{1+a^2}\right)e^{\text{ArcSinh}[a+b x]}\right]+8\,\text{PolyLog}\left[2,-\left(a+\sqrt{1+a^2}\right)e^{\text{ArcSinh}[a+b x]}\right]\right)$$

Problem 71: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 205 leaves, 11 steps):

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

Result (type 4, 890 leaves):

$$-\frac{1}{3}\,\text{ArcSinh}[a+b\,x]^3+\text{ArcSinh}[a+b\,x]^2\,\text{Log}\Big[\frac{a+\sqrt{1+a^2}-e^{\text{ArcSinh}[a+b\,x]}}{a+\sqrt{1+a^2}}\Big]+$$
$$\text{ArcSinh}[a+b\,x]^2\,\text{Log}\Big[\frac{-a+\sqrt{1+a^2}+e^{\text{ArcSinh}[a+b\,x]}}{-a+\sqrt{1+a^2}}\Big]+i\,\pi\,\text{ArcSinh}[a+b\,x]\,\text{Log}\Big[1+a\,e^{\text{ArcSinh}[a+b\,x]}-\sqrt{1+a^2}\,e^{\text{ArcSinh}[a+b\,x]}\Big]-$$
$$4\,i\,\text{ArcSin}\Big[\frac{\sqrt{1-i\,a}}{\sqrt{2}}\Big]\,\text{ArcSinh}[a+b\,x]\,\text{Log}\Big[1+a\,e^{\text{ArcSinh}[a+b\,x]}-\sqrt{1+a^2}\,e^{\text{ArcSinh}[a+b\,x]}\Big]+$$
$$\text{ArcSinh}[a+b\,x]^2\,\text{Log}\Big[1+a\,e^{\text{ArcSinh}[a+b\,x]}-\sqrt{1+a^2}\,e^{\text{ArcSinh}[a+b\,x]}\Big]+i\,\pi\,\text{ArcSinh}[a+b\,x]\,\text{Log}\Big[1+a\,e^{\text{ArcSinh}[a+b\,x]}+\sqrt{1+a^2}\,e^{\text{ArcSinh}[a+b\,x]}\Big]+$$
$$4\,i\,\text{ArcSin}\Big[\frac{\sqrt{1-i\,a}}{\sqrt{2}}\Big]\,\text{ArcSinh}[a+b\,x]\,\text{Log}\Big[1+a\,e^{\text{ArcSinh}[a+b\,x]}+\sqrt{1+a^2}\,e^{\text{ArcSinh}[a+b\,x]}\Big]+$$
$$\text{ArcSinh}[a+b\,x]^2\,\text{Log}\Big[1+a\,e^{\text{ArcSinh}[a+b\,x]}+\sqrt{1+a^2}\,e^{\text{ArcSinh}[a+b\,x]}\Big]-$$
$$i\,\pi\,\text{ArcSinh}[a+b\,x]\,\text{Log}\Big[1+\left(a-\sqrt{1+a^2}\right)(a+b\,x)+\left(a-\sqrt{1+a^2}\right)\sqrt{1+(a+b\,x)^2}\Big]+$$
$$4\,i\,\text{ArcSin}\Big[\frac{\sqrt{1-i\,a}}{\sqrt{2}}\Big]\,\text{ArcSinh}[a+b\,x]\,\text{Log}\Big[1+\left(a-\sqrt{1+a^2}\right)(a+b\,x)+\left(a-\sqrt{1+a^2}\right)\sqrt{1+(a+b\,x)^2}\Big]-$$
$$\text{ArcSinh}[a+b\,x]^2\,\text{Log}\Big[1+\left(a-\sqrt{1+a^2}\right)(a+b\,x)+\left(a-\sqrt{1+a^2}\right)\sqrt{1+(a+b\,x)^2}\Big]-$$
$$i\,\pi\,\text{ArcSinh}[a+b\,x]\,\text{Log}\Big[1+\left(a+\sqrt{1+a^2}\right)(a+b\,x)+\left(a+\sqrt{1+a^2}\right)\sqrt{1+(a+b\,x)^2}\Big]-$$
$$4\,i\,\text{ArcSin}\Big[\frac{\sqrt{1-i\,a}}{\sqrt{2}}\Big]\,\text{ArcSinh}[a+b\,x]\,\text{Log}\Big[1+\left(a+\sqrt{1+a^2}\right)(a+b\,x)+\left(a+\sqrt{1+a^2}\right)\sqrt{1+(a+b\,x)^2}\Big]-$$
$$\text{ArcSinh}[a+b\,x]^2\,\text{Log}\Big[1+\left(a+\sqrt{1+a^2}\right)(a+b\,x)+\left(a+\sqrt{1+a^2}\right)\sqrt{1+(a+b\,x)^2}\Big]+2\,\text{ArcSinh}[a+b\,x]\,\text{PolyLog}\Big[2,\frac{e^{\text{ArcSinh}[a+b\,x]}}{a-\sqrt{1+a^2}}\Big]+$$
$$2\,\text{ArcSinh}[a+b\,x]\,\text{PolyLog}\Big[2,\frac{e^{\text{ArcSinh}[a+b\,x]}}{a+\sqrt{1+a^2}}\Big]-2\,\text{PolyLog}\Big[3,\frac{e^{\text{ArcSinh}[a+b\,x]}}{a-\sqrt{1+a^2}}\Big]-2\,\text{PolyLog}\Big[3,\frac{e^{\text{ArcSinh}[a+b\,x]}}{a+\sqrt{1+a^2}}\Big]$$

Problem 72: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 178 leaves, 11 steps):

$$-\frac{\text{ArcSinh}[a+b\,x]^2}{x}-\frac{2\,b\,\text{ArcSinh}[a+b\,x]\,\text{Log}\left[1-\frac{e^{\text{ArcSinh}[a+b\,x]}}{a-\sqrt{1+a^2}}\right]}{\sqrt{1+a^2}}+$$

$$\frac{2\,b\,\text{ArcSinh}[a+b\,x]\,\text{Log}\left[1-\frac{e^{\text{ArcSinh}[a+b\,x]}}{a+\sqrt{1+a^2}}\right]}{\sqrt{1+a^2}}-\frac{2\,b\,\text{PolyLog}\left[2,\frac{e^{\text{ArcSinh}[a+b\,x]}}{a-\sqrt{1+a^2}}\right]}{\sqrt{1+a^2}}+\frac{2\,b\,\text{PolyLog}\left[2,\frac{e^{\text{ArcSinh}[a+b\,x]}}{a+\sqrt{1+a^2}}\right]}{\sqrt{1+a^2}}$$

Result (type 4, 866 leaves) :

$$-\frac{\text{ArcSinh}[a+b\,x]^2}{x}-\frac{2\,i\,b\,\pi\,\text{ArcTanh}\left[\frac{-1-a\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[a+b\,x]\right]}{\sqrt{1+a^2}}\right]}{\sqrt{1+a^2}}-$$

$$\frac{1}{\sqrt{-1-a^2}}2\,b\left(-2\,\text{ArcCos}[i\,a]\,\text{ArcTanh}\left[\frac{(-i+a)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[a+b\,x]\right)\right]}{\sqrt{-1-a^2}}\right]-\left(\pi-2\,i\,\text{ArcSinh}[a+b\,x]\right)\right.$$

$$\text{ArcTanh}\left[\frac{(i+a)\,\text{Tan}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[a+b\,x]\right)\right]}{\sqrt{-1-a^2}}\right]+\left(\text{ArcCos}[i\,a]+2\,i\,\text{ArcTanh}\left[\frac{(-i+a)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[a+b\,x]\right)\right]}{\sqrt{-1-a^2}}\right]+\right.$$

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

$$\left(\text{ArcCos}[i\,a]-2\,i\left(\text{ArcTanh}\left[\frac{(-i+a)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[a+b\,x]\right)\right]}{\sqrt{-1-a^2}}\right]+\text{ArcTanh}\left[\frac{(i+a)\,\text{Tan}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[a+b\,x]\right)\right]}{\sqrt{-1-a^2}}\right]\right)\right)$$

$$\text{Log}\left[\frac{i\,\sqrt{-1-a^2}\,e^{\frac{1}{2}\text{ArcSinh}[a+b\,x]}}{\sqrt{2}\,\sqrt{b\,x}}\right]-\left(\text{ArcCos}[i\,a]+2\,i\,\text{ArcTanh}\left[\frac{(-i+a)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[a+b\,x]\right)\right]}{\sqrt{-1-a^2}}\right]\right)$$

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

$$\left(\text{ArcCos}[i\,a]-2\,i\,\text{ArcTanh}\left[\frac{(-i+a)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[a+b\,x]\right)\right]}{\sqrt{-1-a^2}}\right]\right)$$

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

$$i\left(\text{PolyLog}\left[2,-\frac{\left(-i\,a+\sqrt{-1-a^2}\right)\left(i+a+\sqrt{-1-a^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[a+b\,x]\right)\right]\right)}{-i-a+\sqrt{-1-a^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[a+b\,x]\right)\right]}\right]-\right.$$

$$\left.\left.\text{PolyLog}\left[2,\frac{\left(i\,a+\sqrt{-1-a^2}\right)\left(i+a+\sqrt{-1-a^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[a+b\,x]\right)\right]\right)}{-i-a+\sqrt{-1-a^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[a+b\,x]\right)\right]}\right]\right)\right)$$

Problem 73: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{ArcSinh}[a+b\,x]^2}{x^3}\,dx$$

Optimal (type 4, 235 leaves, 14 steps):

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

Result (type 4, 925 leaves):

$$-\frac{b\sqrt{1+(a+bx)^2}\,\text{ArcSinh}[a+bx]}{(1+a^2)\,x}-\frac{\text{ArcSinh}[a+bx]^2}{2x^2}+\frac{i\,a\,b^2\,\pi\,\text{ArcTanh}\left[\frac{-1-a\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[a+bx]\right]}{\sqrt{1+a^2}}\right]}{(1+a^2)^{3/2}}+$$

$$\frac{b^2\,\text{Log}\left[-\frac{bx}{a}\right]}{1+a^2}-\frac{1}{(-1-a^2)^{3/2}}\,a\,b^2\left(-2\,\text{ArcCos}[i\,a]\,\text{ArcTanh}\left[\frac{(-i+a)\,\text{Cot}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[a+bx])\right]}{\sqrt{-1-a^2}}\right]-\right.$$

$$(\pi-2\,i\,\text{ArcSinh}[a+bx])\,\text{ArcTanh}\left[\frac{(i+a)\,\text{Tan}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[a+bx])\right]}{\sqrt{-1-a^2}}\right]+$$

$$\left(\text{ArcCos}[i\,a]+2\,i\,\text{ArcTanh}\left[\frac{(-i+a)\,\text{Cot}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[a+bx])\right]}{\sqrt{-1-a^2}}\right]+2\,i\,\text{ArcTanh}\left[\frac{(i+a)\,\text{Tan}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[a+bx])\right]}{\sqrt{-1-a^2}}\right]\right)$$

$$\text{Log}\left[\frac{\sqrt{-1-a^2}\,e^{-\frac{1}{2}\text{ArcSinh}[a+bx]}}{\sqrt{2}\,\sqrt{bx}}\right]+$$

$$\left(\text{ArcCos}[i\,a]-2\,i\left(\text{ArcTanh}\left[\frac{(-i+a)\,\text{Cot}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[a+bx])\right]}{\sqrt{-1-a^2}}\right]+\text{ArcTanh}\left[\frac{(i+a)\,\text{Tan}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[a+bx])\right]}{\sqrt{-1-a^2}}\right]\right)\right)$$

$$\text{Log}\left[\frac{i\,\sqrt{-1-a^2}\,e^{\frac{1}{2}\text{ArcSinh}[a+bx]}}{\sqrt{2}\,\sqrt{bx}}\right]-\left(\text{ArcCos}[i\,a]+2\,i\,\text{ArcTanh}\left[\frac{(-i+a)\,\text{Cot}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[a+bx])\right]}{\sqrt{-1-a^2}}\right]\right)$$

$$\text{Log}\left[\frac{(i+a)\left(a+i\left(-1+\sqrt{-1-a^2}\right)\right)\left(i+\text{Cot}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[a+bx])\right]\right)}{i+a-\sqrt{-1-a^2}\,\text{Cot}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[a+bx])\right]}\right]-$$

$$\left(\text{ArcCos}[i\,a]-2\,i\,\text{ArcTanh}\left[\frac{(-i+a)\,\text{Cot}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[a+bx])\right]}{\sqrt{-1-a^2}}\right]\right)$$

$$\text{Log}\left[\frac{(i+a)\left(a-i\left(1+\sqrt{-1-a^2}\right)\right)\left(-i+\text{Cot}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[a+bx])\right]\right)}{-i-a+\sqrt{-1-a^2}\,\text{Cot}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[a+bx])\right]}\right]+$$

$$i\left(\text{PolyLog}\left[2,-\frac{\left(-i\,a+\sqrt{-1-a^2}\right)\left(i+a+\sqrt{-1-a^2}\,\text{Cot}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[a+bx])\right]\right)}{-i-a+\sqrt{-1-a^2}\,\text{Cot}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[a+bx])\right]}\right]-\right.$$

$$\left.\left.\text{PolyLog}\left[2,\frac{\left(i\,a+\sqrt{-1-a^2}\right)\left(i+a+\sqrt{-1-a^2}\,\text{Cot}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[a+bx])\right]\right)}{-i-a+\sqrt{-1-a^2}\,\text{Cot}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[a+bx])\right]}\right]\right)\right)$$

Problem 74: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{\text{ArcSinh}[a+b x]^2}{x^4} \, dx$$

