Mathematica 11.3 Integration Test Results

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

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

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

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

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

Result (type 4, 447 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 4, 1061 leaves):

$$-\frac{1}{3\,e}\left(\text{ArcSinh}[c\,x]^3+24\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\right]\text{ArcSinh}[c\,x]\right.$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Problem 3: Unable to integrate problem.

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

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

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

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

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

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

Result (type 8, 16 leaves):

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

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

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

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

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

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

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

Result (type 4, 460 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 4, 1521 leaves):

$$\frac{1}{12\,e}\left(12\,a^2\,\text{Log}[d+e\,x]+3\,a\,b\left(\pi^2-4\,i\,\pi\,\text{ArcSinh}[c\,x]-4\,\text{ArcSinh}[c\,x]^2-\right.\right.$$

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

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

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

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

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

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

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

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

$$4 b^2 \left(\text{ArcSinh}[c x]^3 + 24 \text{ArcSin}\left[\frac{\sqrt{1+\frac{i c d}{e}}}{\sqrt{2}}\right] \text{ArcSinh}[c x]\right.$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$12\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,d}{e}}}{\sqrt{2}}\right]\text{ArcSinh}[c\,x]\,\text{Log}\left[1-\frac{\left(c\,d+\sqrt{c^2\,d^2+e^2}\right)\left(c\,x+\sqrt{1+c^2\,x^2}\right)}{e}\right]+$$
$$3\,\text{ArcSinh}[c\,x]^2\,\text{Log}\left[1-\frac{\left(c\,d+\sqrt{c^2\,d^2+e^2}\right)\left(c\,x+\sqrt{1+c^2\,x^2}\right)}{e}\right]-6\,\text{ArcSinh}[c\,x]$$
$$\text{PolyLog}\left[2,\frac{e\,e^{\text{ArcSinh}[c\,x]}}{-c\,d+\sqrt{c^2\,d^2+e^2}}\right]-6\,\text{ArcSinh}[c\,x]\,\text{PolyLog}\left[2,-\frac{e\,e^{\text{ArcSinh}[c\,x]}}{c\,d+\sqrt{c^2\,d^2+e^2}}\right]+$$
$$\left.\left.6\,\text{PolyLog}\left[3,\frac{e\,e^{\text{ArcSinh}[c\,x]}}{-c\,d+\sqrt{c^2\,d^2+e^2}}\right]+6\,\text{PolyLog}\left[3,-\frac{e\,e^{\text{ArcSinh}[c\,x]}}{c\,d+\sqrt{c^2\,d^2+e^2}}\right]\right)\right)$$

Problem 17: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 263 leaves, 10 steps):

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

Result (type 4, 1381 leaves):

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

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

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

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

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

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

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

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

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

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

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

Problem 18: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 349 leaves, 13 steps):

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

Result (type 4, 1558 leaves):

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$i \Bigg(\text{PolyLog}\Bigg[2, \Bigg(i \left(c\, d - i \sqrt{-c^2 d^2 - e^2}\right) \Bigg(c\, d - i\, e - \sqrt{-c^2 d^2 - e^2}$$

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

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

$$\left(c\,d-i\,e-\sqrt{-c^2\,d^2-e^2}\,\operatorname{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\operatorname{ArcSinh}[c\,x]\right)\right]\right)\Big/$$
$$\left.\left.\left(e\left(c\,d-i\,e+\sqrt{-c^2\,d^2-e^2}\,\operatorname{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\operatorname{ArcSinh}[c\,x]\right)\right]\right)\right)\right)\right)$$

Problem 31: Unable to integrate problem.

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

Optimal (type 6, 179 leaves, 3 steps):

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

Result (type 8, 18 leaves):

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

Problem 37: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 664 leaves, 22 steps):

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

Result (type 4, 1552 leaves):

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

$$
\begin{aligned}
&\frac{1}{\sqrt{-c^2 f^2-g^2}}\left(2\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]-\right.\\
&\quad 2\,\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]\text{ArcTanh}\left[\frac{(-c\,f-i\,g)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\\
&\quad\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\left(\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]-\right.\right.\\
&\qquad\left.\left.\text{ArcTanh}\left[\frac{(-c\,f-i\,g)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\right)\\
&\quad\text{Log}\left[\frac{e^{-\frac{1}{2}i\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)}\sqrt{-c^2 f^2-g^2}}{\sqrt{2}\,\sqrt{-i\,g}\,\sqrt{c\,f+c\,g\,x}}\right]+\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+\right.\\
&\qquad 2\,i\left(\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]-\right.\\
&\qquad\left.\left.\text{ArcTanh}\left[\frac{(-c\,f-i\,g)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\right)\\
&\quad\text{Log}\left[\frac{e^{\frac{1}{2}i\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)}\sqrt{-c^2 f^2-g^2}}{\sqrt{2}\,\sqrt{-i\,g}\,\sqrt{c\,f+c\,g\,x}}\right]-\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+\right.\\
&\qquad\left.2\,i\,\text{ArcTanh}\left[\frac{(-c\,f-i\,g)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\text{Log}\left[1-\right.\\
&\qquad\left(i\left(c\,f-i\sqrt{-c^2 f^2-g^2}\right)\left(c\,f-i\,g-\sqrt{-c^2 f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big/\\
&\qquad\left.\left(g\left(c\,f-i\,g+\sqrt{-c^2 f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\right]+\\
&\quad\left(-\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+2\,i\,\text{ArcTanh}\left[\frac{(-c\,f-i\,g)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\text{Log}\left[1-\right.\\
&\qquad\left(i\left(c\,f+i\sqrt{-c^2 f^2-g^2}\right)\left(c\,f-i\,g-\sqrt{-c^2 f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big/\\
&\qquad\left.\left(g\left(c\,f-i\,g+\sqrt{-c^2 f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\right]+\\
&\quad i\left(\text{PolyLog}\left[2,\left(i\left(c\,f-i\sqrt{-c^2 f^2-g^2}\right)\left(c\,f-i\,g-\sqrt{-c^2 f^2-g^2}\right.\right.\right.\right.\\
&\qquad\left.\left.\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big/\left(g\left(c\,f-i\,g+\sqrt{-c^2 f^2-g^2}\right.\right.\\
&\qquad\left.\left.\left.\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\right]-\text{PolyLog}\left[2,\left(i\left(c\,f+i\sqrt{-c^2 f^2-g^2}\right)\right.\right.
\end{aligned}
$$

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

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

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

Optimal (type 4, 781 leaves, 35 steps):

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

Result (type 4, 1574 leaves):

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

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

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

$$\frac{1}{\sqrt{-c^2f^2-g^2}}\left(2\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\text{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]-\right.$$

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

$$\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\left(\text{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]-\right.\right.$$

$$\left.\left.\text{ArcTanh}\left[\frac{\left(-c\,f-i\,g\right)\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)\right)$$

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

$$2\,i\left(\text{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]-\right.$$

$$\left.\left.\text{ArcTanh}\left[\frac{\left(-c\,f-i\,g\right)\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)\right)$$

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

$$\left.2\,i\,\text{ArcTanh}\left[\frac{\left(-c\,f-i\,g\right)\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)\text{Log}\left[1-\right.$$

$$\left(i\left(c\,f-i\sqrt{-c^2f^2-g^2}\right)\left(c\,f-i\,g-\sqrt{-c^2f^2-g^2}\ \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big/$$

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

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

$$\left(\mathrm{i}\left(c f+\mathrm{i}\sqrt{-c^2 f^2-g^2}\right)\left(c f-\mathrm{i} g-\sqrt{-c^2 f^2-g^2}\,\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\mathrm{ArcSinh}[c x]\right)\right]\right)\right)\Big/$$
$$\left(g\left(c f-\mathrm{i} g+\sqrt{-c^2 f^2-g^2}\,\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\mathrm{ArcSinh}[c x]\right)\right]\right)\right)\Big]+$$
$$\mathrm{i}\left(\mathrm{PolyLog}\Big[2,\left(\mathrm{i}\left(c f-\mathrm{i}\sqrt{-c^2 f^2-g^2}\right)\left(c f-\mathrm{i} g-\sqrt{-c^2 f^2-g^2}\right.\right.\right.$$
$$\left.\left.\left.\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\mathrm{ArcSinh}[c x]\right)\right]\right)\right)\Big/\left(g\left(c f-\mathrm{i} g+\sqrt{-c^2 f^2-g^2}\right.\right.$$
$$\left.\left.\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\mathrm{ArcSinh}[c x]\right)\right]\right)\right)\Big]-\mathrm{PolyLog}\Big[2,\left(\mathrm{i}\left(c f+\mathrm{i}\sqrt{-c^2 f^2-g^2}\right)\right.$$
$$\left.\left(c f-\mathrm{i} g-\sqrt{-c^2 f^2-g^2}\,\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\mathrm{ArcSinh}[c x]\right)\right]\right)\right)\Big/$$
$$\left.\left.\left(g\left(c f-\mathrm{i} g+\sqrt{-c^2 f^2-g^2}\,\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\mathrm{ArcSinh}[c x]\right)\right]\right)\right)\Big]\right)\right)$$

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

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

Optimal (type 4, 984 leaves, 29 steps) :

$$\frac{a\,d\,(c^2 f^2+g^2)\sqrt{d+c^2 d x^2}}{g^3}-\frac{b\,c\,d\,x\sqrt{d+c^2 d x^2}}{3\,g\sqrt{1+c^2 x^2}}-\frac{b\,c\,d\,(c^2 f^2+g^2)\,x\sqrt{d+c^2 d x^2}}{g^3\sqrt{1+c^2 x^2}}+$$
$$\frac{b\,c^3 d\,f\,x^2\sqrt{d+c^2 d x^2}}{4\,g^2\sqrt{1+c^2 x^2}}-\frac{b\,c^3 d\,x^3\sqrt{d+c^2 d x^2}}{9\,g\sqrt{1+c^2 x^2}}+\frac{b\,d\,(c^2 f^2+g^2)\sqrt{d+c^2 d x^2}\,\text{ArcSinh}[c\,x]}{g^3}-$$
$$\frac{c^2 d\,f\,x\sqrt{d+c^2 d x^2}\,(a+b\,\text{ArcSinh}[c\,x])}{2\,g^2}+\frac{d\,(1+c^2 x^2)\sqrt{d+c^2 d x^2}\,(a+b\,\text{ArcSinh}[c\,x])}{3\,g}-$$
$$\frac{c\,d\,f\sqrt{d+c^2 d x^2}\,(a+b\,\text{ArcSinh}[c\,x])^2}{4\,b\,g^2\sqrt{1+c^2 x^2}}-\frac{c\,d\,(c^2 f^2+g^2)\,x\sqrt{d+c^2 d x^2}\,(a+b\,\text{ArcSinh}[c\,x])^2}{2\,b\,g^3\sqrt{1+c^2 x^2}}-$$
$$\frac{d\,(c^2 f^2+g^2)^2\sqrt{d+c^2 d x^2}\,(a+b\,\text{ArcSinh}[c\,x])^2}{2\,b\,c\,g^4\,(f+g\,x)\sqrt{1+c^2 x^2}}+$$
$$\frac{d\,(c^2 f^2+g^2)\sqrt{1+c^2 x^2}\sqrt{d+c^2 d x^2}\,(a+b\,\text{ArcSinh}[c\,x])^2}{2\,b\,c\,g^2\,(f+g\,x)}-$$
$$\frac{a\,d\,(c^2 f^2+g^2)^{3/2}\sqrt{d+c^2 d x^2}\,\text{ArcTanh}\left[\frac{g-c^2 f x}{\sqrt{c^2 f^2+g^2}\sqrt{1+c^2 x^2}}\right]}{g^4\sqrt{1+c^2 x^2}}+$$
$$\frac{b\,d\,(c^2 f^2+g^2)^{3/2}\sqrt{d+c^2 d x^2}\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1+\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f-\sqrt{c^2 f^2+g^2}}\right]}{g^4\sqrt{1+c^2 x^2}}-$$
$$\frac{b\,d\,(c^2 f^2+g^2)^{3/2}\sqrt{d+c^2 d x^2}\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1+\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f+\sqrt{c^2 f^2+g^2}}\right]}{g^4\sqrt{1+c^2 x^2}}+$$
$$\frac{b\,d\,(c^2 f^2+g^2)^{3/2}\sqrt{d+c^2 d x^2}\,\text{PolyLog}\left[2,-\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f-\sqrt{c^2 f^2+g^2}}\right]}{g^4\sqrt{1+c^2 x^2}}-$$
$$\frac{b\,d\,(c^2 f^2+g^2)^{3/2}\sqrt{d+c^2 d x^2}\,\text{PolyLog}\left[2,-\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f+\sqrt{c^2 f^2+g^2}}\right]}{g^4\sqrt{1+c^2 x^2}}$$

Result (type 4, 4049 leaves) :

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

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

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

$$\frac{1}{\sqrt{-c^2f^2-g^2}}\left(2\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\text{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]-\right.$$

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

$$\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\left(\text{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]-\right.\right.$$

$$\left.\left.\text{ArcTanh}\left[\frac{\left(-c\,f-i\,g\right)\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)\right)$$

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

$$2\,i\left(\text{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]-\right.$$

$$\left.\left.\text{ArcTanh}\left[\frac{\left(-c\,f-i\,g\right)\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)\right)$$

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

$$\left.2\,i\,\text{ArcTanh}\left[\frac{\left(-c\,f-i\,g\right)\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)\text{Log}\left[1-\right.$$

$$\left(i\left(c\,f-i\sqrt{-c^2f^2-g^2}\right)\left(c\,f-i\,g-\sqrt{-c^2f^2-g^2}\ \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big/$$

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

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

$$\left(i\left(c\,f+i\sqrt{-c^2 f^2-g^2}\right)\left(c\,f-i\,g-\sqrt{-c^2 f^2-g^2}\ \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big/$$

$$\left(g\left(c\,f-i\,g+\sqrt{-c^2 f^2-g^2}\ \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big]+$$

$$i\left(\text{PolyLog}\left[2,\left(i\left(c\,f-i\sqrt{-c^2 f^2-g^2}\right)\left(c\,f-i\,g-\sqrt{-c^2 f^2-g^2}\right.\right.\right.\right.$$

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

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

$$\left.\left(c\,f-i\,g-\sqrt{-c^2 f^2-g^2}\ \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big/$$

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

$$b\,d\left(\frac{1}{8\sqrt{1+c^2 x^2}}\sqrt{d\left(1+c^2 x^2\right)}\left(\frac{i\,\pi\,\text{ArcTanh}\left[\frac{-g+c\,f\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{\sqrt{c^2 f^2+g^2}}\right]}{\sqrt{c^2 f^2+g^2}}+\right.\right.$$

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

$$\left(\pi-2\,i\,\text{ArcSinh}[c\,x]\right)\text{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\text{Tan}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+$$

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

$$\left.2\,i\,\text{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\text{Tan}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$

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

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

$$\left.\left.\text{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\text{Tan}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\right)$$

$$\text{Log}\left[\frac{\left(\frac{1}{2}+\frac{i}{2}\right) e^{\frac{1}{2}\text{ArcSinh}[c x]} \sqrt{-c^2 f^2-g^2}}{\sqrt{-i g} \sqrt{c f+c g x}}\right] - \left(\text{ArcCos}\left[-\frac{i c f}{g}\right] + 2 i \,\text{ArcTanh}\left[\frac{(c f+i g) \,\text{Cot}\left[\frac{1}{4} (\pi+2 i \,\text{ArcSinh}[c x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$

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

$$\left(\text{ArcCos}\left[-\frac{i c f}{g}\right] - 2 i \,\text{ArcTanh}\left[\frac{(c f+i g) \,\text{Cot}\left[\frac{1}{4} (\pi+2 i \,\text{ArcSinh}[c x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$

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

$$i \left(\text{PolyLog}\left[2, \left(\left(i c f+\sqrt{-c^2 f^2-g^2}\right) \left(i c f+g-i \sqrt{-c^2 f^2-g^2} \,\text{Cot}\left[\frac{1}{4} (\pi+2 i \,\text{ArcSinh}[c x])\right]\right)\right) \Big/ \left(g \left(i c f+g+i \sqrt{-c^2 f^2-g^2} \,\text{Cot}\left[\frac{1}{4} (\pi+2 i \,\text{ArcSinh}[c x])\right]\right)\right)\right] - \text{PolyLog}\left[2, \left(\left(c f+i \sqrt{-c^2 f^2-g^2}\right) \left(-c f+i g+\sqrt{-c^2 f^2-g^2} \,\text{Cot}\left[\frac{1}{4} (\pi+2 i \,\text{ArcSinh}[c x])\right]\right)\right) \Big/ \left(g \left(i c f+g+i \sqrt{-c^2 f^2-g^2} \,\text{Cot}\left[\frac{1}{4} (\pi+2 i \,\text{ArcSinh}[c x])\right]\right)\right)\right]\right)\Bigg)\Bigg) +$$

$$\frac{1}{72 g^4 \sqrt{1+c^2 x^2}} \sqrt{d \left(1+c^2 x^2\right)} \Bigg(-18 c g \left(4 c^2 f^2+g^2\right) x + 18 g \left(4 c^2 f^2+g^2\right) \sqrt{1+c^2 x^2} \,\text{ArcSinh}[c x] -$$

$$18 c f \left(2 c^2 f^2+g^2\right) \text{ArcSinh}[c x]^2 + 9 c f g^2 \,\text{Cosh}[2 \,\text{ArcSinh}[c x]] +$$

$$6 g^3 \,\text{ArcSinh}[c x] \,\text{Cosh}[3 \,\text{ArcSinh}[c x]] +$$

$$9 \left(8 c^4 f^4+8 c^2 f^2 g^2+g^4\right) \left(-\frac{i \pi \,\text{ArcTanh}\left[\frac{-g+c f \,\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c x]\right]}{\sqrt{c^2 f^2+g^2}}\right]}{\sqrt{c^2 f^2+g^2}} -\right.$$

$$\frac{1}{\sqrt{-c^2 f^2-g^2}}\left(2\,\text{ArcCos}\left[-\frac{\mathrm{i}\,c\,f}{g}\right]\text{ArcTanh}\left[\frac{(c\,f+\mathrm{i}\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\right.$$

$$\left(\pi-2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\text{ArcTanh}\left[\frac{(c\,f-\mathrm{i}\,g)\,\text{Tan}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+$$

$$\left(\text{ArcCos}\left[-\frac{\mathrm{i}\,c\,f}{g}\right]-2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{(c\,f+\mathrm{i}\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]-\right.$$

$$\left.2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{(c\,f-\mathrm{i}\,g)\,\text{Tan}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\text{Log}\Big[$$

$$\frac{\left(\frac{1}{2}-\frac{\mathrm{i}}{2}\right)e^{-\frac{1}{2}\text{ArcSinh}[c\,x]}\sqrt{-c^2 f^2-g^2}}{\sqrt{-\mathrm{i}\,g}\,\sqrt{c\,f+c\,g\,x}}\Big]+\left(\text{ArcCos}\left[-\frac{\mathrm{i}\,c\,f}{g}\right]+\right.$$

$$2\,\mathrm{i}\left(\text{ArcTanh}\left[\frac{(c\,f+\mathrm{i}\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\right.$$

$$\left.\left.\text{ArcTanh}\left[\frac{(c\,f-\mathrm{i}\,g)\,\text{Tan}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\right)$$

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

$$\left.2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{(c\,f+\mathrm{i}\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\text{Log}\Big[$$

$$\left((\mathrm{i}\,c\,f+g)\left(-\mathrm{i}\,c\,f+g+\sqrt{-c^2 f^2-g^2}\right)\left(1+\mathrm{i}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big/$$

$$\left(g\left(\mathrm{i}\,c\,f+g+\mathrm{i}\,\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big]-$$

$$\left(\text{ArcCos}\left[-\frac{\mathrm{i}\,c\,f}{g}\right]-2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{(c\,f+\mathrm{i}\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$

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

$$\left(g\left(c\,f-\mathrm{i}\,g+\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big]+$$

$$\mathrm{i}\,\Big(\text{PolyLog}\Big[2,\Big(\left(\mathrm{i}\,c\,f+\sqrt{-c^2 f^2-g^2}\right)\Big(\mathrm{i}\,c\,f+g-\mathrm{i}\,\sqrt{-c^2 f^2-g^2}$$

$$\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\text{ArcSinh}[c\,x]\right)\right]\Big)\Big)\Big/\Big(g\Big(\mathrm{i}\,c\,f+g+\mathrm{i}\,\sqrt{-c^2 f^2-g^2}\,\text{Cot}\Big[$$

$$\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\Big]\Big)\Big)\Big]-\text{PolyLog}\Big[2,\Big(\Big(c\,f+i\,\sqrt{-c^2\,f^2-g^2}\Big)$$

