Mathematica 11.3 Integration Test Results

Test results for the 108 problems in "5.1.4b (f x)^m (d+e x^2)^p (a+b arcsin(c x))^n.m"

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

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

Optimal (type 4, 705 leaves, 27 steps):

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

Result (type 4, 1547 leaves):

$$-\frac{a\,d^2}{4\,e^3\,(d+e\,x^2)^2}+\frac{a\,d}{e^3\,(d+e\,x^2)}+\frac{a\,\text{Log}[d+e\,x^2]}{2\,e^3}+$$

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

$$\frac{1}{16\,e^{5/2}}d\left(-\frac{c\sqrt{1-c^2x^2}}{\left(c^2 d+e\right)\left(-i\sqrt{d}+\sqrt{e}\,x\right)}-\frac{\text{ArcSin}[c\,x]}{\sqrt{e}\left(-i\sqrt{d}+\sqrt{e}\,x\right)^2}-\right.$$

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

$$\left.\left.\left.\left.\left(c^3\left(d+i\sqrt{d}\,\sqrt{e}\,x\right)\right)\right]\right)\right)\Big/\left(\sqrt{e}\,\left(c^2 d+e\right)^{3/2}\right)\right)-$$

$$\frac{7\,i\sqrt{d}\left(-\frac{\text{ArcSin}[c\,x]}{i\sqrt{d}+\sqrt{e}\,x}-\frac{c\,\text{Log}\left[\frac{2e\left(\sqrt{e}+i\,c^2\sqrt{d}\,x+\sqrt{c^2 d+e}\,\sqrt{1-c^2x^2}\right)}{c\sqrt{c^2 d+e}\,\left(i\sqrt{d}+\sqrt{e}\,x\right)}\right]}{\sqrt{c^2 d+e}}\right)}{16\,e^3}-\frac{1}{16\,e^{5/2}}$$

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

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

$$\left.\left.\left.\left.\left(c^3\left(d-i\sqrt{d}\,\sqrt{e}\,x\right)\right)\right]\right)\right)\Big/\left(\sqrt{e}\,\left(c^2 d+e\right)^{3/2}\right)\right)+\frac{1}{16\,e^3}\left(i\left(\pi-2\,\text{ArcSin}[c\,x]\right)^2-\right.$$

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

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

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

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

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

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

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

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

$$\frac{1}{16\,e^3}\left(i\left(\pi-2\,\text{ArcSin}[c\,x]\right)^2-32\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i\,c\sqrt{d}}{\sqrt{e}}}}{\sqrt{2}}\right]\right.$$

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

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

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

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

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

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

Problem 49: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 727 leaves, 32 steps):

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

Result (type 4, 1601 leaves):

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

$$b\left(-\frac{5\,i\left(\frac{\text{ArcSin}[c\,x]}{-i\sqrt{d}+\sqrt{e}\,x}+\frac{c\,\text{Log}\left[-\frac{2\,e\left(\sqrt{e}-i\,c^2\sqrt{d}\,x+\sqrt{c^2 d+e}\,\sqrt{1-c^2x^2}\right)}{c\sqrt{c^2d+e}\left(-i\sqrt{d}+\sqrt{e}\,x\right)}\right]}{\sqrt{c^2 d+e}}\right)}{16\,d^{5/2}}+\frac{1}{16\,d^2}\sqrt{e}\left(-\frac{c\sqrt{1-c^2x^2}}{\left(c^2 d+e\right)\left(-i\sqrt{d}+\sqrt{e}\,x\right)}-\right.\right.$$

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

$$\frac{5\,i\left(-\frac{\text{ArcSin}[c\,x]}{i\sqrt{d}+\sqrt{e}\,x}-\frac{c\,\text{Log}\left[\frac{2\,e\left(\sqrt{e}+i\,c^2\sqrt{d}\,x+\sqrt{c^2 d+e}\,\sqrt{1-c^2x^2}\right)}{c\sqrt{c^2d+e}\left(i\sqrt{d}+\sqrt{e}\,x\right)}\right]}{\sqrt{c^2 d+e}}\right)}{16\,d^{5/2}}+\frac{1}{16\,d^2}\sqrt{e}\left(-\frac{c\sqrt{1-c^2x^2}}{\left(c^2 d+e\right)\left(i\sqrt{d}+\sqrt{e}\,x\right)}-\right.$$

