Mathematica 11.3 Integration Test Results

Test results for the 541 problems in "7.1.4a (f x)^m (d+c^2 d 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):

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

Result (type 4, 286 leaves):

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

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):

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

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):

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

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

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

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

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

Result (type 4, 264 leaves):

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

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

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

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

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

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.

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

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):

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

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

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

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

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

Result (type 4, 286 leaves):

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

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

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

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

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

Result (type 4, 323 leaves):

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

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

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

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

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

Result (type 4, 367 leaves):

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

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):

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

Result (type 4, 348 leaves):

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

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):

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

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):

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

Result (type 4, 403 leaves):

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

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

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

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

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

Result (type 4, 457 leaves):

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

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):

$$\frac{1}{4 d^3}\left(-\frac{2 a}{x^2}-\frac{a c^2}{\left(1+c^2 x^2\right)^2}-\frac{4 a c^2}{1+c^2 x^2}+\frac{9 b c^2\left(\sqrt{1+c^2 x^2}-i \text{ArcSinh}[c x]\right)}{4 i+4 c x}+\frac{9 b c^2\left(\sqrt{1+c^2 x^2}+i \text{ArcSinh}[c x]\right)}{-4 i+4 c x}-\frac{2 b\left(c x \sqrt{1+c^2 x^2}+\text{ArcSinh}[c x]\right)}{x^2}+\frac{b c^2\left((-2 i+c x) \sqrt{1+c^2 x^2}+3 \text{ArcSinh}[c x]\right)}{12(-i+c x)^2}+\frac{b c^2\left((2 i+c x) \sqrt{1+c^2 x^2}+3 \text{ArcSinh}[c x]\right)}{12(i+c x)^2}-12 a c^2 \text{Log}[x]+6 a c^2 \text{Log}\left[1+c^2 x^2\right]-6 b c^2\left(\text{ArcSinh}[c x]\left(\text{ArcSinh}[c x]+2 \text{Log}\left[1-e^{-2 \text{ArcSinh}[c x]}\right]\right)-\text{PolyLog}\left[2, e^{-2 \text{ArcSinh}[c x]}\right]\right)+3 b c^2\left(3 i \pi \text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+(2 i \pi+4 \text{ArcSinh}[c x]) \text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]-2 i \pi \text{Log}\left[-\text{Cos}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right]+4 i \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-4 \text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]\right)+3 b c^2\left(i \pi \text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+(-2 i \pi+4 \text{ArcSinh}[c x]) \text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]+4 i \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+2 i \pi \text{Log}\left[\text{Sin}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right]-4 \text{PolyLog}\left[2, i e^{-\text{ArcSinh}[c x]}\right]\right)\right)$$

Problem 126: Unable to integrate problem.

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

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

$$-\frac{15\,b\,c\,d^2\,x^{2+m}\,\sqrt{d+c^2\,d\,x^2}}{(2+m)^2\,(4+m)\,(6+m)\,\sqrt{1+c^2\,x^2}}-\frac{5\,b\,c\,d^2\,x^{2+m}\,\sqrt{d+c^2\,d\,x^2}}{(6+m)\,\left(8+6\,m+m^2\right)\,\sqrt{1+c^2\,x^2}}-$$
$$\frac{b\,c\,d^2\,x^{2+m}\,\sqrt{d+c^2\,d\,x^2}}{\left(12+8\,m+m^2\right)\,\sqrt{1+c^2\,x^2}}-\frac{5\,b\,c^3\,d^2\,x^{4+m}\,\sqrt{d+c^2\,d\,x^2}}{(4+m)^2\,(6+m)\,\sqrt{1+c^2\,x^2}}-\frac{2\,b\,c^3\,d^2\,x^{4+m}\,\sqrt{d+c^2\,d\,x^2}}{(4+m)\,(6+m)\,\sqrt{1+c^2\,x^2}}-$$
$$\frac{b\,c^5\,d^2\,x^{6+m}\,\sqrt{d+c^2\,d\,x^2}}{(6+m)^2\,\sqrt{1+c^2\,x^2}}+\frac{15\,d^2\,x^{1+m}\,\sqrt{d+c^2\,d\,x^2}\,\left(a+b\,\text{ArcSinh}[c\,x]\right)}{(6+m)\,\left(8+6\,m+m^2\right)}+$$
$$\frac{5\,d\,x^{1+m}\,\left(d+c^2\,d\,x^2\right)^{3/2}\,\left(a+b\,\text{ArcSinh}[c\,x]\right)}{(4+m)\,(6+m)}+\frac{x^{1+m}\,\left(d+c^2\,d\,x^2\right)^{5/2}\,\left(a+b\,\text{ArcSinh}[c\,x]\right)}{6+m}+$$
$$\left(15\,d^2\,x^{1+m}\,\sqrt{d+c^2\,d\,x^2}\,\left(a+b\,\text{ArcSinh}[c\,x]\right)\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},-c^2\,x^2\right]\right)\Big/$$
$$\left((6+m)\,\left(8+14\,m+7\,m^2+m^3\right)\,\sqrt{1+c^2\,x^2}\right)-$$
$$\left(15\,b\,c\,d^2\,x^{2+m}\,\sqrt{d+c^2\,d\,x^2}\,\text{HypergeometricPFQ}\left[\left\{1,1+\frac{m}{2},1+\frac{m}{2}\right\},\left\{\frac{3}{2}+\frac{m}{2},2+\frac{m}{2}\right\},-c^2\,x^2\right]\right)\Big/$$
$$\left((1+m)\,(2+m)^2\,(4+m)\,(6+m)\,\sqrt{1+c^2\,x^2}\right)$$

Result (type 8, 28 leaves):

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

Problem 127: Unable to integrate problem.

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

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

$$-\frac{3\,b\,c\,d\,x^{2+m}\,\sqrt{d+c^2\,d\,x^2}}{(2+m)^2\,(4+m)\,\sqrt{1+c^2\,x^2}}-\frac{b\,c\,d\,x^{2+m}\,\sqrt{d+c^2\,d\,x^2}}{\left(8+6\,m+m^2\right)\,\sqrt{1+c^2\,x^2}}-\frac{b\,c^3\,d\,x^{4+m}\,\sqrt{d+c^2\,d\,x^2}}{(4+m)^2\,\sqrt{1+c^2\,x^2}}+$$
$$\frac{3\,d\,x^{1+m}\,\sqrt{d+c^2\,d\,x^2}\,\left(a+b\,\text{ArcSinh}[c\,x]\right)}{8+6\,m+m^2}+\frac{x^{1+m}\,\left(d+c^2\,d\,x^2\right)^{3/2}\,\left(a+b\,\text{ArcSinh}[c\,x]\right)}{4+m}+$$
$$\left(3\,d\,x^{1+m}\,\sqrt{d+c^2\,d\,x^2}\,\left(a+b\,\text{ArcSinh}[c\,x]\right)\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{1+m}{2},\frac{3+m}{2},-c^2\,x^2\right]\right)\Big/$$
$$\left(\left(8+14\,m+7\,m^2+m^3\right)\,\sqrt{1+c^2\,x^2}\right)-$$
$$\left(3\,b\,c\,d\,x^{2+m}\,\sqrt{d+c^2\,d\,x^2}\,\text{HypergeometricPFQ}\left[\left\{1,1+\frac{m}{2},1+\frac{m}{2}\right\},\left\{\frac{3}{2}+\frac{m}{2},2+\frac{m}{2}\right\},-c^2\,x^2\right]\right)\Big/$$
$$\left((1+m)\,(2+m)^2\,(4+m)\,\sqrt{1+c^2\,x^2}\right)$$

Result (type 8, 28 leaves):

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

Problem 128: 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):

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

Result (type 8, 28 leaves):

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

Problem 129: Unable to integrate problem.

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

Optimal (type 5, 161 leaves, 2 steps):

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

Result (type 9, 181 leaves):

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

Problem 130: Unable to integrate problem.