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

$$\Big(g\,\Big(i\,c\,f+g+i\,\sqrt{-c^2\,f^2-g^2}\ \text{Cot}\Big[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\Big]\Big)\Big)\Big]\Big)\Big)-$$

$$18\,c\,f\,g^2\,\text{ArcSinh}[c\,x]\,\text{Sinh}[2\,\text{ArcSinh}[c\,x]]-2\,g^3\,\text{Sinh}[3\,\text{ArcSinh}[c\,x]]\Big)\Big)$$

Problem 46: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 1536 leaves, 37 steps):

$$\frac{a\,d^2\left(c^2\,f^2+g^2\right)^2\sqrt{d+c^2\,d\,x^2}}{g^5}+\frac{2\,b\,c\,d^2\,x\,\sqrt{d+c^2\,d\,x^2}}{15\,g\,\sqrt{1+c^2\,x^2}}-$$

$$\frac{b\,c\,d^2\left(c^2\,f^2+g^2\right)^2 x\,\sqrt{d+c^2\,d\,x^2}}{g^5\,\sqrt{1+c^2\,x^2}}-\frac{b\,c\,d^2\left(c^2\,f^2+2\,g^2\right)x\,\sqrt{d+c^2\,d\,x^2}}{3\,g^3\,\sqrt{1+c^2\,x^2}}+$$

$$\frac{b\,c^3\,d^2\,f\,x^2\,\sqrt{d+c^2\,d\,x^2}}{16\,g^2\,\sqrt{1+c^2\,x^2}}+\frac{b\,c^3\,d^2\,f\left(c^2\,f^2+2\,g^2\right)x^2\,\sqrt{d+c^2\,d\,x^2}}{4\,g^4\,\sqrt{1+c^2\,x^2}}-\frac{b\,c^3\,d^2\,x^3\,\sqrt{d+c^2\,d\,x^2}}{45\,g\,\sqrt{1+c^2\,x^2}}-$$

$$\frac{b\,c^3\,d^2\left(c^2\,f^2+2\,g^2\right)x^3\,\sqrt{d+c^2\,d\,x^2}}{9\,g^3\,\sqrt{1+c^2\,x^2}}+\frac{b\,c^5\,d^2\,f\,x^4\,\sqrt{d+c^2\,d\,x^2}}{16\,g^2\,\sqrt{1+c^2\,x^2}}-\frac{b\,c^5\,d^2\,x^5\,\sqrt{d+c^2\,d\,x^2}}{25\,g\,\sqrt{1+c^2\,x^2}}+$$

$$\frac{b\,d^2\left(c^2\,f^2+g^2\right)^2\sqrt{d+c^2\,d\,x^2}\ \text{ArcSinh}[c\,x]}{g^5}-\frac{c^2\,d^2\,f\,x\,\sqrt{d+c^2\,d\,x^2}\left(a+b\,\text{ArcSinh}[c\,x]\right)}{8\,g^2}-$$

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

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

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

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

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

Result (type 4, 9270 leaves):

$$\sqrt{d\left(1+c^2 x^2\right)}\left(\frac{a d^2\left(15 c^4 f^4+35 c^2 f^2 g^2+23 g^4\right)}{15 g^5}-\frac{a c^2 d^2 f\left(4 c^2 f^2+9 g^2\right) x}{8 g^4}+\frac{a c^2 d^2\left(5 c^2 f^2+11 g^2\right) x^2}{15 g^3}-\frac{a c^4 d^2 f x^3}{4 g^2}+\frac{a c^4 d^2 x^4}{5 g}\right)+\frac{a d^{5/2}\left(c^2 f^2+g^2\right)^{5/2}\text{Log}[f+g x]}{g^6}-\frac{a c d^{5/2} f\left(8 c^4 f^4+20 c^2 f^2 g^2+15 g^4\right)\text{Log}\left[c d x+\sqrt{d}\sqrt{d\left(1+c^2 x^2\right)}\right]}{8 g^6}-\frac{1}{g^6}a d^{5/2}\left(c^2 f^2+g^2\right)^{5/2}\text{Log}\left[d g-c^2 d f x+\sqrt{d}\sqrt{c^2 f^2+g^2}\sqrt{d\left(1+c^2 x^2\right)}\right]+b d^2\left(-\frac{c x\sqrt{d\left(1+c^2 x^2\right)}}{g\sqrt{1+c^2 x^2}}+\frac{\sqrt{d\left(1+c^2 x^2\right)}\,\text{ArcSinh}[c x]}{g}-\frac{c f\sqrt{d\left(1+c^2 x^2\right)}\,\text{ArcSinh}[c x]^2}{2 g^2\sqrt{1+c^2 x^2}}+\right.$$

$$\frac{1}{g^2\sqrt{1+c^2x^2}}\left(c^2f^2+g^2\right)\sqrt{d\left(1+c^2x^2\right)}\left(-\frac{i\,\pi\,\mathrm{ArcTanh}\left[\frac{-g+c\,f\,\mathrm{Tanh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]}{\sqrt{c^2f^2+g^2}}\right]}{\sqrt{c^2f^2+g^2}}-\right.$$

$$\frac{1}{\sqrt{-c^2f^2-g^2}}\left(2\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[c\,x]\right)\mathrm{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\mathrm{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]-\right.$$

$$2\,\mathrm{ArcCos}\left[-\frac{i\,c\,f}{g}\right]\mathrm{ArcTanh}\left[\frac{\left(-c\,f-i\,g\right)\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]+$$

$$\left(\mathrm{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\left(\mathrm{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\mathrm{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]-\right.\right.$$

$$\left.\left.\mathrm{ArcTanh}\left[\frac{\left(-c\,f-i\,g\right)\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)\right)$$

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

$$2\,i\left(\mathrm{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\mathrm{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]-\right.$$

$$\left.\left.\mathrm{ArcTanh}\left[\frac{\left(-c\,f-i\,g\right)\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)\right)$$

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

$$\left.2\,i\,\mathrm{ArcTanh}\left[\frac{\left(-c\,f-i\,g\right)\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)\mathrm{Log}\left[1-\right.$$

$$\left(i\left(c\,f-i\sqrt{-c^2f^2-g^2}\right)\left(c\,f-i\,g-\sqrt{-c^2f^2-g^2}\,\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[c\,x]\right)\right]\right)\right)\Big/$$

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

$$\left(-\mathrm{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+2\,i\,\mathrm{ArcTanh}\left[\frac{\left(-c\,f-i\,g\right)\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2f^2-g^2}}\right]\right)\mathrm{Log}\left[1-\right.$$

$$\left(i\left(c\,f+i\sqrt{-c^2f^2-g^2}\right)\left(c\,f-i\,g-\sqrt{-c^2f^2-g^2}\,\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[c\,x]\right)\right]\right)\right)\Big/$$

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

$$i\left(\mathrm{PolyLog}\left[2,\left(i\left(c\,f-i\sqrt{-c^2 f^2-g^2}\right)\left(c\,f-i\,g-\sqrt{-c^2 f^2-g^2}\right.\right.\right.\right.$$

$$\left.\left.\left.\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[c\,x]\right)\right]\right)\right)\Big/\left(g\left(c\,f-i\,g+\sqrt{-c^2 f^2-g^2}\right.\right.$$

$$\left.\left.\left.\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[c\,x]\right)\right]\right)\right)\right]-\mathrm{PolyLog}\left[2,\left(i\left(c\,f+i\sqrt{-c^2 f^2-g^2}\right)\right.\right.$$

$$\left.\left(c\,f-i\,g-\sqrt{-c^2 f^2-g^2}\,\mathrm{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\mathrm{ArcSinh}[c\,x]\right)\right]\right)\right)\Big/$$

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

$$2\,b\,d^2\left(\frac{1}{8\sqrt{1+c^2 x^2}}\sqrt{d\left(1+c^2 x^2\right)}\left(\frac{i\,\pi\,\mathrm{ArcTanh}\left[\frac{-g+c\,f\,\mathrm{Tanh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]}{\sqrt{c^2 f^2+g^2}}\right]}{\sqrt{c^2 f^2+g^2}}+\right.\right.$$

$$\frac{1}{\sqrt{-c^2 f^2-g^2}}\left(2\,\mathrm{ArcCos}\left[-\frac{i\,c\,f}{g}\right]\mathrm{ArcTanh}\left[\frac{\left(c\,f+i\,g\right)\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\right.$$

$$\left(\pi-2\,i\,\mathrm{ArcSinh}[c\,x]\right)\mathrm{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\mathrm{Tan}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+$$

$$\left(\mathrm{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\,\mathrm{ArcTanh}\left[\frac{\left(c\,f+i\,g\right)\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]-\right.$$

$$\left.2\,i\,\mathrm{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\mathrm{Tan}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$

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

$$\left(\mathrm{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+2\,i\left(\mathrm{ArcTanh}\left[\frac{\left(c\,f+i\,g\right)\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\right.\right.$$

$$\left.\left.\mathrm{ArcTanh}\left[\frac{\left(c\,f-i\,g\right)\mathrm{Tan}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\right)$$

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

$$2\,i\,\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2\,f^2-g^2}}\right]\Bigg)$$

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

$$\left(g\,\left(i\,c\,f+g+i\,\sqrt{-c^2\,f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right)\right)\Big]-$$

$$\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\,\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2\,f^2-g^2}}\right]\right)$$

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

$$\left(g\,\left(c\,f-i\,g+\sqrt{-c^2\,f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right)\right)\Big]+$$

$$i\,\Bigg(\text{PolyLog}\Big[2,\,\Big(\left(i\,c\,f+\sqrt{-c^2\,f^2-g^2}\right)\,\Big(i\,c\,f+g-i\,\sqrt{-c^2\,f^2-g^2}$$

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

$$\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\Big)\Big)\Big]-\text{PolyLog}\Big[2,\,\Big(\left(c\,f+i\,\sqrt{-c^2\,f^2-g^2}\right)$$

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

$$\left(g\,\left(i\,c\,f+g+i\,\sqrt{-c^2\,f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right)\right)\Big]\Bigg)\Bigg)\Bigg)+$$

$$\frac{1}{72\,g^4\,\sqrt{1+c^2\,x^2}}\,\sqrt{d\,(1+c^2\,x^2)}\,\Bigg(-18\,c\,g\,(4\,c^2\,f^2+g^2)\,x+18\,g\,(4\,c^2\,f^2+g^2)$$

$$\sqrt{1+c^2\,x^2}\,\text{ArcSinh}[c\,x]-$$
$$18\,c\,f\,(2\,c^2\,f^2+g^2)\,\text{ArcSinh}[c\,x]^2+9\,c\,f\,g^2\,\text{Cosh}[2\,\text{ArcSinh}[c\,x]]+$$
$$6\,g^3\,\text{ArcSinh}[c\,x]\,\text{Cosh}[3\,\text{ArcSinh}[c\,x]]+$$

$$9\,(8\,c^4\,f^4+8\,c^2\,f^2\,g^2+g^4)\,\Bigg(-\frac{i\,\pi\,\text{ArcTanh}\left[\frac{-g+c\,f\,\text{Tanh}\left[\frac{1}{2}\,\text{ArcSinh}[c\,x]\right]}{\sqrt{c^2\,f^2+g^2}}\right]}{\sqrt{c^2\,f^2+g^2}}-$$

$$\frac{1}{\sqrt{-c^2\,f^2-g^2}}\,\Bigg(2\,\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]\,\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2\,f^2-g^2}}\right]+$$

$$\left(\pi - 2\,\mathbb{i}\,\text{ArcSinh}[c\,x]\right)\,\text{ArcTanh}\left[\frac{(c\,f - \mathbb{i}\,g)\,\text{Tan}\left[\frac{1}{4}\left(\pi + 2\,\mathbb{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2 - g^2}}\right] +$$

$$\left(\text{ArcCos}\left[-\frac{\mathbb{i}\,c\,f}{g}\right] - 2\,\mathbb{i}\,\text{ArcTanh}\left[\frac{(c\,f + \mathbb{i}\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi + 2\,\mathbb{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2 - g^2}}\right] -\right.$$

$$\left.2\,\mathbb{i}\,\text{ArcTanh}\left[\frac{(c\,f - \mathbb{i}\,g)\,\text{Tan}\left[\frac{1}{4}\left(\pi + 2\,\mathbb{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2 - g^2}}\right]\right)\,\text{Log}\Big[$$

$$\frac{\left(\frac{1}{2} - \frac{\mathbb{i}}{2}\right)\,e^{-\frac{1}{2}\text{ArcSinh}[c\,x]}\,\sqrt{-c^2\,f^2 - g^2}}{\sqrt{-\mathbb{i}\,g}\,\sqrt{c\,f + c\,g\,x}}\Big] + \left(\text{ArcCos}\left[-\frac{\mathbb{i}\,c\,f}{g}\right] +\right.$$

$$2\,\mathbb{i}\,\left(\text{ArcTanh}\left[\frac{(c\,f + \mathbb{i}\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi + 2\,\mathbb{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2 - g^2}}\right] +\right.$$

$$\left.\left.\text{ArcTanh}\left[\frac{(c\,f - \mathbb{i}\,g)\,\text{Tan}\left[\frac{1}{4}\left(\pi + 2\,\mathbb{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2 - g^2}}\right]\right)\right)$$

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

$$\left.2\,\mathbb{i}\,\text{ArcTanh}\left[\frac{(c\,f + \mathbb{i}\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi + 2\,\mathbb{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2 - g^2}}\right]\right)\,\text{Log}\Big[$$

$$\left((\mathbb{i}\,c\,f + g)\left(-\mathbb{i}\,c\,f + g + \sqrt{-c^2\,f^2 - g^2}\right)\left(1 + \mathbb{i}\,\text{Cot}\left[\frac{1}{4}\left(\pi + 2\,\mathbb{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big/$$

$$\left(g\left(\mathbb{i}\,c\,f + g + \mathbb{i}\,\sqrt{-c^2\,f^2 - g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi + 2\,\mathbb{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big] -$$

$$\left(\text{ArcCos}\left[-\frac{\mathbb{i}\,c\,f}{g}\right] - 2\,\mathbb{i}\,\text{ArcTanh}\left[\frac{(c\,f + \mathbb{i}\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi + 2\,\mathbb{i}\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2 - g^2}}\right]\right)$$

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

$$\left(g\left(c\,f - \mathbb{i}\,g + \sqrt{-c^2\,f^2 - g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi + 2\,\mathbb{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big] +$$

$$\mathbb{i}\,\Big(\text{PolyLog}\Big[2,\,\Big(\left(\mathbb{i}\,c\,f + \sqrt{-c^2\,f^2 - g^2}\right)\Big(\mathbb{i}\,c\,f + g - \mathbb{i}\,\sqrt{-c^2\,f^2 - g^2}$$

$$\left.\text{Cot}\left[\frac{1}{4}\left(\pi + 2\,\mathbb{i}\,\text{ArcSinh}[c\,x]\right)\right]\Big)\Big)\right/\Big(g\,\Big(\mathbb{i}\,c\,f + g + \mathbb{i}\,\sqrt{-c^2\,f^2 - g^2}\,\text{Cot}\Big[$$

$$\frac{1}{4}\left(\pi + 2\,\mathbb{i}\,\text{ArcSinh}[c\,x]\right)\Big]\Big)\Big)\Big] - \text{PolyLog}\Big[2,\,\Big(\left(c\,f + \mathbb{i}\,\sqrt{-c^2\,f^2 - g^2}\right)$$

$$\left(-c\,f + \mathbb{i}\,g + \sqrt{-c^2\,f^2 - g^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi + 2\,\mathbb{i}\,\text{ArcSinh}[c\,x]\right)\right]\right)\Big)\Big/$$

$$\left.\left.\left(g\left(\mathrm{i}\, c\, f+g+\mathrm{i}\sqrt{-c^2 f^2-g^2}\,\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]\right)\right]\right)\right)\right]\right)\right) -$$

$$\left.\left. 18\, c\, f\, g^2\,\mathrm{ArcSinh}[c\,x]\,\mathrm{Sinh}[2\,\mathrm{ArcSinh}[c\,x]] - 2\, g^3\,\mathrm{Sinh}[3\,\mathrm{ArcSinh}[c\,x]]\right)\right) +$$

$$b\, d^2 \left(-\frac{1}{32\, g^2\sqrt{1+c^2 x^2}}\sqrt{d\left(1+c^2 x^2\right)}\left(-2\, c\, g\, x+2\, g\sqrt{1+c^2 x^2}\,\mathrm{ArcSinh}[c\,x]-\right.\right.$$

$$c\, f\,\mathrm{ArcSinh}[c\,x]^2+$$

$$\left(2\, c^2 f^2+g^2\right)\left(-\frac{\mathrm{i}\,\pi\,\mathrm{ArcTanh}\left[\frac{-g+c\, f\,\mathrm{Tanh}\left[\frac{1}{2}\mathrm{ArcSinh}[c\,x]\right]}{\sqrt{c^2 f^2+g^2}}\right]}{\sqrt{c^2 f^2+g^2}}-\frac{1}{\sqrt{-c^2 f^2-g^2}}\right.$$

$$\left(2\,\mathrm{ArcCos}\left[-\frac{\mathrm{i}\, c\, f}{g}\right]\mathrm{ArcTanh}\left[\frac{\left(c\, f+\mathrm{i}\, g\right)\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\right.$$

$$\left(\pi-2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]\right)\mathrm{ArcTanh}\left[\frac{\left(c\, f-\mathrm{i}\, g\right)\mathrm{Tan}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+$$

$$\left(\mathrm{ArcCos}\left[-\frac{\mathrm{i}\, c\, f}{g}\right]-2\,\mathrm{i}\,\mathrm{ArcTanh}\left[\frac{\left(c\, f+\mathrm{i}\, g\right)\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]-\right.$$

$$\left.2\,\mathrm{i}\,\mathrm{ArcTanh}\left[\frac{\left(c\, f-\mathrm{i}\, g\right)\mathrm{Tan}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$

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

$$2\,\mathrm{i}\left(\mathrm{ArcTanh}\left[\frac{\left(c\, f+\mathrm{i}\, g\right)\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\right.$$

$$\left.\left.\mathrm{ArcTanh}\left[\frac{\left(c\, f-\mathrm{i}\, g\right)\mathrm{Tan}\left[\frac{1}{4}\left(\pi+2\,\mathrm{i}\,\mathrm{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\right)$$

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

$$\left(\text{ArcCos}\left[-\frac{i c f}{g}\right]-2 i \text{ArcTanh}\left[\frac{(c f+i g) \text{Cot}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right) \text{Log}\left[\left((i c f+g)\left(i c f-g+\sqrt{-c^2 f^2-g^2}\right)\left(i+\text{Cot}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right)\right)\Big/\left(g\left(c f-i g+\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right)\right)\right]+i$$

$$\left(\text{PolyLog}\left[2,\left(\left(i c f+\sqrt{-c^2 f^2-g^2}\right)\left(i c f+g-i\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right)\right)\Big/\left(g\left(i c f+g+i\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right)\right)\right]-\text{PolyLog}\left[2,\left(\left(c f+i\sqrt{-c^2 f^2-g^2}\right)\left(-c f+i g+\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right)\right)\Big/\left(g\left(i c f+g+i\sqrt{-c^2 f^2-g^2}\,\text{Cot}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]\right)\right)\right]\right)\Bigg)\Bigg)\Bigg)+$$

$$\frac{1}{16\sqrt{1+c^2 x^2}}\sqrt{d\left(1+c^2 x^2\right)}\left(-\frac{i \pi \text{ArcTanh}\left[\frac{-g+c f \text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]}{\sqrt{c^2 f^2+g^2}}\right]}{\sqrt{c^2 f^2+g^2}}-\right.$$