Optimal (type 4, 478 leaves, 40 steps):

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

Result (type 4, 2153 leaves):

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

$$\frac{1}{3\left(1+a^2\right)^2}\left(-\frac{i \pi \text{ArcTanh}\left[\frac{-1-a \text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[a+b x]\right]}{\sqrt{1+a^2}}\right]}{\sqrt{1+a^2}}-\frac{1}{\sqrt{-1-a^2}}\left(2\left(\frac{\pi}{2}-i \text{ArcSinh}[a+b x]\right) \text{ArcTanh}\left[\frac{(-i-a) \text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i \text{ArcSinh}[a+b x]\right)\right]}{\sqrt{-1-a^2}}\right]-\right.\right.$$

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

$$\left(\text{ArcCos}[i a]-2 i\left(\text{ArcTanh}\left[\frac{(-i-a) \text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i \text{ArcSinh}[a+b x]\right)\right]}{\sqrt{-1-a^2}}\right]-\text{ArcTanh}\left[\frac{(-i+a) \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i \text{ArcSinh}[a+b x]\right)\right]}{\sqrt{-1-a^2}}\right]\right)\right)$$

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

$$\left(\mathrm{ArcCos}[i\,a]+2\,i\left(\mathrm{ArcTanh}\left[\frac{(-i-a)\,\mathrm{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[a+b\,x]\right)\right]}{\sqrt{-1-a^2}}\right]-\mathrm{ArcTanh}\left[\frac{(-i+a)\,\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[a+b\,x]\right)\right]}{\sqrt{-1-a^2}}\right]\right)\right)$$

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

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

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

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

$$i\left(\mathrm{PolyLog}\left[2,\frac{i\left(-a-i\sqrt{-1-a^2}\right)\left(-i-a-\sqrt{-1-a^2}\,\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[a+b\,x]\right)\right]\right)}{-i-a+\sqrt{-1-a^2}\,\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[a+b\,x]\right)\right]}\right]-\right.$$

$$\left.\mathrm{PolyLog}\left[2,\frac{i\left(-a+i\sqrt{-1-a^2}\right)\left(-i-a-\sqrt{-1-a^2}\,\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[a+b\,x]\right)\right]\right)}{-i-a+\sqrt{-1-a^2}\,\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[a+b\,x]\right)\right]}\right]\right)\Bigg)\Bigg)+\frac{1}{3\left(1+a^2\right)^2}$$

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

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

$$\left(\mathrm{ArcCos}[i\,a]-2\,i\left(\mathrm{ArcTanh}\left[\frac{(-i-a)\,\mathrm{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[a+b\,x]\right)\right]}{\sqrt{-1-a^2}}\right]-\mathrm{ArcTanh}\left[\frac{(-i+a)\,\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[a+b\,x]\right)\right]}{\sqrt{-1-a^2}}\right]\right)\right)$$

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

$$\Bigg(\text{ArcCos}[\mathrm{i}\,a]+2\,\mathrm{i}\left(\text{ArcTanh}\left[\frac{(-\mathrm{i}-a)\ \text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[a+b\,x]\right)\right]}{\sqrt{-1-a^2}}\right]-\text{ArcTanh}\left[\frac{(-\mathrm{i}+a)\ \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[a+b\,x]\right)\right]}{\sqrt{-1-a^2}}\right]\right)\Bigg)$$

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

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

$$\left(-\text{ArcCos}[\mathrm{i}\,a]+2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{(-\mathrm{i}+a)\ \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[a+b\,x]\right)\right]}{\sqrt{-1-a^2}}\right]\right)$$

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

$$\mathrm{i}\ \Bigg(\text{PolyLog}\left[2,\frac{\mathrm{i}\left(-a-\mathrm{i}\sqrt{-1-a^2}\right)\left(-\mathrm{i}-a-\sqrt{-1-a^2}\ \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[a+b\,x]\right)\right]\right)}{-\mathrm{i}-a+\sqrt{-1-a^2}\ \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[a+b\,x]\right)\right]}\right]-$$

$$\text{PolyLog}\left[2,\frac{\mathrm{i}\left(-a+\mathrm{i}\sqrt{-1-a^2}\right)\left(-\mathrm{i}-a-\sqrt{-1-a^2}\ \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[a+b\,x]\right)\right]\right)}{-\mathrm{i}-a+\sqrt{-1-a^2}\ \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[a+b\,x]\right)\right]}\right]\Bigg)\Bigg)\Bigg)\Bigg)$$

Problem 78: Unable to integrate problem.

$$\int\frac{\text{ArcSinh}[a+b\,x]^3}{x}\,dx$$

Optimal (type 4, 275 leaves, 13 steps):

$$-\frac{1}{4}\text{ArcSinh}[a+b x]^4+\text{ArcSinh}[a+b x]^3\,\text{Log}\left[1-\frac{e^{\text{ArcSinh}[a+b x]}}{a-\sqrt{1+a^2}}\right]+\text{ArcSinh}[a+b x]^3\,\text{Log}\left[1-\frac{e^{\text{ArcSinh}[a+b x]}}{a+\sqrt{1+a^2}}\right]+$$
$$3\,\text{ArcSinh}[a+b x]^2\,\text{PolyLog}\left[2,\frac{e^{\text{ArcSinh}[a+b x]}}{a-\sqrt{1+a^2}}\right]+3\,\text{ArcSinh}[a+b x]^2\,\text{PolyLog}\left[2,\frac{e^{\text{ArcSinh}[a+b x]}}{a+\sqrt{1+a^2}}\right]-6\,\text{ArcSinh}[a+b x]\,\text{PolyLog}\left[3,\frac{e^{\text{ArcSinh}[a+b x]}}{a-\sqrt{1+a^2}}\right]-$$
$$6\,\text{ArcSinh}[a+b x]\,\text{PolyLog}\left[3,\frac{e^{\text{ArcSinh}[a+b x]}}{a+\sqrt{1+a^2}}\right]+6\,\text{PolyLog}\left[4,\frac{e^{\text{ArcSinh}[a+b x]}}{a-\sqrt{1+a^2}}\right]+6\,\text{PolyLog}\left[4,\frac{e^{\text{ArcSinh}[a+b x]}}{a+\sqrt{1+a^2}}\right]$$

Result (type 8, 14 leaves):

$$\int\frac{\text{ArcSinh}[a+b x]^3}{x}\,dx$$

Problem 79: Unable to integrate problem.

$$\int\frac{\text{ArcSinh}[a+b x]^3}{x^2}\,dx$$

Optimal (type 4, 268 leaves, 13 steps):

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

Result (type 8, 14 leaves):

$$\int\frac{\text{ArcSinh}[a+b x]^3}{x^2}\,dx$$

Problem 80: Unable to integrate problem.

$$\int\frac{\text{ArcSinh}[a+b x]^3}{x^3}\,dx$$

Optimal (type 4, 514 leaves, 21 steps):

$$-\frac{3\,b^2\,\text{ArcSinh}[a+b\,x]^2}{2\,(1+a^2)}-\frac{3\,b\,\sqrt{1+(a+b\,x)^2}\,\text{ArcSinh}[a+b\,x]^2}{2\,(1+a^2)\,x}-\frac{\text{ArcSinh}[a+b\,x]^3}{2\,x^2}+\frac{3\,b^2\,\text{ArcSinh}[a+b\,x]\,\text{Log}\Big[1-\frac{e^{\text{ArcSinh}[a+b\,x]}}{a-\sqrt{1+a^2}}\Big]}{1+a^2}+$$

$$\frac{3\,a\,b^2\,\text{ArcSinh}[a+b\,x]^2\,\text{Log}\Big[1-\frac{e^{\text{ArcSinh}[a+b\,x]}}{a-\sqrt{1+a^2}}\Big]}{2\,(1+a^2)^{3/2}}+\frac{3\,b^2\,\text{ArcSinh}[a+b\,x]\,\text{Log}\Big[1-\frac{e^{\text{ArcSinh}[a+b\,x]}}{a+\sqrt{1+a^2}}\Big]}{1+a^2}-\frac{3\,a\,b^2\,\text{ArcSinh}[a+b\,x]^2\,\text{Log}\Big[1-\frac{e^{\text{ArcSinh}[a+b\,x]}}{a+\sqrt{1+a^2}}\Big]}{2\,(1+a^2)^{3/2}}+$$

$$\frac{3\,b^2\,\text{PolyLog}\Big[2,\frac{e^{\text{ArcSinh}[a+b\,x]}}{a-\sqrt{1+a^2}}\Big]}{1+a^2}+\frac{3\,a\,b^2\,\text{ArcSinh}[a+b\,x]\,\text{PolyLog}\Big[2,\frac{e^{\text{ArcSinh}[a+b\,x]}}{a-\sqrt{1+a^2}}\Big]}{(1+a^2)^{3/2}}+\frac{3\,b^2\,\text{PolyLog}\Big[2,\frac{e^{\text{ArcSinh}[a+b\,x]}}{a+\sqrt{1+a^2}}\Big]}{1+a^2}-$$

$$\frac{3\,a\,b^2\,\text{ArcSinh}[a+b\,x]\,\text{PolyLog}\Big[2,\frac{e^{\text{ArcSinh}[a+b\,x]}}{a+\sqrt{1+a^2}}\Big]}{(1+a^2)^{3/2}}-\frac{3\,a\,b^2\,\text{PolyLog}\Big[3,\frac{e^{\text{ArcSinh}[a+b\,x]}}{a-\sqrt{1+a^2}}\Big]}{(1+a^2)^{3/2}}+\frac{3\,a\,b^2\,\text{PolyLog}\Big[3,\frac{e^{\text{ArcSinh}[a+b\,x]}}{a+\sqrt{1+a^2}}\Big]}{(1+a^2)^{3/2}}$$

Result (type 8, 14 leaves) :

$$\int \frac{\text{ArcSinh}[a+b\,x]^3}{x^3}\,dx$$

Problem 94: Unable to integrate problem.

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

Optimal (type 4, 545 leaves, 22 steps) :

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

Result (type 8, 18 leaves) :

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

Problem 126: Unable to integrate problem.

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

Optimal (type 5, 187 leaves, 3 steps) :

$$\frac{(e(c+d\,x))^{1+m} (a+b\,\text{ArcSinh}[c+d\,x])^2}{d\,e\,(1+m)} - \frac{2 b\,(e(c+d\,x))^{2+m} (a+b\,\text{ArcSinh}[c+d\,x])\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},-(c+d\,x)^2\right]}{d\,e^2 (1+m)(2+m)} + \frac{2 b^2 (e(c+d\,x))^{3+m}\,\text{HypergeometricPFQ}\left[\left\{1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2}\right\},\left\{2+\frac{m}{2},\frac{5}{2}+\frac{m}{2}\right\},-(c+d\,x)^2\right]}{d\,e^3 (1+m)(2+m)(3+m)}$$

Result (type 8, 25 leaves) :

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

Problem 132: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 116 leaves, 8 steps):

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

Result (type 4, 152 leaves):

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

Problem 142: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 155 leaves, 9 steps):

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

Result (type 4, 256 leaves):

$$\frac{1}{64\, d\, e}\Big(64\, a^3\, \text{Log}[c+d\, x] + 96\, a^2\, b\, \Big(\text{ArcSinh}[c+d\, x]\, \Big(\text{ArcSinh}[c+d\, x] + 2\, \text{Log}\big[1-e^{-2\, \text{ArcSinh}[c+d\, x]}\big]\Big) - \text{PolyLog}\big[2,\, e^{-2\, \text{ArcSinh}[c+d\, x]}\big]\Big) + 8\, a\, b^2\, \Big(i\, \pi^3 - 8\, \text{ArcSinh}[c+d\, x]^3 + 24\, \text{ArcSinh}[c+d\, x]^2\, \text{Log}\big[1-e^{2\, \text{ArcSinh}[c+d\, x]}\big] + 24\, \text{ArcSinh}[c+d\, x]\, \text{PolyLog}\big[2,\, e^{2\, \text{ArcSinh}[c+d\, x]}\big] - 12\, \text{PolyLog}\big[3,\, e^{2\, \text{ArcSinh}[c+d\, x]}\big]\Big) + b^3\, \Big(\pi^4 - 16\, \text{ArcSinh}[c+d\, x]^4 + 64\, \text{ArcSinh}[c+d\, x]^3\, \text{Log}\big[1-e^{2\, \text{ArcSinh}[c+d\, x]}\big] + 96\, \text{ArcSinh}[c+d\, x]^2\, \text{PolyLog}\big[2,\, e^{2\, \text{ArcSinh}[c+d\, x]}\big] - 96\, \text{ArcSinh}[c+d\, x]\, \text{PolyLog}\big[3,\, e^{2\, \text{ArcSinh}[c+d\, x]}\big] + 48\, \text{PolyLog}\big[4,\, e^{2\, \text{ArcSinh}[c+d\, x]}\big]\Big)\Big)$$

Problem 145: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 261 leaves, 16 steps):