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

Optimal (type 5, 268 leaves, 4 steps):

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

Result (type 8, 28 leaves):

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

Problem 131: Unable to integrate problem.

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

Optimal (type 5, 402 leaves, 6 steps):

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

Result (type 8, 28 leaves):

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

Problem 132: 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 138: 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, 165 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 140: 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, 179 leaves, 10 steps):

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

Result (type 4, 222 leaves):

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

Problem 147: 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, 256 leaves, 17 steps):

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

Result (type 4, 333 leaves):

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

Problem 149: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 313 leaves):

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

Problem 156: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 336 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):

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

Problem 158: 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, 355 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):

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

Problem 161: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 423 leaves):

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

Problem 163: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 325 leaves):

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

Problem 164: Result more than twice size of optimal antiderivative.

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

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):

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

Problem 165: 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):

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

Result (type 4, 424 leaves):

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

Problem 166: 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):

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

Problem 167: 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):

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

Result (type 4, 523 leaves):

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

Problem 168: Result more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 735 leaves):

$$-\frac{a^2}{3\,d\,x^3}+\frac{a^2\,c^2}{d\,x}+\frac{a^2\,c^3\,\text{ArcTan}[c\,x]}{d}+$$
$$\frac{1}{d}2\,a\,b\left(-\frac{c\,\sqrt{1+c^2\,x^2}}{6\,x^2}-\frac{\text{ArcSinh}[c\,x]}{3\,x^3}-\frac{1}{6}c^3\,\text{Log}[x]+\frac{1}{6}c^3\,\text{Log}\left[1+\sqrt{1+c^2\,x^2}\right]-\right.$$
$$c^2\left(-\frac{\text{ArcSinh}[c\,x]}{x}+c\,\text{Log}[x]-c\,\text{Log}\left[1+\sqrt{1+c^2\,x^2}\right]\right)+$$
$$\frac{1}{4}\,i\,c^3\left(3\,i\,\pi\,\text{ArcSinh}[c\,x]+\text{ArcSinh}[c\,x]^2+(2\,i\,\pi+4\,\text{ArcSinh}[c\,x])\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]-\right.$$
$$4\,i\,\pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]-2\,i\,\pi\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]+$$
$$\left.4\,i\,\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]-4\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]\right)-$$
$$\frac{1}{4}\,i\,c^3\left(i\,\pi\,\text{ArcSinh}[c\,x]+\text{ArcSinh}[c\,x]^2+(-2\,i\,\pi+4\,\text{ArcSinh}[c\,x])\,\text{Log}\left[1-i\,e^{-\text{ArcSinh}[c\,x]}\right]-\right.$$
$$4\,i\,\pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]+4\,i\,\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+$$
$$\left.\left.2\,i\,\pi\,\text{Log}\left[\text{Sin}\left[\frac{1}{4}(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]-4\,\text{PolyLog}\left[2,i\,e^{-\text{ArcSinh}[c\,x]}\right]\right)\right)+$$
$$\frac{1}{24\,d}b^2\,c^3\left(-4\,\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+14\,\text{ArcSinh}[c\,x]^2\,\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-\right.$$
$$2\,\text{ArcSinh}[c\,x]\,\text{Csch}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]^2-\frac{1}{2}c\,x\,\text{ArcSinh}[c\,x]^2\,\text{Csch}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]^4-$$
$$56\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1-e^{-\text{ArcSinh}[c\,x]}\right]-24\,i\,\text{ArcSinh}[c\,x]^2\,\text{Log}\left[1-i\,e^{-\text{ArcSinh}[c\,x]}\right]+$$
$$24\,i\,\text{ArcSinh}[c\,x]^2\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]+56\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1+e^{-\text{ArcSinh}[c\,x]}\right]-$$
$$56\,\text{PolyLog}\left[2,-e^{-\text{ArcSinh}[c\,x]}\right]-48\,i\,\text{ArcSinh}[c\,x]\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]+$$
$$48\,i\,\text{ArcSinh}[c\,x]\,\text{PolyLog}\left[2,i\,e^{-\text{ArcSinh}[c\,x]}\right]+56\,\text{PolyLog}\left[2,e^{-\text{ArcSinh}[c\,x]}\right]-$$
$$48\,i\,\text{PolyLog}\left[3,-i\,e^{-\text{ArcSinh}[c\,x]}\right]+48\,i\,\text{PolyLog}\left[3,i\,e^{-\text{ArcSinh}[c\,x]}\right]-$$
$$2\,\text{ArcSinh}[c\,x]\,\text{Sech}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]^2-\frac{8\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]^4}{c^3\,x^3}+$$
$$\left.4\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-14\,\text{ArcSinh}[c\,x]^2\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)$$

Problem 170: 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):

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

Problem 171: 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):

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

Result (type 4, 478 leaves):

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

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

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

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

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

Result (type 4, 472 leaves):

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

Problem 174: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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

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

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

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

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

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

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

Result (type 4, 689 leaves):

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

Problem 176: 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) :

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

Result (type 4, 649 leaves):

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

Problem 177: Result more than twice size of optimal antiderivative.

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

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

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

$$\frac{(a+b \text{ArcSinh}[c x])^2}{3 d^2 x^3 (1+c^2 x^2)}+\frac{5 c^2 (a+b \text{ArcSinh}[c x])^2}{3 d^2 x (1+c^2 x^2)}+\frac{5 c^4 x (a+b \text{ArcSinh}[c x])^2}{2 d^2 (1+c^2 x^2)}+$$

$$\frac{5 c^3 (a+b \text{ArcSinh}[c x])^2 \text{ArcTan}[e^{\text{ArcSinh}[c x]}]}{d^2}-\frac{b^2 c^3 \text{ArcTan}[c x]}{d^2}+$$

$$\frac{26 b c^3 (a+b \text{ArcSinh}[c x]) \text{ArcTanh}[e^{\text{ArcSinh}[c x]}]}{3 d^2}+\frac{13 b^2 c^3 \text{PolyLog}[2,-e^{\text{ArcSinh}[c x]}]}{3 d^2}-$$

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

$$\frac{5 i b c^3 (a+b \text{ArcSinh}[c x]) \text{PolyLog}[2,i e^{\text{ArcSinh}[c x]}]}{d^2}-\frac{13 b^2 c^3 \text{PolyLog}[2,e^{\text{ArcSinh}[c x]}]}{3 d^2}+$$

$$\frac{5 i b^2 c^3 \text{PolyLog}[3,-i e^{\text{ArcSinh}[c x]}]}{d^2}-\frac{5 i b^2 c^3 \text{PolyLog}[3,i e^{\text{ArcSinh}[c x]}]}{d^2}$$

Result (type 4, 897 leaves) :

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Problem 183: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 752 leaves):

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

$$\frac{1}{d^3} 2 a b \left(\frac{5 i \left(\sqrt{1+c^2 x^2}+i \text{ArcSinh}[c x]\right)}{16 (-1-i c x)}+\frac{5 i \left(i \sqrt{1+c^2 x^2}+\text{ArcSinh}[c x]\right)}{16 (i+c x)}-\right.$$

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

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

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

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

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

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

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

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

$$\frac{1}{24 d^3} b^2 \left(i \pi^3-\frac{2}{1+c^2 x^2}-\frac{4 c x \text{ArcSinh}[c x]}{\left(1+c^2 x^2\right)^{3/2}}-\frac{32 c x \text{ArcSinh}[c x]}{\sqrt{1+c^2 x^2}}+\frac{6 \text{ArcSinh}[c x]^2}{\left(1+c^2 x^2\right)^2}+\right.$$

$$\frac{12 \text{ArcSinh}[c x]^2}{1+c^2 x^2}-16 \text{ArcSinh}[c x]^3-24 \text{ArcSinh}[c x]^2 \text{Log}\left[1+e^{-2 \text{ArcSinh}[c x]}\right]+$$

$$24 \text{ArcSinh}[c x]^2 \text{Log}\left[1-e^{2 \text{ArcSinh}[c x]}\right]+32 \text{Log}\left[\sqrt{1+c^2 x^2}\right]+$$

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

$$\left.12 \text{PolyLog}\left[3,-e^{-2 \text{ArcSinh}[c x]}\right]-12 \text{PolyLog}\left[3, e^{2 \text{ArcSinh}[c x]}\right]\right)$$

Problem 184: Result more than twice size of optimal antiderivative.