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

$$(\pi-2 i \text{ArcSinh}[c x]) \text{ArcTanh}\left[\frac{(c f-i g) \text{Tan}\left[\frac{1}{4}(\pi+2 i \text{ArcSinh}[c x])\right]}{\sqrt{-c^2 f^2-g^2}}\right]+$$

$$\left(\text{ArcCos}\left[-\frac{i c f}{g}\right]-2 i \text{ArcTanh}\left[\frac{(c f+i g) \text{Cot}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]-\right.$$
$$\left.2 i \text{ArcTanh}\left[\frac{(c f-i g) \text{Tan}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$
$$\text{Log}\left[\frac{\left(\frac{1}{2}-\frac{i}{2}\right) e^{-\frac{1}{2}\text{ArcSinh}[c x]} \sqrt{-c^2 f^2-g^2}}{\sqrt{-i g} \sqrt{c f+c g x}}\right]+$$
$$\left(\text{ArcCos}\left[-\frac{i c f}{g}\right]+2 i \left(\text{ArcTanh}\left[\frac{(c f+i g) \text{Cot}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]+\right.\right.$$
$$\left.\left.\text{ArcTanh}\left[\frac{(c f-i g) \text{Tan}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\right)$$
$$\text{Log}\left[\frac{\left(\frac{1}{2}+\frac{i}{2}\right) e^{\frac{1}{2}\text{ArcSinh}[c x]} \sqrt{-c^2 f^2-g^2}}{\sqrt{-i g} \sqrt{c f+c g x}}\right]-\left(\text{ArcCos}\left[-\frac{i c f}{g}\right]+\right.$$
$$\left.2 i \text{ArcTanh}\left[\frac{(c f+i g) \text{Cot}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$
$$\text{Log}\left[\left((i c f+g)\left(-i c f+g+\sqrt{-c^2 f^2-g^2}\right)\left(1+i \text{Cot}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[c x]\right)\right]\right)\right)\Big/\right.$$
$$\left.\left(g\left(i c f+g+i \sqrt{-c^2 f^2-g^2} \text{Cot}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[c x]\right)\right]\right)\right)\right]-$$
$$\left(\text{ArcCos}\left[-\frac{i c f}{g}\right]-2 i \text{ArcTanh}\left[\frac{(c f+i g) \text{Cot}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)$$
$$\text{Log}\left[\left((i c f+g)\left(i c f-g+\sqrt{-c^2 f^2-g^2}\right)\left(i+\text{Cot}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[c x]\right)\right]\right)\right)\Big/\right.$$
$$\left.\left(g\left(c f-i g+\sqrt{-c^2 f^2-g^2} \text{Cot}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[c x]\right)\right]\right)\right)\right]+$$
$$i \left(\text{PolyLog}\left[2, \left(\left(i c f+\sqrt{-c^2 f^2-g^2}\right)\left(i c f+g-i \sqrt{-c^2 f^2-g^2}\right.\right.\right.\right.$$
$$\left.\left.\text{Cot}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[c x]\right)\right]\right)\right)\Big/\left(g\left(i c f+g+i \sqrt{-c^2 f^2-g^2}\right.\right.$$
$$\left.\left.\left.\text{Cot}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[c x]\right)\right]\right)\right)\right]-\text{PolyLog}\left[2, \left(\left(c f+i \sqrt{-c^2 f^2-g^2}\right)\right.\right.$$
$$\left.\left(-c f+i g+\sqrt{-c^2 f^2-g^2} \text{Cot}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[c x]\right)\right]\right)\right)\Big/$$

$$\left.\left.\left(g\left(i c f+g+i\sqrt{-c^2 f^2-g^2}\ \text{Cot}\left[\frac{1}{4}\left(\pi+2 i\ \text{ArcSinh}[c x]\right)\right]\right)\right)\right]\right)\Bigg)\Bigg) -$$

$$\frac{1}{144 g^4\sqrt{1+c^2 x^2}}\sqrt{d\left(1+c^2 x^2\right)}\ \Bigg(-18 c g\left(4 c^2 f^2+g^2\right) x+18 g\left(4 c^2 f^2+g^2\right)$$

$$\sqrt{1+c^2 x^2}\ \text{ArcSinh}[c x] -$$
$$18 c f\left(2 c^2 f^2+g^2\right)\text{ArcSinh}[c x]^2+9 c f g^2$$
$$\text{Cosh}[2\ \text{ArcSinh}[c x]] +$$
$$6 g^3\ \text{ArcSinh}[c x]\ \text{Cosh}[3\ \text{ArcSinh}[c x]] +$$
$$9\left(8 c^4 f^4+8 c^2 f^2 g^2+g^4\right)$$

$$\Bigg(-\frac{i\pi\ \text{ArcTanh}\left[\frac{-g+c f\ \text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c x]\right]}{\sqrt{c^2 f^2+g^2}}\right]}{\sqrt{c^2 f^2+g^2}} -$$

$$\frac{1}{\sqrt{-c^2 f^2-g^2}}\Bigg(2\ \text{ArcCos}\left[-\frac{i c f}{g}\right]\text{ArcTanh}\left[\frac{\left(c f+i g\right)\text{Cot}\left[\frac{1}{4}\left(\pi+2 i\ \text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right] +$$

$$\left(\pi-2 i\ \text{ArcSinh}[c x]\right)\text{ArcTanh}\left[\frac{\left(c f-i g\right)\text{Tan}\left[\frac{1}{4}\left(\pi+2 i\ \text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right] +$$

$$\Bigg(\text{ArcCos}\left[-\frac{i c f}{g}\right]-2 i\ \text{ArcTanh}\left[\frac{\left(c f+i g\right)\text{Cot}\left[\frac{1}{4}\left(\pi+2 i\ \text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right] -$$

$$2 i\ \text{ArcTanh}\left[\frac{\left(c f-i g\right)\text{Tan}\left[\frac{1}{4}\left(\pi+2 i\ \text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\Bigg)\ \text{Log}\Bigg[$$

$$\frac{\left(\frac{1}{2}-\frac{i}{2}\right)e^{-\frac{1}{2}\text{ArcSinh}[c x]}\sqrt{-c^2 f^2-g^2}}{\sqrt{-i g}\ \sqrt{c f+c g x}}\Bigg] + \Bigg(\text{ArcCos}\left[-\frac{i c f}{g}\right] +$$

$$2 i\ \Bigg(\text{ArcTanh}\left[\frac{\left(c f+i g\right)\text{Cot}\left[\frac{1}{4}\left(\pi+2 i\ \text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right] +$$

$$\text{ArcTanh}\left[\frac{\left(c f-i g\right)\text{Tan}\left[\frac{1}{4}\left(\pi+2 i\ \text{ArcSinh}[c x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\Bigg)\Bigg)$$

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

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

$$\Big(\big(i\,c\,f+g\big)\,\big(-i\,c\,f+g+\sqrt{-c^2\,f^2-g^2}\big)\,\big(1+i\,\text{Cot}\big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\big]\big)\Big)\Big/$$

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

$$\Big(\text{ArcCos}\Big[-\frac{i\,c\,f}{g}\Big]-2\,i\,\text{ArcTanh}\Big[\frac{(c\,f+i\,g)\,\text{Cot}\big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\big]}{\sqrt{-c^2\,f^2-g^2}}\Big]\Big)$$

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

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

$$i\,\Big(\text{PolyLog}\Big[2,\,\Big(\big(i\,c\,f+\sqrt{-c^2\,f^2-g^2}\big)\,\big(i\,c\,f+g-i\,\sqrt{-c^2\,f^2-g^2}$$

$$\text{Cot}\big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\big]\big)\Big)\Big/\Big(g\,\big(i\,c\,f+g+i\,\sqrt{-c^2\,f^2-g^2}\,\text{Cot}\big[$$

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

$$\big(-c\,f+i\,g+\sqrt{-c^2\,f^2-g^2}\,\text{Cot}\big[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\big]\big)\Big)\Big/$$

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

$$18\,c\,f\,g^2\,\text{ArcSinh}[c\,x]\,\text{Sinh}[2\,\text{ArcSinh}[c\,x]]-2\,g^3\,\text{Sinh}[3\,\text{ArcSinh}[c\,x]]\Bigg)+$$

$$\frac{1}{32\,\sqrt{1+c^2\,x^2}}\,\sqrt{d\,(1+c^2\,x^2)}$$

$$\Bigg(-\frac{32\,c^5\,f^4\,x}{g^5}-$$

$$\frac{24\,c^3\,f^2\,x}{g^3}-$$

$$\frac{2\,c\,x}{g}+$$

$$\frac{2\,(16\,c^4\,f^4+12\,c^2\,f^2\,g^2+g^4)\,\sqrt{1+c^2\,x^2}\,\text{ArcSinh}[c\,x]}{g^5}-$$

$$\frac{16\,c^5\,f^5\,\text{ArcSinh}[c\,x]^2}{g^6}-$$
$$\frac{16\,c^3\,f^3\,\text{ArcSinh}[c\,x]^2}{g^4}-$$
$$\frac{3\,c\,f\,\text{ArcSinh}[c\,x]^2}{g^2}+$$
$$\frac{2\,c\,f\,\left(2\,c^2\,f^2+g^2\right)\,\text{Cosh}[2\,\text{ArcSinh}[c\,x]]}{g^4}+$$
$$\frac{8\,c^2\,f^2\,\text{ArcSinh}[c\,x]\,\text{Cosh}[3\,\text{ArcSinh}[c\,x]]}{3\,g^3}+$$
$$\frac{2\,\text{ArcSinh}[c\,x]\,\text{Cosh}[3\,\text{ArcSinh}[c\,x]]}{3\,g}+$$
$$\frac{c\,f\,\text{Cosh}[4\,\text{ArcSinh}[c\,x]]}{4\,g^2}+$$
$$\frac{2\,\text{ArcSinh}[c\,x]\,\text{Cosh}[5\,\text{ArcSinh}[c\,x]]}{5\,g}+$$
$$\frac{1}{g^6}\left(2\,c^2\,f^2+g^2\right)\left(16\,c^4\,f^4+16\,c^2\,f^2\,g^2+g^4\right)$$
$$\left(-\frac{i\,\pi\,\text{ArcTanh}\left[\frac{-g+c\,f\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c\,x]\right]}{\sqrt{c^2\,f^2+g^2}}\right]}{\sqrt{c^2\,f^2+g^2}}-\frac{1}{\sqrt{-c^2\,f^2-g^2}}\right.$$
$$\left(2\,\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]\,\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2-g^2}}\right]+\right.$$
$$\left(\pi-2\,i\,\text{ArcSinh}[c\,x]\right)\,\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Tan}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2-g^2}}\right]+$$
$$\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\,\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2-g^2}}\right]-\right.$$
$$\left.2\,i\,\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Tan}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2-g^2}}\right]\right)$$
$$\text{Log}\left[\frac{\left(\frac{1}{2}-\frac{i}{2}\right)\,e^{-\frac{1}{2}\text{ArcSinh}[c\,x]}\,\sqrt{-c^2\,f^2-g^2}}{\sqrt{-i\,g}\,\sqrt{c\,f+c\,g\,x}}\right]+\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+\right.$$
$$2\,i\,\left(\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2-g^2}}\right]+\right.$$

$$\text{ArcTanh}\left[\frac{(c\,f - i\,g)\,\text{Tan}\left[\frac{1}{4}\,(\pi + 2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2 f^2 - g^2}}\right]\Bigg)\Bigg)$$

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

$$2\,i\,\text{ArcTanh}\left[\frac{(c\,f + i\,g)\,\text{Cot}\left[\frac{1}{4}\,(\pi + 2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2 f^2 - g^2}}\right]\Bigg)\,\text{Log}\Big[$$

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

$$\left(g\left(i\,c\,f + g + i\,\sqrt{-c^2 f^2 - g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi + 2\,i\,\text{ArcSinh}[c\,x])\right]\right)\right)\Big] -$$

$$\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right] - 2\,i\,\text{ArcTanh}\left[\frac{(c\,f + i\,g)\,\text{Cot}\left[\frac{1}{4}\,(\pi + 2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2 f^2 - g^2}}\right]\right)\,\text{Log}\Big[$$

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

$$\left(g\left(c\,f - i\,g + \sqrt{-c^2 f^2 - g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi + 2\,i\,\text{ArcSinh}[c\,x])\right]\right)\right)\Big] + i$$

$$\Bigg(\text{PolyLog}\Big[2,\ \Big(\left(i\,c\,f + \sqrt{-c^2 f^2 - g^2}\right)\Big(i\,c\,f + g - i\,\sqrt{-c^2 f^2 - g^2}$$

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

$$\frac{1}{4}\,(\pi + 2\,i\,\text{ArcSinh}[c\,x])\Big]\Big)\Big)\Big] - \text{PolyLog}\Big[2,\ \Big(\left(c\,f + i\,\sqrt{-c^2 f^2 - g^2}\right)$$

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

$$\left(g\left(i\,c\,f + g + i\,\sqrt{-c^2 f^2 - g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi + 2\,i\,\text{ArcSinh}[c\,x])\right]\right)\right)\Big]\Bigg)\Bigg) -$$

$$\frac{8\,c^3 f^3\,\text{ArcSinh}[c\,x]\,\text{Sinh}[2\,\text{ArcSinh}[c\,x]]}{g^4} - \frac{4\,c\,f\,\text{ArcSinh}[c\,x]\,\text{Sinh}[2\,\text{ArcSinh}[c\,x]]}{g^2} -$$

$$\frac{8\,c^2 f^2\,\text{Sinh}[3\,\text{ArcSinh}[c\,x]]}{9\,g^3} -$$

$$\frac{2\,\text{Sinh}[3\,\text{ArcSinh}[c\,x]]}{9\,g} -$$

$$\frac{c\,f\,\text{ArcSinh}[c\,x]\,\text{Sinh}[4\,\text{ArcSinh}[c\,x]]}{g^2} -$$

$$\left.\left.\frac{2\,\text{Sinh}[5\,\text{ArcSinh}[c\,x]]}{25\,g}\right)\right)$$

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

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

Optimal (type 4, 325 leaves, 10 steps):

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

Result (type 4, 1233 leaves):

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

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

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

$$\left(\pi-2\,i\,\text{ArcSinh}[c\,x]\right)\,\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Tan}\left[\frac{1}{4}\,\left(\pi+2\,i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2\,f^2-g^2}}\right]+$$

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

$$2\,i\,\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Tan}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2\,f^2-g^2}}\right]\Bigg)$$

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

$$\Bigg(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]+2\,i\,\Bigg(\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2\,f^2-g^2}}\right]+$$

$$\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Tan}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2\,f^2-g^2}}\right]\Bigg)\Bigg)$$

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

$$2\,i\,\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2\,f^2-g^2}}\right]\Bigg)$$

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

$$\left(g\,\left(i\,c\,f+g+i\,\sqrt{-c^2\,f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right)\right)\Bigg]-$$

$$\Bigg(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right]-2\,i\,\text{ArcTanh}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{-c^2\,f^2-g^2}}\right]\Bigg)$$

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

$$\left(g\,\left(c\,f-i\,g+\sqrt{-c^2\,f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right)\right)\Bigg]+i\,\Bigg(\text{PolyLog}\Bigg[2,$$

$$\Bigg(\left(i\,c\,f+\sqrt{-c^2\,f^2-g^2}\right)\,\left(i\,c\,f+g-i\,\sqrt{-c^2\,f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right)\Bigg)\Big/$$

$$\left(g\,\left(i\,c\,f+g+i\,\sqrt{-c^2\,f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right)\right)\Bigg]-\text{PolyLog}\Bigg[2,$$

$$\Bigg(\left(c\,f+i\,\sqrt{-c^2\,f^2-g^2}\right)\,\left(-c\,f+i\,g+\sqrt{-c^2\,f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right)\Bigg)\Big/$$

$$\left(g\,\left(i\,c\,f+g+i\,\sqrt{-c^2\,f^2-g^2}\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]\right)\right)\Bigg]\Bigg)\Bigg)$$

Problem 52: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 444 leaves, 13 steps):

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

Result (type 4, 1586 leaves):

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

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

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

$$\frac{1}{\sqrt{-c^2 f^2 - g^2}}\left(2\left(\frac{\pi}{2} - i\,\text{ArcSinh}[c\,x]\right)\text{ArcTanh}\left[\frac{(c\,f - i\,g)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2} - i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2 - g^2}}\right] - \right.$$

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

$$\left(\text{ArcCos}\left[-\frac{i\,c\,f}{g}\right] - 2\,i\left(\text{ArcTanh}\left[\frac{(c\,f - i\,g)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2} - i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2 - g^2}}\right] - \right.\right.$$

$$\left.\left.\text{ArcTanh}\left[\frac{(-c\,f - i\,g)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2} - i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2 - g^2}}\right]\right)\right)$$

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

$$2\,i\left(\text{ArcTanh}\left[\frac{(c\,f-i\,g)\,\text{Cot}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]-\right.$$

$$\left.\left.\text{ArcTanh}\left[\frac{(-c\,f-i\,g)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\right)$$

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

$$\left.2\,i\,\text{ArcTanh}\left[\frac{(-c\,f-i\,g)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]}{\sqrt{-c^2 f^2-g^2}}\right]\right)\text{Log}\Big[1-$$

$$\left(i\left(c\,f-i\sqrt{-c^2 f^2-g^2}\right)\left(c\,f-i\,g-\sqrt{-c^2 f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big/$$

$$\left(g\left(c\,f-i\,g+\sqrt{-c^2 f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big]+$$

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

$$\left(i\left(c\,f+i\sqrt{-c^2 f^2-g^2}\right)\left(c\,f-i\,g-\sqrt{-c^2 f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big/$$

$$\left(g\left(c\,f-i\,g+\sqrt{-c^2 f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big]+$$

$$i\left(\text{PolyLog}\Big[2,\left(i\left(c\,f-i\sqrt{-c^2 f^2-g^2}\right)\left(c\,f-i\,g-\sqrt{-c^2 f^2-g^2}\right.\right.\right.$$

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

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

$$\left.\left(c\,f-i\,g-\sqrt{-c^2 f^2-g^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[c\,x]\right)\right]\right)\right)\Big/$$

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

Problem 54: Attempted integration timed out after 120 seconds.

$$\int\frac{(a+b\,\text{ArcSinh}[c\,x])^2\,\text{Log}\left[h\,(f+g\,x)^m\right]}{\sqrt{1+c^2 x^2}}\,dx$$

Optimal (type 4, 438 leaves, 13 steps):

$$\frac{m\,(a+b\,\text{ArcSinh}[c\,x])^4}{12\,b^2\,c}-\frac{m\,(a+b\,\text{ArcSinh}[c\,x])^3\,\text{Log}\Big[1+\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f-\sqrt{c^2\,f^2+g^2}}\Big]}{3\,b\,c}-$$
$$\frac{m\,(a+b\,\text{ArcSinh}[c\,x])^3\,\text{Log}\Big[1+\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f+\sqrt{c^2\,f^2+g^2}}\Big]}{3\,b\,c}+\frac{(a+b\,\text{ArcSinh}[c\,x])^3\,\text{Log}\big[h\,(f+g\,x)^m\big]}{3\,b\,c}-$$
$$\frac{m\,(a+b\,\text{ArcSinh}[c\,x])^2\,\text{PolyLog}\Big[2,-\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f-\sqrt{c^2\,f^2+g^2}}\Big]}{c}-$$
$$\frac{m\,(a+b\,\text{ArcSinh}[c\,x])^2\,\text{PolyLog}\Big[2,-\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f+\sqrt{c^2\,f^2+g^2}}\Big]}{c}+$$
$$\frac{2\,b\,m\,(a+b\,\text{ArcSinh}[c\,x])\,\text{PolyLog}\Big[3,-\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f-\sqrt{c^2\,f^2+g^2}}\Big]}{c}+$$
$$\frac{2\,b\,m\,(a+b\,\text{ArcSinh}[c\,x])\,\text{PolyLog}\Big[3,-\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f+\sqrt{c^2\,f^2+g^2}}\Big]}{c}-$$
$$\frac{2\,b^2\,m\,\text{PolyLog}\Big[4,-\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f-\sqrt{c^2\,f^2+g^2}}\Big]}{c}-\frac{2\,b^2\,m\,\text{PolyLog}\Big[4,-\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f+\sqrt{c^2\,f^2+g^2}}\Big]}{c}$$

Result (type 1, 1 leaves):

???