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

Result (type 4, 694 leaves):

$$-\frac{a^3}{3 d e^4 (c+d x)^3}-\frac{a^2 b \sqrt{1+c^2+2 c d x+d^2 x^2}}{2 d e^4 (c+d x)^2}-\frac{a^2 b \text{ArcSinh}[c+d x]}{d e^4 (c+d x)^3}-\frac{a^2 b \text{Log}[c+d x]}{2 d e^4}+\frac{a^2 b \text{Log}\left[1+\sqrt{1+c^2+2 c d x+d^2 x^2}\right]}{2 d e^4}+\frac{1}{8 d e^4} a b^2 \Bigg(-8 \text{PolyLog}\left[2,-e^{-\text{ArcSinh}[c+d x]}\right]-\frac{1}{(c+d x)^3} 2 \Big(-2+4 \text{ArcSinh}[c+d x]^2+2 \text{Cosh}[2 \text{ArcSinh}[c+d x]]-3 (c+d x) \text{ArcSinh}[c+d x] \text{Log}\left[1-e^{-\text{ArcSinh}[c+d x]}\right]+3 (c+d x) \text{ArcSinh}[c+d x] \text{Log}\left[1+e^{-\text{ArcSinh}[c+d x]}\right]-4 (c+d x)^3 \text{PolyLog}\left[2,e^{-\text{ArcSinh}[c+d x]}\right]+2 \text{ArcSinh}[c+d x] \text{Sinh}[2 \text{ArcSinh}[c+d x]]+\text{ArcSinh}[c+d x] \text{Log}\left[1-e^{-\text{ArcSinh}[c+d x]}\right] \text{Sinh}[3 \text{ArcSinh}[c+d x]]-\text{ArcSinh}[c+d x] \text{Log}\left[1+e^{-\text{ArcSinh}[c+d x]}\right] \text{Sinh}[3 \text{ArcSinh}[c+d x]]\Big)\Bigg)+$$

$$\frac{1}{48 d e^4} b^3 \Bigg(-24 \text{ArcSinh}[c+d x] \text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c+d x]\right]+4 \text{ArcSinh}[c+d x]^3 \text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c+d x]\right]-6 \text{ArcSinh}[c+d x]^2 \text{Csch}\left[\frac{1}{2} \text{ArcSinh}[c+d x]\right]^2-(c+d x) \text{ArcSinh}[c+d x]^3 \text{Csch}\left[\frac{1}{2} \text{ArcSinh}[c+d x]\right]^4-24 \text{ArcSinh}[c+d x]^2 \text{Log}\left[1-e^{-\text{ArcSinh}[c+d x]}\right]+24 \text{ArcSinh}[c+d x]^2 \text{Log}\left[1+e^{-\text{ArcSinh}[c+d x]}\right]+48 \text{Log}\left[\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c+d x]\right]\right]-48 \text{ArcSinh}[c+d x] \text{PolyLog}\left[2,-e^{-\text{ArcSinh}[c+d x]}\right]+48 \text{ArcSinh}[c+d x] \text{PolyLog}\left[2,e^{-\text{ArcSinh}[c+d x]}\right]-48 \text{PolyLog}\left[3,-e^{-\text{ArcSinh}[c+d x]}\right]+48 \text{PolyLog}\left[3,e^{-\text{ArcSinh}[c+d x]}\right]-6 \text{ArcSinh}[c+d x]^2 \text{Sech}\left[\frac{1}{2} \text{ArcSinh}[c+d x]\right]^2-\frac{16 \text{ArcSinh}[c+d x]^3 \text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c+d x]\right]^4}{(c+d x)^3}+24 \text{ArcSinh}[c+d x] \text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c+d x]\right]-4 \text{ArcSinh}[c+d x]^3 \text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c+d x]\right]\Bigg)$$

Problem 151: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 186 leaves, 10 steps):

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

Result (type 4, 390 leaves):

$$\frac{1}{16\,d\,e}\Big(16\,a^4\,\text{Log}[c+d\,x]+32\,a^3\,b\,\big(\text{ArcSinh}[c+d\,x]\,\big(\text{ArcSinh}[c+d\,x]+2\,\text{Log}\big[1-e^{-2\,\text{ArcSinh}[c+d\,x]}\big]\big)-\text{PolyLog}\big[2,\,e^{-2\,\text{ArcSinh}[c+d\,x]}\big]\big)+$$
$$4\,a^2\,b^2\,\big(i\,\pi^3-8\,\text{ArcSinh}[c+d\,x]^3+24\,\text{ArcSinh}[c+d\,x]^2\,\text{Log}\big[1-e^{2\,\text{ArcSinh}[c+d\,x]}\big]+$$
$$24\,\text{ArcSinh}[c+d\,x]\,\text{PolyLog}\big[2,\,e^{2\,\text{ArcSinh}[c+d\,x]}\big]-12\,\text{PolyLog}\big[3,\,e^{2\,\text{ArcSinh}[c+d\,x]}\big]\big)+$$
$$a\,b^3\,\big(\pi^4-16\,\text{ArcSinh}[c+d\,x]^4+64\,\text{ArcSinh}[c+d\,x]^3\,\text{Log}\big[1-e^{2\,\text{ArcSinh}[c+d\,x]}\big]+96\,\text{ArcSinh}[c+d\,x]^2\,\text{PolyLog}\big[2,\,e^{2\,\text{ArcSinh}[c+d\,x]}\big]-$$
$$96\,\text{ArcSinh}[c+d\,x]\,\text{PolyLog}\big[3,\,e^{2\,\text{ArcSinh}[c+d\,x]}\big]+48\,\text{PolyLog}\big[4,\,e^{2\,\text{ArcSinh}[c+d\,x]}\big]\big)+$$
$$16\,b^4\,\Big(-\frac{i\,\pi^5}{160}-\frac{1}{5}\,\text{ArcSinh}[c+d\,x]^5+\text{ArcSinh}[c+d\,x]^4\,\text{Log}\big[1-e^{2\,\text{ArcSinh}[c+d\,x]}\big]+2\,\text{ArcSinh}[c+d\,x]^3\,\text{PolyLog}\big[2,\,e^{2\,\text{ArcSinh}[c+d\,x]}\big]-$$
$$3\,\text{ArcSinh}[c+d\,x]^2\,\text{PolyLog}\big[3,\,e^{2\,\text{ArcSinh}[c+d\,x]}\big]+3\,\text{ArcSinh}[c+d\,x]\,\text{PolyLog}\big[4,\,e^{2\,\text{ArcSinh}[c+d\,x]}\big]-\frac{3}{2}\,\text{PolyLog}\big[5,\,e^{2\,\text{ArcSinh}[c+d\,x]}\big]\Big)\Big)$$

Problem 152: Result more than twice size of optimal antiderivative.

$$\int\frac{(a+b\,\text{ArcSinh}[c+d\,x])^4}{(c\,e+d\,e\,x)^2}\,dx$$

Optimal (type 4, 234 leaves, 13 steps):

$$-\frac{(a+b\,\text{ArcSinh}[c+d\,x])^4}{d\,e^2\,(c+d\,x)}-\frac{8\,b\,(a+b\,\text{ArcSinh}[c+d\,x])^3\,\text{ArcTanh}\big[e^{\text{ArcSinh}[c+d\,x]}\big]}{d\,e^2}-\frac{12\,b^2\,(a+b\,\text{ArcSinh}[c+d\,x])^2\,\text{PolyLog}\big[2,\,-e^{\text{ArcSinh}[c+d\,x]}\big]}{d\,e^2}+$$
$$\frac{12\,b^2\,(a+b\,\text{ArcSinh}[c+d\,x])^2\,\text{PolyLog}\big[2,\,e^{\text{ArcSinh}[c+d\,x]}\big]}{d\,e^2}+\frac{24\,b^3\,(a+b\,\text{ArcSinh}[c+d\,x])\,\text{PolyLog}\big[3,\,-e^{\text{ArcSinh}[c+d\,x]}\big]}{d\,e^2}-$$
$$\frac{24\,b^3\,(a+b\,\text{ArcSinh}[c+d\,x])\,\text{PolyLog}\big[3,\,e^{\text{ArcSinh}[c+d\,x]}\big]}{d\,e^2}-\frac{24\,b^4\,\text{PolyLog}\big[4,\,-e^{\text{ArcSinh}[c+d\,x]}\big]}{d\,e^2}+\frac{24\,b^4\,\text{PolyLog}\big[4,\,e^{\text{ArcSinh}[c+d\,x]}\big]}{d\,e^2}$$

Result (type 4, 510 leaves):

$$\frac{1}{2\,d\,e^2}\left(-\frac{2\,a^4}{c+d\,x}-8\,a^3\,b\left(\frac{\text{ArcSinh}[c+d\,x]}{c+d\,x}+\text{Log}\left[\frac{1}{2}\,(c+d\,x)\,\text{Csch}\left[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\right]\right]-\text{Log}\left[\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\right]\right]\right)+12\,a^2\,b^2\left(\text{ArcSinh}[c+d\,x]\right.\right.$$

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

$$8\,a\,b^3\left(-\frac{\text{ArcSinh}[c+d\,x]^3}{c+d\,x}+3\,\text{ArcSinh}[c+d\,x]^2\,\text{Log}\left[1-e^{-\text{ArcSinh}[c+d\,x]}\right]-3\,\text{ArcSinh}[c+d\,x]^2\,\text{Log}\left[1+e^{-\text{ArcSinh}[c+d\,x]}\right]+6\,\text{ArcSinh}[c+d\,x]\right.$$

$$\left.\text{PolyLog}\left[2,-e^{-\text{ArcSinh}[c+d\,x]}\right]-6\,\text{ArcSinh}[c+d\,x]\,\text{PolyLog}\left[2,e^{-\text{ArcSinh}[c+d\,x]}\right]+6\,\text{PolyLog}\left[3,-e^{-\text{ArcSinh}[c+d\,x]}\right]-6\,\text{PolyLog}\left[3,e^{-\text{ArcSinh}[c+d\,x]}\right]\right)+$$

$$b^4\left(\pi^4-2\,\text{ArcSinh}[c+d\,x]^4-\frac{2\,\text{ArcSinh}[c+d\,x]^4}{c+d\,x}-8\,\text{ArcSinh}[c+d\,x]^3\,\text{Log}\left[1+e^{-\text{ArcSinh}[c+d\,x]}\right]+\right.$$

$$8\,\text{ArcSinh}[c+d\,x]^3\,\text{Log}\left[1-e^{\text{ArcSinh}[c+d\,x]}\right]+24\,\text{ArcSinh}[c+d\,x]^2\,\text{PolyLog}\left[2,-e^{-\text{ArcSinh}[c+d\,x]}\right]+$$

$$24\,\text{ArcSinh}[c+d\,x]^2\,\text{PolyLog}\left[2,e^{\text{ArcSinh}[c+d\,x]}\right]+48\,\text{ArcSinh}[c+d\,x]\,\text{PolyLog}\left[3,-e^{-\text{ArcSinh}[c+d\,x]}\right]-$$

$$\left.\left.48\,\text{ArcSinh}[c+d\,x]\,\text{PolyLog}\left[3,e^{\text{ArcSinh}[c+d\,x]}\right]+48\,\text{PolyLog}\left[4,-e^{-\text{ArcSinh}[c+d\,x]}\right]+48\,\text{PolyLog}\left[4,e^{\text{ArcSinh}[c+d\,x]}\right]\right)\right)$$

Problem 153: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 186 leaves, 10 steps):

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

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

Result (type 4, 360 leaves):

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

Problem 154: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 385 leaves, 21 steps):

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

Result (type 4, 1198 leaves):

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

$$\frac{1}{(c+d\,x)^3}\,2\,\Big(-2+4\,\text{ArcSinh}[c+d\,x]^2+2\,\text{Cosh}[2\,\text{ArcSinh}[c+d\,x]]-3\,(c+d\,x)\,\text{ArcSinh}[c+d\,x]\,\text{Log}\big[1-e^{-\text{ArcSinh}[c+d\,x]}\big]+$$
$$3\,(c+d\,x)\,\text{ArcSinh}[c+d\,x]\,\text{Log}\big[1+e^{-\text{ArcSinh}[c+d\,x]}\big]-4\,(c+d\,x)^3\,\text{PolyLog}\big[2,\,e^{-\text{ArcSinh}[c+d\,x]}\big]+2\,\text{ArcSinh}[c+d\,x]\,\text{Sinh}[2\,\text{ArcSinh}[c+d\,x]]+$$
$$\text{ArcSinh}[c+d\,x]\,\text{Log}\big[1-e^{-\text{ArcSinh}[c+d\,x]}\big]\,\text{Sinh}[3\,\text{ArcSinh}[c+d\,x]]-\text{ArcSinh}[c+d\,x]\,\text{Log}\big[1+e^{-\text{ArcSinh}[c+d\,x]}\big]\,\text{Sinh}[3\,\text{ArcSinh}[c+d\,x]]\Big)\Bigg)+$$

$$\frac{1}{12\,d\,e^4}\,a\,b^3\,\Bigg(-24\,\text{ArcSinh}[c+d\,x]\,\text{Coth}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]+4\,\text{ArcSinh}[c+d\,x]^3\,\text{Coth}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]-$$
$$6\,\text{ArcSinh}[c+d\,x]^2\,\text{Csch}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]^2-(c+d\,x)\,\text{ArcSinh}[c+d\,x]^3\,\text{Csch}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]^4-$$
$$24\,\text{ArcSinh}[c+d\,x]^2\,\text{Log}\big[1-e^{-\text{ArcSinh}[c+d\,x]}\big]+24\,\text{ArcSinh}[c+d\,x]^2\,\text{Log}\big[1+e^{-\text{ArcSinh}[c+d\,x]}\big]+48\,\text{Log}\Big[\text{Tanh}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]\Big]-$$
$$48\,\text{ArcSinh}[c+d\,x]\,\text{PolyLog}\big[2,\,-e^{-\text{ArcSinh}[c+d\,x]}\big]+48\,\text{ArcSinh}[c+d\,x]\,\text{PolyLog}\big[2,\,e^{-\text{ArcSinh}[c+d\,x]}\big]-48\,\text{PolyLog}\big[3,\,-e^{-\text{ArcSinh}[c+d\,x]}\big]+$$
$$48\,\text{PolyLog}\big[3,\,e^{-\text{ArcSinh}[c+d\,x]}\big]-6\,\text{ArcSinh}[c+d\,x]^2\,\text{Sech}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]^2-\frac{16\,\text{ArcSinh}[c+d\,x]^3\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\big]^4}{(c+d\,x)^3}+$$
$$24\,\text{ArcSinh}[c+d\,x]\,\text{Tanh}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]-4\,\text{ArcSinh}[c+d\,x]^3\,\text{Tanh}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]\Bigg)+$$