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

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) :

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

$$\frac{1}{d^3} 2 a b c \left(\frac{7 \left(\sqrt{1+c^2 x^2}+i \,\text{ArcSinh}[c x]\right)}{16 (-1-i c x)}-\frac{\text{ArcSinh}[c x]}{c x}-\frac{7 \left(i \sqrt{1+c^2 x^2}+\text{ArcSinh}[c x]\right)}{16 (i+c x)}+\frac{i \left((-2 i+c x) \sqrt{1+c^2 x^2}+3 \,\text{ArcSinh}[c x]\right)}{48 (-i+c x)^2}-\frac{i \left((2 i+c x) \sqrt{1+c^2 x^2}+3 \,\text{ArcSinh}[c x]\right)}{48 (i+c x)^2}+\text{Log}[c x]-\text{Log}\left[1+\sqrt{1+c^2 x^2}\right]-\frac{15}{32} i \left(3 i \pi \,\text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+(2 i \pi+4 \,\text{ArcSinh}[c x]) \,\text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi \,\text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]-2 i \pi \,\text{Log}\left[-\text{Cos}\left[\frac{1}{4} (\pi+2 i \,\text{ArcSinh}[c x])\right]\right]+4 i \pi \,\text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-4 \,\text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]\right)+\frac{15}{32} i \left(i \pi \,\text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+(-2 i \pi+4 \,\text{ArcSinh}[c x]) \,\text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi \,\text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]+4 i \pi \,\text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+2 i \pi \,\text{Log}\left[\text{Sin}\left[\frac{1}{4} (\pi+2 i \,\text{ArcSinh}[c x])\right]\right]-4 \,\text{PolyLog}\left[2,i e^{-\text{ArcSinh}[c x]}\right]\right)\right)+$$

$$\frac{1}{24 d^3} b^2 c \left(\frac{2 c x}{1+c^2 x^2}-\frac{4 \,\text{ArcSinh}[c x]}{\left(1+c^2 x^2\right)^{3/2}}-\frac{42 \,\text{ArcSinh}[c x]}{\sqrt{1+c^2 x^2}}-\frac{6 c x \,\text{ArcSinh}[c x]^2}{\left(1+c^2 x^2\right)^2}-\frac{21 c x \,\text{ArcSinh}[c x]^2}{1+c^2 x^2}+88 \,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-12 \,\text{ArcSinh}[c x]^2 \,\text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]+48 \,\text{ArcSinh}[c x] \,\text{Log}\left[1-e^{-\text{ArcSinh}[c x]}\right]+45 i \,\text{ArcSinh}[c x]^2 \,\text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]-45 i \,\text{ArcSinh}[c x]^2 \,\text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-48 \,\text{ArcSinh}[c x] \,\text{Log}\left[1+e^{-\text{ArcSinh}[c x]}\right]+48 \,\text{PolyLog}\left[2,-e^{-\text{ArcSinh}[c x]}\right]+90 i \,\text{ArcSinh}[c x] \,\text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]-90 i \,\text{ArcSinh}[c x] \,\text{PolyLog}\left[2,i e^{-\text{ArcSinh}[c x]}\right]-48 \,\text{PolyLog}\left[2,e^{-\text{ArcSinh}[c x]}\right]+90 i \,\text{PolyLog}\left[3,-i e^{-\text{ArcSinh}[c x]}\right]-90 i \,\text{PolyLog}\left[3,i e^{-\text{ArcSinh}[c x]}\right]+12 \,\text{ArcSinh}[c x]^2 \,\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right)$$

Problem 185: 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) :

$$-\frac{a^2}{2 d^3 x^2}-\frac{a^2 c^2}{4 d^3 \left(1+c^2 x^2\right)^2}-\frac{a^2 c^2}{d^3 \left(1+c^2 x^2\right)}-\frac{3 a^2 c^2 \text{Log}[x]}{d^3}+\frac{3 a^2 c^2 \text{Log}\left[1+c^2 x^2\right]}{2 d^3}+\frac{1}{d^3}2 a b \left(-\frac{c^2 \left(\left(2 i-c x\right) \sqrt{1+c^2 x^2}-3 \text{ArcSinh}[c x]\right)}{48 \left(-i+c x\right)^2}-\frac{9 i c^2 \left(\sqrt{1+c^2 x^2}+i \text{ArcSinh}[c x]\right)}{16 \left(-1-i c x\right)}-\frac{9 i c^3 \left(i \sqrt{1+c^2 x^2}+\text{ArcSinh}[c x]\right)}{16 \left(i c+c^2 x\right)}-\frac{c x \sqrt{1+c^2 x^2}+\text{ArcSinh}[c x]}{2 x^2}+\frac{c^2 \left(\left(2 i+c x\right) \sqrt{1+c^2 x^2}+3 \text{ArcSinh}[c x]\right)}{48 \left(i+c x\right)^2}-\frac{3}{2} c^2 \left(\text{ArcSinh}[c x] \left(\text{ArcSinh}[c x]+2 \text{Log}\left[1-e^{-2 \text{ArcSinh}[c x]}\right]\right)-\text{PolyLog}\left[2, e^{-2 \text{ArcSinh}[c x]}\right]\right)+\frac{3}{4} c^2 \left(3 i \pi \text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+\left(2 i \pi+4 \text{ArcSinh}[c x]\right) \text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]-2 i \pi \text{Log}\left[-\text{Cos}\left[\frac{1}{4} \left(\pi+2 i \text{ArcSinh}[c x]\right)\right]\right]+4 i \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-4 \text{PolyLog}\left[2, -i e^{-\text{ArcSinh}[c x]}\right]\right)+\frac{3}{4} c^2 \left(i \pi \text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+\left(-2 i \pi+4 \text{ArcSinh}[c x]\right) \text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]-4 i \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]+4 i \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+2 i \pi \text{Log}\left[\text{Sin}\left[\frac{1}{4} \left(\pi+2 i \text{ArcSinh}[c x]\right)\right]\right]-4 \text{PolyLog}\left[2, i e^{-\text{ArcSinh}[c x]}\right]\right)\right)+$$

$$\frac{1}{d^3} b^2 c^2 \left(-3 \text{ArcSinh}[c x] \text{PolyLog}\left[2, -e^{-2 \text{ArcSinh}[c x]}\right]-3 \text{ArcSinh}[c x] \text{PolyLog}\left[2, e^{2 \text{ArcSinh}[c x]}\right]+\frac{1}{24} \left(-3 i \pi^3+\frac{2}{1+c^2 x^2}+\frac{4 c x \text{ArcSinh}[c x]}{\left(1+c^2 x^2\right)^{3/2}}+\frac{56 c x \text{ArcSinh}[c x]}{\sqrt{1+c^2 x^2}}-\frac{24 \sqrt{1+c^2 x^2} \text{ArcSinh}[c x]}{c x}-\frac{12 \text{ArcSinh}[c x]^2}{c^2 x^2}-\frac{6 \text{ArcSinh}[c x]^2}{\left(1+c^2 x^2\right)^2}-\frac{24 \text{ArcSinh}[c x]^2}{1+c^2 x^2}+48 \text{ArcSinh}[c x]^3+72 \text{ArcSinh}[c x]^2 \text{Log}\left[1+e^{-2 \text{ArcSinh}[c x]}\right]-72 \text{ArcSinh}[c x]^2 \text{Log}\left[1-e^{2 \text{ArcSinh}[c x]}\right]+24 \text{Log}[c x]-56 \text{Log}\left[\sqrt{1+c^2 x^2}\right]-36 \text{PolyLog}\left[3, -e^{-2 \text{ArcSinh}[c x]}\right]+36 \text{PolyLog}\left[3, e^{2 \text{ArcSinh}[c x]}\right]\right)\right)$$