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

$$\frac{1}{16\,d^3}\left(i\left(\pi-2\,\text{ArcSin}[c\,x]\right)^2-32\,i\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{i\,c\sqrt{d}}{\sqrt{e}}}}{\sqrt{2}}\right]\right.$$

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

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

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

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

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

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

$$\left.\left.\text{PolyLog}\left[2,-\frac{\left(c\sqrt{d}+\sqrt{c^2 d+e}\right)e^{-i\,\text{ArcSin}[c\,x]}}{\sqrt{e}}\right]\right)\right)-\frac{1}{16\,d^3}\left(i\left(\pi-2\,\text{ArcSin}[c\,x]\right)^2-\right.$$

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

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

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

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

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

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

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

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

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

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

Optimal (type 4, 783 leaves, 34 steps):

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

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

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

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

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

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

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

Result (type 4, 1653 leaves):

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

$$b\left(-\frac{c\,x\,\sqrt{1-c^2\,x^2}+\text{ArcSin}[c\,x]}{2\,d^3\,x^2}+\frac{9\,\mathrm{i}\,e\left(\frac{\text{ArcSin}[c\,x]}{-\mathrm{i}\,\sqrt{d}+\sqrt{e}\,x}+\frac{c\,\text{Log}\left[-\frac{2\,e\,\left(\sqrt{e}-\mathrm{i}\,c^2\,\sqrt{d}\,x+\sqrt{c^2\,d+e}\,\sqrt{1-c^2\,x^2}\right)}{c\,\sqrt{c^2\,d+e}\,\left(-\mathrm{i}\,\sqrt{d}+\sqrt{e}\,x\right)}\right]}{\sqrt{c^2\,d+e}}\right)}{16\,d^{7/2}}-\right.$$

$$\frac{1}{16\,d^3}e^{3/2}\left(-\frac{c\,\sqrt{1-c^2\,x^2}}{\left(c^2\,d+e\right)\,\left(-\mathrm{i}\,\sqrt{d}+\sqrt{e}\,x\right)}-\frac{\text{ArcSin}[c\,x]}{\sqrt{e}\,\left(-\mathrm{i}\,\sqrt{d}+\sqrt{e}\,x\right)^2}-\right.$$

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

$$\frac{9\,\mathrm{i}\,e\left(-\frac{\text{ArcSin}[c\,x]}{\mathrm{i}\,\sqrt{d}+\sqrt{e}\,x}-\frac{c\,\text{Log}\left[\frac{2\,e\,\left(\sqrt{e}+\mathrm{i}\,c^2\,\sqrt{d}\,x+\sqrt{c^2\,d+e}\,\sqrt{1-c^2\,x^2}\right)}{c\,\sqrt{c^2\,d+e}\,\left(\mathrm{i}\,\sqrt{d}+\sqrt{e}\,x\right)}\right]}{\sqrt{c^2\,d+e}}\right)}{16\,d^{7/2}}-\frac{1}{16\,d^3}e^{3/2}\left(-\frac{c\,\sqrt{1-c^2\,x^2}}{\left(c^2\,d+e\right)\,\left(\mathrm{i}\,\sqrt{d}+\sqrt{e}\,x\right)}-\right.$$

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

$$\frac{1}{16\,d^4}3\,e\left(\mathrm{i}\,\left(\pi-2\,\text{ArcSin}[c\,x]\right)^2-32\,\mathrm{i}\,\text{ArcSin}\left[\frac{\sqrt{1-\frac{\mathrm{i}\,c\,\sqrt{d}}{\sqrt{e}}}}{\sqrt{2}}\right]\right.$$

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

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

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

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

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

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

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

$$\frac{1}{16\,d^4}3\,e\left(i\left(\pi-2\,\text{ArcSin}[c\,x]\right)^2-32\,i\,\text{ArcSin}\left[\frac{\sqrt{1+\frac{i c\sqrt{d}}{\sqrt{e}}}}{\sqrt{2}}\right]\right.$$

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

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

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

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

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

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

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

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

Problem 56: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

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

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

Result (type 6, 164 leaves):

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

Problem 57: Result unnecessarily involves higher level functions.

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

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

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

Result (type 6, 231 leaves):

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

Problem 58: Result unnecessarily involves higher level functions.