$$\frac{1}{24\,d\,e^4}\,b^4\,\Bigg(-2\,\pi^4+4\,\text{ArcSinh}[c+d\,x]^4-24\,\text{ArcSinh}[c+d\,x]^2\,\text{Coth}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]+2\,\text{ArcSinh}[c+d\,x]^4\,\text{Coth}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]-$$
$$4\,\text{ArcSinh}[c+d\,x]^3\,\text{Csch}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]^2-\frac{1}{2}\,(c+d\,x)\,\text{ArcSinh}[c+d\,x]^4\,\text{Csch}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]^4+$$
$$96\,\text{ArcSinh}[c+d\,x]\,\text{Log}\big[1-e^{-\text{ArcSinh}[c+d\,x]}\big]-96\,\text{ArcSinh}[c+d\,x]\,\text{Log}\big[1+e^{-\text{ArcSinh}[c+d\,x]}\big]+16\,\text{ArcSinh}[c+d\,x]^3\,\text{Log}\big[1+e^{-\text{ArcSinh}[c+d\,x]}\big]-$$
$$16\,\text{ArcSinh}[c+d\,x]^3\,\text{Log}\big[1-e^{\text{ArcSinh}[c+d\,x]}\big]-48\,\big(-2+\text{ArcSinh}[c+d\,x]^2\big)\,\text{PolyLog}\big[2,\,-e^{-\text{ArcSinh}[c+d\,x]}\big]-$$
$$96\,\text{PolyLog}\big[2,\,e^{-\text{ArcSinh}[c+d\,x]}\big]-48\,\text{ArcSinh}[c+d\,x]^2\,\text{PolyLog}\big[2,\,e^{\text{ArcSinh}[c+d\,x]}\big]-96\,\text{ArcSinh}[c+d\,x]\,\text{PolyLog}\big[3,\,-e^{-\text{ArcSinh}[c+d\,x]}\big]+$$
$$96\,\text{ArcSinh}[c+d\,x]\,\text{PolyLog}\big[3,\,e^{\text{ArcSinh}[c+d\,x]}\big]-96\,\text{PolyLog}\big[4,\,-e^{-\text{ArcSinh}[c+d\,x]}\big]-96\,\text{PolyLog}\big[4,\,e^{\text{ArcSinh}[c+d\,x]}\big]-$$
$$4\,\text{ArcSinh}[c+d\,x]^3\,\text{Sech}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]^2-\frac{8\,\text{ArcSinh}[c+d\,x]^4\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\big]^4}{(c+d\,x)^3}+$$
$$24\,\text{ArcSinh}[c+d\,x]^2\,\text{Tanh}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]-2\,\text{ArcSinh}[c+d\,x]^4\,\text{Tanh}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]\Bigg)+$$

$$\frac{1}{d\,e^4}\,4\,a^3\,b\,\Bigg(\frac{1}{12}\,\text{ArcSinh}[c+d\,x]\,\text{Coth}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]-\frac{1}{24}\,\text{Csch}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]^2-\frac{1}{24}\,\text{ArcSinh}[c+d\,x]\,\text{Coth}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]$$
$$\text{Csch}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]^2+\frac{1}{6}\,\text{Log}\Big[\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]\Big]-\frac{1}{6}\,\text{Log}\Big[\text{Sinh}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]\Big]-\frac{1}{24}\,\text{Sech}\Big[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\Big]^2-$$

$$\frac{1}{12}\text{ArcSinh}[c+d x]\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c+d x]\right]-\frac{1}{24}\text{ArcSinh}[c+d x]\,\text{Sech}\left[\frac{1}{2}\text{ArcSinh}[c+d x]\right]^2\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c+d x]\right]\Bigg)$$

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

$$\int (c e+d e x)^2\,(a+b\,\text{ArcSinh}[c+d x])^{7/2}\,dx$$

Optimal (type 4, 481 leaves, 35 steps):

$$\frac{175 b^3 e^2\sqrt{1+(c+d x)^2}\sqrt{a+b\,\text{ArcSinh}[c+d x]}}{54 d}-\frac{35 b^3 e^2 (c+d x)^2\sqrt{1+(c+d x)^2}\sqrt{a+b\,\text{ArcSinh}[c+d x]}}{216 d}-$$
$$\frac{35 b^2 e^2 (c+d x)(a+b\,\text{ArcSinh}[c+d x])^{3/2}}{18 d}+\frac{35 b^2 e^2 (c+d x)^3 (a+b\,\text{ArcSinh}[c+d x])^{3/2}}{108 d}+\frac{7 b e^2\sqrt{1+(c+d x)^2}(a+b\,\text{ArcSinh}[c+d x])^{5/2}}{9 d}-$$
$$\frac{7 b e^2 (c+d x)^2\sqrt{1+(c+d x)^2}(a+b\,\text{ArcSinh}[c+d x])^{5/2}}{18 d}+\frac{e^2 (c+d x)^3 (a+b\,\text{ArcSinh}[c+d x])^{7/2}}{3 d}-\frac{105 b^{7/2} e^2 e^{a/b}\sqrt{\pi}\,\text{Erf}\left[\frac{\sqrt{a+b\,\text{ArcSinh}[c+d x]}}{\sqrt{b}}\right]}{128 d}+$$
$$\frac{35 b^{7/2} e^2 e^{\frac{3a}{b}}\sqrt{\frac{\pi}{3}}\,\text{Erf}\left[\frac{\sqrt{3}\sqrt{a+b\,\text{ArcSinh}[c+d x]}}{\sqrt{b}}\right]}{3456 d}-\frac{105 b^{7/2} e^2 e^{-\frac{a}{b}}\sqrt{\pi}\,\text{Erfi}\left[\frac{\sqrt{a+b\,\text{ArcSinh}[c+d x]}}{\sqrt{b}}\right]}{128 d}+\frac{35 b^{7/2} e^2 e^{-\frac{3a}{b}}\sqrt{\frac{\pi}{3}}\,\text{Erfi}\left[\frac{\sqrt{3}\sqrt{a+b\,\text{ArcSinh}[c+d x]}}{\sqrt{b}}\right]}{3456 d}$$

Result (type 4, 1095 leaves):

$$-\frac{1}{10368\, d} e^2 \Big(2592\, a^3 c \sqrt{a+b\,\text{ArcSinh}[c+d x]} + 22680\, a b^2 c \sqrt{a+b\,\text{ArcSinh}[c+d x]} +$$
$$2592\, a^3 d x \sqrt{a+b\,\text{ArcSinh}[c+d x]} + 22680\, a b^2 d x \sqrt{a+b\,\text{ArcSinh}[c+d x]} - 9072\, a^2 b \sqrt{1+c^2+2 c d x+d^2 x^2} \sqrt{a+b\,\text{ArcSinh}[c+d x]} -$$
$$34020\, b^3 \sqrt{1+c^2+2 c d x+d^2 x^2} \sqrt{a+b\,\text{ArcSinh}[c+d x]} + 7776\, a^2 b c\, \text{ArcSinh}[c+d x] \sqrt{a+b\,\text{ArcSinh}[c+d x]} +$$
$$22680\, b^3 c\, \text{ArcSinh}[c+d x] \sqrt{a+b\,\text{ArcSinh}[c+d x]} + 7776\, a^2 b d x\, \text{ArcSinh}[c+d x] \sqrt{a+b\,\text{ArcSinh}[c+d x]} +$$
$$22680\, b^3 d x\, \text{ArcSinh}[c+d x] \sqrt{a+b\,\text{ArcSinh}[c+d x]} - 18144\, a b^2 \sqrt{1+c^2+2 c d x+d^2 x^2}\, \text{ArcSinh}[c+d x] \sqrt{a+b\,\text{ArcSinh}[c+d x]} +$$
$$7776\, a b^2 c\, \text{ArcSinh}[c+d x]^2 \sqrt{a+b\,\text{ArcSinh}[c+d x]} + 7776\, a b^2 d x\, \text{ArcSinh}[c+d x]^2 \sqrt{a+b\,\text{ArcSinh}[c+d x]} -$$
$$9072\, b^3 \sqrt{1+c^2+2 c d x+d^2 x^2}\, \text{ArcSinh}[c+d x]^2 \sqrt{a+b\,\text{ArcSinh}[c+d x]} + 2592\, b^3 c\, \text{ArcSinh}[c+d x]^3 \sqrt{a+b\,\text{ArcSinh}[c+d x]} +$$
$$2592\, b^3 d x\, \text{ArcSinh}[c+d x]^3 \sqrt{a+b\,\text{ArcSinh}[c+d x]} + 1008\, a^2 b \sqrt{a+b\,\text{ArcSinh}[c+d x]}\, \text{Cosh}[3\, \text{ArcSinh}[c+d x]] +$$
$$420\, b^3 \sqrt{a+b\,\text{ArcSinh}[c+d x]}\, \text{Cosh}[3\, \text{ArcSinh}[c+d x]] + 2016\, a b^2\, \text{ArcSinh}[c+d x] \sqrt{a+b\,\text{ArcSinh}[c+d x]}\, \text{Cosh}[3\, \text{ArcSinh}[c+d x]] +$$
$$1008\, b^3\, \text{ArcSinh}[c+d x]^2 \sqrt{a+b\,\text{ArcSinh}[c+d x]}\, \text{Cosh}[3\, \text{ArcSinh}[c+d x]] + 8505\, b^{7/2} \sqrt{\pi}\, \text{Cosh}\Big[\frac{a}{b}\Big]\, \text{Erfi}\Big[\frac{\sqrt{a+b\,\text{ArcSinh}[c+d x]}}{\sqrt{b}}\Big] -$$
$$35\, b^{7/2} \sqrt{3\pi}\, \text{Cosh}\Big[\frac{3 a}{b}\Big]\, \text{Erfi}\Big[\frac{\sqrt{3} \sqrt{a+b\,\text{ArcSinh}[c+d x]}}{\sqrt{b}}\Big] - 8505\, b^{7/2} \sqrt{\pi}\, \text{Erfi}\Big[\frac{\sqrt{a+b\,\text{ArcSinh}[c+d x]}}{\sqrt{b}}\Big]\, \text{Sinh}\Big[\frac{a}{b}\Big] +$$
$$8505\, b^{7/2} \sqrt{\pi}\, \text{Erf}\Big[\frac{\sqrt{a+b\,\text{ArcSinh}[c+d x]}}{\sqrt{b}}\Big] \Big(\text{Cosh}\Big[\frac{a}{b}\Big] + \text{Sinh}\Big[\frac{a}{b}\Big]\Big) + 35\, b^{7/2} \sqrt{3\pi}\, \text{Erfi}\Big[\frac{\sqrt{3} \sqrt{a+b\,\text{ArcSinh}[c+d x]}}{\sqrt{b}}\Big]\, \text{Sinh}\Big[\frac{3 a}{b}\Big] -$$
$$35\, b^{7/2} \sqrt{3\pi}\, \text{Erf}\Big[\frac{\sqrt{3} \sqrt{a+b\,\text{ArcSinh}[c+d x]}}{\sqrt{b}}\Big] \Big(\text{Cosh}\Big[\frac{3 a}{b}\Big] + \text{Sinh}\Big[\frac{3 a}{b}\Big]\Big) - 864\, a^3 \sqrt{a+b\,\text{ArcSinh}[c+d x]}\, \text{Sinh}[3\, \text{ArcSinh}[c+d x]] -$$
$$840\, a b^2 \sqrt{a+b\,\text{ArcSinh}[c+d x]}\, \text{Sinh}[3\, \text{ArcSinh}[c+d x]] - 2592\, a^2 b\, \text{ArcSinh}[c+d x] \sqrt{a+b\,\text{ArcSinh}[c+d x]}\, \text{Sinh}[3\, \text{ArcSinh}[c+d x]] -$$
$$840\, b^3\, \text{ArcSinh}[c+d x] \sqrt{a+b\,\text{ArcSinh}[c+d x]}\, \text{Sinh}[3\, \text{ArcSinh}[c+d x]] - 2592\, a b^2\, \text{ArcSinh}[c+d x]^2 \sqrt{a+b\,\text{ArcSinh}[c+d x]}$$
$$\text{Sinh}[3\, \text{ArcSinh}[c+d x]] - 864\, b^3\, \text{ArcSinh}[c+d x]^3 \sqrt{a+b\,\text{ArcSinh}[c+d x]}\, \text{Sinh}[3\, \text{ArcSinh}[c+d x]]\Big)$$

Problem 228: Result unnecessarily involves imaginary or complex numbers.