Problem 186: 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):

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

Result (type 4, 1161 leaves):

$$-\frac{a^2}{3 d^3 x^3}+\frac{3 a^2 c^2}{d^3 x}+\frac{a^2 c^4 x}{4 d^3 \left(1+c^2 x^2\right)^2}+\frac{11 a^2 c^4 x}{8 d^3 \left(1+c^2 x^2\right)}+\frac{35 a^2 c^3 \text{ArcTan}[c x]}{8 d^3}+$$
$$\frac{1}{d^3} 2 a b \left(-\frac{c \sqrt{1+c^2 x^2}}{6 x^2}+\frac{i c^3 \left(\left(2 i-c x\right) \sqrt{1+c^2 x^2}-3 \text{ArcSinh}[c x]\right)}{48 \left(-i+c x\right)^2}-\right.$$
$$\frac{11 c^3 \left(\sqrt{1+c^2 x^2}+i \text{ArcSinh}[c x]\right)}{16 \left(-1-i c x\right)}-\frac{\text{ArcSinh}[c x]}{3 x^3}+\frac{11 c^4 \left(i \sqrt{1+c^2 x^2}+\text{ArcSinh}[c x]\right)}{16 \left(i c+c^2 x\right)}+$$
$$\frac{i c^3 \left(\left(2 i+c x\right) \sqrt{1+c^2 x^2}+3 \text{ArcSinh}[c x]\right)}{48 \left(i+c x\right)^2}-\frac{1}{6} c^3 \text{Log}[x]+$$
$$\frac{1}{6} c^3 \text{Log}\left[1+\sqrt{1+c^2 x^2}\right]-3 c^2 \left(-\frac{\text{ArcSinh}[c x]}{x}+c \text{Log}[x]-c \text{Log}\left[1+\sqrt{1+c^2 x^2}\right]\right)+$$
$$\frac{35}{32} i c^3 \left(3 i \pi \text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+\left(2 i \pi+4 \text{ArcSinh}[c x]\right) \text{Log}\left[1+i e^{-\text{ArcSinh}[c x]}\right]-\right.$$
$$4 i \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]-2 i \pi \text{Log}\left[-\text{Cos}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[c x]\right)\right]\right]+$$
$$\left.4 i \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]-4 \text{PolyLog}\left[2,-i e^{-\text{ArcSinh}[c x]}\right]\right)-$$
$$\frac{35}{32} i c^3 \left(i \pi \text{ArcSinh}[c x]+\text{ArcSinh}[c x]^2+\left(-2 i \pi+4 \text{ArcSinh}[c x]\right) \text{Log}\left[1-i e^{-\text{ArcSinh}[c x]}\right]-\right.$$
$$4 i \pi \text{Log}\left[1+e^{\text{ArcSinh}[c x]}\right]+4 i \pi \text{Log}\left[\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right]+$$

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

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

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

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

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

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

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

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

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

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

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

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

$$\frac{1}{12}\text{ArcSinh}[c\,x]\,\text{Sech}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]^2+\frac{1}{12}\text{Sech}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]$$

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

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

Problem 260: Result more than twice size of optimal antiderivative.

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

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):

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

Problem 277: 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):

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

Result (type 4, 97 leaves):

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

Problem 386: Attempted integration timed out after 120 seconds.

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

Optimal (type 8, 28 leaves, 0 steps):

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

Result (type 1, 1 leaves):

???

Problem 391: Attempted integration timed out after 120 seconds.

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

Optimal (type 8, 30 leaves, 0 steps):

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

Result (type 1, 1 leaves):

???

Problem 393: Attempted integration timed out after 120 seconds.

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

Optimal (type 8, 28 leaves, 0 steps):

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

Result (type 1, 1 leaves):

???

Problem 395: Attempted integration timed out after 120 seconds.

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

Optimal (type 8, 30 leaves, 0 steps):

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

Result (type 1, 1 leaves):

???

Problem 481: Result more than twice size of optimal antiderivative.

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

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

$$\frac{4\,\mathrm{i}\,b\,f^4\,\left(1+c^2\,x^2\right)^{5/2}}{3\,c\,\left(\mathrm{i}-c\,x\right)\,\left(d+\mathrm{i}\,c\,d\,x\right)^{5/2}\,\left(f-\mathrm{i}\,c\,f\,x\right)^{5/2}}-$$

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

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

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

Result (type 3, 876 leaves) :

$$\frac{\sqrt{i d (-i + c x)}\ \sqrt{-i f (i + c x)}\ \left(-\frac{4 i a f}{3 d^3 (-i+c x)^2} - \frac{8 a f}{3 d^3 (-i+c x)}\right)}{c} +$$

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

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

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

Problem 487: 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):

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

Result (type 3, 1412 leaves):

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

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

$$\Bigg(b f^2 \sqrt{i (-i d + c d x)} \sqrt{-i (i f + c f x)} \sqrt{-d f (1 + c^2 x^2)} \left(\text{Cosh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right] - i \text{Sinh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]\right) \left(\text{Cosh}\left[\frac{3}{2} \text{ArcSinh}[c x]\right] \Big((-14 + 3 i \text{ArcSinh}[c x]) \text{ArcSinh}[c x] -$$

$$28\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+14\,\mathrm{i}\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\Big)+$$

$$\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\,\Big(84\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]-$$

$$\mathrm{i}\,\left(8-6\,\mathrm{i}\,\text{ArcSinh}[c\,x]+9\,\text{ArcSinh}[c\,x]^2+42\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\right)\Big)+$$

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

$$28\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]+\sqrt{1+c^2\,x^2}\,\Big(\text{ArcSinh}[c\,x]\,\left(-14\,\mathrm{i}+3\,\text{ArcSinh}[c\,x]\right)+$$

$$28\,\mathrm{i}\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+14\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\Big)\Big)$$

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

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

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

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

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

$$\text{Cosh}\left[\frac{3}{2}\,\text{ArcSinh}[c\,x]\right]\,\Big(9+35\,\mathrm{i}\,\text{ArcSinh}[c\,x]+9\,\text{ArcSinh}[c\,x]^2-$$

$$52\,\mathrm{i}\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+26\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\Big)+$$

$$\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\,\Big(20-24\,\mathrm{i}\,\text{ArcSinh}[c\,x]+27\,\text{ArcSinh}[c\,x]^2-156\,\mathrm{i}$$

$$\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]+78\,\text{Log}\left[\sqrt{1+c^2\,x^2}\right]\Big)+20\,\mathrm{i}\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]-$$

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

$$156\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+$$

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

$$35\,\text{ArcSinh}[c\,x]\,\text{Sinh}\left[\frac{3}{2}\,\text{ArcSinh}[c\,x]\right]+9\,\mathrm{i}\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{3}{2}\,\text{ArcSinh}[c\,x]\right]+$$

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

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

$$3\,\mathrm{i}\,\text{Sinh}\left[\frac{5}{2}\,\text{ArcSinh}[c\,x]\right]+3\,\text{ArcSinh}[c\,x]\,\text{Sinh}\left[\frac{5}{2}\,\text{ArcSinh}[c\,x]\right]\Big)\Big)\Big/$$

$$\Big(12\,c\,d^3\,\left(\mathrm{i}+c\,x\right)\,\sqrt{-\left(-\mathrm{i}\,d+c\,d\,x\right)\,\left(\mathrm{i}\,f+c\,f\,x\right)}$$

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

Problem 500: 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):

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

Result (type 3, 1331 leaves):