Problem 55: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int \frac{(a+b\,\text{ArcSinh}[c\,x])\,\text{Log}\big[h\,(f+g\,x)^m\big]}{\sqrt{1+c^2\,x^2}}\,dx$$

Optimal (type 4, 332 leaves, 11 steps):

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

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

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

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

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

Result (type 4, 1547 leaves) :

$$-\frac{1}{24\,c}\left(3\,a\,m\,\pi^2-12\,i\,a\,m\,\pi\,\text{ArcSinh}[c\,x]-12\,a\,m\,\text{ArcSinh}[c\,x]^2-4\,b\,m\,\text{ArcSinh}[c\,x]^3-\right.$$

$$96\,a\,m\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,f}{g}}}{\sqrt{2}}\right]\,\text{ArcTan}\left[\frac{(c\,f+i\,g)\,\text{Cot}\left[\frac{1}{4}\,(\pi+2\,i\,\text{ArcSinh}[c\,x])\right]}{\sqrt{c^2\,f^2+g^2}}\right]+$$

$$12\,b\,m\,\text{ArcSinh}[c\,x]^2\,\text{Log}\left[\frac{-c\,f-e^{\text{ArcSinh}[c\,x]}\,g+\sqrt{c^2\,f^2+g^2}}{-c\,f+\sqrt{c^2\,f^2+g^2}}\right]+$$

$$12\,b\,m\,\text{ArcSinh}[c\,x]^2\,\text{Log}\left[\frac{c\,f+e^{\text{ArcSinh}[c\,x]}\,g+\sqrt{c^2\,f^2+g^2}}{c\,f+\sqrt{c^2\,f^2+g^2}}\right]+$$

$$12\,i\,a\,m\,\pi\,\text{Log}\left[\frac{-c\,e^{\text{ArcSinh}[c\,x]}\,f+g-e^{\text{ArcSinh}[c\,x]}\,\sqrt{c^2\,f^2+g^2}}{g}\right]-$$

$$48\,i\,a\,m\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,f}{g}}}{\sqrt{2}}\right]\,\text{Log}\left[\frac{-c\,e^{\text{ArcSinh}[c\,x]}\,f+g-e^{\text{ArcSinh}[c\,x]}\,\sqrt{c^2\,f^2+g^2}}{g}\right]+$$

$$24\,a\,m\,\text{ArcSinh}[c\,x]\,\text{Log}\left[\frac{-c\,e^{\text{ArcSinh}[c\,x]}\,f+g-e^{\text{ArcSinh}[c\,x]}\,\sqrt{c^2\,f^2+g^2}}{g}\right]+$$

$$12\,i\,b\,m\,\pi\,\text{ArcSinh}[c\,x]\,\text{Log}\left[\frac{-c\,e^{\text{ArcSinh}[c\,x]}\,f+g-e^{\text{ArcSinh}[c\,x]}\,\sqrt{c^2\,f^2+g^2}}{g}\right]-$$

$$48\,i\,b\,m\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,f}{g}}}{\sqrt{2}}\right]\text{ArcSinh}[c\,x]\,\text{Log}\left[\frac{-c\,e^{\text{ArcSinh}[c\,x]}\,f+g-e^{\text{ArcSinh}[c\,x]}\sqrt{c^2\,f^2+g^2}}{g}\right]+$$

$$12\,b\,m\,\text{ArcSinh}[c\,x]^2\,\text{Log}\left[\frac{-c\,e^{\text{ArcSinh}[c\,x]}\,f+g-e^{\text{ArcSinh}[c\,x]}\sqrt{c^2\,f^2+g^2}}{g}\right]+$$

$$12\,i\,a\,m\,\pi\,\text{Log}\left[\frac{-c\,e^{\text{ArcSinh}[c\,x]}\,f+g+e^{\text{ArcSinh}[c\,x]}\sqrt{c^2\,f^2+g^2}}{g}\right]+$$

$$48\,i\,a\,m\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,f}{g}}}{\sqrt{2}}\right]\text{Log}\left[\frac{-c\,e^{\text{ArcSinh}[c\,x]}\,f+g+e^{\text{ArcSinh}[c\,x]}\sqrt{c^2\,f^2+g^2}}{g}\right]+$$

$$24\,a\,m\,\text{ArcSinh}[c\,x]\,\text{Log}\left[\frac{-c\,e^{\text{ArcSinh}[c\,x]}\,f+g+e^{\text{ArcSinh}[c\,x]}\sqrt{c^2\,f^2+g^2}}{g}\right]+$$

$$12\,i\,b\,m\,\pi\,\text{ArcSinh}[c\,x]\,\text{Log}\left[\frac{-c\,e^{\text{ArcSinh}[c\,x]}\,f+g+e^{\text{ArcSinh}[c\,x]}\sqrt{c^2\,f^2+g^2}}{g}\right]+$$

$$48\,i\,b\,m\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\,f}{g}}}{\sqrt{2}}\right]\text{ArcSinh}[c\,x]\,\text{Log}\left[\frac{-c\,e^{\text{ArcSinh}[c\,x]}\,f+g+e^{\text{ArcSinh}[c\,x]}\sqrt{c^2\,f^2+g^2}}{g}\right]+$$

$$12\,b\,m\,\text{ArcSinh}[c\,x]^2\,\text{Log}\left[\frac{-c\,e^{\text{ArcSinh}[c\,x]}\,f+g+e^{\text{ArcSinh}[c\,x]}\sqrt{c^2\,f^2+g^2}}{g}\right]-$$

$$12\,i\,a\,m\,\pi\,\text{Log}[c\,(f+g\,x)]-24\,a\,\text{ArcSinh}[c\,x]\,\text{Log}\left[h\,(f+g\,x)^m\right]-12\,b\,\text{ArcSinh}[c\,x]^2$$

$$\text{Log}\left[h\,(f+g\,x)^m\right]-12\,i\,b\,m\,\pi\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1+\frac{\left(-c\,f+\sqrt{c^2\,f^2+g^2}\right)\left(c\,x+\sqrt{1+c^2\,x^2}\right)}{g}\right]-$$

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

$$12\,b\,m\,\text{ArcSinh}[c\,x]^2\,\text{Log}\left[1+\frac{\left(-c\,f+\sqrt{c^2\,f^2+g^2}\right)\left(c\,x+\sqrt{1+c^2\,x^2}\right)}{g}\right]-$$

$$12\,i\,b\,m\,\pi\,\text{ArcSinh}[c\,x]\,\text{Log}\left[1-\frac{\left(c\,f+\sqrt{c^2\,f^2+g^2}\right)\left(c\,x+\sqrt{1+c^2\,x^2}\right)}{g}\right]+$$

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

$$12\,b\,m\,\text{ArcSinh}[c\,x]^2\,\text{Log}\left[1-\frac{\left(c\,f+\sqrt{c^2 f^2+g^2}\right)\left(c\,x+\sqrt{1+c^2 x^2}\right)}{g}\right]+$$

$$24\,a\,m\,\text{PolyLog}\left[2,\frac{e^{\text{ArcSinh}[c\,x]}\left(c\,f-\sqrt{c^2 f^2+g^2}\right)}{g}\right]+$$

$$24\,b\,m\,\text{ArcSinh}[c\,x]\,\text{PolyLog}\left[2,\frac{e^{\text{ArcSinh}[c\,x]}\,g}{-c\,f+\sqrt{c^2 f^2+g^2}}\right]+24\,b\,m\,\text{ArcSinh}[c\,x]$$

$$\text{PolyLog}\left[2,-\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f+\sqrt{c^2 f^2+g^2}}\right]+24\,a\,m\,\text{PolyLog}\left[2,\frac{e^{\text{ArcSinh}[c\,x]}\left(c\,f+\sqrt{c^2 f^2+g^2}\right)}{g}\right]-$$

$$\left.24\,b\,m\,\text{PolyLog}\left[3,\frac{e^{\text{ArcSinh}[c\,x]}\,g}{-c\,f+\sqrt{c^2 f^2+g^2}}\right]-24\,b\,m\,\text{PolyLog}\left[3,-\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f+\sqrt{c^2 f^2+g^2}}\right]\right)$$

Problem 56: Attempted integration timed out after 120 seconds.

$$\int \frac{\text{Log}\left[h\,(f+g\,x)^m\right]}{\sqrt{1+c^2 x^2}}\,dx$$

Optimal (type 4, 197 leaves, 9 steps):

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

$$\frac{\text{ArcSinh}[c\,x]\,\text{Log}\left[h\,(f+g\,x)^m\right]}{c}-\frac{m\,\text{PolyLog}\left[2,-\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f-\sqrt{c^2 f^2+g^2}}\right]}{c}-\frac{m\,\text{PolyLog}\left[2,-\frac{e^{\text{ArcSinh}[c\,x]}\,g}{c\,f+\sqrt{c^2 f^2+g^2}}\right]}{c}$$

Result (type 1, 1 leaves):

???

Problem 62: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 131 leaves, 9 steps):

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

Result (type 4, 290 leaves):

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

Problem 71: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 205 leaves, 11 steps):

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

Result (type 4, 890 leaves):

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

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

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

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

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

$$i\,\pi\,\text{ArcSinh}[a+b\,x]\,\text{Log}\left[1+a\,e^{\text{ArcSinh}[a+b\,x]}+\sqrt{1+a^2}\,e^{\text{ArcSinh}[a+b\,x]}\right]+$$

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

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

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

$$4\,i\,\text{ArcSin}\left[\frac{\sqrt{1-i\,a}}{\sqrt{2}}\right]\text{ArcSinh}[a+b\,x]$$

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

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

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

$$4\,i\,\text{ArcSin}\left[\frac{\sqrt{1-i\,a}}{\sqrt{2}}\right]\text{ArcSinh}[a+b\,x]$$

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

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

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

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

Problem 72: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 178 leaves, 11 steps):

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

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

Result (type 4, 866 leaves) :

$$-\frac{\text{ArcSinh}[a+b x]^2}{x}-\frac{2\,\text{i}\,b\,\pi\,\text{ArcTanh}\left[\frac{-1-a\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[a+b x]\right]}{\sqrt{1+a^2}}\right]}{\sqrt{1+a^2}}-$$

$$\frac{1}{\sqrt{-1-a^2}}\,2\,b\,\Bigg(-2\,\text{ArcCos}[\text{i}\,a]\,\text{ArcTanh}\left[\frac{(-\text{i}+a)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\text{i}\,\text{ArcSinh}[a+b x]\right)\right]}{\sqrt{-1-a^2}}\right]-$$

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

$$\Bigg(\text{ArcCos}[\text{i}\,a]+2\,\text{i}\,\text{ArcTanh}\left[\frac{(-\text{i}+a)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\text{i}\,\text{ArcSinh}[a+b x]\right)\right]}{\sqrt{-1-a^2}}\right]+$$

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

$$\Bigg(\text{ArcCos}[\text{i}\,a]-2\,\text{i}\,\Bigg(\text{ArcTanh}\left[\frac{(-\text{i}+a)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\text{i}\,\text{ArcSinh}[a+b x]\right)\right]}{\sqrt{-1-a^2}}\right]+\text{ArcTanh}\Big[$$

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

$$\left(\text{ArcCos}[\text{i}\,a]+2\,\text{i}\,\text{ArcTanh}\left[\frac{(-\text{i}+a)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\text{i}\,\text{ArcSinh}[a+b x]\right)\right]}{\sqrt{-1-a^2}}\right]\right)$$

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

$$\left(\text{i}+a-\sqrt{-1-a^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\text{i}\,\text{ArcSinh}[a+b x]\right)\right]\right)\Big]-$$

$$\left(\text{ArcCos}[\text{i}\,a]-2\,\text{i}\,\text{ArcTanh}\left[\frac{(-\text{i}+a)\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\text{i}\,\text{ArcSinh}[a+b x]\right)\right]}{\sqrt{-1-a^2}}\right]\right)$$

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

$$\left(-\text{i}-a+\sqrt{-1-a^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\text{i}\,\text{ArcSinh}[a+b x]\right)\right]\right)\Big]+$$

$$\text{i}\,\Bigg(\text{PolyLog}\Big[2,-\Big(\Big(\left(-\text{i}\,a+\sqrt{-1-a^2}\right)\left(\text{i}+a+\sqrt{-1-a^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\text{i}\,\text{ArcSinh}[a+b x]\right)\right]\right)\Big)\Big/$$

$$\left(-\text{i}-a+\sqrt{-1-a^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\text{i}\,\text{ArcSinh}[a+b x]\right)\right]\right)\Big)\Big]-$$

$$\text{PolyLog}\Big[2,\Big(\left(\text{i}\,a+\sqrt{-1-a^2}\right)\left(\text{i}+a+\sqrt{-1-a^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\text{i}\,\text{ArcSinh}[a+b x]\right)\right]\right)\Big)\Big/$$

$$\left(-\text{i}-a+\sqrt{-1-a^2}\,\text{Cot}\left[\frac{1}{4}\left(\pi+2\,\text{i}\,\text{ArcSinh}[a+b x]\right)\right]\right)\Big]\Bigg)\Bigg)$$

Problem 73: Result unnecessarily involves complex numbers and more than

twice size of optimal antiderivative.

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

Optimal (type 4, 235 leaves, 14 steps):

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

Result (type 4, 925 leaves):

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

$$\frac{1}{\left(-1-a^2\right)^{3/2}} a b^2 \left(-2 \text{ArcCos}[i a]\ \text{ArcTanh}\left[\frac{(-i+a) \text{Cot}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[a+b x]\right)\right]}{\sqrt{-1-a^2}}\right]-\right.$$

$$\left(\pi-2 i \text{ArcSinh}[a+b x]\right) \text{ArcTanh}\left[\frac{(i+a) \text{Tan}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[a+b x]\right)\right]}{\sqrt{-1-a^2}}\right]+$$

$$\left(\text{ArcCos}[i a]+2 i \text{ArcTanh}\left[\frac{(-i+a) \text{Cot}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[a+b x]\right)\right]}{\sqrt{-1-a^2}}\right]+\right.$$

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

$$\left(\text{ArcCos}[i a]-2 i \left(\text{ArcTanh}\left[\frac{(-i+a) \text{Cot}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[a+b x]\right)\right]}{\sqrt{-1-a^2}}\right]+\text{ArcTanh}\left[\right.\right.\right.$$

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

$$\left(\text{ArcCos}[i a]+2 i \text{ArcTanh}\left[\frac{(-i+a) \text{Cot}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[a+b x]\right)\right]}{\sqrt{-1-a^2}}\right]\right)$$

$$\text{Log}\left[\left((i+a)\left(a+i\left(-1+\sqrt{-1-a^2}\right)\right)\left(i+\text{Cot}\left[\frac{1}{4}\left(\pi+2 i \text{ArcSinh}[a+b x]\right)\right]\right)\right)\Big/\right.$$

$$\left(i+a-\sqrt{-1-a^2}\ \mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[a+b\,x]\right)\right]\right)\Bigg]-$$
$$\left(\mathrm{ArcCos}[i\,a]-2\,i\,\mathrm{ArcTanh}\left[\frac{(-i+a)\ \mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[a+b\,x]\right)\right]}{\sqrt{-1-a^2}}\right]\right)$$
$$\mathrm{Log}\Bigg[\left((i+a)\left(a-i\left(1+\sqrt{-1-a^2}\right)\right)\left(-i+\mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[a+b\,x]\right)\right]\right)\right)\Big/$$
$$\left(-i-a+\sqrt{-1-a^2}\ \mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[a+b\,x]\right)\right]\right)\Bigg]+$$
$$i\left(\mathrm{PolyLog}\left[2,-\left(\left(\left(-i\,a+\sqrt{-1-a^2}\right)\left(i+a+\sqrt{-1-a^2}\ \mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[a+b\,x]\right)\right]\right)\right)\Big/\right.\right.\right.$$
$$\left.\left.\left(-i-a+\sqrt{-1-a^2}\ \mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[a+b\,x]\right)\right]\right)\right)\right]-$$
$$\mathrm{PolyLog}\left[2,\left(\left(i\,a+\sqrt{-1-a^2}\right)\left(i+a+\sqrt{-1-a^2}\ \mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[a+b\,x]\right)\right]\right)\right)\Big/\right.$$
$$\left.\left.\left(-i-a+\sqrt{-1-a^2}\ \mathrm{Cot}\left[\frac{1}{4}\left(\pi+2\,i\,\mathrm{ArcSinh}[a+b\,x]\right)\right]\right)\right]\right)\right)$$

Problem 74: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

$$\int\frac{\mathrm{ArcSinh}[a+b\,x]^2}{x^4}\,dx$$

Optimal (type 4, 478 leaves, 40 steps):

$$-\frac{b^2}{3\left(1+a^2\right)x}-\frac{b\sqrt{1+(a+b\,x)^2}\ \mathrm{ArcSinh}[a+b\,x]}{3\left(1+a^2\right)x^2}+\frac{a\,b^2\sqrt{1+(a+b\,x)^2}\ \mathrm{ArcSinh}[a+b\,x]}{\left(1+a^2\right)^2x}-$$
$$\frac{\mathrm{ArcSinh}[a+b\,x]^2}{3\,x^3}-\frac{a^2\,b^3\,\mathrm{ArcSinh}[a+b\,x]\,\mathrm{Log}\left[1-\frac{e^{\mathrm{ArcSinh}[a+b\,x]}}{a-\sqrt{1+a^2}}\right]}{\left(1+a^2\right)^{5/2}}+$$
$$\frac{b^3\,\mathrm{ArcSinh}[a+b\,x]\,\mathrm{Log}\left[1-\frac{e^{\mathrm{ArcSinh}[a+b\,x]}}{a-\sqrt{1+a^2}}\right]}{3\left(1+a^2\right)^{3/2}}+\frac{a^2\,b^3\,\mathrm{ArcSinh}[a+b\,x]\,\mathrm{Log}\left[1-\frac{e^{\mathrm{ArcSinh}[a+b\,x]}}{a+\sqrt{1+a^2}}\right]}{\left(1+a^2\right)^{5/2}}-$$
$$\frac{b^3\,\mathrm{ArcSinh}[a+b\,x]\,\mathrm{Log}\left[1-\frac{e^{\mathrm{ArcSinh}[a+b\,x]}}{a+\sqrt{1+a^2}}\right]}{3\left(1+a^2\right)^{3/2}}-\frac{a\,b^3\,\mathrm{Log}[x]}{\left(1+a^2\right)^2}-\frac{a^2\,b^3\,\mathrm{PolyLog}\left[2,\frac{e^{\mathrm{ArcSinh}[a+b\,x]}}{a-\sqrt{1+a^2}}\right]}{\left(1+a^2\right)^{5/2}}+$$
$$\frac{b^3\,\mathrm{PolyLog}\left[2,\frac{e^{\mathrm{ArcSinh}[a+b\,x]}}{a-\sqrt{1+a^2}}\right]}{3\left(1+a^2\right)^{3/2}}+\frac{a^2\,b^3\,\mathrm{PolyLog}\left[2,\frac{e^{\mathrm{ArcSinh}[a+b\,x]}}{a+\sqrt{1+a^2}}\right]}{\left(1+a^2\right)^{5/2}}-\frac{b^3\,\mathrm{PolyLog}\left[2,\frac{e^{\mathrm{ArcSinh}[a+b\,x]}}{a+\sqrt{1+a^2}}\right]}{3\left(1+a^2\right)^{3/2}}$$

Result (type 4, 2153 leaves):

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

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

$$\frac{a \,\text{Log}\left[1-\frac{a+b x}{a}\right]}{(1+a^2)^2} - \frac{1}{3\,(1+a^2)^2} \left(-\frac{i\,\pi\,\text{ArcTanh}\left[\frac{-1-a \,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[a+b x]\right]}{\sqrt{1+a^2}}\right]}{\sqrt{1+a^2}} - \right.$$

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

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

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

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

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

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

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

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

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

$$\text{Log}\left[1 - \left(i\left(-a - i\sqrt{-1-a^2}\right)\left(-i - a - \sqrt{-1-a^2}\ \text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[a+b x]\right)\right]\right)\right) \Big/ \right.$$

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

$$\left(-\text{ArcCos}[\mathrm{i}\,a]+2\,\mathrm{i}\,\text{ArcTanh}\left[\frac{(-\mathrm{i}+a)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[a+b\,x]\right)\right]}{\sqrt{-1-a^2}}\right]\right)$$

$$\text{Log}\left[1-\left(\mathrm{i}\left(-a+\mathrm{i}\sqrt{-1-a^2}\right)\left(-\mathrm{i}-a-\sqrt{-1-a^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[a+b\,x]\right)\right]\right)\right)\Big/\right.$$

$$\left.\left(-\mathrm{i}-a+\sqrt{-1-a^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[a+b\,x]\right)\right]\right)\right]+\mathrm{i}\left(\text{PolyLog}\left[2,\right.\right.$$

$$\left(\mathrm{i}\left(-a-\mathrm{i}\sqrt{-1-a^2}\right)\left(-\mathrm{i}-a-\sqrt{-1-a^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[a+b\,x]\right)\right]\right)\right)\Big/$$

$$\left.\left(-\mathrm{i}-a+\sqrt{-1-a^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[a+b\,x]\right)\right]\right)\right]-\text{PolyLog}\left[2,\right.$$

$$\left(\mathrm{i}\left(-a+\mathrm{i}\sqrt{-1-a^2}\right)\left(-\mathrm{i}-a-\sqrt{-1-a^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[a+b\,x]\right)\right]\right)\right)\Big/$$

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

$$\frac{1}{3\left(1+a^2\right)^2}\,2\,a^2\left(-\frac{\mathrm{i}\,\pi\,\text{ArcTanh}\left[\frac{-1-a\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[a+b\,x]\right]}{\sqrt{1+a^2}}\right]}{\sqrt{1+a^2}}-\frac{1}{\sqrt{-1-a^2}}\right.$$

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

$$2\,\text{ArcCos}[\mathrm{i}\,a]\,\text{ArcTanh}\left[\frac{(-\mathrm{i}+a)\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-\mathrm{i}\,\text{ArcSinh}[a+b\,x]\right)\right]}{\sqrt{-1-a^2}}\right]+$$

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

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

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

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

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

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

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

$$\text{Log}\left[1-\left(i\left(-a-i\sqrt{-1-a^2}\right)\left(-i-a-\sqrt{-1-a^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[a+b\,x]\right)\right]\right)\right)\Big/\left(-i-a+\sqrt{-1-a^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[a+b\,x]\right)\right]\right)\right]+$$

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

$$\text{Log}\left[1-\left(i\left(-a+i\sqrt{-1-a^2}\right)\left(-i-a-\sqrt{-1-a^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[a+b\,x]\right)\right]\right)\right)\Big/\left(-i-a+\sqrt{-1-a^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[a+b\,x]\right)\right]\right)\right]+i\left(\text{PolyLog}\left[2,\left(i\left(-a-i\sqrt{-1-a^2}\right)\left(-i-a-\sqrt{-1-a^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[a+b\,x]\right)\right]\right)\right)\Big/\left(-i-a+\sqrt{-1-a^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[a+b\,x]\right)\right]\right)\right]-\text{PolyLog}\left[2,\left(i\left(-a+i\sqrt{-1-a^2}\right)\left(-i-a-\sqrt{-1-a^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[a+b\,x]\right)\right]\right)\right)\Big/\left(-i-a+\sqrt{-1-a^2}\,\text{Tan}\left[\frac{1}{2}\left(\frac{\pi}{2}-i\,\text{ArcSinh}[a+b\,x]\right)\right]\right)\right]\right)\Bigg)\Bigg)$$

Problem 78: Unable to integrate problem.