$$\int (c\, e + d\, e\, x)^{7/2} (a + b\, \text{ArcSinh}[c + d x])\, dx$$

Optimal (type 4, 298 leaves, 8 steps) :

$$\frac{28\, b\, e^2\, (e\, (c+d\, x))^{3/2} \sqrt{1+(c+d\, x)^2}}{405\, d} - \frac{4\, b\, (e\, (c+d\, x))^{7/2} \sqrt{1+(c+d\, x)^2}}{81\, d} - \frac{28\, b\, e^3 \sqrt{e\, (c+d\, x)}\ \sqrt{1+(c+d\, x)^2}}{135\, d\, (1+c+d\, x)} + \frac{2\, (e\, (c+d\, x))^{9/2}\, (a+b\, \text{ArcSinh}[c+d\, x])}{9\, d\, e} + \frac{28\, b\, e^{7/2}\, (1+c+d\, x) \sqrt{\frac{1+(c+d\, x)^2}{(1+c+d\, x)^2}}\ \text{EllipticE}\left[2\, \text{ArcTan}\left[\frac{\sqrt{e\, (c+d\, x)}}{\sqrt{e}}\right], \frac{1}{2}\right]}{135\, d \sqrt{1+(c+d\, x)^2}} - \frac{14\, b\, e^{7/2}\, (1+c+d\, x) \sqrt{\frac{1+(c+d\, x)^2}{(1+c+d\, x)^2}}\ \text{EllipticF}\left[2\, \text{ArcTan}\left[\frac{\sqrt{e\, (c+d\, x)}}{\sqrt{e}}\right], \frac{1}{2}\right]}{135\, d \sqrt{1+(c+d\, x)^2}}$$

Result (type 4, 150 leaves):

$$\frac{1}{135\, d} (e\, (c+d\, x))^{7/2} \left(30\, a\, (c+d\, x) - \frac{4\, b\, (-7+5\, c^2+10\, c\, d\, x+5\, d^2\, x^2) \sqrt{1+(c+d\, x)^2}}{3\, (c+d\, x)^2} + 30\, b\, (c+d\, x)\, \text{ArcSinh}[c+d\, x] + \frac{1}{(c+d\, x)^{7/2}} 28\, (-1)^{3/4}\, b\, \left(\text{EllipticE}\left[i\, \text{ArcSinh}\left[(-1)^{1/4} \sqrt{c+d\, x}\right], -1\right] - \text{EllipticF}\left[i\, \text{ArcSinh}\left[(-1)^{1/4} \sqrt{c+d\, x}\right], -1\right]\right)\right)$$

Problem 229: Result unnecessarily involves imaginary or complex numbers.

$$\int (c\, e+d\, e\, x)^{5/2}\, (a+b\, \text{ArcSinh}[c+d\, x])\, dx$$

Optimal (type 4, 177 leaves, 6 steps):

$$\frac{20\, b\, e^2 \sqrt{e\, (c+d\, x)}\ \sqrt{1+(c+d\, x)^2}}{147\, d} - \frac{4\, b\, (e\, (c+d\, x))^{5/2} \sqrt{1+(c+d\, x)^2}}{49\, d} + \frac{2\, (e\, (c+d\, x))^{7/2}\, (a+b\, \text{ArcSinh}[c+d\, x])}{7\, d\, e} - \frac{10\, b\, e^{5/2}\, (1+c+d\, x) \sqrt{\frac{1+(c+d\, x)^2}{(1+c+d\, x)^2}}\ \text{EllipticF}\left[2\, \text{ArcTan}\left[\frac{\sqrt{e\, (c+d\, x)}}{\sqrt{e}}\right], \frac{1}{2}\right]}{147\, d \sqrt{1+(c+d\, x)^2}}$$

Result (type 4, 149 leaves):

$$\frac{1}{147\, d}\left(e\,(c+d\,x)\right)^{5/2}\left(42\,a\,(c+d\,x)-\frac{4\,b\,\left(-5+3\,c^2+6\,c\,d\,x+3\,d^2\,x^2\right)\sqrt{1+(c+d\,x)^2}}{(c+d\,x)^2}+\right.$$

$$\left.42\,b\,(c+d\,x)\,\text{ArcSinh}[c+d\,x]-\frac{20\,(-1)^{1/4}\,b\,\sqrt{1+(c+d\,x)^2}\;\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{(-1)^{1/4}}{\sqrt{c+d\,x}}\right],-1\right]}{(c+d\,x)^{7/2}\sqrt{1+\frac{1}{(c+d\,x)^2}}}\right)$$

Problem 230: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 261 leaves, 7 steps):

$$-\frac{4\,b\,(e\,(c+d\,x))^{3/2}\sqrt{1+(c+d\,x)^2}}{25\,d}+\frac{12\,b\,e\,\sqrt{e\,(c+d\,x)}\,\sqrt{1+(c+d\,x)^2}}{25\,d\,(1+c+d\,x)}+\frac{2\,(e\,(c+d\,x))^{5/2}\,(a+b\,\text{ArcSinh}[c+d\,x])}{5\,d\,e}-$$

$$\frac{12\,b\,e^{3/2}\,(1+c+d\,x)\,\sqrt{\frac{1+(c+d\,x)^2}{(1+c+d\,x)^2}}\;\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{e\,(c+d\,x)}}{\sqrt{e}}\right],\frac{1}{2}\right]}{25\,d\,\sqrt{1+(c+d\,x)^2}}+\frac{6\,b\,e^{3/2}\,(1+c+d\,x)\,\sqrt{\frac{1+(c+d\,x)^2}{(1+c+d\,x)^2}}\;\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{e\,(c+d\,x)}}{\sqrt{e}}\right],\frac{1}{2}\right]}{25\,d\,\sqrt{1+(c+d\,x)^2}}$$

Result (type 4, 145 leaves):

$$\frac{1}{25\,d\,(c+d\,x)^{3/2}}2\,(e\,(c+d\,x))^{3/2}\left((c+d\,x)^{3/2}\left(5\,a\,(c+d\,x)-2\,b\,\sqrt{1+c^2+2\,c\,d\,x+d^2\,x^2}+5\,b\,(c+d\,x)\,\text{ArcSinh}[c+d\,x]\right)-\right.$$

$$\left.6\,(-1)^{3/4}\,b\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}\sqrt{c+d\,x}\right],-1\right]+6\,(-1)^{3/4}\,b\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}\sqrt{c+d\,x}\right],-1\right]\right)$$

Problem 231: Result unnecessarily involves imaginary or complex numbers.

$$\int \sqrt{c\,e+d\,e\,x}\,(a+b\,\text{ArcSinh}[c+d\,x])\,dx$$

Optimal (type 4, 142 leaves, 5 steps):

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

Result (type 4, 122 leaves):

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

Problem 232: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 223 leaves, 6 steps):

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

Result (type 4, 111 leaves):

$$\frac{1}{d \sqrt{e (c+d x)}} \Big(2 (c+d x) (a+b \text{ArcSinh}[c+d x])+$$
$$4 (-1)^{3/4} b \sqrt{c+d x} \text{EllipticE}\left[i \text{ArcSinh}\left[(-1)^{1/4} \sqrt{c+d x}\right],-1\right]-4 (-1)^{3/4} b \sqrt{c+d x} \text{EllipticF}\left[i \text{ArcSinh}\left[(-1)^{1/4} \sqrt{c+d x}\right],-1\right]\Big)$$

Problem 233: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 104 leaves):

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

Problem 234: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 266 leaves, 7 steps):

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

$$\frac{4\,b\,(1+c+d x)\,\sqrt{\frac{1+(c+d x)^2}{(1+c+d x)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{e\,(c+d x)}}{\sqrt{e}}\right],\frac{1}{2}\right]}{3\,d\,e^{5/2}\,\sqrt{1+(c+d x)^2}}+\frac{2\,b\,(1+c+d x)\,\sqrt{\frac{1+(c+d x)^2}{(1+c+d x)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{e\,(c+d x)}}{\sqrt{e}}\right],\frac{1}{2}\right]}{3\,d\,e^{5/2}\,\sqrt{1+(c+d x)^2}}$$

Result (type 4, 160 leaves):

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

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

Problem 235: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{a+b\,\text{ArcSinh}[c+d x]}{(c\,e+d\,e\,x)^{7/2}}\,dx$$

Optimal (type 4, 145 leaves, 5 steps):

$$-\frac{4 b \sqrt{1+(c+d x)^2}}{15 d e^2 (e (c+d x))^{3/2}}-\frac{2 (a+b \text{ArcSinh}[c+d x])}{5 d e (e (c+d x))^{5/2}}-\frac{2 b (1+c+d x) \sqrt{\frac{1+(c+d x)^2}{(1+c+d x)^2}} \text{EllipticF}\left[2 \text{ArcTan}\left[\frac{\sqrt{e (c+d x)}}{\sqrt{e}}\right], \frac{1}{2}\right]}{15 d e^{7/2} \sqrt{1+(c+d x)^2}}$$

Result (type 4, 167 leaves):

$$-\left(\left(2\left(\sqrt{\frac{1+c^2+2 c d x+d^2 x^2}{(c+d x)^2}} \left(3 a+2 b (c+d x) \sqrt{1+c^2+2 c d x+d^2 x^2}+3 b \text{ArcSinh}[c+d x]\right)+2 (-1)^{1/4} b (c+d x)^{3/2} \sqrt{1+c^2+2 c d x+d^2 x^2} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{(-1)^{1/4}}{\sqrt{c+d x}}\right],-1\right]\right)\right) \Big/ \left(15 d e (e (c+d x))^{5/2} \sqrt{1+\frac{1}{(c+d x)^2}}\right)\right)$$

Problem 236: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int (c e+d e x)^{7/2} (a+b \text{ArcSinh}[c+d x])^2 \, dx$$

Optimal (type 5, 134 leaves, 3 steps):

$$\frac{2 (e (c+d x))^{9/2} (a+b \text{ArcSinh}[c+d x])^2}{9 d e}-\frac{8 b (e (c+d x))^{11/2} (a+b \text{ArcSinh}[c+d x]) \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{11}{4},\frac{15}{4},-(c+d x)^2\right]}{99 d e^2}+\frac{16 b^2 (e (c+d x))^{13/2} \text{HypergeometricPFQ}\left[\left\{1,\frac{13}{4},\frac{13}{4}\right\},\left\{\frac{15}{4},\frac{17}{4}\right\},-(c+d x)^2\right]}{1287 d e^3}$$

Result (type 5, 269 leaves):

$$\frac{1}{9 d} (e (c+d x))^{7/2} \left(2 a^2 (c+d x)+4 a b (c+d x) \text{ArcSinh}[c+d x]-\frac{1}{45 (c+d x)^{7/2}} 8 a b \left((c+d x)^{3/2} \sqrt{1+(c+d x)^2} \left(-7+5 (c+d x)^2\right)+21 (-1)^{3/4} \left(-\text{EllipticE}\left[i \text{ArcSinh}\left[(-1)^{1/4} \sqrt{c+d x}\right],-1\right]+\text{EllipticF}\left[i \text{ArcSinh}\left[(-1)^{1/4} \sqrt{c+d x}\right],-1\right]\right)\right)+\frac{2}{11} b^2 (c+d x) \text{ArcSinh}[c+d x] \left(11 \text{ArcSinh}[c+d x]-4 (c+d x) \sqrt{1+(c+d x)^2} \text{Hypergeometric2F1}\left[1,\frac{13}{4},\frac{15}{4},-(c+d x)^2\right]\right)+\frac{945 b^2 \pi (c+d x)^3 \text{HypergeometricPFQ}\left[\left\{1,\frac{13}{4},\frac{13}{4}\right\},\left\{\frac{15}{4},\frac{17}{4}\right\},-(c+d x)^2\right]}{512 \sqrt{2} \text{Gamma}\left[\frac{15}{4}\right] \text{Gamma}\left[\frac{17}{4}\right]}\right)$$

Problem 237: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int (c e+d e x)^{5/2} (a+b \text{ArcSinh}[c+d x])^2 \, dx$$

Optimal (type 5, 134 leaves, 3 steps):

$$\frac{2 (e (c+d x))^{7/2} (a+b \text{ArcSinh}[c+d x])^2}{7 d e}-\frac{8 b (e (c+d x))^{9/2} (a+b \text{ArcSinh}[c+d x]) \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{9}{4},\frac{13}{4},-(c+d x)^2\right]}{63 d e^2}+\frac{16 b^2 (e (c+d x))^{11/2} \text{HypergeometricPFQ}\left[\left\{1,\frac{11}{4},\frac{11}{4}\right\},\left\{\frac{13}{4},\frac{15}{4}\right\},-(c+d x)^2\right]}{693 d e^3}$$

Result (type 5, 334 leaves):

$$\frac{1}{6174 d} (e (c+d x))^{5/2} \left(1764 a^2 (c+d x)+168 a b \left(-\frac{2 \sqrt{1+(c+d x)^2} \left(-5+3 (c+d x)^2\right)}{(c+d x)^2}+21 (c+d x) \text{ArcSinh}[c+d x]-\frac{10 (-1)^{1/4} \sqrt{1+(c+d x)^2} \text{EllipticF}\left[i \text{ArcSinh}\left[\frac{(-1)^{1/4}}{\sqrt{c+d x}}\right],-1\right]}{(c+d x)^{7/2} \sqrt{1+\frac{1}{(c+d x)^2}}}\right)+\frac{1}{(c+d x)^2} b^2 \left(-1336 (c+d x)+1932 \sqrt{1+(c+d x)^2} \text{ArcSinh}[c+d x]-1323 (c+d x) \text{ArcSinh}[c+d x]^2-252 \text{ArcSinh}[c+d x] \text{Cosh}[3 \text{ArcSinh}[c+d x]]-1680 \sqrt{1+(c+d x)^2} \text{ArcSinh}[c+d x] \text{Hypergeometric2F1}\left[\frac{3}{4},1,\frac{5}{4},-(c+d x)^2\right]+\frac{210 \sqrt{2} \pi (c+d x) \text{HypergeometricPFQ}\left[\left\{\frac{3}{4},\frac{3}{4},1\right\},\left\{\frac{5}{4},\frac{7}{4}\right\},-(c+d x)^2\right]}{\text{Gamma}\left[\frac{5}{4}\right] \text{Gamma}\left[\frac{7}{4}\right]}+72 \text{Sinh}[3 \text{ArcSinh}[c+d x]]+441 \text{ArcSinh}[c+d x]^2 \text{Sinh}[3 \text{ArcSinh}[c+d x]]\right)\right)$$