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

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

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

$$\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)$$
$$\left(\text{Cosh}\left[\frac{3}{2}\text{ArcSinh}[c\,x]\right]\left(\left(14\,i-3\,\text{ArcSinh}[c\,x]\right)\text{ArcSinh}[c\,x]+\right.\right.$$
$$\left.28\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]-14\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)+$$
$$\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\left(8+6\,i\,\text{ArcSinh}[c\,x]+9\,\text{ArcSinh}[c\,x]^2-\right.$$
$$\left.84\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+42\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)-$$
$$2\,i\left(4+4\,i\,\text{ArcSinh}[c\,x]+6\,\text{ArcSinh}[c\,x]^2-56\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+\right.$$
$$28\,\text{Log}\left[\sqrt{1+c^2x^2}\right]+\sqrt{1+c^2x^2}\left(\text{ArcSinh}[c\,x]\left(14\,i+3\,\text{ArcSinh}[c\,x]\right)-\right.$$
$$\left.\left.28\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+14\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)\right)$$
$$\left.\left.\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)\right)\Big/\left(6\,c\,f^3\left(1+i\,c\,x\right)\sqrt{-\left(-i\,d+c\,d\,x\right)\left(i\,f+c\,f\,x\right)}\right.$$
$$\left.\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)^4\right)-$$
$$\left(i\,b\,d^2\sqrt{i\left(-i\,d+c\,d\,x\right)}\sqrt{-i\left(i\,f+c\,f\,x\right)}\sqrt{-d\,f\left(1+c^2x^2\right)}\right.$$
$$\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)$$
$$\left(-\text{Cosh}\left[\frac{3}{2}\text{ArcSinh}[c\,x]\right]\left(9-35\,i\,\text{ArcSinh}[c\,x]+9\,\text{ArcSinh}[c\,x]^2+\right.\right.$$
$$\left.52\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+26\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)+\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]$$
$$\left(20+24\,i\,\text{ArcSinh}[c\,x]+27\,\text{ArcSinh}[c\,x]^2+156\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+\right.$$
$$\left.78\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)-i\left(3\left(-i+\text{ArcSinh}[c\,x]\right)\text{Cosh}\left[\frac{5}{2}\text{ArcSinh}[c\,x]\right]+\right.$$
$$2\left(13+7\,i\,\text{ArcSinh}[c\,x]+18\,\text{ArcSinh}[c\,x]^2+104\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+\right.$$
$$3\,i\left(i+\text{ArcSinh}[c\,x]\right)\text{Cosh}[2\,\text{ArcSinh}[c\,x]]+52\,\text{Log}\left[\sqrt{1+c^2x^2}\right]+\sqrt{1+c^2x^2}$$
$$\left(6+38\,i\,\text{ArcSinh}[c\,x]+9\,\text{ArcSinh}[c\,x]^2+52\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+26\right.$$
$$\left.\left.\left.\left.\left.\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)\right)\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)\right)\right)\Big/\left(12\,c\,f^3\left(-i+c\,x\right)\right.$$
$$\left.\sqrt{-\left(-i\,d+c\,d\,x\right)\left(i\,f+c\,f\,x\right)}\left(\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right)^4\right)$$

Problem 501: Result more than twice size of optimal antiderivative.

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

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

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

Result (type 3, 877 leaves):

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

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

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

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

Problem 516: 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):

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

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

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

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

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

$$\mathrm{i}\,\Bigg(\text{ArcSinh}[c\, x]\,\left(4\,\mathrm{i}+\text{ArcSinh}[c\, x]\right)+8\,\mathrm{i}\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\,\text{ArcSinh}[c\, x]\right]\right]+$$

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

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

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

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

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

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

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

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

$$\text{Log}\left[1-\mathrm{i}\,\mathrm{e}^{-\text{ArcSinh}[c\, x]}\right]+24\,\pi\,\text{Log}\left[1+\mathrm{e}^{\text{ArcSinh}[c\, x]}\right]-24\,\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\, x]\right]\right]-$$

$$12\,\pi\,\text{Log}\left[\text{Sin}\left[\frac{1}{4}\,\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\, x]\right)\right]\right]\Bigg)\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\, x]\right]\Bigg)\Bigg)\Bigg/$$

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

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

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

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

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

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

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

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

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

$$\text{Log}\left[1-\mathrm{i}\,\mathrm{e}^{-\text{ArcSinh}[c\, x]}\right]+24\,\pi\,\text{Log}\left[1+\mathrm{e}^{\text{ArcSinh}[c\, x]}\right]-24\,\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\, x]\right]\right]-$$

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

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

$$\left(3\,c\,d^2\sqrt{-\left(-i\,d+c\,d\,x\right)\left(i\,f+c\,f\,x\right)}\,\sqrt{1+c^2\,x^2}\right.$$

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

Problem 517: Result more than twice size of optimal antiderivative.

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

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

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

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

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

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

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

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

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

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

Result (type 4, 1609 leaves):

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

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

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

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

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

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

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

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

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

$$\left(3\,c\,d^3\,\sqrt{-\left(-i\,d + c\,d\,x\right)\,\left(i\,f + c\,f\,x\right)}\,\sqrt{1 + c^2\,x^2}\right.$$

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

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

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

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

$$28\,\pi\,\text{Log}\left[1 + e^{\text{ArcSinh}[c\,x]}\right] + 28\,\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right] +$$

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

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

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

$$\left(3\,c\,d^3\,\sqrt{-\left(-i\,d + c\,d\,x\right)\,\left(i\,f + c\,f\,x\right)}\,\sqrt{1 + c^2\,x^2}\right.$$

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

Problem 522: Result more than twice size of optimal antiderivative.

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 4, 2492 leaves):

$$\frac{\sqrt{i\,d\,\left(-i+c\,x\right)}\,\sqrt{-i\,f\,\left(i+c\,x\right)}\,\left(\frac{4\,i\,a^2\,f^2}{d^2}+\frac{a^2\,c\,f^2\,x}{2\,d^2}+\frac{8\,a^2\,f^2}{d^2\,\left(-i+c\,x\right)}\right)}{c}-$$