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

Optimal (type 4, 275 leaves, 13 steps) :

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

Result (type 8, 14 leaves):

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

Problem 79: Unable to integrate problem.

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

Optimal (type 4, 268 leaves, 13 steps):

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

Result (type 8, 14 leaves):

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

Problem 80: Unable to integrate problem.

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

Optimal (type 4, 514 leaves, 21 steps):

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

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

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

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

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

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

Result (type 8, 14 leaves) :

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

Problem 94: Unable to integrate problem.

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

Optimal (type 4, 545 leaves, 22 steps) :

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

Result (type 8, 18 leaves) :

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

Problem 126: Unable to integrate problem.

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

Optimal (type 5, 187 leaves, 3 steps) :

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

Result (type 8, 25 leaves) :

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

Problem 132: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 115 leaves, 8 steps):

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

Result (type 4, 152 leaves):

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

Problem 142: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 155 leaves, 9 steps):

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

Result (type 4, 256 leaves):

$$\frac{1}{64 d e}\left(64 a^3 \operatorname{Log}[c + d x] + 96 a^2 b \left(\operatorname{ArcSinh}[c + d x] \left(\operatorname{ArcSinh}[c + d x] + 2 \operatorname{Log}\left[1 - e^{-2 \operatorname{ArcSinh}[c+d x]}\right]\right) - \operatorname{PolyLog}\left[2, e^{-2 \operatorname{ArcSinh}[c+d x]}\right]\right) + 8 a b^2 \left(i \pi^3 - 8 \operatorname{ArcSinh}[c + d x]^3 + 24 \operatorname{ArcSinh}[c + d x]^2 \operatorname{Log}\left[1 - e^{2 \operatorname{ArcSinh}[c+d x]}\right] + 24 \operatorname{ArcSinh}[c + d x] \operatorname{PolyLog}\left[2, e^{2 \operatorname{ArcSinh}[c+d x]}\right] - 12 \operatorname{PolyLog}\left[3, e^{2 \operatorname{ArcSinh}[c+d x]}\right]\right) + b^3 \left(\pi^4 - 16 \operatorname{ArcSinh}[c + d x]^4 + 64 \operatorname{ArcSinh}[c + d x]^3 \operatorname{Log}\left[1 - e^{2 \operatorname{ArcSinh}[c+d x]}\right] + 96 \operatorname{ArcSinh}[c + d x]^2 \operatorname{PolyLog}\left[2, e^{2 \operatorname{ArcSinh}[c+d x]}\right] - 96 \operatorname{ArcSinh}[c + d x] \operatorname{PolyLog}\left[3, e^{2 \operatorname{ArcSinh}[c+d x]}\right] + 48 \operatorname{PolyLog}\left[4, e^{2 \operatorname{ArcSinh}[c+d x]}\right]\right)\right)$$

Problem 145: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 261 leaves, 16 steps):

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

Result (type 4, 694 leaves):

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

$$\frac{1}{48\,d\,e^4}b^3\left(-24\,\text{ArcSinh}[c+d\,x]\,\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c+d\,x]\right]+4\,\text{ArcSinh}[c+d\,x]^3\,\text{Coth}\left[\frac{1}{2}\text{ArcSinh}[c+d\,x]\right]-6\,\text{ArcSinh}[c+d\,x]^2\,\text{Csch}\left[\frac{1}{2}\text{ArcSinh}[c+d\,x]\right]^2-(c+d\,x)\,\text{ArcSinh}[c+d\,x]^3\,\text{Csch}\left[\frac{1}{2}\text{ArcSinh}[c+d\,x]\right]^4-24\,\text{ArcSinh}[c+d\,x]^2\,\text{Log}\left[1-e^{-\text{ArcSinh}[c+d\,x]}\right]+24\,\text{ArcSinh}[c+d\,x]^2\,\text{Log}\left[1+e^{-\text{ArcSinh}[c+d\,x]}\right]+48\,\text{Log}\left[\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c+d\,x]\right]\right]-48\,\text{ArcSinh}[c+d\,x]\,\text{PolyLog}\left[2,-e^{-\text{ArcSinh}[c+d\,x]}\right]+48\,\text{ArcSinh}[c+d\,x]\,\text{PolyLog}\left[2,e^{-\text{ArcSinh}[c+d\,x]}\right]-48\,\text{PolyLog}\left[3,-e^{-\text{ArcSinh}[c+d\,x]}\right]+48\,\text{PolyLog}\left[3,e^{-\text{ArcSinh}[c+d\,x]}\right]-6\,\text{ArcSinh}[c+d\,x]^2\,\text{Sech}\left[\frac{1}{2}\text{ArcSinh}[c+d\,x]\right]^2-\frac{16\,\text{ArcSinh}[c+d\,x]^3\,\text{Sinh}\left[\frac{1}{2}\text{ArcSinh}[c+d\,x]\right]^4}{(c+d\,x)^3}+24\,\text{ArcSinh}[c+d\,x]\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c+d\,x]\right]-4\,\text{ArcSinh}[c+d\,x]^3\,\text{Tanh}\left[\frac{1}{2}\text{ArcSinh}[c+d\,x]\right]\right)$$

Problem 151: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 4, 186 leaves, 10 steps):

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

Result (type 4, 390 leaves):

$$\frac{1}{16\,d\,e}\Big(16\,a^4\,\text{Log}[c+d\,x]+32\,a^3\,b\,\left(\text{ArcSinh}[c+d\,x]\,\left(\text{ArcSinh}[c+d\,x]+2\,\text{Log}\left[1-e^{-2\,\text{ArcSinh}[c+d\,x]}\right]\right)-\text{PolyLog}\left[2,\,e^{-2\,\text{ArcSinh}[c+d\,x]}\right]\right)+4\,a^2\,b^2\,\left(i\,\pi^3-8\,\text{ArcSinh}[c+d\,x]^3+24\,\text{ArcSinh}[c+d\,x]^2\,\text{Log}\left[1-e^{2\,\text{ArcSinh}[c+d\,x]}\right]+24\,\text{ArcSinh}[c+d\,x]\,\text{PolyLog}\left[2,\,e^{2\,\text{ArcSinh}[c+d\,x]}\right]-12\,\text{PolyLog}\left[3,\,e^{2\,\text{ArcSinh}[c+d\,x]}\right]\right)+a\,b^3\,\left(\pi^4-16\,\text{ArcSinh}[c+d\,x]^4+64\,\text{ArcSinh}[c+d\,x]^3\,\text{Log}\left[1-e^{2\,\text{ArcSinh}[c+d\,x]}\right]+96\,\text{ArcSinh}[c+d\,x]^2\,\text{PolyLog}\left[2,\,e^{2\,\text{ArcSinh}[c+d\,x]}\right]-96\,\text{ArcSinh}[c+d\,x]\,\text{PolyLog}\left[3,\,e^{2\,\text{ArcSinh}[c+d\,x]}\right]+48\,\text{PolyLog}\left[4,\,e^{2\,\text{ArcSinh}[c+d\,x]}\right]\right)+16\,b^4\,\left(-\frac{i\,\pi^5}{160}-\frac{1}{5}\,\text{ArcSinh}[c+d\,x]^5+\text{ArcSinh}[c+d\,x]^4\,\text{Log}\left[1-e^{2\,\text{ArcSinh}[c+d\,x]}\right]+2\,\text{ArcSinh}[c+d\,x]^3\,\text{PolyLog}\left[2,\,e^{2\,\text{ArcSinh}[c+d\,x]}\right]-3\,\text{ArcSinh}[c+d\,x]^2\,\text{PolyLog}\left[3,\,e^{2\,\text{ArcSinh}[c+d\,x]}\right]+3\,\text{ArcSinh}[c+d\,x]\,\text{PolyLog}\left[4,\,e^{2\,\text{ArcSinh}[c+d\,x]}\right]-\frac{3}{2}\,\text{PolyLog}\left[5,\,e^{2\,\text{ArcSinh}[c+d\,x]}\right]\right)\Big)$$

Problem 152: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 234 leaves, 13 steps):

$$-\frac{(a+b\,\text{ArcSinh}[c+d\,x])^4}{d\,e^2\,(c+d\,x)}-\frac{8\,b\,(a+b\,\text{ArcSinh}[c+d\,x])^3\,\text{ArcTanh}\left[e^{\text{ArcSinh}[c+d\,x]}\right]}{d\,e^2}-\frac{12\,b^2\,(a+b\,\text{ArcSinh}[c+d\,x])^2\,\text{PolyLog}\left[2,\,-e^{\text{ArcSinh}[c+d\,x]}\right]}{d\,e^2}+\frac{12\,b^2\,(a+b\,\text{ArcSinh}[c+d\,x])^2\,\text{PolyLog}\left[2,\,e^{\text{ArcSinh}[c+d\,x]}\right]}{d\,e^2}+\frac{24\,b^3\,(a+b\,\text{ArcSinh}[c+d\,x])\,\text{PolyLog}\left[3,\,-e^{\text{ArcSinh}[c+d\,x]}\right]}{d\,e^2}-\frac{24\,b^3\,(a+b\,\text{ArcSinh}[c+d\,x])\,\text{PolyLog}\left[3,\,e^{\text{ArcSinh}[c+d\,x]}\right]}{d\,e^2}-\frac{24\,b^4\,\text{PolyLog}\left[4,\,-e^{\text{ArcSinh}[c+d\,x]}\right]}{d\,e^2}+\frac{24\,b^4\,\text{PolyLog}\left[4,\,e^{\text{ArcSinh}[c+d\,x]}\right]}{d\,e^2}$$

Result (type 4, 510 leaves):

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

Problem 153: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 186 leaves, 10 steps):

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

Result (type 4, 360 leaves):

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

Problem 154: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 385 leaves, 21 steps):

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

Result (type 4, 1198 leaves):

$$-\frac{a^4}{3 d e^4 (c+d x)^3}+$$
$$\frac{1}{4 d e^4} a^2 b^2 \left(-8 \text{PolyLog}\left[2,-e^{-\text{ArcSinh}[c+d x]}\right]-\frac{1}{(c+d x)^3} 2 \left(-2+4 \text{ArcSinh}[c+d x]^2+\right.\right.$$
$$2 \text{Cosh}[2 \text{ArcSinh}[c+d x]]-3 (c+d x) \text{ArcSinh}[c+d x] \text{Log}\left[1-e^{-\text{ArcSinh}[c+d x]}\right]+$$
$$3 (c+d x) \text{ArcSinh}[c+d x] \text{Log}\left[1+e^{-\text{ArcSinh}[c+d x]}\right]-4 (c+d x)^3$$
$$\text{PolyLog}\left[2,e^{-\text{ArcSinh}[c+d x]}\right]+2 \text{ArcSinh}[c+d x] \text{Sinh}[2 \text{ArcSinh}[c+d x]]+$$
$$\text{ArcSinh}[c+d x] \text{Log}\left[1-e^{-\text{ArcSinh}[c+d x]}\right] \text{Sinh}[3 \text{ArcSinh}[c+d x]]-$$
$$\left.\left.\text{ArcSinh}[c+d x] \text{Log}\left[1+e^{-\text{ArcSinh}[c+d x]}\right] \text{Sinh}[3 \text{ArcSinh}[c+d x]]\right)\right)+$$
$$\frac{1}{12 d e^4} a b^3 \left(-24 \text{ArcSinh}[c+d x] \text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c+d x]\right]+\right.$$
$$4 \text{ArcSinh}[c+d x]^3 \text{Coth}\left[\frac{1}{2} \text{ArcSinh}[c+d x]\right]-$$
$$6 \text{ArcSinh}[c+d x]^2 \text{Csch}\left[\frac{1}{2} \text{ArcSinh}[c+d x]\right]^2-$$
$$(c+d x) \text{ArcSinh}[c+d x]^3 \text{Csch}\left[\frac{1}{2} \text{ArcSinh}[c+d x]\right]^4-$$
$$24 \text{ArcSinh}[c+d x]^2 \text{Log}\left[1-e^{-\text{ArcSinh}[c+d x]}\right]+$$
$$24 \text{ArcSinh}[c+d x]^2 \text{Log}\left[1+e^{-\text{ArcSinh}[c+d x]}\right]+48 \text{Log}\left[\text{Tanh}\left[\frac{1}{2} \text{ArcSinh}[c+d x]\right]\right]-$$
$$48 \text{ArcSinh}[c+d x] \text{PolyLog}\left[2,-e^{-\text{ArcSinh}[c+d x]}\right]+$$
$$48 \text{ArcSinh}[c+d x] \text{PolyLog}\left[2,e^{-\text{ArcSinh}[c+d x]}\right]-48 \text{PolyLog}\left[3,-e^{-\text{ArcSinh}[c+d x]}\right]+$$

$$48\,\text{PolyLog}\left[3,\,e^{-\text{ArcSinh}[c+d\,x]}\right]-6\,\text{ArcSinh}[c+d\,x]^2\,\text{Sech}\left[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\right]^2-$$

$$\frac{16\,\text{ArcSinh}[c+d\,x]^3\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\right]^4}{(c+d\,x)^3}+$$

$$\left.24\,\text{ArcSinh}[c+d\,x]\,\text{Tanh}\left[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\right]-4\,\text{ArcSinh}[c+d\,x]^3\,\text{Tanh}\left[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\right]\right)+$$

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

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

$$\frac{1}{2}\,(c+d\,x)\,\text{ArcSinh}[c+d\,x]^4\,\text{Csch}\left[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\right]^4+$$

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

$$16\,\text{ArcSinh}[c+d\,x]^3\,\text{Log}\left[1+e^{-\text{ArcSinh}[c+d\,x]}\right]-16\,\text{ArcSinh}[c+d\,x]^3\,\text{Log}\left[1-e^{\text{ArcSinh}[c+d\,x]}\right]-$$

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

$$96\,\text{PolyLog}\left[2,\,e^{-\text{ArcSinh}[c+d\,x]}\right]-48\,\text{ArcSinh}[c+d\,x]^2\,\text{PolyLog}\left[2,\,e^{\text{ArcSinh}[c+d\,x]}\right]-$$

$$96\,\text{ArcSinh}[c+d\,x]\,\text{PolyLog}\left[3,\,-e^{-\text{ArcSinh}[c+d\,x]}\right]+$$

$$96\,\text{ArcSinh}[c+d\,x]\,\text{PolyLog}\left[3,\,e^{\text{ArcSinh}[c+d\,x]}\right]-96\,\text{PolyLog}\left[4,\,-e^{-\text{ArcSinh}[c+d\,x]}\right]-$$

$$96\,\text{PolyLog}\left[4,\,e^{\text{ArcSinh}[c+d\,x]}\right]-4\,\text{ArcSinh}[c+d\,x]^3\,\text{Sech}\left[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\right]^2-$$

$$\frac{8\,\text{ArcSinh}[c+d\,x]^4\,\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\right]^4}{(c+d\,x)^3}+24\,\text{ArcSinh}[c+d\,x]^2$$

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

$$\frac{1}{d\,e^4}\,4\,a^3\,b\left(\frac{1}{12}\,\text{ArcSinh}[c+d\,x]\,\text{Coth}\left[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\right]-\frac{1}{24}\,\text{Csch}\left[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\right]^2-\right.$$

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

$$\frac{1}{6}\,\text{Log}\left[\text{Cosh}\left[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\right]\right]-\frac{1}{6}\,\text{Log}\left[\text{Sinh}\left[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\right]\right]-$$

$$\frac{1}{24}\,\text{Sech}\left[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\right]^2-\frac{1}{12}\,\text{ArcSinh}[c+d\,x]\,\text{Tanh}\left[\frac{1}{2}\,\text{ArcSinh}[c+d\,x]\right]-$$

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

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

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

Optimal (type 4, 481 leaves, 35 steps):

$$\frac{175\,b^3\,e^2\,\sqrt{1+(c+d\,x)^2}\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}}{54\,d}-$$

$$\frac{35\,b^3\,e^2\,(c+d\,x)^2\,\sqrt{1+(c+d\,x)^2}\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}}{216\,d}-$$

$$\frac{35\,b^2\,e^2\,(c+d\,x)\,(a+b\,\text{ArcSinh}[c+d\,x])^{3/2}}{18\,d}+\frac{35\,b^2\,e^2\,(c+d\,x)^3\,(a+b\,\text{ArcSinh}[c+d\,x])^{3/2}}{108\,d}+$$

$$\frac{7\,b\,e^2\,\sqrt{1+(c+d\,x)^2}\,(a+b\,\text{ArcSinh}[c+d\,x])^{5/2}}{9\,d}-$$

$$\frac{7\,b\,e^2\,(c+d\,x)^2\,\sqrt{1+(c+d\,x)^2}\,(a+b\,\text{ArcSinh}[c+d\,x])^{5/2}}{18\,d}+$$

$$\frac{e^2\,(c+d\,x)^3\,(a+b\,\text{ArcSinh}[c+d\,x])^{7/2}}{3\,d}-\frac{105\,b^{7/2}\,e^2\,e^{a/b}\,\sqrt{\pi}\,\text{Erf}\left[\frac{\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}}{\sqrt{b}}\right]}{128\,d}+$$

$$\frac{35\,b^{7/2}\,e^2\,e^{\frac{3a}{b}}\,\sqrt{\frac{\pi}{3}}\,\text{Erf}\left[\frac{\sqrt{3}\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}}{\sqrt{b}}\right]}{3456\,d}-\frac{105\,b^{7/2}\,e^2\,e^{-\frac{a}{b}}\,\sqrt{\pi}\,\text{Erfi}\left[\frac{\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}}{\sqrt{b}}\right]}{128\,d}+$$

$$\frac{35\,b^{7/2}\,e^2\,e^{-\frac{3a}{b}}\,\sqrt{\frac{\pi}{3}}\,\text{Erfi}\left[\frac{\sqrt{3}\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}}{\sqrt{b}}\right]}{3456\,d}$$