Problem 238: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 5, 134 leaves, 3 steps):

$$\frac{2\,(e\,(c+d\,x))^{5/2}\,(a+b\,\text{ArcSinh}[c+d\,x])^2}{5\,d\,e}-\frac{8\,b\,(e\,(c+d\,x))^{7/2}\,(a+b\,\text{ArcSinh}[c+d\,x])\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{7}{4},\frac{11}{4},-(c+d\,x)^2\right]}{35\,d\,e^2}+\frac{16\,b^2\,(e\,(c+d\,x))^{9/2}\,\text{HypergeometricPFQ}\left[\left\{1,\frac{9}{4},\frac{9}{4}\right\},\left\{\frac{11}{4},\frac{13}{4}\right\},-(c+d\,x)^2\right]}{315\,d\,e^3}$$

Result (type 5, 251 leaves):

$$\frac{1}{5\,d}(e\,(c+d\,x))^{3/2}\left(2\,a^2\,(c+d\,x)-\frac{8}{5}\,a\,b\,\sqrt{1+(c+d\,x)^2}+4\,a\,b\,(c+d\,x)\,\text{ArcSinh}[c+d\,x]+\frac{1}{5\,(c+d\,x)^{3/2}}\right.$$
$$24\,(-1)^{3/4}\,a\,b\left(-\text{EllipticE}\left[\text{i}\,\text{ArcSinh}\left[(-1)^{1/4}\sqrt{c+d\,x}\right],-1\right]+\text{EllipticF}\left[\text{i}\,\text{ArcSinh}\left[(-1)^{1/4}\sqrt{c+d\,x}\right],-1\right]\right)+$$
$$\frac{2}{7}\,b^2\,(c+d\,x)\,\text{ArcSinh}[c+d\,x]\left(7\,\text{ArcSinh}[c+d\,x]-4\,(c+d\,x)\,\sqrt{1+(c+d\,x)^2}\,\text{Hypergeometric2F1}\left[1,\frac{9}{4},\frac{11}{4},-(c+d\,x)^2\right]\right)+$$
$$\left.\frac{15\,b^2\,\pi\,(c+d\,x)^3\,\text{HypergeometricPFQ}\left[\left\{1,\frac{9}{4},\frac{9}{4}\right\},\left\{\frac{11}{4},\frac{13}{4}\right\},-(c+d\,x)^2\right]}{32\,\sqrt{2}\,\text{Gamma}\left[\frac{11}{4}\right]\,\text{Gamma}\left[\frac{13}{4}\right]}\right)$$

Problem 239: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 5, 134 leaves, 3 steps):

$$\frac{2\,(e\,(c+d\,x))^{3/2}\,(a+b\,\text{ArcSinh}[c+d\,x])^2}{3\,d\,e}-\frac{8\,b\,(e\,(c+d\,x))^{5/2}\,(a+b\,\text{ArcSinh}[c+d\,x])\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{4},\frac{9}{4},-(c+d\,x)^2\right]}{15\,d\,e^2}+\frac{16\,b^2\,(e\,(c+d\,x))^{7/2}\,\text{HypergeometricPFQ}\left[\left\{1,\frac{7}{4},\frac{7}{4}\right\},\left\{\frac{9}{4},\frac{11}{4}\right\},-(c+d\,x)^2\right]}{105\,d\,e^3}$$

Result (type 5, 276 leaves):

$$\frac{1}{27\,d}\sqrt{e\,(c+d\,x)}\left(18\,a^2\,(c+d\,x)+36\,a\,b\,(c+d\,x)\,\text{ArcSinh}[c+d\,x]-24\,b^2\sqrt{1+(c+d\,x)^2}\,\text{ArcSinh}[c+d\,x]+2\,b^2\,(c+d\,x)\,\left(8+9\,\text{ArcSinh}[c+d\,x]^2\right)-\right.$$

$$\frac{24\,a\,b\left(\sqrt{c+d\,x}+(c+d\,x)^{5/2}-(-1)^{1/4}\,(c+d\,x)\sqrt{1+\frac{1}{(c+d\,x)^2}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{(-1)^{1/4}}{\sqrt{c+d\,x}}\right],-1\right]\right)}{\sqrt{c+d\,x}\,\sqrt{1+(c+d\,x)^2}}+24\,b^2\sqrt{1+(c+d\,x)^2}$$

$$\left.\text{ArcSinh}[c+d\,x]\,\text{Hypergeometric2F1}\left[\frac{3}{4},1,\frac{5}{4},-(c+d\,x)^2\right]-\frac{3\sqrt{2}\,b^2\,\pi\,(c+d\,x)\,\text{HypergeometricPFQ}\left[\left\{\frac{3}{4},\frac{3}{4},1\right\},\left\{\frac{5}{4},\frac{7}{4}\right\},-(c+d\,x)^2\right]}{\text{Gamma}\left[\frac{5}{4}\right]\,\text{Gamma}\left[\frac{7}{4}\right]}\right)$$

Problem 240: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 5, 132 leaves, 3 steps):

$$\frac{2\sqrt{e\,(c+d\,x)}\,(a+b\,\text{ArcSinh}[c+d\,x])^2}{d\,e}-\frac{8\,b\,(e\,(c+d\,x))^{3/2}\,(a+b\,\text{ArcSinh}[c+d\,x])\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},-(c+d\,x)^2\right]}{3\,d\,e^2}+$$

$$\frac{16\,b^2\,(e\,(c+d\,x))^{5/2}\,\text{HypergeometricPFQ}\left[\left\{1,\frac{5}{4},\frac{5}{4}\right\},\left\{\frac{7}{4},\frac{9}{4}\right\},-(c+d\,x)^2\right]}{15\,d\,e^3}$$

Result (type 5, 223 leaves):

$$\frac{1}{12\,d\sqrt{e\,(c+d\,x)}\,\text{Gamma}\left[\frac{7}{4}\right]\,\text{Gamma}\left[\frac{9}{4}\right]}\left(3\sqrt{2}\,b^2\,\pi\,(c+d\,x)^3\,\text{HypergeometricPFQ}\left[\left\{1,\frac{5}{4},\frac{5}{4}\right\},\left\{\frac{7}{4},\frac{9}{4}\right\},-(c+d\,x)^2\right]+8\,\text{Gamma}\left[\frac{7}{4}\right]\,\text{Gamma}\left[\frac{9}{4}\right]\right.$$

$$\left(12\,(-1)^{3/4}\,a\,b\sqrt{c+d\,x}\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}\sqrt{c+d\,x}\right],-1\right]-12\,(-1)^{3/4}\,a\,b\sqrt{c+d\,x}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}\sqrt{c+d\,x}\right],-1\right]+\right.$$

$$\left.\left.(c+d\,x)\,\left(3\,(a+b\,\text{ArcSinh}[c+d\,x])^2-2\,b^2\,\text{ArcSinh}[c+d\,x]\,\text{Hypergeometric2F1}\left[1,\frac{5}{4},\frac{7}{4},-(c+d\,x)^2\right]\,\text{Sinh}[2\,\text{ArcSinh}[c+d\,x]]\right)\right)\right)$$

Problem 241: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 5, 130 leaves, 3 steps):

$$-\frac{2\,(a+b\,\text{ArcSinh}[c+d\,x])^2}{d\,e\,\sqrt{e\,(c+d\,x)}}+\frac{8\,b\,\sqrt{e\,(c+d\,x)}\,(a+b\,\text{ArcSinh}[c+d\,x])\,\text{Hypergeometric2F1}\left[\frac{1}{4},\frac{1}{2},\frac{5}{4},-(c+d\,x)^2\right]}{d\,e^2}-\frac{16\,b^2\,(e\,(c+d\,x))^{3/2}\,\text{HypergeometricPFQ}\left[\left\{\frac{3}{4},\frac{3}{4},1\right\},\left\{\frac{5}{4},\frac{7}{4}\right\},-(c+d\,x)^2\right]}{3\,d\,e^3}$$

Result (type 5, 224 leaves):

$$\frac{1}{d\,(e\,(c+d\,x))^{3/2}}\left(-2\,a^2\,(c+d\,x)+2\,a\,b\,(c+d\,x)^{3/2}\left(-\frac{2\,\text{ArcSinh}[c+d\,x]}{\sqrt{c+d\,x}}+\frac{4\,(-1)^{1/4}\,\sqrt{1+(c+d\,x)^2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{(-1)^{1/4}}{\sqrt{c+d\,x}}\right],-1\right]}{(c+d\,x)\,\sqrt{1+\frac{1}{(c+d\,x)^2}}}\right)+\right.$$
$$b^2\,(c+d\,x)\left(-\frac{\sqrt{2}\,\pi\,(c+d\,x)^2\,\text{HypergeometricPFQ}\left[\left\{\frac{3}{4},\frac{3}{4},1\right\},\left\{\frac{5}{4},\frac{7}{4}\right\},-(c+d\,x)^2\right]}{\text{Gamma}\left[\frac{5}{4}\right]\,\text{Gamma}\left[\frac{7}{4}\right]}-\right.$$
$$\left.\left.2\,\text{ArcSinh}[c+d\,x]\left(\text{ArcSinh}[c+d\,x]-2\,\text{Hypergeometric2F1}\left[\frac{3}{4},1,\frac{5}{4},-(c+d\,x)^2\right]\,\text{Sinh}[2\,\text{ArcSinh}[c+d\,x]]\right)\right)\right)$$

Problem 242: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 5, 134 leaves, 3 steps):

$$-\frac{2\,(a+b\,\text{ArcSinh}[c+d\,x])^2}{3\,d\,e\,(e\,(c+d\,x))^{3/2}}-\frac{8\,b\,(a+b\,\text{ArcSinh}[c+d\,x])\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-(c+d\,x)^2\right]}{3\,d\,e^2\,\sqrt{e\,(c+d\,x)}}+\frac{16\,b^2\,\sqrt{e\,(c+d\,x)}\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{4},1\right\},\left\{\frac{3}{4},\frac{5}{4}\right\},-(c+d\,x)^2\right]}{3\,d\,e^3}$$

Result (type 5, 262 leaves):

$$\frac{1}{36\,d\,e\,(e\,(c+d\,x))^{3/2}}\Bigg(-24\,a^2+48\,a\,b\,\Big(-\text{ArcSinh}[c+d\,x]-2\,(c+d\,x)\Big(\sqrt{1+(c+d\,x)^2}+(-1)^{3/4}\,\sqrt{c+d\,x}\,\Big(\text{EllipticE}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}\,\sqrt{c+d\,x}\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}\,\sqrt{c+d\,x}\right],-1\right]\Big)\Big)\Big)+b^2\,\Big(32\,(c+d\,x)^3\,\sqrt{1+(c+d\,x)^2}\,\text{ArcSinh}[c+d\,x]\,\text{Hypergeometric2F1}\left[1,\frac{5}{4},\frac{7}{4},-(c+d\,x)^2\right]-\frac{3\,\sqrt{2}\,\pi\,(c+d\,x)^4\,\text{HypergeometricPFQ}\left[\left\{1,\frac{5}{4},\frac{5}{4}\right\},\left\{\frac{7}{4},\frac{9}{4}\right\},-(c+d\,x)^2\right]}{\text{Gamma}\left[\frac{7}{4}\right]\,\text{Gamma}\left[\frac{9}{4}\right]}-24\,\Big(-8\,(c+d\,x)^2+\text{ArcSinh}[c+d\,x]^2+2\,\text{ArcSinh}[c+d\,x]\,\text{Sinh}[2\,\text{ArcSinh}[c+d\,x]]\Big)\Big)\Bigg)$$

Problem 243: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{(a+b\,\text{ArcSinh}[c+d\,x])^2}{(c\,e+d\,e\,x)^{7/2}}\,dx$$

Optimal (type 5, 134 leaves, 3 steps):

$$-\frac{2\,(a+b\,\text{ArcSinh}[c+d\,x])^2}{5\,d\,e\,(e\,(c+d\,x))^{5/2}}-\frac{8\,b\,(a+b\,\text{ArcSinh}[c+d\,x])\,\text{Hypergeometric2F1}\left[-\frac{3}{4},\frac{1}{2},\frac{1}{4},-(c+d\,x)^2\right]}{15\,d\,e^2\,(e\,(c+d\,x))^{3/2}}-\frac{16\,b^2\,\text{HypergeometricPFQ}\left[\left\{-\frac{1}{4},-\frac{1}{4},1\right\},\left\{\frac{1}{4},\frac{3}{4}\right\},-(c+d\,x)^2\right]}{15\,d\,e^3\,\sqrt{e\,(c+d\,x)}}$$

Result (type 5, 258 leaves):

$$\frac{1}{15\, d\, e\, (e\,(c+d\,x))^{5/2}}\left(-6\,a^2-12\,a\,b\,\text{ArcSinh}[c+d\,x]-\frac{8\,a\,b\,(c+d\,x)\left(1+(c+d\,x)^2+(-1)^{1/4}\,(c+d\,x)^{5/2}\,\sqrt{1+\frac{1}{(c+d\,x)^2}}\;\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[\frac{(-1)^{1/4}}{\sqrt{c+d\,x}}\right],-1\right]\right)}{\sqrt{1+(c+d\,x)^2}}+\right.$$

$$b^2\left(8-6\,\text{ArcSinh}[c+d\,x]^2-8\,\text{Cosh}[2\,\text{ArcSinh}[c+d\,x]]-8\,(c+d\,x)^3\,\sqrt{1+(c+d\,x)^2}\;\text{ArcSinh}[c+d\,x]\;\text{Hypergeometric2F1}\left[\frac{3}{4},1,\frac{5}{4},-(c+d\,x)^2\right]+\right.$$

$$\left.\left.\frac{\sqrt{2}\,\pi\,(c+d\,x)^4\,\text{HypergeometricPFQ}\left[\left\{\frac{3}{4},\frac{3}{4},1\right\},\left\{\frac{5}{4},\frac{7}{4}\right\},-(c+d\,x)^2\right]}{\text{Gamma}\left[\frac{5}{4}\right]\,\text{Gamma}\left[\frac{7}{4}\right]}-4\,\text{ArcSinh}[c+d\,x]\;\text{Sinh}[2\,\text{ArcSinh}[c+d\,x]]\right)\right)$$

Problem 245: Attempted integration timed out after 120 seconds.

$$\int (c\,e+d\,e\,x)^{5/2}\,(a+b\,\text{ArcSinh}[c+d\,x])^3\,dx$$

Optimal (type 9, 81 leaves, 2 steps):

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

Result (type 1, 1 leaves):

???