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

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

$$\left(a\,b\,f^2\sqrt{\mathrm{i}\,(-\mathrm{i}\,d+c\,d\,x)}\,\sqrt{-\mathrm{i}\,(\mathrm{i}\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2x^2)}\right.$$
$$\left(\mathrm{Cosh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\left(\mathrm{ArcSinh}[c\,x]\,(-4\,\mathrm{i}+\mathrm{ArcSinh}[c\,x])+\right.\right.$$
$$\left.8\,\mathrm{i}\,\mathrm{ArcTan}\left[\mathrm{Tanh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]+4\,\mathrm{Log}\left[\sqrt{1+c^2x^2}\right]\right)+$$
$$\mathrm{i}\left(\mathrm{ArcSinh}[c\,x]\,(4\,\mathrm{i}+\mathrm{ArcSinh}[c\,x])+8\,\mathrm{i}\,\mathrm{ArcTan}\left[\mathrm{Tanh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]+\right.$$
$$\left.\left.\left.4\,\mathrm{Log}\left[\sqrt{1+c^2x^2}\right]\right)\mathrm{Sinh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)\right)\Big/\left(c\,d^2\sqrt{-(-\mathrm{i}\,d+c\,d\,x)\,(\mathrm{i}\,f+c\,f\,x)}\right.$$
$$\left.\sqrt{1+c^2x^2}\left(\mathrm{Cosh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]+\mathrm{i}\,\mathrm{Sinh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)\right)-$$
$$\left(b^2f^2\sqrt{\mathrm{i}\,(-\mathrm{i}\,d+c\,d\,x)}\,\sqrt{-\mathrm{i}\,(\mathrm{i}\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2x^2)}\right.$$
$$\left(\mathrm{Cosh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\left(6\,\mathrm{i}\,\pi\,\mathrm{ArcSinh}[c\,x]+(6-6\,\mathrm{i})\,\mathrm{ArcSinh}[c\,x]^2+\mathrm{ArcSinh}[c\,x]^3+\right.\right.$$
$$12\,(-\mathrm{i}\,\pi+2\,\mathrm{ArcSinh}[c\,x])\,\mathrm{Log}\left[1-\mathrm{i}\,e^{-\mathrm{ArcSinh}[c\,x]}\right]-24\,\mathrm{i}\,\pi\,\mathrm{Log}\left[1+e^{\mathrm{ArcSinh}[c\,x]}\right]+$$
$$\left.24\,\mathrm{i}\,\pi\,\mathrm{Log}\left[\mathrm{Cosh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]+12\,\mathrm{i}\,\pi\,\mathrm{Log}\left[\mathrm{Sin}\left[\tfrac{1}{4}(\pi+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x])\right]\right]\right)-$$
$$24\,\mathrm{PolyLog}\left[2,\mathrm{i}\,e^{-\mathrm{ArcSinh}[c\,x]}\right]\left(\mathrm{Cosh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]+\mathrm{i}\,\mathrm{Sinh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)+$$
$$\left(-6\,\pi\,\mathrm{ArcSinh}[c\,x]-(6-6\,\mathrm{i})\,\mathrm{ArcSinh}[c\,x]^2+\mathrm{i}\,\mathrm{ArcSinh}[c\,x]^3+12\,(\pi+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x])\right.$$
$$\mathrm{Log}\left[1-\mathrm{i}\,e^{-\mathrm{ArcSinh}[c\,x]}\right]+24\,\pi\,\mathrm{Log}\left[1+e^{\mathrm{ArcSinh}[c\,x]}\right]-24\,\pi\,\mathrm{Log}\left[\mathrm{Cosh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]-$$
$$\left.\left.\left.12\,\pi\,\mathrm{Log}\left[\mathrm{Sin}\left[\tfrac{1}{4}(\pi+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x])\right]\right]\right)\mathrm{Sinh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)\right)\Big/$$
$$\left(3\,c\,d^2\sqrt{-(-\mathrm{i}\,d+c\,d\,x)\,(\mathrm{i}\,f+c\,f\,x)}\,\sqrt{1+c^2x^2}\left(\mathrm{Cosh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]+\right.\right.$$
$$\left.\left.\mathrm{i}\,\mathrm{Sinh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right)\right)+$$
$$\left(2\,\mathrm{i}\,b^2f^2\sqrt{\mathrm{i}\,(-\mathrm{i}\,d+c\,d\,x)}\,\sqrt{-\mathrm{i}\,(\mathrm{i}\,f+c\,f\,x)}\,\sqrt{-d\,f\,(1+c^2x^2)}\right.$$
$$\left(\mathrm{Cosh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\left(-6\,\pi\,\mathrm{ArcSinh}[c\,x]-6\,c\,x\,\mathrm{ArcSinh}[c\,x]+(6+6\,\mathrm{i})\,\mathrm{ArcSinh}[c\,x]^2+\right.\right.$$
$$2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]^3+3\sqrt{1+c^2x^2}\,(2+\mathrm{ArcSinh}[c\,x]^2)+12\,\pi\,\mathrm{Log}\left[1-\mathrm{i}\,e^{-\mathrm{ArcSinh}[c\,x]}\right]+$$
$$24\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]\,\mathrm{Log}\left[1-\mathrm{i}\,e^{-\mathrm{ArcSinh}[c\,x]}\right]+24\,\pi\,\mathrm{Log}\left[1+e^{\mathrm{ArcSinh}[c\,x]}\right]-$$
$$\left.24\,\pi\,\mathrm{Log}\left[\mathrm{Cosh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]-12\,\pi\,\mathrm{Log}\left[\mathrm{Sin}\left[\tfrac{1}{4}(\pi+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x])\right]\right]\right)+$$
$$\mathrm{i}\left(-6\,\pi\,\mathrm{ArcSinh}[c\,x]-6\,c\,x\,\mathrm{ArcSinh}[c\,x]-(6-6\,\mathrm{i})\,\mathrm{ArcSinh}[c\,x]^2+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]^3+\right.$$
$$3\sqrt{1+c^2x^2}\,(2+\mathrm{ArcSinh}[c\,x]^2)+12\,\pi\,\mathrm{Log}\left[1-\mathrm{i}\,e^{-\mathrm{ArcSinh}[c\,x]}\right]+24\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]$$
$$\mathrm{Log}\left[1-\mathrm{i}\,e^{-\mathrm{ArcSinh}[c\,x]}\right]+24\,\pi\,\mathrm{Log}\left[1+e^{\mathrm{ArcSinh}[c\,x]}\right]-24\,\pi\,\mathrm{Log}\left[\mathrm{Cosh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]\right]-$$
$$\left.12\,\pi\,\mathrm{Log}\left[\mathrm{Sin}\left[\tfrac{1}{4}(\pi+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x])\right]\right]\right)\mathrm{Sinh}\left[\tfrac{1}{2}\mathrm{ArcSinh}[c\,x]\right]+$$

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

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

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

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

$$\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\Bigg(24\,\pi\,\text{ArcSinh}[c\,x]+48\,c\,x\,\text{ArcSinh}[c\,x]+(24-24\,i)\,\text{ArcSinh}[c\,x]^2-$$

$$10\,i\,\text{ArcSinh}[c\,x]^3+3\,i\sqrt{1+c^2 x^2}\left(c\,x+8\,i\left(2+\text{ArcSinh}[c\,x]^2\right)\right)-$$

$$3\,i\,\text{ArcSinh}[c\,x]\,\text{Cosh}[2\,\text{ArcSinh}[c\,x]]-48\,\pi\,\text{Log}\left[1-i\,e^{-\text{ArcSinh}[c\,x]}\right]-96\,i\,\text{ArcSinh}[c\,x]$$

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

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

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

$$3\,\text{ArcSinh}[c\,x]\,\text{Cosh}[2\,\text{ArcSinh}[c\,x]]-i\,\Bigg(24\,\pi\,\text{ArcSinh}[c\,x]+48\,c\,x\,\text{ArcSinh}[c\,x]-$$

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

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

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

$$3\,i\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}[2\,\text{ArcSinh}[c\,x]]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

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

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

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

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

$$2\Bigg(8\,i\,c\,x+8\,i\,\text{ArcSinh}[c\,x]+5\,\text{ArcSinh}[c\,x]^2+16\,i\,\text{ArcTan}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+$$

$$8\,\text{Log}\left[\sqrt{1+c^2 x^2}\right]-\text{ArcSinh}[c\,x]\,\text{Sinh}[2\,\text{ArcSinh}[c\,x]]\Bigg)\Bigg)+$$

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

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

$$8\,\text{Log}\left[\sqrt{1+c^2 x^2}\right]-\text{ArcSinh}[c\,x]\,\text{Sinh}[2\,\text{ArcSinh}[c\,x]]\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

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

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

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

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

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

Result (type 4, 2622 leaves):

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

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

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

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

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

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

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

$$\left(3\,c\,d^3\sqrt{-\left(-\mathrm{i}\,d+c\,d\,x\right)\left(\mathrm{i}\,f+c\,f\,x\right)}\,\sqrt{1+c^2\,x^2}\right.$$

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

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

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

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

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

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

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

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

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

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

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

$$\left(7\,\pi\,\text{ArcSinh}[c\,x]-\left(7+7\,\mathrm{i}\right)\text{ArcSinh}[c\,x]^2-\mathrm{i}\,\text{ArcSinh}[c\,x]^3+\right.$$

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

$$28\,\pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]+28\,\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+$$

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

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

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

$$\left(3\,c\,d^3\sqrt{-\left(-i\,d+c\,d\,x\right)\left(i\,f+c\,f\,x\right)}\,\sqrt{1+c^2x^2}\right.$$

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

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

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

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

$$\text{Cosh}\left[\frac{3}{2}\text{ArcSinh}[c\,x]\right]\left(9+35\,i\,\text{ArcSinh}[c\,x]+9\,\text{ArcSinh}[c\,x]^2-\right.$$

$$\left.52\,i\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+26\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)+$$

$$\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\left(20-24\,i\,\text{ArcSinh}[c\,x]+27\,\text{ArcSinh}[c\,x]^2-156\,i\right.$$

$$\left.\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]+78\,\text{Log}\left[\sqrt{1+c^2x^2}\right]\right)+20\,i\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]-$$

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

$$156\,\text{ArcTan}\left[\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\right]\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]+$$

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

$$35\,\text{ArcSinh}[c\,x]\,\text{Sinh}\left[\frac{3}{2}\text{ArcSinh}[c\,x]\right]+9\,i\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{3}{2}\text{ArcSinh}[c\,x]\right]+$$

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

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

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

$$\left(6\,c\,d^3\left(i+c\,x\right)\sqrt{-\left(-i\,d+c\,d\,x\right)\left(i\,f+c\,f\,x\right)}\right.$$

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

Problem 527: Result more than twice size of optimal antiderivative.