Result (type 4, 1095 leaves) :

$$-\frac{1}{10368\,d}e^2\left(2592\,a^3\,c\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}+22680\,a\,b^2\,c\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}+\right.$$
$$2592\,a^3\,d\,x\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}+22680\,a\,b^2\,d\,x\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}-$$
$$9072\,a^2\,b\,\sqrt{1+c^2+2\,c\,d\,x+d^2\,x^2}\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}-34020\,b^3\,\sqrt{1+c^2+2\,c\,d\,x+d^2\,x^2}$$
$$\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}+7776\,a^2\,b\,c\,\text{ArcSinh}[c+d\,x]\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}+$$
$$22680\,b^3\,c\,\text{ArcSinh}[c+d\,x]\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}+7776\,a^2\,b\,d\,x\,\text{ArcSinh}[c+d\,x]$$
$$\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}+22680\,b^3\,d\,x\,\text{ArcSinh}[c+d\,x]\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}-$$
$$18144\,a\,b^2\,\sqrt{1+c^2+2\,c\,d\,x+d^2\,x^2}\,\text{ArcSinh}[c+d\,x]\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}+$$
$$7776\,a\,b^2\,c\,\text{ArcSinh}[c+d\,x]^2\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}+$$
$$7776\,a\,b^2\,d\,x\,\text{ArcSinh}[c+d\,x]^2\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}-$$
$$9072\,b^3\,\sqrt{1+c^2+2\,c\,d\,x+d^2\,x^2}\,\text{ArcSinh}[c+d\,x]^2\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}+$$
$$2592\,b^3\,c\,\text{ArcSinh}[c+d\,x]^3\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}+$$
$$2592\,b^3\,d\,x\,\text{ArcSinh}[c+d\,x]^3\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}+$$
$$1008\,a^2\,b\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}\,\text{Cosh}[3\,\text{ArcSinh}[c+d\,x]]+$$
$$420\,b^3\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}\,\text{Cosh}[3\,\text{ArcSinh}[c+d\,x]]+$$
$$2016\,a\,b^2\,\text{ArcSinh}[c+d\,x]\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}\,\text{Cosh}[3\,\text{ArcSinh}[c+d\,x]]+$$
$$1008\,b^3\,\text{ArcSinh}[c+d\,x]^2\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}\,\text{Cosh}[3\,\text{ArcSinh}[c+d\,x]]+$$
$$8505\,b^{7/2}\,\sqrt{\pi}\,\text{Cosh}\left[\frac{a}{b}\right]\,\text{Erfi}\left[\frac{\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}}{\sqrt{b}}\right]-$$
$$35\,b^{7/2}\,\sqrt{3\,\pi}\,\text{Cosh}\left[\frac{3\,a}{b}\right]\,\text{Erfi}\left[\frac{\sqrt{3}\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}}{\sqrt{b}}\right]-$$
$$8505\,b^{7/2}\,\sqrt{\pi}\,\text{Erfi}\left[\frac{\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}}{\sqrt{b}}\right]\,\text{Sinh}\left[\frac{a}{b}\right]+$$
$$8505\,b^{7/2}\,\sqrt{\pi}\,\text{Erf}\left[\frac{\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}}{\sqrt{b}}\right]\,\left(\text{Cosh}\left[\frac{a}{b}\right]+\text{Sinh}\left[\frac{a}{b}\right]\right)+$$
$$35\,b^{7/2}\,\sqrt{3\,\pi}\,\text{Erfi}\left[\frac{\sqrt{3}\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}}{\sqrt{b}}\right]\,\text{Sinh}\left[\frac{3\,a}{b}\right]-$$
$$35\,b^{7/2}\,\sqrt{3\,\pi}\,\text{Erf}\left[\frac{\sqrt{3}\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}}{\sqrt{b}}\right]\,\left(\text{Cosh}\left[\frac{3\,a}{b}\right]+\text{Sinh}\left[\frac{3\,a}{b}\right]\right)-$$
$$864\,a^3\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}\,\text{Sinh}[3\,\text{ArcSinh}[c+d\,x]]-$$
$$840\,a\,b^2\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}\,\text{Sinh}[3\,\text{ArcSinh}[c+d\,x]]-$$
$$2592\,a^2\,b\,\text{ArcSinh}[c+d\,x]\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}\,\text{Sinh}[3\,\text{ArcSinh}[c+d\,x]]-$$
$$840\,b^3\,\text{ArcSinh}[c+d\,x]\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}\,\text{Sinh}[3\,\text{ArcSinh}[c+d\,x]]-$$
$$2592\,a\,b^2\,\text{ArcSinh}[c+d\,x]^2\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}\,\text{Sinh}[3\,\text{ArcSinh}[c+d\,x]]-$$
$$\left.864\,b^3\,\text{ArcSinh}[c+d\,x]^3\,\sqrt{a+b\,\text{ArcSinh}[c+d\,x]}\,\text{Sinh}[3\,\text{ArcSinh}[c+d\,x]]\right)$$

Problem 228: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 298 leaves, 8 steps):

$$\frac{28\,b\,e^2\,\left(e\,(c+d\,x)\right)^{3/2}\,\sqrt{1+(c+d\,x)^2}}{405\,d}-\frac{4\,b\,\left(e\,(c+d\,x)\right)^{7/2}\,\sqrt{1+(c+d\,x)^2}}{81\,d}-\frac{28\,b\,e^3\,\sqrt{e\,(c+d\,x)}\,\sqrt{1+(c+d\,x)^2}}{135\,d\,(1+c+d\,x)}+\frac{2\,\left(e\,(c+d\,x)\right)^{9/2}\,(a+b\,\text{ArcSinh}[c+d\,x])}{9\,d\,e}+\frac{28\,b\,e^{7/2}\,(1+c+d\,x)\,\sqrt{\frac{1+(c+d\,x)^2}{(1+c+d\,x)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{e\,(c+d\,x)}}{\sqrt{e}}\right],\frac{1}{2}\right]}{135\,d\,\sqrt{1+(c+d\,x)^2}}-\frac{14\,b\,e^{7/2}\,(1+c+d\,x)\,\sqrt{\frac{1+(c+d\,x)^2}{(1+c+d\,x)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{e\,(c+d\,x)}}{\sqrt{e}}\right],\frac{1}{2}\right]}{135\,d\,\sqrt{1+(c+d\,x)^2}}$$

Result (type 4, 150 leaves):

$$\frac{1}{135\,d}\left(e\,(c+d\,x)\right)^{7/2}\left(30\,a\,(c+d\,x)-\frac{4\,b\,\left(-7+5\,c^2+10\,c\,d\,x+5\,d^2\,x^2\right)\,\sqrt{1+(c+d\,x)^2}}{3\,(c+d\,x)^2}+30\,b\,(c+d\,x)\,\text{ArcSinh}[c+d\,x]+\frac{1}{(c+d\,x)^{7/2}}28\,(-1)^{3/4}\,b\,\left(\text{EllipticE}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}\,\sqrt{c+d\,x}\right],-1\right]-\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}\,\sqrt{c+d\,x}\right],-1\right]\right)\right)$$

Problem 229: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 177 leaves, 6 steps):

$$\frac{20\,b\,e^2\,\sqrt{e\,(c+d\,x)}\,\sqrt{1+(c+d\,x)^2}}{147\,d}-\frac{4\,b\,\left(e\,(c+d\,x)\right)^{5/2}\,\sqrt{1+(c+d\,x)^2}}{49\,d}+\frac{2\,\left(e\,(c+d\,x)\right)^{7/2}\,(a+b\,\text{ArcSinh}[c+d\,x])}{7\,d\,e}-\frac{10\,b\,e^{5/2}\,(1+c+d\,x)\,\sqrt{\frac{1+(c+d\,x)^2}{(1+c+d\,x)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{e\,(c+d\,x)}}{\sqrt{e}}\right],\frac{1}{2}\right]}{147\,d\,\sqrt{1+(c+d\,x)^2}}$$

Result (type 4, 149 leaves):

$$\frac{1}{147\,d}\left(e\,(c+d\,x)\right)^{5/2}\left(42\,a\,(c+d\,x)-\frac{4\,b\,\left(-5+3\,c^2+6\,c\,d\,x+3\,d^2\,x^2\right)\sqrt{1+(c+d\,x)^2}}{(c+d\,x)^2}+42\,b\,(c+d\,x)\,\text{ArcSinh}[c+d\,x]-\frac{20\,(-1)^{1/4}\,b\,\sqrt{1+(c+d\,x)^2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{(-1)^{1/4}}{\sqrt{c+d\,x}}\right],-1\right]}{(c+d\,x)^{7/2}\sqrt{1+\frac{1}{(c+d\,x)^2}}}\right)$$

Problem 230: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 261 leaves, 7 steps):

$$-\frac{4\,b\,(e\,(c+d\,x))^{3/2}\sqrt{1+(c+d\,x)^2}}{25\,d}+\frac{12\,b\,e\,\sqrt{e\,(c+d\,x)}\,\sqrt{1+(c+d\,x)^2}}{25\,d\,(1+c+d\,x)}+\frac{2\,(e\,(c+d\,x))^{5/2}\,(a+b\,\text{ArcSinh}[c+d\,x])}{5\,d\,e}-\frac{12\,b\,e^{3/2}\,(1+c+d\,x)\sqrt{\frac{1+(c+d\,x)^2}{(1+c+d\,x)^2}}\,\text{EllipticE}\left[2\,\text{ArcTan}\left[\frac{\sqrt{e\,(c+d\,x)}}{\sqrt{e}}\right],\frac{1}{2}\right]}{25\,d\,\sqrt{1+(c+d\,x)^2}}+\frac{6\,b\,e^{3/2}\,(1+c+d\,x)\sqrt{\frac{1+(c+d\,x)^2}{(1+c+d\,x)^2}}\,\text{EllipticF}\left[2\,\text{ArcTan}\left[\frac{\sqrt{e\,(c+d\,x)}}{\sqrt{e}}\right],\frac{1}{2}\right]}{25\,d\,\sqrt{1+(c+d\,x)^2}}$$

Result (type 4, 145 leaves):

$$\frac{1}{25\,d\,(c+d\,x)^{3/2}}2\,(e\,(c+d\,x))^{3/2}\left((c+d\,x)^{3/2}\left(5\,a\,(c+d\,x)-2\,b\,\sqrt{1+c^2+2\,c\,d\,x+d^2\,x^2}+5\,b\,(c+d\,x)\,\text{ArcSinh}[c+d\,x]\right)-6\,(-1)^{3/4}\,b\,\text{EllipticE}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}\sqrt{c+d\,x}\right],-1\right]+6\,(-1)^{3/4}\,b\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[(-1)^{1/4}\sqrt{c+d\,x}\right],-1\right]\right)$$

Problem 231: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 142 leaves, 5 steps):

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

Result (type 4, 122 leaves):

$$\frac{1}{9 d} 2 \sqrt{e (c + d x)} \left(3 a (c + d x) - 2 b \sqrt{1 + (c + d x)^2} + 3 b (c + d x) \operatorname{ArcSinh}[c + d x] + \frac{2 (-1)^{1/4} b \sqrt{1 + (c + d x)^2} \operatorname{EllipticF}\left[i \operatorname{ArcSinh}\left[\frac{(-1)^{1/4}}{\sqrt{c+d x}}\right], -1\right]}{(c + d x)^{3/2} \sqrt{1 + \frac{1}{(c+d x)^2}}}\right)$$

Problem 232: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 223 leaves, 6 steps):

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

Result (type 4, 111 leaves):

$$\frac{1}{d\sqrt{e\,(c+d\,x)}}\Big(2\,(c+d\,x)\,(a+b\,\text{ArcSinh}[c+d\,x])+4\,(-1)^{3/4}\,b\,\sqrt{c+d\,x}\,\text{EllipticE}\big[\mathrm{i}\,\text{ArcSinh}\big[(-1)^{1/4}\sqrt{c+d\,x}\big],-1\big]-4\,(-1)^{3/4}\,b\,\sqrt{c+d\,x}\,\text{EllipticF}\big[\mathrm{i}\,\text{ArcSinh}\big[(-1)^{1/4}\sqrt{c+d\,x}\big],-1\big]\Big)$$

Problem 233: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 106 leaves, 4 steps):

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

Result (type 4, 104 leaves):

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

Problem 234: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 266 leaves, 7 steps):

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

Result (type 4, 160 leaves):

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

Problem 235: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 4, 145 leaves, 5 steps):

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

Result (type 4, 167 leaves):

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

Problem 236: Result unnecessarily involves complex numbers and more than

twice size of optimal antiderivative.

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

Optimal (type 5, 134 leaves, 3 steps):

$$\frac{2 (e (c + d x))^{9/2} (a + b \text{ArcSinh}[c + d x])^2}{9 d e} - \frac{1}{99 d e^2} 8 b (e (c + d x))^{11/2} (a + b \text{ArcSinh}[c + d x]) \text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{11}{4}, \frac{15}{4}, -(c + d x)^2\right] + \frac{1}{1287 d e^3} 16 b^2 (e (c + d x))^{13/2} \text{HypergeometricPFQ}\left[\left\{1, \frac{13}{4}, \frac{13}{4}\right\}, \left\{\frac{15}{4}, \frac{17}{4}\right\}, -(c + d x)^2\right]$$

Result (type 5, 269 leaves):

$$\frac{1}{9 d} (e (c + d x))^{7/2} \left(2 a^2 (c + d x) + 4 a b (c + d x) \text{ArcSinh}[c + d x] - \frac{1}{45 (c + d x)^{7/2}} 8 a b \left((c + d x)^{3/2} \sqrt{1 + (c + d x)^2} \left(-7 + 5 (c + d x)^2\right) + 21 (-1)^{3/4} \left(-\text{EllipticE}\left[i \text{ArcSinh}\left[(-1)^{1/4} \sqrt{c + d x}\right], -1\right] + \text{EllipticF}\left[i \text{ArcSinh}\left[(-1)^{1/4} \sqrt{c + d x}\right], -1\right]\right)\right) + \frac{2}{11} b^2 (c + d x) \text{ArcSinh}[c + d x] \left(11 \text{ArcSinh}[c + d x] - 4 (c + d x) \sqrt{1 + (c + d x)^2} \text{Hypergeometric2F1}\left[1, \frac{13}{4}, \frac{15}{4}, -(c + d x)^2\right]\right) + \left(945 b^2 \pi (c + d x)^3 \text{HypergeometricPFQ}\left[\left\{1, \frac{13}{4}, \frac{13}{4}\right\}, \left\{\frac{15}{4}, \frac{17}{4}\right\}, -(c + d x)^2\right]\right) \Big/ \left(512 \sqrt{2} \text{Gamma}\left[\frac{15}{4}\right] \text{Gamma}\left[\frac{17}{4}\right]\right)\right)$$

Problem 237: Result unnecessarily involves complex numbers and more than twice size of optimal antiderivative.

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

Optimal (type 5, 134 leaves, 3 steps):

$$\frac{2 (e (c + d x))^{7/2} (a + b \text{ArcSinh}[c + d x])^2}{7 d e} - \frac{1}{63 d e^2} 8 b (e (c + d x))^{9/2} (a + b \text{ArcSinh}[c + d x]) \text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{9}{4}, \frac{13}{4}, -(c + d x)^2\right] + \frac{1}{693 d e^3} 16 b^2 (e (c + d x))^{11/2} \text{HypergeometricPFQ}\left[\left\{1, \frac{11}{4}, \frac{11}{4}\right\}, \left\{\frac{13}{4}, \frac{15}{4}\right\}, -(c + d x)^2\right]$$

Result (type 5, 334 leaves):

$$\frac{1}{6174\,d}\left(e\,(c+d\,x)\right)^{5/2}\left(1764\,a^2\,(c+d\,x)+168\,a\,b\left(-\frac{2\sqrt{1+(c+d\,x)^2}\,\left(-5+3\,(c+d\,x)^2\right)}{(c+d\,x)^2}+21\,(c+d\,x)\,\text{ArcSinh}[c+d\,x]-\frac{10\,(-1)^{1/4}\sqrt{1+(c+d\,x)^2}\;\text{EllipticF}\left[\,\mathrm{i}\,\text{ArcSinh}\left[\frac{(-1)^{1/4}}{\sqrt{c+d\,x}}\right],-1\right]}{(c+d\,x)^{7/2}\sqrt{1+\frac{1}{(c+d\,x)^2}}}\right)+\frac{1}{(c+d\,x)^2}\,b^2\left(-1336\,(c+d\,x)+1932\sqrt{1+(c+d\,x)^2}\;\text{ArcSinh}[c+d\,x]-1323\,(c+d\,x)\,\text{ArcSinh}[c+d\,x]^2-252\,\text{ArcSinh}[c+d\,x]\,\text{Cosh}[3\,\text{ArcSinh}[c+d\,x]]-1680\sqrt{1+(c+d\,x)^2}\;\text{ArcSinh}[c+d\,x]\,\text{Hypergeometric2F1}\left[\frac{3}{4},1,\frac{5}{4},-(c+d\,x)^2\right]+\left(210\sqrt{2}\,\pi\,(c+d\,x)\,\text{HypergeometricPFQ}\left[\left\{\frac{3}{4},\frac{3}{4},1\right\},\left\{\frac{5}{4},\frac{7}{4}\right\},-(c+d\,x)^2\right]\right)\Big/\left(\text{Gamma}\left[\frac{5}{4}\right]\text{Gamma}\left[\frac{7}{4}\right]\right)+72\,\text{Sinh}[3\,\text{ArcSinh}[c+d\,x]]+441\,\text{ArcSinh}[c+d\,x]^2\,\text{Sinh}[3\,\text{ArcSinh}[c+d\,x]]\right)\right)$$

Problem 238: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 5, 134 leaves, 3 steps):

$$\frac{2\,(e\,(c+d\,x))^{5/2}\,(a+b\,\text{ArcSinh}[c+d\,x])^2}{5\,d\,e}-\frac{1}{35\,d\,e^2}8\,b\,(e\,(c+d\,x))^{7/2}\,(a+b\,\text{ArcSinh}[c+d\,x])\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{7}{4},\frac{11}{4},-(c+d\,x)^2\right]+\frac{1}{315\,d\,e^3}16\,b^2\,(e\,(c+d\,x))^{9/2}\,\text{HypergeometricPFQ}\left[\left\{1,\frac{9}{4},\frac{9}{4}\right\},\left\{\frac{11}{4},\frac{13}{4}\right\},-(c+d\,x)^2\right]$$

Result (type 5, 251 leaves):

$$\frac{1}{5\,d}\left(e\,(c+d\,x)\right)^{3/2}\left(2\,a^2\,(c+d\,x)-\frac{8}{5}\,a\,b\,\sqrt{1+(c+d\,x)^2}+4\,a\,b\,(c+d\,x)\,\text{ArcSinh}[c+d\,x]+\frac{1}{5\,(c+d\,x)^{3/2}}\right.$$
$$24\,(-1)^{3/4}\,a\,b\,\left(-\text{EllipticE}\left[\mathbb{i}\,\text{ArcSinh}\left[(-1)^{1/4}\,\sqrt{c+d\,x}\right],-1\right]+\right.$$
$$\left.\text{EllipticF}\left[\mathbb{i}\,\text{ArcSinh}\left[(-1)^{1/4}\,\sqrt{c+d\,x}\right],-1\right]\right)+\frac{2}{7}\,b^2\,(c+d\,x)\,\text{ArcSinh}[c+d\,x]$$
$$\left(7\,\text{ArcSinh}[c+d\,x]-4\,(c+d\,x)\,\sqrt{1+(c+d\,x)^2}\,\text{Hypergeometric2F1}\left[1,\frac{9}{4},\frac{11}{4},-(c+d\,x)^2\right]\right)+$$
$$\left(15\,b^2\,\pi\,(c+d\,x)^3\,\text{HypergeometricPFQ}\left[\left\{1,\frac{9}{4},\frac{9}{4}\right\},\left\{\frac{11}{4},\frac{13}{4}\right\},-(c+d\,x)^2\right]\right)\Big/$$
$$\left.\left(32\,\sqrt{2}\,\text{Gamma}\left[\frac{11}{4}\right]\,\text{Gamma}\left[\frac{13}{4}\right]\right)\right)$$

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

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

Optimal (type 5, 134 leaves, 3 steps):

$$\frac{2\,\left(e\,(c+d\,x)\right)^{3/2}\,\left(a+b\,\text{ArcSinh}[c+d\,x]\right)^2}{3\,d\,e}-\frac{1}{15\,d\,e^2}$$
$$8\,b\,\left(e\,(c+d\,x)\right)^{5/2}\,\left(a+b\,\text{ArcSinh}[c+d\,x]\right)\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{4},\frac{9}{4},-(c+d\,x)^2\right]+$$
$$\frac{1}{105\,d\,e^3}16\,b^2\,\left(e\,(c+d\,x)\right)^{7/2}\,\text{HypergeometricPFQ}\left[\left\{1,\frac{7}{4},\frac{7}{4}\right\},\left\{\frac{9}{4},\frac{11}{4}\right\},-(c+d\,x)^2\right]$$