Problem 247: Attempted integration timed out after 120 seconds.

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

Optimal (type 9, 79 leaves, 2 steps):

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

Result (type 1, 1 leaves):

???

Problem 251: Attempted integration timed out after 120 seconds.

$$\int \frac{(a + b\,\text{ArcSinh}[c + d\,x])^3}{(c\,e + d\,e\,x)^{7/2}}\,dx$$

Optimal (type 9, 81 leaves, 2 steps):

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

Result (type 1, 1 leaves):

???

Problem 253: Attempted integration timed out after 120 seconds.

$$\int (c\,e + d\,e\,x)^{5/2}\,(a + b\,\text{ArcSinh}[c + d\,x])^4\,dx$$

Optimal (type 9, 81 leaves, 2 steps):

$$\frac{2\,(e\,(c + d\,x))^{7/2}\,(a + b\,\text{ArcSinh}[c + d\,x])^4}{7\,d\,e} - \frac{8\,b\,\text{Unintegrable}\left[\frac{(e\,(c+d\,x))^{7/2}\,(a+b\,\text{ArcSinh}[c+d\,x])^3}{\sqrt{1+(c+d\,x)^2}},\,x\right]}{7\,e}$$

Result (type 1, 1 leaves):

???

Problem 255: Attempted integration timed out after 120 seconds.

$$\int \sqrt{c\,e + d\,e\,x}\,(a + b\,\text{ArcSinh}[c + d\,x])^4\,dx$$

Optimal (type 9, 81 leaves, 2 steps):

$$\frac{2\,(e\,(c + d\,x))^{3/2}\,(a + b\,\text{ArcSinh}[c + d\,x])^4}{3\,d\,e} - \frac{8\,b\,\text{Unintegrable}\left[\frac{(e\,(c+d\,x))^{3/2}\,(a+b\,\text{ArcSinh}[c+d\,x])^3}{\sqrt{1+(c+d\,x)^2}},\,x\right]}{3\,e}$$

Result (type 1, 1 leaves):

???

Problem 259: Attempted integration timed out after 120 seconds.

$$\int \frac{(a+b\,\text{ArcSinh}[c+d\,x])^4}{(c\,e+d\,e\,x)^{7/2}}\,dx$$

Optimal (type 9, 81 leaves, 2 steps):

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

Result (type 1, 1 leaves):

???

Problem 284: Result unnecessarily involves imaginary or complex numbers.

$$\int x^2\,\text{ArcSinh}[a\,x^2]\,dx$$

Optimal (type 4, 101 leaves, 4 steps):

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

Result (type 4, 75 leaves):

$$\frac{1}{9}\left(-\frac{2\,(x+a^2x^5)}{a\sqrt{1+a^2x^4}}+3\,x^3\,\text{ArcSinh}[a\,x^2]-\frac{2\sqrt{i\,a}\,\text{EllipticF}\left[i\,\text{ArcSinh}[\sqrt{i\,a}\,x],-1\right]}{a^2}\right)$$

Problem 286: Result unnecessarily involves imaginary or complex numbers.

$$\int \text{ArcSinh}[a\,x^2]\,dx$$

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

$$-\frac{2\,x\sqrt{1+a^2x^4}}{1+a\,x^2}+x\,\text{ArcSinh}[a\,x^2]+\frac{2\,(1+a\,x^2)\sqrt{\frac{1+a^2x^4}{(1+a\,x^2)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}[\sqrt{a}\,x],\frac{1}{2}\right]}{\sqrt{a}\sqrt{1+a^2x^4}}-\frac{(1+a\,x^2)\sqrt{\frac{1+a^2x^4}{(1+a\,x^2)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}[\sqrt{a}\,x],\frac{1}{2}\right]}{\sqrt{a}\sqrt{1+a^2x^4}}$$

Result (type 4, 59 leaves):

$$x\,\text{ArcSinh}\left[a\,x^2\right]-\frac{2\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{i\,a}\,x\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{i\,a}\,x\right],-1\right]\right)}{\sqrt{i\,a}}$$

Problem 288: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{ArcSinh}\left[a\,x^2\right]}{x^2}\,dx$$

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

$$-\frac{\text{ArcSinh}\left[a\,x^2\right]}{x}+\frac{\sqrt{a}\,\left(1+a\,x^2\right)\sqrt{\frac{1+a^2\,x^4}{\left(1+a\,x^2\right)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\sqrt{a}\,x\right],\frac{1}{2}\right]}{\sqrt{1+a^2\,x^4}}$$

Result (type 4, 42 leaves):

$$-\frac{\text{ArcSinh}\left[a\,x^2\right]+2\,\sqrt{i\,a}\,x\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{i\,a}\,x\right],-1\right]}{x}$$

Problem 290: Result unnecessarily involves imaginary or complex numbers.

$$\int\frac{\text{ArcSinh}\left[a\,x^2\right]}{x^4}\,dx$$

Optimal (type 4, 197 leaves, 6 steps):

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

Result (type 4, 88 leaves):

$$\frac{1}{3}\left(-\frac{2\,a\,\sqrt{1+a^2\,x^4}}{x}-\frac{\text{ArcSinh}\left[a\,x^2\right]}{x^3}+\frac{2\,a^2\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[\sqrt{i\,a}\,x\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{i\,a}\,x\right],-1\right]\right)}{\sqrt{i\,a}}\right)$$

Problem 302: Result more than twice size of optimal antiderivative.

$$\int \text{ArcSinh}\left[\frac{a}{x}\right] dx$$

Optimal (type 3, 25 leaves, 5 steps):

$$x\,\text{ArcCsch}\left[\frac{x}{a}\right]+a\,\text{ArcTanh}\left[\sqrt{1+\frac{a^2}{x^2}}\right]$$

Result (type 3, 77 leaves):

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

Problem 311: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 60 leaves, 5 steps):

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

Result (type 4, 128 leaves):

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

Problem 328: Unable to integrate problem.

$$\int \left(a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right)^{5/2} dx$$

Optimal (type 4, 348 leaves, 2 steps):

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

$$x\,\left(a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]\right)^{5/2}+\frac{15\,b^2\,\sqrt{\pi}\,x\,\text{FresnelS}\left[\frac{\sqrt{-\frac{i}{b}}\,\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]+i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{\sqrt{-\frac{i}{b}}\,\left(\text{Cos}\left[\frac{1}{2}\,\text{ArcSin}[1-i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\,\text{ArcSin}[1-i\,d\,x^2]\right]\right)}-$$

$$\frac{15\,\sqrt{-\frac{i}{b}}\,b^3\,\sqrt{\pi}\,x\,\text{FresnelC}\left[\frac{\sqrt{-\frac{i}{b}}\,\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}}{\sqrt{\pi}}\right]\left(i\,\text{Cosh}\left[\frac{a}{2\,b}\right]+\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{\text{Cos}\left[\frac{1}{2}\,\text{ArcSin}[1-i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\,\text{ArcSin}[1-i\,d\,x^2]\right]}$$

Result (type 8, 24 leaves):

$$\int\left(a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]\right)^{5/2}\,dx$$

Problem 329: Unable to integrate problem.

$$\int\left(a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]\right)^{3/2}\,dx$$

Optimal (type 4, 312 leaves, 2 steps):

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

$$\frac{3\,\sqrt{i\,b}\,b\,\sqrt{\pi}\,x\,\text{FresnelC}\left[\frac{\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}}{\sqrt{i\,b}\,\sqrt{\pi}}\right]\left(i\,\text{Cosh}\left[\frac{a}{2\,b}\right]-\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{\text{Cos}\left[\frac{1}{2}\,\text{ArcSin}[1-i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\,\text{ArcSin}[1-i\,d\,x^2]\right]}-\frac{3\,b^2\,\sqrt{\pi}\,x\,\text{FresnelS}\left[\frac{\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}}{\sqrt{i\,b}\,\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]-i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{\sqrt{i\,b}\,\left(\text{Cos}\left[\frac{1}{2}\,\text{ArcSin}[1-i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\,\text{ArcSin}[1-i\,d\,x^2]\right]\right)}$$

Result (type 8, 24 leaves):

$$\int\left(a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]\right)^{3/2}\,dx$$

Problem 330: Unable to integrate problem.

$$\int\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}\,dx$$

Optimal (type 4, 263 leaves, 1 step):

$$x\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}+\frac{\sqrt{\pi}\,x\,\text{FresnelS}\left[\frac{\sqrt{-\frac{i}{b}}\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2b}\right]+i\,\text{Sinh}\left[\frac{a}{2b}\right]\right)}{\sqrt{-\frac{i}{b}}\left(\text{Cos}\left[\frac{1}{2}\text{ArcSin}[1-i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}[1-i\,d\,x^2]\right]\right)}-$$

$$\frac{\sqrt{-\frac{i}{b}}\,b\sqrt{\pi}\,x\,\text{FresnelC}\left[\frac{\sqrt{-\frac{i}{b}}\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}}{\sqrt{\pi}}\right]\left(i\,\text{Cosh}\left[\frac{a}{2b}\right]+\text{Sinh}\left[\frac{a}{2b}\right]\right)}{\text{Cos}\left[\frac{1}{2}\text{ArcSin}[1-i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}[1-i\,d\,x^2]\right]}$$

Result (type 8, 24 leaves):

$$\int\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}\,dx$$

Problem 332: Unable to integrate problem.

$$\int\frac{1}{(a+i\,b\,\text{ArcSin}[1-i\,d\,x^2])^{3/2}}\,dx$$

Optimal (type 4, 291 leaves, 1 step):

$$-\frac{\sqrt{2\,i\,d\,x^2+d^2\,x^4}}{b\,d\,x\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}}-\frac{\left(-\frac{i}{b}\right)^{3/2}\sqrt{\pi}\,x\,\text{FresnelC}\left[\frac{\sqrt{-\frac{i}{b}}\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2b}\right]-i\,\text{Sinh}\left[\frac{a}{2b}\right]\right)}{\text{Cos}\left[\frac{1}{2}\text{ArcSin}[1-i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}[1-i\,d\,x^2]\right]}+$$

$$\frac{\left(-\frac{i}{b}\right)^{3/2}\sqrt{\pi}\,x\,\text{FresnelS}\left[\frac{\sqrt{-\frac{i}{b}}\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2b}\right]+i\,\text{Sinh}\left[\frac{a}{2b}\right]\right)}{\text{Cos}\left[\frac{1}{2}\text{ArcSin}[1-i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}[1-i\,d\,x^2]\right]}$$

Result (type 8, 24 leaves):

$$\int\frac{1}{(a+i\,b\,\text{ArcSin}[1-i\,d\,x^2])^{3/2}}\,dx$$

Problem 333: Unable to integrate problem.

$$\int\frac{1}{(a+i\,b\,\text{ArcSin}[1-i\,d\,x^2])^{5/2}}\,dx$$

Optimal (type 4, 326 leaves, 2 steps):

$$-\frac{\sqrt{2\,i\,d\,x^2+d^2\,x^4}}{3\,b\,d\,x\,\left(a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right)^{3/2}}-\frac{x}{3\,b^2\,\sqrt{a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]}}-\frac{\sqrt{\pi}\,x\,\text{FresnelS}\left[\frac{\sqrt{a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]}}{\sqrt{i\,b}\,\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]-i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{3\,\sqrt{i\,b}\,b^2\,\left(\text{Cos}\left[\frac{1}{2}\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right]-\text{Sin}\left[\frac{1}{2}\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right]\right)}-\frac{\sqrt{\pi}\,x\,\text{FresnelC}\left[\frac{\sqrt{a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]}}{\sqrt{i\,b}\,\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]+i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{3\,\sqrt{i\,b}\,b^2\,\left(\text{Cos}\left[\frac{1}{2}\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right]-\text{Sin}\left[\frac{1}{2}\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right]\right)}$$

Result (type 8, 24 leaves):

$$\int\frac{1}{\left(a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right)^{5/2}}\,dx$$

Problem 334: Unable to integrate problem.

$$\int\frac{1}{\left(a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right)^{7/2}}\,dx$$