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

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

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

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 530: 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):

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

Result (type 4, 2143 leaves):

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

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

$$\Big(\text{Cosh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\,\Big(8\,\text{ArcTan}\Big[\text{Tanh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big]+$$

$$i\,\Big(\text{ArcSinh}[c\,x]\,(4\,i+\text{ArcSinh}[c\,x])+4\,\text{Log}\Big[\sqrt{1+c^2x^2}\Big]\Big)\Big)+$$

$$\Big(\text{ArcSinh}[c\,x]\,(-4\,i+\text{ArcSinh}[c\,x])-8\,i\,\text{ArcTan}\Big[\text{Tanh}\Big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\Big]\Big]+$$

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

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

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

$$\Big(-18\,\pi\,\text{ArcSinh}[c\,x]-(6-6\,i)\,\text{ArcSinh}[c\,x]^2+i\,\text{ArcSinh}[c\,x]^3-$$

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

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

$$24\,i\,\text{PolyLog}\Big[2,-i\,e^{-\text{ArcSinh}[c\,x]}\Big]-\frac{12\,i\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]}{\text{Cosh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]-i\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]}\Big)\Bigg)\Big/$$

$$\Bigg(3\,c\,f^2\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\sqrt{1+c^2x^2}$$

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

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

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

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

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

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

$$\frac{12\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]}{\sqrt{1+c^2x^2}\,\big(\text{Cosh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]-i\,\text{Sinh}\big[\frac{1}{2}\,\text{ArcSinh}[c\,x]\big]\big)}\Big)\Bigg)\Big/$$

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

$$\Bigg(b^2 d^2 (-i + c x) \sqrt{i(-i d + c d x)} \sqrt{-i(i f + c f x)} \sqrt{-d f (1 + c^2 x^2)} \Bigg(-\frac{96 c x \text{ArcSinh}[c x]}{\sqrt{1+c^2 x^2}} + \frac{(48 - 48 i) \text{ArcSinh}[c x]^2}{\sqrt{1+c^2 x^2}} - \frac{20 i \text{ArcSinh}[c x]^3}{\sqrt{1+c^2 x^2}} + \frac{48 (2 + \text{ArcSinh}[c x]^2) + 6 i c x (1 + 2 \text{ArcSinh}[c x]^2) - 6 i \text{ArcSinh}[c x] \text{Cosh}[2 \text{ArcSinh}[c x]]}{\sqrt{1+c^2 x^2}} + \frac{1}{\sqrt{1+c^2 x^2}} 48 \Big(2 (\pi - 2 i \text{ArcSinh}[c x]) \text{Log}[1 + i e^{-\text{ArcSinh}[c x]}] + \pi \Big(3 \text{ArcSinh}[c x] - 4 \text{Log}[1 + e^{\text{ArcSinh}[c x]}] - 2 \text{Log}[-\text{Cos}[\frac{1}{4}(\pi + 2 i \text{ArcSinh}[c x])]] + 4 \text{Log}[\text{Cosh}[\frac{1}{2} \text{ArcSinh}[c x]]]\Big) + 4 i \text{PolyLog}[2, -i e^{-\text{ArcSinh}[c x]}]\Big) + \frac{96 i \text{ArcSinh}[c x]^2 \text{Sinh}[\frac{1}{2} \text{ArcSinh}[c x]]}{\sqrt{1+c^2 x^2} \left(\text{Cosh}[\frac{1}{2} \text{ArcSinh}[c x]] - i \text{Sinh}[\frac{1}{2} \text{ArcSinh}[c x]]\right)}\Bigg)\Bigg) \Big/ \left(24 c f^2 \sqrt{-(-i d + c d x)(i f + c f x)} \left(\text{Cosh}[\frac{1}{2} \text{ArcSinh}[c x]] + i \text{Sinh}[\frac{1}{2} \text{ArcSinh}[c x]]\right)^2\right) +$$

$$\Bigg(a b d^2 \sqrt{i(-i d + c d x)} \sqrt{-i(i f + c f x)} \sqrt{-d f (1 + c^2 x^2)} \Bigg(\text{Sinh}[\frac{1}{2} \text{ArcSinh}[c x]] \Big(-16 \sqrt{1+c^2 x^2} \text{ArcSinh}[c x] + i \text{Cosh}[2 \text{ArcSinh}[c x]] + 2 \Big(8 c x + 8 \text{ArcSinh}[c x] + 5 i \text{ArcSinh}[c x]^2 + 16 \text{ArcTan}[\text{Tanh}[\frac{1}{2} \text{ArcSinh}[c x]]] + 8 i \text{Log}[\sqrt{1+c^2 x^2}] - i \text{ArcSinh}[c x] \text{Sinh}[2 \text{ArcSinh}[c x]]\Big)\Big) - \text{Cosh}[\frac{1}{2} \text{ArcSinh}[c x]] \Big(16 i \sqrt{1+c^2 x^2} \text{ArcSinh}[c x] + \text{Cosh}[2 \text{ArcSinh}[c x]] - 2 \Big(8 i c x - 8 i \text{ArcSinh}[c x] - 5 \text{ArcSinh}[c x]^2 + 16 i \text{ArcTan}[\text{Tanh}[\frac{1}{2} \text{ArcSinh}[c x]]] - 8 \text{Log}[\sqrt{1+c^2 x^2}] + \text{ArcSinh}[c x] \text{Sinh}[2 \text{ArcSinh}[c x]]\Big)\Big)\Bigg)\Bigg) \Big/ \left(4 c f^2 \sqrt{-(-i d + c d x)(i f + c f x)} \sqrt{1+c^2 x^2} \left(\text{Cosh}[\frac{1}{2} \text{ArcSinh}[c x]] - i \text{Sinh}[\frac{1}{2} \text{ArcSinh}[c x]]\right)\right)$$

Problem 534: 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):

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

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 536: Result more than twice size of optimal antiderivative.

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

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

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

Result (type 4, 2552 leaves):

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

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

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

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

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

$$\Bigg(\text{Cosh}\left[\frac{3}{2}\text{ArcSinh}[c\,x]\right]\Bigg((14\,i-3\,\text{ArcSinh}[c\,x])\,\text{ArcSinh}[c\,x]+$$

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

$$\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]\Bigg(8+6\,i\,\text{ArcSinh}[c\,x]+9\,\text{ArcSinh}[c\,x]^2-$$

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

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

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

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

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

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

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

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

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

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

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

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

$$\left(3\,c\,f^3\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\sqrt{1+c^2\,x^2}\right.$$

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

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

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

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

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

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

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

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

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

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

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

$$\Bigg(-21\,\pi\,\text{ArcSinh}[c\,x]-(7-7\,i)\,\text{ArcSinh}[c\,x]^2+i\,\text{ArcSinh}[c\,x]^3+$$