Result (type 5, 276 leaves):

$$\frac{1}{27\, d}\sqrt{e\,(c+d\,x)}\left(18\, a^2\,(c+d\,x)+36\, a\, b\,(c+d\,x)\,\text{ArcSinh}[c+d\,x]-24\, b^2\sqrt{1+(c+d\,x)^2}\,\text{ArcSinh}[c+d\,x]+2\, b^2\,(c+d\,x)\,\left(8+9\,\text{ArcSinh}[c+d\,x]^2\right)-\left(24\, a\, b\left(\sqrt{c+d\,x}+(c+d\,x)^{5/2}-(-1)^{1/4}\,(c+d\,x)\sqrt{1+\frac{1}{(c+d\,x)^2}}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{(-1)^{1/4}}{\sqrt{c+d\,x}}\right],-1\right]\right)\right)\Big/\left(\sqrt{c+d\,x}\,\sqrt{1+(c+d\,x)^2}\right)+24\, b^2\sqrt{1+(c+d\,x)^2}\,\text{ArcSinh}[c+d\,x]\,\text{Hypergeometric2F1}\left[\frac{3}{4},1,\frac{5}{4},-(c+d\,x)^2\right]-\left(3\sqrt{2}\, b^2\,\pi\,(c+d\,x)\,\text{HypergeometricPFQ}\left[\left\{\frac{3}{4},\frac{3}{4},1\right\},\left\{\frac{5}{4},\frac{7}{4}\right\},-(c+d\,x)^2\right]\right)\Big/\left(\text{Gamma}\left[\frac{5}{4}\right]\,\text{Gamma}\left[\frac{7}{4}\right]\right)\right)$$

Problem 240: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 5, 132 leaves, 3 steps):

$$\frac{2\sqrt{e\,(c+d\,x)}\,(a+b\,\text{ArcSinh}[c+d\,x])^2}{d\,e}-\frac{1}{3\,d\,e^2}8\,b\,(e\,(c+d\,x))^{3/2}\,(a+b\,\text{ArcSinh}[c+d\,x])\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{3}{4},\frac{7}{4},-(c+d\,x)^2\right]+\frac{1}{15\,d\,e^3}16\,b^2\,(e\,(c+d\,x))^{5/2}\,\text{HypergeometricPFQ}\left[\left\{1,\frac{5}{4},\frac{5}{4}\right\},\left\{\frac{7}{4},\frac{9}{4}\right\},-(c+d\,x)^2\right]$$

Result (type 5, 223 leaves):

$$\frac{1}{12\, d\, \sqrt{e\, (c+d\, x)}\, \text{Gamma}\left[\frac{7}{4}\right]\, \text{Gamma}\left[\frac{9}{4}\right]}$$
$$\left(3\, \sqrt{2}\, b^2\, \pi\, (c+d\, x)^3\, \text{HypergeometricPFQ}\left[\left\{1, \frac{5}{4}, \frac{5}{4}\right\}, \left\{\frac{7}{4}, \frac{9}{4}\right\}, -(c+d\, x)^2\right] + \right.$$
$$8\, \text{Gamma}\left[\frac{7}{4}\right]\, \text{Gamma}\left[\frac{9}{4}\right]\, \left(12\, (-1)^{3/4}\, a\, b\, \sqrt{c+d\, x}\, \text{EllipticE}\left[i\, \text{ArcSinh}\left[(-1)^{1/4}\, \sqrt{c+d\, x}\right], -1\right] - \right.$$
$$12\, (-1)^{3/4}\, a\, b\, \sqrt{c+d\, x}\, \text{EllipticF}\left[i\, \text{ArcSinh}\left[(-1)^{1/4}\, \sqrt{c+d\, x}\right], -1\right] +$$
$$(c+d\, x)\, \left(3\, (a+b\, \text{ArcSinh}[c+d\, x])^2 - 2\, b^2\, \text{ArcSinh}[c+d\, x]\right.$$
$$\left.\left.\left.\text{Hypergeometric2F1}\left[1, \frac{5}{4}, \frac{7}{4}, -(c+d\, x)^2\right]\, \text{Sinh}[2\, \text{ArcSinh}[c+d\, x]]\right)\right)\right)$$

Problem 241: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 5, 130 leaves, 3 steps):

$$-\frac{2\, (a+b\, \text{ArcSinh}[c+d\, x])^2}{d\, e\, \sqrt{e\, (c+d\, x)}} + \frac{1}{d\, e^2}$$
$$8\, b\, \sqrt{e\, (c+d\, x)}\, (a+b\, \text{ArcSinh}[c+d\, x])\, \text{Hypergeometric2F1}\left[\frac{1}{4}, \frac{1}{2}, \frac{5}{4}, -(c+d\, x)^2\right] -$$
$$\frac{1}{3\, d\, e^3} 16\, b^2\, (e\, (c+d\, x))^{3/2}\, \text{HypergeometricPFQ}\left[\left\{\frac{3}{4}, \frac{3}{4}, 1\right\}, \left\{\frac{5}{4}, \frac{7}{4}\right\}, -(c+d\, x)^2\right]$$

Result (type 5, 224 leaves):

$$\frac{1}{d\,\left(e\,(c+d\,x)\right)^{3/2}}\left(-2\,a^2\,(c+d\,x)+2\,a\,b\,(c+d\,x)^{3/2}\left(-\frac{2\,\text{ArcSinh}[c+d\,x]}{\sqrt{c+d\,x}}+\frac{4\,(-1)^{1/4}\,\sqrt{1+(c+d\,x)^2}\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\frac{(-1)^{1/4}}{\sqrt{c+d\,x}}\right],-1\right]}{(c+d\,x)\,\sqrt{1+\frac{1}{(c+d\,x)^2}}}\right)+b^2\,(c+d\,x)\,\left(-\left(\left(\sqrt{2}\,\pi\,(c+d\,x)^2\,\text{HypergeometricPFQ}\left[\left\{\frac{3}{4},\frac{3}{4},1\right\},\left\{\frac{5}{4},\frac{7}{4}\right\},-(c+d\,x)^2\right]\right)\Big/\left(\text{Gamma}\left[\frac{5}{4}\right]\,\text{Gamma}\left[\frac{7}{4}\right]\right)\right)-2\,\text{ArcSinh}[c+d\,x]\,\left(\text{ArcSinh}[c+d\,x]-2\,\text{Hypergeometric2F1}\left[\frac{3}{4},1,\frac{5}{4},-(c+d\,x)^2\right]\,\text{Sinh}[2\,\text{ArcSinh}[c+d\,x]]\right)\right)\right)$$

Problem 242: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 5, 134 leaves, 3 steps):

$$-\frac{2\,(a+b\,\text{ArcSinh}[c+d\,x])^2}{3\,d\,e\,\left(e\,(c+d\,x)\right)^{3/2}}-\left(8\,b\,(a+b\,\text{ArcSinh}[c+d\,x])\,\text{Hypergeometric2F1}\left[-\frac{1}{4},\frac{1}{2},\frac{3}{4},-(c+d\,x)^2\right]\right)\Big/\left(3\,d\,e^2\,\sqrt{e\,(c+d\,x)}\right)+\frac{1}{3\,d\,e^3}16\,b^2\,\sqrt{e\,(c+d\,x)}\,\text{HypergeometricPFQ}\left[\left\{\frac{1}{4},\frac{1}{4},1\right\},\left\{\frac{3}{4},\frac{5}{4}\right\},-(c+d\,x)^2\right]$$

Result (type 5, 262 leaves):

$$\frac{1}{36\,d\,e\,(e\,(c+d\,x))^{3/2}}\Bigg(-24\,a^2+48\,a\,b\,\Big(-\text{ArcSinh}[c+d\,x]-2\,(c+d\,x)\,\Big(\sqrt{1+(c+d\,x)^2}+(-1)^{3/4}\sqrt{c+d\,x}\,\Big(\text{EllipticE}\big[\,\mathrm{i}\,\text{ArcSinh}\big[(-1)^{1/4}\sqrt{c+d\,x}\,\big],-1\big]-\text{EllipticF}\big[\,\mathrm{i}\,\text{ArcSinh}\big[(-1)^{1/4}\sqrt{c+d\,x}\,\big],-1\big]\Big)\Big)\Big)+b^2\Bigg(32\,(c+d\,x)^3\sqrt{1+(c+d\,x)^2}\,\text{ArcSinh}[c+d\,x]\,\text{Hypergeometric2F1}\Big[1,\frac{5}{4},\frac{7}{4},-(c+d\,x)^2\Big]-\Big(3\sqrt{2}\,\pi\,(c+d\,x)^4\,\text{HypergeometricPFQ}\Big[\Big\{1,\frac{5}{4},\frac{5}{4}\Big\},\Big\{\frac{7}{4},\frac{9}{4}\Big\},-(c+d\,x)^2\Big]\Big)\Big/\Big(\text{Gamma}\Big[\frac{7}{4}\Big]\,\text{Gamma}\Big[\frac{9}{4}\Big]\Big)-24\,\big(-8\,(c+d\,x)^2+\text{ArcSinh}[c+d\,x]^2+2\,\text{ArcSinh}[c+d\,x]\,\text{Sinh}[2\,\text{ArcSinh}[c+d\,x]]\big)\Bigg)\Bigg)$$

Problem 243: Result unnecessarily involves imaginary or complex numbers.

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

Optimal (type 5, 134 leaves, 3 steps):

$$-\frac{2\,(a+b\,\text{ArcSinh}[c+d\,x])^2}{5\,d\,e\,(e\,(c+d\,x))^{5/2}}-\Big(8\,b\,(a+b\,\text{ArcSinh}[c+d\,x])\,\text{Hypergeometric2F1}\Big[-\frac{3}{4},\frac{1}{2},\frac{1}{4},-(c+d\,x)^2\Big]\Big)\Big/\Big(15\,d\,e^2\,(e\,(c+d\,x))^{3/2}\Big)-\frac{16\,b^2\,\text{HypergeometricPFQ}\Big[\Big\{-\frac{1}{4},-\frac{1}{4},1\Big\},\Big\{\frac{1}{4},\frac{3}{4}\Big\},-(c+d\,x)^2\Big]}{15\,d\,e^3\sqrt{e\,(c+d\,x)}}$$

Result (type 5, 258 leaves):

$$\frac{1}{15\,d\,e\,(e\,(c+d\,x))^{5/2}}\Bigg(-6\,a^2-12\,a\,b\,\text{ArcSinh}[c+d\,x]-\frac{1}{\sqrt{1+(c+d\,x)^2}}8\,a\,b\,(c+d\,x)\left(1+(c+d\,x)^2+(-1)^{1/4}\,(c+d\,x)^{5/2}\sqrt{1+\frac{1}{(c+d\,x)^2}}\,\text{EllipticF}\Big[\,\mathrm{i}\,\text{ArcSinh}\Big[\frac{(-1)^{1/4}}{\sqrt{c+d\,x}}\Big],-1\Big]\right)+b^2\Bigg(8-6\,\text{ArcSinh}[c+d\,x]^2-8\,\text{Cosh}[2\,\text{ArcSinh}[c+d\,x]]-8\,(c+d\,x)^3\sqrt{1+(c+d\,x)^2}\,\text{ArcSinh}[c+d\,x]\,\text{Hypergeometric2F1}\Big[\frac{3}{4},1,\frac{5}{4},-(c+d\,x)^2\Big]+\Big(\sqrt{2}\,\pi\,(c+d\,x)^4\,\text{HypergeometricPFQ}\Big[\Big\{\frac{3}{4},\frac{3}{4},1\Big\},\Big\{\frac{5}{4},\frac{7}{4}\Big\},-(c+d\,x)^2\Big]\Big)\Big/\Big(\text{Gamma}\Big[\frac{5}{4}\Big]\,\text{Gamma}\Big[\frac{7}{4}\Big]\Big)-4\,\text{ArcSinh}[c+d\,x]\,\text{Sinh}[2\,\text{ArcSinh}[c+d\,x]]\Bigg)\Bigg)$$

Problem 245: Attempted integration timed out after 120 seconds.

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

Optimal (type 8, 82 leaves, 2 steps):

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

Result (type 1, 1 leaves):

???

Problem 247: Attempted integration timed out after 120 seconds.

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

Optimal (type 8, 80 leaves, 2 steps):

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

Result (type 1, 1 leaves):

???

Problem 251: Attempted integration timed out after 120 seconds.

$$\int \frac{(a + b\,\text{ArcSinh}[c + d\,x])^3}{(c\,e + d\,e\,x)^{7/2}}\,dx$$

Optimal (type 8, 82 leaves, 2 steps):

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

Result (type 1, 1 leaves):

???

Problem 253: Attempted integration timed out after 120 seconds.

$$\int (c\,e + d\,e\,x)^{5/2}\,(a + b\,\text{ArcSinh}[c + d\,x])^4\,dx$$

Optimal (type 8, 82 leaves, 2 steps):

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

Result (type 1, 1 leaves):

???

Problem 255: Attempted integration timed out after 120 seconds.

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

Optimal (type 8, 82 leaves, 2 steps):

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

Result (type 1, 1 leaves):

???

Problem 259: Attempted integration timed out after 120 seconds.

$$\int\frac{(a+b\,\text{ArcSinh}[c+d\,x])^4}{(c\,e+d\,e\,x)^{7/2}}\,dx$$

Optimal (type 8, 82 leaves, 2 steps):

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

Result (type 1, 1 leaves):

???

Problem 284: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 75 leaves):

$$\frac{1}{9}\left(-\frac{2\,\left(x+a^2\,x^5\right)}{a\,\sqrt{1+a^2\,x^4}}+3\,x^3\,\text{ArcSinh}\left[a\,x^2\right]-\frac{2\,\sqrt{i\,a}\,\,\text{EllipticF}\left[i\,\text{ArcSinh}\left[\sqrt{i\,a}\,\,x\right],\,-1\right]}{a^2}\right)$$

Problem 286: Result unnecessarily involves imaginary or complex numbers.

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

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

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

Result (type 4, 59 leaves):

$$x \text{ArcSinh}\left[a x^2\right]-\frac{1}{\sqrt{i a}} 2 \left(\text{EllipticE}\left[i \text{ArcSinh}\left[\sqrt{i a} x\right],-1\right]-\text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{i a} x\right],-1\right]\right)$$

Problem 288: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{ArcSinh}\left[a x^2\right]}{x^2} \, dx$$

Optimal (type 4, 75 leaves, 3 steps):

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

Result (type 4, 42 leaves):

$$-\frac{\text{ArcSinh}\left[a x^2\right]+2 \sqrt{i a} x \text{EllipticF}\left[i \text{ArcSinh}\left[\sqrt{i a} x\right],-1\right]}{x}$$

Problem 290: Result unnecessarily involves imaginary or complex numbers.

$$\int \frac{\text{ArcSinh}\left[a x^2\right]}{x^4} \, dx$$

Optimal (type 4, 197 leaves, 6 steps):

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

Result (type 4, 88 leaves):

$$\frac{1}{3} \left(-\frac{2 a \sqrt{1+a^2 x^4}}{x}-\frac{\text{ArcSinh}\left[a x^2\right]}{x^3}+\frac{1}{\sqrt{i a}}\right.$$
$$\left.2 a^2 \left(\text{EllipticE}\left[i\, \text{ArcSinh}\left[\sqrt{i a}\ x\right],-1\right]-\text{EllipticF}\left[i\, \text{ArcSinh}\left[\sqrt{i a}\ x\right],-1\right]\right)\right)$$

Problem 302: Result more than twice size of optimal antiderivative.

$$\int \text{ArcSinh}\left[\frac{a}{x}\right] dx$$

Optimal (type 3, 25 leaves, 5 steps):

$$x\, \text{ArcCsch}\left[\frac{x}{a}\right]+a\, \text{ArcTanh}\left[\sqrt{1+\frac{a^2}{x^2}}\right]$$

Result (type 3, 77 leaves):

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

Problem 311: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{ArcSinh}\left[a x^n\right]}{x} dx$$

Optimal (type 4, 60 leaves, 5 steps):

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

Result (type 4, 128 leaves):

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

Problem 328: Unable to integrate problem.

$$\int \left(a + i\, b\, \text{ArcSin}\left[1 - i\, d\, x^2\right]\right)^{5/2} dx$$

Optimal (type 4, 348 leaves, 2 steps):

$$15 b^2 x \sqrt{a + i\, b\, \text{ArcSin}\left[1 - i\, d\, x^2\right]} - \frac{5 b \sqrt{2 i d x^2 + d^2 x^4} \left(a + i\, b\, \text{ArcSin}\left[1 - i\, d\, x^2\right]\right)^{3/2}}{d\, x} + x \left(a + i\, b\, \text{ArcSin}\left[1 - i\, d\, x^2\right]\right)^{5/2} + \left(15 b^2 \sqrt{\pi}\, x\, \text{FresnelS}\left[\frac{\sqrt{-\frac{i}{b}} \sqrt{a + i\, b\, \text{ArcSin}\left[1 - i\, d\, x^2\right]}}{\sqrt{\pi}}\right] \left(\text{Cosh}\left[\frac{a}{2 b}\right] + i\, \text{Sinh}\left[\frac{a}{2 b}\right]\right)\right) \Big/ \left(\sqrt{-\frac{i}{b}} \left(\text{Cos}\left[\frac{1}{2} \text{ArcSin}\left[1 - i\, d\, x^2\right]\right] - \text{Sin}\left[\frac{1}{2} \text{ArcSin}\left[1 - i\, d\, x^2\right]\right]\right)\right) - \left(15 \sqrt{-\frac{i}{b}}\, b^3 \sqrt{\pi}\, x\, \text{FresnelC}\left[\frac{\sqrt{-\frac{i}{b}} \sqrt{a + i\, b\, \text{ArcSin}\left[1 - i\, d\, x^2\right]}}{\sqrt{\pi}}\right] \left(i\, \text{Cosh}\left[\frac{a}{2 b}\right] + \text{Sinh}\left[\frac{a}{2 b}\right]\right)\right) \Big/ \left(\text{Cos}\left[\frac{1}{2} \text{ArcSin}\left[1 - i\, d\, x^2\right]\right] - \text{Sin}\left[\frac{1}{2} \text{ArcSin}\left[1 - i\, d\, x^2\right]\right]\right)$$

Result (type 8, 24 leaves):

$$\int \left(a + i\, b\, \text{ArcSin}\left[1 - i\, d\, x^2\right]\right)^{5/2} dx$$

Problem 329: Unable to integrate problem.

$$\int \left(a + i\, b\, \text{ArcSin}\left[1 - i\, d\, x^2\right]\right)^{3/2} dx$$

Optimal (type 4, 312 leaves, 2 steps):

$$-\frac{3\,b\,\sqrt{2\,i\,d\,x^2+d^2\,x^4}\,\sqrt{a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]}}{d\,x}+x\,\left(a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right)^{3/2}+$$
$$\left(3\,\sqrt{i\,b}\,b\,\sqrt{\pi}\,x\,\text{FresnelC}\left[\frac{\sqrt{a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]}}{\sqrt{i\,b}\,\sqrt{\pi}}\right]\left(i\,\text{Cosh}\left[\frac{a}{2\,b}\right]-\text{Sinh}\left[\frac{a}{2\,b}\right]\right)\right)\Big/$$
$$\left(\text{Cos}\left[\frac{1}{2}\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right]-\text{Sin}\left[\frac{1}{2}\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right]\right)-$$
$$\frac{3\,b^2\,\sqrt{\pi}\,x\,\text{FresnelS}\left[\frac{\sqrt{a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]}}{\sqrt{i\,b}\,\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]-i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{\sqrt{i\,b}\,\left(\text{Cos}\left[\frac{1}{2}\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right]-\text{Sin}\left[\frac{1}{2}\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right]\right)}$$

Result (type 8, 24 leaves):

$$\int\left(a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right)^{3/2}\,dx$$

Problem 330: Unable to integrate problem.

$$\int\sqrt{a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]}\,dx$$

Optimal (type 4, 263 leaves, 1 step):

$$x\,\sqrt{a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]}+\frac{\sqrt{\pi}\,x\,\text{FresnelS}\left[\frac{\sqrt{-\frac{i}{b}}\,\sqrt{a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]+i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{\sqrt{-\frac{i}{b}}\,\left(\text{Cos}\left[\frac{1}{2}\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right]-\text{Sin}\left[\frac{1}{2}\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right]\right)}-$$
$$\left(\sqrt{-\frac{i}{b}}\,b\,\sqrt{\pi}\,x\,\text{FresnelC}\left[\frac{\sqrt{-\frac{i}{b}}\,\sqrt{a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]}}{\sqrt{\pi}}\right]\left(i\,\text{Cosh}\left[\frac{a}{2\,b}\right]+\text{Sinh}\left[\frac{a}{2\,b}\right]\right)\right)\Big/$$
$$\left(\text{Cos}\left[\frac{1}{2}\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right]-\text{Sin}\left[\frac{1}{2}\,\text{ArcSin}\left[1-i\,d\,x^2\right]\right]\right)$$

Result (type 8, 24 leaves):

$$\int\sqrt{a+i\,b\,\text{ArcSin}\left[1-i\,d\,x^2\right]}\,dx$$

Problem 332: Unable to integrate problem.