Optimal (type 4, 389 leaves, 2 steps):

$$-\frac{\sqrt{2\,i\,d\,x^2+d^2\,x^4}}{5\,b\,d\,x\,\left(a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right)^{5/2}}-\frac{x}{15\,b^2\,\left(a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right)^{3/2}}-\frac{\sqrt{2\,i\,d\,x^2+d^2\,x^4}}{15\,b^3\,d\,x\,\sqrt{a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]}}-\frac{\left(-\frac{i}{b}\right)^{3/2}\sqrt{\pi}\,x\,\text{FresnelC}\left[\frac{\sqrt{-\frac{i}{b}}\,\sqrt{a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]-i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{15\,b^2\,\left(\text{Cos}\left[\frac{1}{2}\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right]-\text{Sin}\left[\frac{1}{2}\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right]\right)}+\frac{\left(-\frac{i}{b}\right)^{3/2}\sqrt{\pi}\,x\,\text{FresnelS}\left[\frac{\sqrt{-\frac{i}{b}}\,\sqrt{a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]+i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{15\,b^2\,\left(\text{Cos}\left[\frac{1}{2}\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right]-\text{Sin}\left[\frac{1}{2}\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right]\right)}$$

Result (type 8, 24 leaves):

$$\int\frac{1}{\left(a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right)^{7/2}}\,dx$$

Problem 335: Unable to integrate problem.

$$\int\left(a-i\,b\,\text{ArcSin}\left[1+i\,d\,x^2\right]\right)^{5/2}\,dx$$

Optimal (type 4, 348 leaves, 2 steps):

$$15 b^2 x \sqrt{a - i b \text{ArcSin}[1 + i d x^2]} - \frac{5 b \sqrt{-2 i d x^2 + d^2 x^4} \left(a - i b \text{ArcSin}[1 + i d x^2]\right)^{3/2}}{d x} + x \left(a - i b \text{ArcSin}[1 + i d x^2]\right)^{5/2} +$$

$$\frac{15 b^2 \sqrt{\pi}\, x \text{ FresnelS}\left[\frac{\sqrt{\frac{i}{b}} \sqrt{a - i b \text{ArcSin}[1 + i d x^2]}}{\sqrt{\pi}}\right] \left(\text{Cosh}\left[\frac{a}{2 b}\right] - i \text{Sinh}\left[\frac{a}{2 b}\right]\right)}{\sqrt{\frac{i}{b}} \left(\text{Cos}\left[\frac{1}{2} \text{ArcSin}[1 + i d x^2]\right] - \text{Sin}\left[\frac{1}{2} \text{ArcSin}[1 + i d x^2]\right]\right)} - \frac{15 b^2 \sqrt{\pi}\, x \text{ FresnelC}\left[\frac{\sqrt{\frac{i}{b}} \sqrt{a - i b \text{ArcSin}[1 + i d x^2]}}{\sqrt{\pi}}\right] \left(\text{Cosh}\left[\frac{a}{2 b}\right] + i \text{Sinh}\left[\frac{a}{2 b}\right]\right)}{\sqrt{\frac{i}{b}} \left(\text{Cos}\left[\frac{1}{2} \text{ArcSin}[1 + i d x^2]\right] - \text{Sin}\left[\frac{1}{2} \text{ArcSin}[1 + i d x^2]\right]\right)}$$

Result (type 8, 24 leaves):

$$\int \left(a - i b \text{ArcSin}[1 + i d x^2]\right)^{5/2} dx$$

Problem 336: Unable to integrate problem.

$$\int \left(a - i b \text{ArcSin}[1 + i d x^2]\right)^{3/2} dx$$

Optimal (type 4, 310 leaves, 2 steps):

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

$$\frac{3 b^2 \sqrt{\pi}\, x \text{ FresnelS}\left[\frac{\sqrt{a - i b \text{ArcSin}[1 + i d x^2]}}{\sqrt{-i b} \sqrt{\pi}}\right] \left(\text{Cosh}\left[\frac{a}{2 b}\right] + i \text{Sinh}\left[\frac{a}{2 b}\right]\right)}{\sqrt{-i b} \left(\text{Cos}\left[\frac{1}{2} \text{ArcSin}[1 + i d x^2]\right] - \text{Sin}\left[\frac{1}{2} \text{ArcSin}[1 + i d x^2]\right]\right)} - \frac{3 \sqrt{-i b}\, b \sqrt{\pi}\, x \text{ FresnelC}\left[\frac{\sqrt{a - i b \text{ArcSin}[1 + i d x^2]}}{\sqrt{-i b} \sqrt{\pi}}\right] \left(i \text{Cosh}\left[\frac{a}{2 b}\right] + \text{Sinh}\left[\frac{a}{2 b}\right]\right)}{\text{Cos}\left[\frac{1}{2} \text{ArcSin}[1 + i d x^2]\right] - \text{Sin}\left[\frac{1}{2} \text{ArcSin}[1 + i d x^2]\right]}$$

Result (type 8, 24 leaves):

$$\int \left(a - i b \text{ArcSin}[1 + i d x^2]\right)^{3/2} dx$$

Problem 337: Unable to integrate problem.

$$\int \sqrt{a - i b \text{ArcSin}[1 + i d x^2]}\, dx$$

Optimal (type 4, 262 leaves, 1 step):

$$x\sqrt{a-i\,b\,\text{ArcSin}[1+i\,d\,x^2]}+\frac{\sqrt{\pi}\,x\,\text{FresnelS}\left[\frac{\sqrt{\frac{i}{b}}\sqrt{a-i\,b\,\text{ArcSin}[1+i\,d\,x^2]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]-i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{\sqrt{\frac{i}{b}}\left(\text{Cos}\left[\frac{1}{2}\text{ArcSin}[1+i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}[1+i\,d\,x^2]\right]\right)}-$$

$$\frac{\sqrt{\pi}\,x\,\text{FresnelC}\left[\frac{\sqrt{\frac{i}{b}}\sqrt{a-i\,b\,\text{ArcSin}[1+i\,d\,x^2]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]+i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{\sqrt{\frac{i}{b}}\left(\text{Cos}\left[\frac{1}{2}\text{ArcSin}[1+i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}[1+i\,d\,x^2]\right]\right)}$$

Result (type 8, 24 leaves):

$$\int\sqrt{a-i\,b\,\text{ArcSin}[1+i\,d\,x^2]}\,dx$$

Problem 339: Unable to integrate problem.

$$\int\frac{1}{(a-i\,b\,\text{ArcSin}[1+i\,d\,x^2])^{3/2}}\,dx$$

Optimal (type 4, 291 leaves, 1 step):

$$-\frac{\sqrt{-2\,i\,d\,x^2+d^2\,x^4}}{b\,d\,x\sqrt{a-i\,b\,\text{ArcSin}[1+i\,d\,x^2]}}+\frac{\left(\frac{i}{b}\right)^{3/2}\sqrt{\pi}\,x\,\text{FresnelS}\left[\frac{\sqrt{\frac{i}{b}}\sqrt{a-i\,b\,\text{ArcSin}[1+i\,d\,x^2]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]-i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{\text{Cos}\left[\frac{1}{2}\text{ArcSin}[1+i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}[1+i\,d\,x^2]\right]}-$$

$$\frac{\left(\frac{i}{b}\right)^{3/2}\sqrt{\pi}\,x\,\text{FresnelC}\left[\frac{\sqrt{\frac{i}{b}}\sqrt{a-i\,b\,\text{ArcSin}[1+i\,d\,x^2]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]+i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{\text{Cos}\left[\frac{1}{2}\text{ArcSin}[1+i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}[1+i\,d\,x^2]\right]}$$

Result (type 8, 24 leaves):

$$\int\frac{1}{(a-i\,b\,\text{ArcSin}[1+i\,d\,x^2])^{3/2}}\,dx$$

Problem 340: Unable to integrate problem.

$$\int\frac{1}{(a-i\,b\,\text{ArcSin}[1+i\,d\,x^2])^{5/2}}\,dx$$

Optimal (type 4, 326 leaves, 2 steps):

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

$$\frac{\sqrt{\pi}\;x\,\text{FresnelS}\left[\frac{\sqrt{a-i\,b\,\text{ArcSin}\left[1+i\,d\,x^2\right]}}{\sqrt{-i\,b}\;\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]+i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{3\,\sqrt{-i\,b}\;b^2\,\left(\text{Cos}\left[\frac{1}{2}\,\text{ArcSin}\left[1+i\,d\,x^2\right]\right]-\text{Sin}\left[\frac{1}{2}\,\text{ArcSin}\left[1+i\,d\,x^2\right]\right]\right)}-\frac{\sqrt{-i\,b}\;\sqrt{\pi}\;x\,\text{FresnelC}\left[\frac{\sqrt{a-i\,b\,\text{ArcSin}\left[1+i\,d\,x^2\right]}}{\sqrt{-i\,b}\;\sqrt{\pi}}\right]\left(i\,\text{Cosh}\left[\frac{a}{2\,b}\right]+\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{3\,b^3\,\left(\text{Cos}\left[\frac{1}{2}\,\text{ArcSin}\left[1+i\,d\,x^2\right]\right]-\text{Sin}\left[\frac{1}{2}\,\text{ArcSin}\left[1+i\,d\,x^2\right]\right]\right)}$$

Result (type 8, 24 leaves):

$$\int\frac{1}{\left(a-i\,b\,\text{ArcSin}\left[1+i\,d\,x^2\right]\right)^{5/2}}\,dx$$

Problem 341: Unable to integrate problem.

$$\int\frac{1}{\left(a-i\,b\,\text{ArcSin}\left[1+i\,d\,x^2\right]\right)^{7/2}}\,dx$$

Optimal (type 4, 389 leaves, 2 steps):

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

$$\frac{\sqrt{-2\,i\,d\,x^2+d^2\,x^4}}{15\,b^3\,d\,x\,\sqrt{a-i\,b\,\text{ArcSin}\left[1+i\,d\,x^2\right]}}-\frac{\left(\frac{i}{b}\right)^{3/2}\sqrt{\pi}\;x\,\text{FresnelC}\left[\frac{\sqrt{\frac{i}{b}}\;\sqrt{a-i\,b\,\text{ArcSin}\left[1+i\,d\,x^2\right]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]+i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{15\,b^2\,\left(\text{Cos}\left[\frac{1}{2}\,\text{ArcSin}\left[1+i\,d\,x^2\right]\right]-\text{Sin}\left[\frac{1}{2}\,\text{ArcSin}\left[1+i\,d\,x^2\right]\right]\right)}+$$

$$\frac{\sqrt{\frac{i}{b}}\;\sqrt{\pi}\;x\,\text{FresnelS}\left[\frac{\sqrt{\frac{i}{b}}\;\sqrt{a-i\,b\,\text{ArcSin}\left[1+i\,d\,x^2\right]}}{\sqrt{\pi}}\right]\left(i\,\text{Cosh}\left[\frac{a}{2\,b}\right]+\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{15\,b^3\,\left(\text{Cos}\left[\frac{1}{2}\,\text{ArcSin}\left[1+i\,d\,x^2\right]\right]-\text{Sin}\left[\frac{1}{2}\,\text{ArcSin}\left[1+i\,d\,x^2\right]\right]\right)}$$

Result (type 8, 24 leaves):

$$\int\frac{1}{\left(a-i\,b\,\text{ArcSin}\left[1+i\,d\,x^2\right]\right)^{7/2}}\,dx$$

Problem 343: Unable to integrate problem.

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

Optimal (type 4, 261 leaves, 8 steps):

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

Result (type 8, 42 leaves):

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

Problem 344: Unable to integrate problem.

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

Optimal (type 4, 194 leaves, 7 steps):

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

Result (type 8, 42 leaves):

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

Problem 345: Unable to integrate problem.

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

Optimal (type 4, 133 leaves, 6 steps):

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

Result (type 8, 40 leaves):

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

Problem 348: Attempted integration timed out after 120 seconds.

$$\int \text{ArcSinh}\left[c\,e^{a+b\,x}\right]\,dx$$

Optimal (type 4, 76 leaves, 6 steps):

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

Result (type 1, 1 leaves):

???

Problem 368: Result more than twice size of optimal antiderivative.

$$\int \text{ArcSinh}\left[\frac{c}{a+b\,x}\right]\,dx$$

Optimal (type 3, 49 leaves, 6 steps):

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

Result (type 3, 147 leaves):

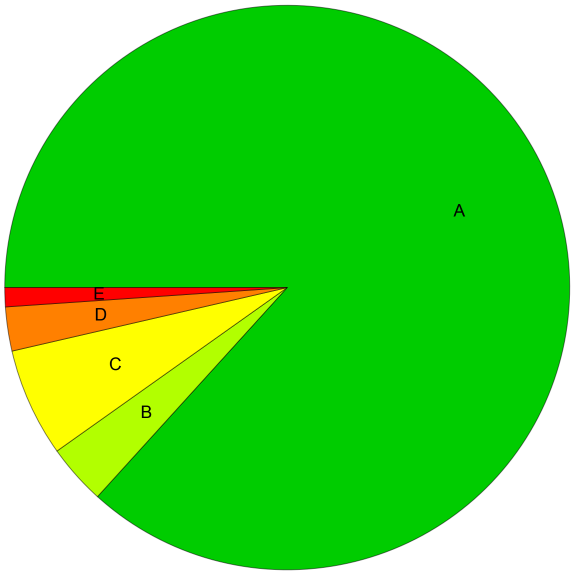
$$x\,\text{ArcSinh}\left[\frac{c}{a+b\,x}\right]+$$

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

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

Summary of Integration Test Results

1190 integration problems



A - 1032 optimal antiderivatives

B - 41 more than twice size of optimal antiderivatives

C - 74 unnecessarily complex antiderivatives

D - 30 unable to integrate problems

E - 13 integration timeouts