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

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

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

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

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

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

$$\left(\mathrm{i}\,a\,b\,d^2\sqrt{\mathrm{i}\left(-\mathrm{i}\,d+c\,d\,x\right)}\sqrt{-\mathrm{i}\left(\mathrm{i}\,f+c\,f\,x\right)}\sqrt{-d\,f\left(1+c^2x^2\right)}\left(\mathrm{Cosh}\left[\frac{1}{2}\,\mathrm{ArcSinh}[c\,x]\right]+\mathrm{i}\,\mathrm{Sinh}\left[\frac{1}{2}\,\mathrm{ArcSinh}[c\,x]\right]\right)\right.$$
$$\left(-\mathrm{Cosh}\left[\frac{3}{2}\,\mathrm{ArcSinh}[c\,x]\right]\left(9-35\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]+9\,\mathrm{ArcSinh}[c\,x]^2+\right.\right.$$
$$\left.52\,\mathrm{i}\,\mathrm{ArcTan}\left[\mathrm{Coth}\left[\frac{1}{2}\,\mathrm{ArcSinh}[c\,x]\right]\right]+26\,\mathrm{Log}\left[\sqrt{1+c^2x^2}\right]\right)+\mathrm{Cosh}\left[\frac{1}{2}\,\mathrm{ArcSinh}[c\,x]\right]$$
$$\left(20+24\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]+27\,\mathrm{ArcSinh}[c\,x]^2+156\,\mathrm{i}\,\mathrm{ArcTan}\left[\mathrm{Coth}\left[\frac{1}{2}\,\mathrm{ArcSinh}[c\,x]\right]\right]+\right.$$
$$\left.78\,\mathrm{Log}\left[\sqrt{1+c^2x^2}\right]\right)-\mathrm{i}\left(3\left(-\mathrm{i}+\mathrm{ArcSinh}[c\,x]\right)\mathrm{Cosh}\left[\frac{5}{2}\,\mathrm{ArcSinh}[c\,x]\right]+\right.$$
$$2\left(13+7\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]+18\,\mathrm{ArcSinh}[c\,x]^2+104\,\mathrm{i}\,\mathrm{ArcTan}\left[\mathrm{Coth}\left[\frac{1}{2}\,\mathrm{ArcSinh}[c\,x]\right]\right]+\right.$$
$$3\,\mathrm{i}\left(\mathrm{i}+\mathrm{ArcSinh}[c\,x]\right)\mathrm{Cosh}[2\,\mathrm{ArcSinh}[c\,x]]+52\,\mathrm{Log}\left[\sqrt{1+c^2x^2}\right]+\sqrt{1+c^2x^2}$$
$$\left(6+38\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]+9\,\mathrm{ArcSinh}[c\,x]^2+52\,\mathrm{i}\,\mathrm{ArcTan}\left[\mathrm{Coth}\left[\frac{1}{2}\,\mathrm{ArcSinh}[c\,x]\right]\right]+26\right.$$
$$\left.\left.\left.\left.\left.\mathrm{Log}\left[\sqrt{1+c^2x^2}\right]\right)\right)\mathrm{Sinh}\left[\frac{1}{2}\,\mathrm{ArcSinh}[c\,x]\right]\right)\right)\right)\Big/\left(6\,c\,f^3\left(-\mathrm{i}+c\,x\right)\right.$$
$$\left.\sqrt{-\left(-\mathrm{i}\,d+c\,d\,x\right)\left(\mathrm{i}\,f+c\,f\,x\right)}\left(\mathrm{Cosh}\left[\frac{1}{2}\,\mathrm{ArcSinh}[c\,x]\right]-\mathrm{i}\,\mathrm{Sinh}\left[\frac{1}{2}\,\mathrm{ArcSinh}[c\,x]\right]\right)^4\right)$$

Problem 537: Result more than twice size of optimal antiderivative.

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

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

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

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

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

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

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

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

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

Result (type 4, 1617 leaves):

$$\frac{\sqrt{\mathrm{i}\,d\,\left(-\mathrm{i}+c\,x\right)}\,\sqrt{-\mathrm{i}\,f\,\left(\mathrm{i}+c\,x\right)}\,\left(\frac{4\,\mathrm{i}\,a^2\,d}{3\,f^3\,(\mathrm{i}+c\,x)^2}-\frac{8\,a^2\,d}{3\,f^3\,(\mathrm{i}+c\,x)}\right)}{c}+$$

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

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

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

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

$$\left(\text{Cosh}\left[\frac{3}{2}\text{ArcSinh}[c x]\right]\left((14 i-3\,\text{ArcSinh}[c x])\,\text{ArcSinh}[c x]+\right.\right.$$

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

$$\text{Cosh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]\left(8+6 i\,\text{ArcSinh}[c x]+9\,\text{ArcSinh}[c x]^2-\right.$$

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

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

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

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

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

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

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

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

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

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

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

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

$$\left(3 c f^3\sqrt{-(-i d+c d x)\,(i f+c f x)}\sqrt{1+c^2 x^2}\right.$$

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

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

$$\left(-21\,\pi\,\text{ArcSinh}[c\,x]-(7-7\,i)\,\text{ArcSinh}[c\,x]^2+i\,\text{ArcSinh}[c\,x]^3+\frac{2\,i\,\text{ArcSinh}[c\,x]\,(2\,i+\text{ArcSinh}[c\,x])}{i+c\,x}-14\,(\pi-2\,i\,\text{ArcSinh}[c\,x])\,\text{Log}\left[1+i\,e^{-\text{ArcSinh}[c\,x]}\right]+28\,\pi\,\text{Log}\left[1+e^{\text{ArcSinh}[c\,x]}\right]+14\,\pi\,\text{Log}\left[-\text{Cos}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right]-28\,\pi\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right]-28\,i\,\text{PolyLog}\left[2,-i\,e^{-\text{ArcSinh}[c\,x]}\right]-\frac{2\,i\,(4+7\,\text{ArcSinh}[c\,x]^2)\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}{\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]-i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}+\frac{4\,\text{ArcSinh}[c\,x]^2\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}{\left(i\,\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^3}\right)\Bigg/\left(3\,c\,f^3\,\sqrt{-(-i\,d+c\,d\,x)\,(i\,f+c\,f\,x)}\,\sqrt{1+c^2\,x^2}\left(\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]+i\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]\right)^2\right)$$

Problem 541: 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):

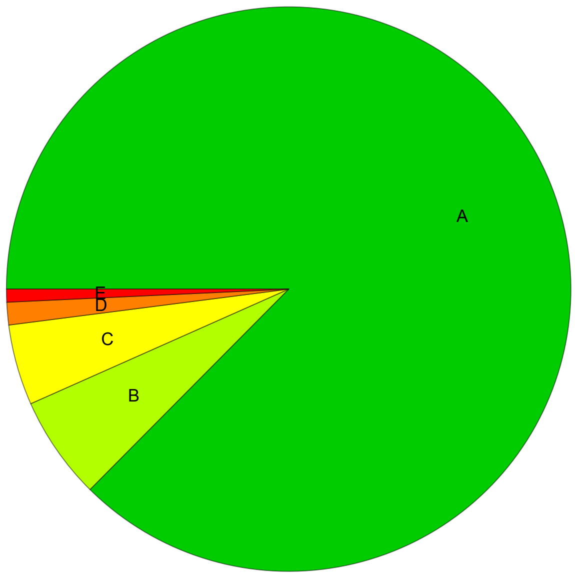
$$\frac{1}{c}\sqrt{i\,d\,(-i+c\,x)}\,\sqrt{-i\,f\,(i+c\,x)}\left(-\frac{i\,a^2}{12\,d^3\,f^3\,(-i+c\,x)^2}+\frac{a^2}{3\,d^3\,f^3\,(-i+c\,x)}+\frac{i\,a^2}{12\,d^3\,f^3\,(i+c\,x)^2}+\frac{a^2}{3\,d^3\,f^3\,(i+c\,x)}\right)+\frac{1}{12\,c\,d^2\,f^2\,\sqrt{d+i\,c\,d\,x}\,\sqrt{f-i\,c\,f\,x}}$$

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

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

Summary of Integration Test Results

541 integration problems



A - 473 optimal antiderivatives

B - 32 more than twice size of optimal antiderivatives

C - 25 unnecessarily complex antiderivatives

D - 7 unable to integrate problems

E - 4 integration timeouts