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

Optimal (type 4, 291 leaves, 1 step):

$$-\frac{\sqrt{2\,i\,d\,x^2+d^2\,x^4}}{b\,d\,x\,\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}}-\left(\left(-\frac{i}{b}\right)^{3/2}\sqrt{\pi}\,x\,\text{FresnelC}\left[\frac{\sqrt{-\frac{i}{b}}\,\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]-i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)\right)\Big/$$
$$\left(\text{Cos}\left[\frac{1}{2}\text{ArcSin}[1-i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}[1-i\,d\,x^2]\right]\right)+$$
$$\left(\left(-\frac{i}{b}\right)^{3/2}\sqrt{\pi}\,x\,\text{FresnelS}\left[\frac{\sqrt{-\frac{i}{b}}\,\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]+i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)\right)\Big/$$
$$\left(\text{Cos}\left[\frac{1}{2}\text{ArcSin}[1-i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}[1-i\,d\,x^2]\right]\right)$$

Result (type 8, 24 leaves):

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

Problem 333: Unable to integrate problem.

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

Optimal (type 4, 326 leaves, 2 steps):

$$-\frac{\sqrt{2\,i\,d\,x^2+d^2\,x^4}}{3\,b\,d\,x\,\left(a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]\right)^{3/2}}-\frac{x}{3\,b^2\,\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}}-$$
$$\frac{\sqrt{\pi}\,x\,\text{FresnelS}\left[\frac{\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}}{\sqrt{i\,b}\,\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]-i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{3\,\sqrt{i\,b}\,b^2\left(\text{Cos}\left[\frac{1}{2}\text{ArcSin}[1-i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}[1-i\,d\,x^2]\right]\right)}-$$
$$\frac{\sqrt{\pi}\,x\,\text{FresnelC}\left[\frac{\sqrt{a+i\,b\,\text{ArcSin}[1-i\,d\,x^2]}}{\sqrt{i\,b}\,\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]+i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{3\,\sqrt{i\,b}\,b^2\left(\text{Cos}\left[\frac{1}{2}\text{ArcSin}[1-i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}[1-i\,d\,x^2]\right]\right)}$$

Result (type 8, 24 leaves):

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

Problem 334: Unable to integrate problem.

$$\int \frac{1}{\left(a+i\, b\, \text{ArcSin}\left[1-i\, d\, x^2\right]\right)^{7/2}}\, dx$$

Optimal (type 4, 389 leaves, 2 steps):

$$-\frac{\sqrt{2\, i\, d\, x^2+d^2\, x^4}}{5\, b\, d\, x\, \left(a+i\, b\, \text{ArcSin}\left[1-i\, d\, x^2\right]\right)^{5/2}}-\frac{x}{15\, b^2\, \left(a+i\, b\, \text{ArcSin}\left[1-i\, d\, x^2\right]\right)^{3/2}}-\frac{\sqrt{2\, i\, d\, x^2+d^2\, x^4}}{15\, b^3\, d\, x\, \sqrt{a+i\, b\, \text{ArcSin}\left[1-i\, d\, x^2\right]}}-$$
$$\left(\left(-\frac{i}{b}\right)^{3/2}\sqrt{\pi}\; x\, \text{FresnelC}\left[\frac{\sqrt{-\frac{i}{b}}\, \sqrt{a+i\, b\, \text{ArcSin}\left[1-i\, d\, x^2\right]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\, b}\right]-i\, \text{Sinh}\left[\frac{a}{2\, b}\right]\right)\right)\Big/$$
$$\left(15\, b^2\, \left(\text{Cos}\left[\frac{1}{2}\text{ArcSin}\left[1-i\, d\, x^2\right]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}\left[1-i\, d\, x^2\right]\right]\right)\right)+$$
$$\left(\left(-\frac{i}{b}\right)^{3/2}\sqrt{\pi}\; x\, \text{FresnelS}\left[\frac{\sqrt{-\frac{i}{b}}\, \sqrt{a+i\, b\, \text{ArcSin}\left[1-i\, d\, x^2\right]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\, b}\right]+i\, \text{Sinh}\left[\frac{a}{2\, b}\right]\right)\right)\Big/$$
$$\left(15\, b^2\, \left(\text{Cos}\left[\frac{1}{2}\text{ArcSin}\left[1-i\, d\, x^2\right]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}\left[1-i\, d\, x^2\right]\right]\right)\right)$$

Result (type 8, 24 leaves):

$$\int \frac{1}{\left(a+i\, b\, \text{ArcSin}\left[1-i\, d\, x^2\right]\right)^{7/2}}\, dx$$

Problem 335: Unable to integrate problem.

$$\int \left(a-i\, b\, \text{ArcSin}\left[1+i\, d\, x^2\right]\right)^{5/2}\, dx$$

Optimal (type 4, 348 leaves, 2 steps):

$$15\,b^2\,x\,\sqrt{a-\mathrm{i}\,b\,\mathrm{ArcSin}\left[1+\mathrm{i}\,d\,x^2\right]}\;-\;\frac{5\,b\,\sqrt{-2\,\mathrm{i}\,d\,x^2+d^2\,x^4}\;\left(a-\mathrm{i}\,b\,\mathrm{ArcSin}\left[1+\mathrm{i}\,d\,x^2\right]\right)^{3/2}}{d\,x}+x\,\left(a-\mathrm{i}\,b\,\mathrm{ArcSin}\left[1+\mathrm{i}\,d\,x^2\right]\right)^{5/2}+$$

$$\left(15\,b^2\,\sqrt{\pi}\;x\,\mathrm{FresnelS}\left[\frac{\sqrt{\frac{\mathrm{i}}{b}}\;\sqrt{a-\mathrm{i}\,b\,\mathrm{ArcSin}\left[1+\mathrm{i}\,d\,x^2\right]}}{\sqrt{\pi}}\right]\left(\mathrm{Cosh}\left[\frac{a}{2\,b}\right]-\mathrm{i}\,\mathrm{Sinh}\left[\frac{a}{2\,b}\right]\right)\right)\Big/$$

$$\left(\sqrt{\frac{\mathrm{i}}{b}}\;\left(\mathrm{Cos}\left[\frac{1}{2}\,\mathrm{ArcSin}\left[1+\mathrm{i}\,d\,x^2\right]\right]-\mathrm{Sin}\left[\frac{1}{2}\,\mathrm{ArcSin}\left[1+\mathrm{i}\,d\,x^2\right]\right]\right)\right)-$$

$$\left(15\,b^2\,\sqrt{\pi}\;x\,\mathrm{FresnelC}\left[\frac{\sqrt{\frac{\mathrm{i}}{b}}\;\sqrt{a-\mathrm{i}\,b\,\mathrm{ArcSin}\left[1+\mathrm{i}\,d\,x^2\right]}}{\sqrt{\pi}}\right]\left(\mathrm{Cosh}\left[\frac{a}{2\,b}\right]+\mathrm{i}\,\mathrm{Sinh}\left[\frac{a}{2\,b}\right]\right)\right)\Big/$$

$$\left(\sqrt{\frac{\mathrm{i}}{b}}\;\left(\mathrm{Cos}\left[\frac{1}{2}\,\mathrm{ArcSin}\left[1+\mathrm{i}\,d\,x^2\right]\right]-\mathrm{Sin}\left[\frac{1}{2}\,\mathrm{ArcSin}\left[1+\mathrm{i}\,d\,x^2\right]\right]\right)\right)$$

Result (type 8, 24 leaves):

$$\int\left(a-\mathrm{i}\,b\,\mathrm{ArcSin}\left[1+\mathrm{i}\,d\,x^2\right]\right)^{5/2}\,\mathrm{d}x$$

Problem 336: Unable to integrate problem.

$$\int\left(a-\mathrm{i}\,b\,\mathrm{ArcSin}\left[1+\mathrm{i}\,d\,x^2\right]\right)^{3/2}\,\mathrm{d}x$$

Optimal (type 4, 310 leaves, 2 steps):

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

$$\frac{3\,b^2\,\sqrt{\pi}\;x\,\mathrm{FresnelS}\left[\frac{\sqrt{a-\mathrm{i}\,b\,\mathrm{ArcSin}\left[1+\mathrm{i}\,d\,x^2\right]}}{\sqrt{-\mathrm{i}\,b}\;\sqrt{\pi}}\right]\left(\mathrm{Cosh}\left[\frac{a}{2\,b}\right]+\mathrm{i}\,\mathrm{Sinh}\left[\frac{a}{2\,b}\right]\right)}{\sqrt{-\mathrm{i}\,b}\;\left(\mathrm{Cos}\left[\frac{1}{2}\,\mathrm{ArcSin}\left[1+\mathrm{i}\,d\,x^2\right]\right]-\mathrm{Sin}\left[\frac{1}{2}\,\mathrm{ArcSin}\left[1+\mathrm{i}\,d\,x^2\right]\right]\right)}-$$

$$\left(3\,\sqrt{-\mathrm{i}\,b}\;b\,\sqrt{\pi}\;x\,\mathrm{FresnelC}\left[\frac{\sqrt{a-\mathrm{i}\,b\,\mathrm{ArcSin}\left[1+\mathrm{i}\,d\,x^2\right]}}{\sqrt{-\mathrm{i}\,b}\;\sqrt{\pi}}\right]\left(\mathrm{i}\,\mathrm{Cosh}\left[\frac{a}{2\,b}\right]+\mathrm{Sinh}\left[\frac{a}{2\,b}\right]\right)\right)\Big/$$

$$\left(\mathrm{Cos}\left[\frac{1}{2}\,\mathrm{ArcSin}\left[1+\mathrm{i}\,d\,x^2\right]\right]-\mathrm{Sin}\left[\frac{1}{2}\,\mathrm{ArcSin}\left[1+\mathrm{i}\,d\,x^2\right]\right]\right)$$

Result (type 8, 24 leaves):

$$\int \left(a - i\, b\, \text{ArcSin}\left[1 + i\, d\, x^2\right]\right)^{3/2} dx$$

Problem 337: Unable to integrate problem.

$$\int \sqrt{a - i\, b\, \text{ArcSin}\left[1 + i\, d\, x^2\right]}\, dx$$

Optimal (type 4, 262 leaves, 1 step):

$$x \sqrt{a - i\, b\, \text{ArcSin}\left[1 + i\, d\, x^2\right]} + \frac{\sqrt{\pi}\, x\, \text{FresnelS}\left[\frac{\sqrt{\frac{i}{b}} \sqrt{a - i\, b\, \text{ArcSin}\left[1 + i\, d\, x^2\right]}}{\sqrt{\pi}}\right] \left(\text{Cosh}\left[\frac{a}{2\, b}\right] - i\, \text{Sinh}\left[\frac{a}{2\, b}\right]\right)}{\sqrt{\frac{i}{b}} \left(\text{Cos}\left[\frac{1}{2} \text{ArcSin}\left[1 + i\, d\, x^2\right]\right] - \text{Sin}\left[\frac{1}{2} \text{ArcSin}\left[1 + i\, d\, x^2\right]\right]\right)} - \frac{\sqrt{\pi}\, x\, \text{FresnelC}\left[\frac{\sqrt{\frac{i}{b}} \sqrt{a - i\, b\, \text{ArcSin}\left[1 + i\, d\, x^2\right]}}{\sqrt{\pi}}\right] \left(\text{Cosh}\left[\frac{a}{2\, b}\right] + i\, \text{Sinh}\left[\frac{a}{2\, b}\right]\right)}{\sqrt{\frac{i}{b}} \left(\text{Cos}\left[\frac{1}{2} \text{ArcSin}\left[1 + i\, d\, x^2\right]\right] - \text{Sin}\left[\frac{1}{2} \text{ArcSin}\left[1 + i\, d\, x^2\right]\right]\right)}$$

Result (type 8, 24 leaves):

$$\int \sqrt{a - i\, b\, \text{ArcSin}\left[1 + i\, d\, x^2\right]}\, dx$$

Problem 339: Unable to integrate problem.

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

Optimal (type 4, 291 leaves, 1 step):

$$-\frac{\sqrt{-2\,i\,d\,x^2+d^2\,x^4}}{b\,d\,x\,\sqrt{a-i\,b\,\text{ArcSin}[1+i\,d\,x^2]}}+\left(\left(\frac{i}{b}\right)^{3/2}\sqrt{\pi}\,x\,\text{FresnelS}\left[\frac{\sqrt{\frac{i}{b}}\,\sqrt{a-i\,b\,\text{ArcSin}[1+i\,d\,x^2]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]-i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)\right)\Big/\left(\text{Cos}\left[\frac{1}{2}\text{ArcSin}[1+i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}[1+i\,d\,x^2]\right]\right)-\left(\left(\frac{i}{b}\right)^{3/2}\sqrt{\pi}\,x\,\text{FresnelC}\left[\frac{\sqrt{\frac{i}{b}}\,\sqrt{a-i\,b\,\text{ArcSin}[1+i\,d\,x^2]}}{\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]+i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)\right)\Big/\left(\text{Cos}\left[\frac{1}{2}\text{ArcSin}[1+i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}[1+i\,d\,x^2]\right]\right)$$

Result (type 8, 24 leaves):

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

Problem 340: Unable to integrate problem.

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

Optimal (type 4, 326 leaves, 2 steps):

$$-\frac{\sqrt{-2\,i\,d\,x^2+d^2\,x^4}}{3\,b\,d\,x\,\left(a-i\,b\,\text{ArcSin}[1+i\,d\,x^2]\right)^{3/2}}-\frac{x}{3\,b^2\,\sqrt{a-i\,b\,\text{ArcSin}[1+i\,d\,x^2]}}-\frac{\sqrt{\pi}\,x\,\text{FresnelS}\left[\frac{\sqrt{a-i\,b\,\text{ArcSin}[1+i\,d\,x^2]}}{\sqrt{-i\,b}\,\sqrt{\pi}}\right]\left(\text{Cosh}\left[\frac{a}{2\,b}\right]+i\,\text{Sinh}\left[\frac{a}{2\,b}\right]\right)}{3\,\sqrt{-i\,b}\,b^2\left(\text{Cos}\left[\frac{1}{2}\text{ArcSin}[1+i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}[1+i\,d\,x^2]\right]\right)}-\left(\sqrt{-i\,b}\,\sqrt{\pi}\,x\,\text{FresnelC}\left[\frac{\sqrt{a-i\,b\,\text{ArcSin}[1+i\,d\,x^2]}}{\sqrt{-i\,b}\,\sqrt{\pi}}\right]\left(i\,\text{Cosh}\left[\frac{a}{2\,b}\right]+\text{Sinh}\left[\frac{a}{2\,b}\right]\right)\right)\Big/\left(3\,b^3\left(\text{Cos}\left[\frac{1}{2}\text{ArcSin}[1+i\,d\,x^2]\right]-\text{Sin}\left[\frac{1}{2}\text{ArcSin}[1+i\,d\,x^2]\right]\right)\right)$$

Result (type 8, 24 leaves):

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

Problem 341: Unable to integrate problem.

$$\int \frac{1}{\left(a - i\, b\, \text{ArcSin}\left[1 + i\, d\, x^2\right]\right)^{7/2}}\, dx$$

Optimal (type 4, 389 leaves, 2 steps):

$$-\frac{\sqrt{-2\, i\, d\, x^2 + d^2\, x^4}}{5\, b\, d\, x\, \left(a - i\, b\, \text{ArcSin}\left[1 + i\, d\, x^2\right]\right)^{5/2}} - \frac{x}{15\, b^2\, \left(a - i\, b\, \text{ArcSin}\left[1 + i\, d\, x^2\right]\right)^{3/2}} - \frac{\sqrt{-2\, i\, d\, x^2 + d^2\, x^4}}{15\, b^3\, d\, x\, \sqrt{a - i\, b\, \text{ArcSin}\left[1 + i\, d\, x^2\right]}} - \left(\left(\frac{i}{b}\right)^{3/2} \sqrt{\pi}\, x\, \text{FresnelC}\left[\frac{\sqrt{\frac{i}{b}}\, \sqrt{a - i\, b\, \text{ArcSin}\left[1 + i\, d\, x^2\right]}}{\sqrt{\pi}}\right] \left(\text{Cosh}\left[\frac{a}{2\, b}\right] + i\, \text{Sinh}\left[\frac{a}{2\, b}\right]\right)\right) \Big/ \left(15\, b^2\, \left(\text{Cos}\left[\frac{1}{2}\, \text{ArcSin}\left[1 + i\, d\, x^2\right]\right] - \text{Sin}\left[\frac{1}{2}\, \text{ArcSin}\left[1 + i\, d\, x^2\right]\right]\right)\right) + \left(\sqrt{\frac{i}{b}}\, \sqrt{\pi}\, x\, \text{FresnelS}\left[\frac{\sqrt{\frac{i}{b}}\, \sqrt{a - i\, b\, \text{ArcSin}\left[1 + i\, d\, x^2\right]}}{\sqrt{\pi}}\right] \left(i\, \text{Cosh}\left[\frac{a}{2\, b}\right] + \text{Sinh}\left[\frac{a}{2\, b}\right]\right)\right) \Big/ \left(15\, b^3\, \left(\text{Cos}\left[\frac{1}{2}\, \text{ArcSin}\left[1 + i\, d\, x^2\right]\right] - \text{Sin}\left[\frac{1}{2}\, \text{ArcSin}\left[1 + i\, d\, x^2\right]\right]\right)\right)$$

Result (type 8, 24 leaves):

$$\int \frac{1}{\left(a - i\, b\, \text{ArcSin}\left[1 + i\, d\, x^2\right]\right)^{7/2}}\, dx$$

Problem 343: Unable to integrate problem.

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

Optimal (type 4, 261 leaves, 8 steps):

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

Result (type 8, 42 leaves):

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

Problem 344: Unable to integrate problem.

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

Optimal (type 4, 195 leaves, 7 steps):

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

Result (type 8, 42 leaves):

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

Problem 345: Unable to integrate problem.

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

Optimal (type 4, 133 leaves, 6 steps):

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

Result (type 8, 40 leaves):

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

Problem 348: Attempted integration timed out after 120 seconds.

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

Optimal (type 4, 76 leaves, 6 steps):

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

Result (type 1, 1 leaves):

???

Problem 368: Result more than twice size of optimal antiderivative.

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

Optimal (type 3, 49 leaves, 6 steps):

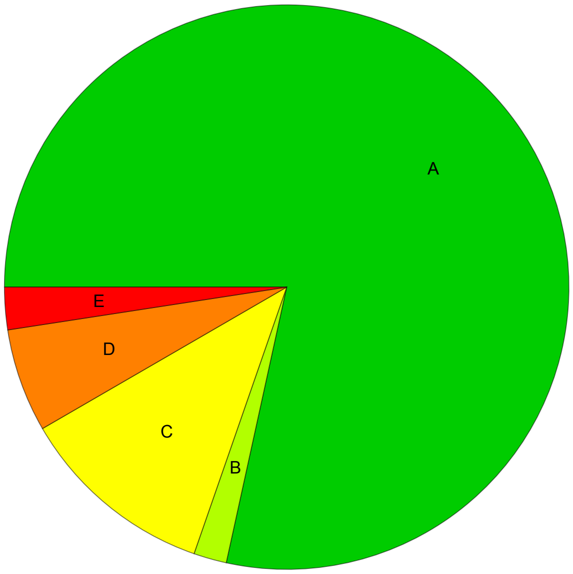
$$\frac{(a+b\,x)\,\text{ArcCsch}\left[\frac{a}{c}+\frac{b\,x}{c}\right]}{b}+\frac{c\,\text{ArcTanh}\left[\sqrt{1+\frac{1}{\left(\frac{a}{c}+\frac{b\,x}{c}\right)^2}}\right]}{b}$$

Result (type 3, 147 leaves):

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

Summary of Integration Test Results

371 integration problems



A - 291 optimal antiderivatives

B - 7 more than twice size of optimal antiderivatives

C - 42 unnecessarily complex antiderivatives

D - 22 unable to integrate problems

E - 9 integration timeouts