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

Optimal (type 3, 226 leaves, 8 steps):

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

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

Result (type 6, 304 leaves):

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

$$a\,x\,\left(15\,d^2+20\,d\,e\,x^2+8\,e^2\,x^4\right)-\left(16\,b\,c\,d\,x^2\,\left(d+e\,x^2\right)^2\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,c^2\,x^2,-\frac{e\,x^2}{d}\right]\right)\Big/$$

$$\left(\sqrt{1-c^2\,x^2}\,\left(4\,d\,\text{AppellF1}\left[1,\frac{1}{2},\frac{1}{2},2,c^2\,x^2,-\frac{e\,x^2}{d}\right]+\right.\right.$$

$$\left.\left.x^2\,\left(-e\,\text{AppellF1}\left[2,\frac{1}{2},\frac{3}{2},3,c^2\,x^2,-\frac{e\,x^2}{d}\right]+c^2\,d\,\text{AppellF1}\left[2,\frac{3}{2},\frac{1}{2},3,c^2\,x^2,-\frac{e\,x^2}{d}\right]\right)\right)\right)+$$

$$\left.b\,x\,\left(15\,d^2+20\,d\,e\,x^2+8\,e^2\,x^4\right)\,\text{ArcSin}[c\,x]\right)$$

Problem 68: Result more than twice size of optimal antiderivative.

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

Optimal (type 4, 821 leaves, 22 steps):

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

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

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

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

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

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

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

Result (type 4, 3335 leaves):

$$\frac{1}{8\,\sqrt{d}\,\sqrt{e}}\left(8\,a^2\,\text{ArcTan}\left[\frac{\sqrt{e}\,x}{\sqrt{d}}\right]+\right.$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$\text{ArcSin}[c\,x]^2\,\text{Log}\Big[\frac{c\sqrt{d}+\sqrt{c^2 d+e}-\sqrt{e}\,e^{i\,\text{ArcSin}[c\,x]}}{c\sqrt{d}+\sqrt{c^2 d+e}}\Big]+\pi\,\text{ArcSin}[c\,x]$$

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

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

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

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

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

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

$$\text{ArcSin}[c\,x]^2\,\text{Log}\Big[\frac{-c\sqrt{d}+\sqrt{c^2 d+e}+\sqrt{e}\,e^{i\,\text{ArcSin}[c\,x]}}{-c\sqrt{d}+\sqrt{c^2 d+e}}\Big]+\pi\,\text{ArcSin}[c\,x]$$

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

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

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

$$\text{ArcSin}[c\,x]^2\,\text{Log}\Big[\frac{c\sqrt{d}+\sqrt{c^2 d+e}+\sqrt{e}\,e^{i\,\text{ArcSin}[c\,x]}}{c\sqrt{d}+\sqrt{c^2 d+e}}\Big]-$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$2\,\mathbb{i}\,\text{ArcSin}[c\,x]\,\text{PolyLog}\Big[2,\,-\frac{\sqrt{e}\,\,\mathbb{e}^{\mathbb{i}\,\text{ArcSin}[c\,x]}}{c\,\sqrt{d}\,+\sqrt{c^2\,d+e}}\Big]+$$

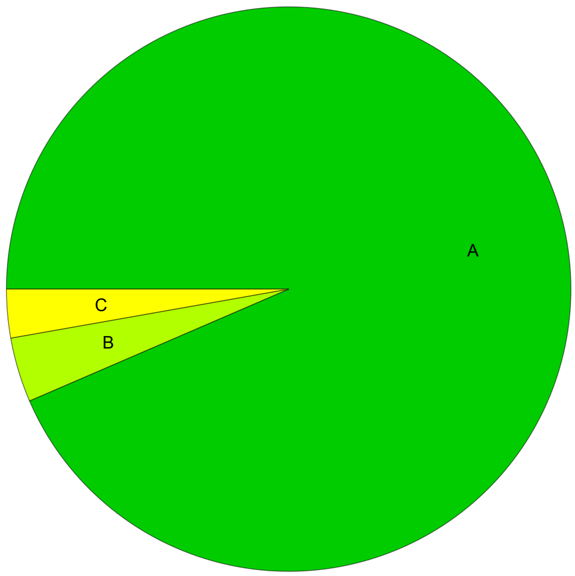
$$2\,\mathbb{i}\,\text{ArcSin}[c\,x]\,\text{PolyLog}\Big[2,\,\frac{\sqrt{e}\,\,\mathbb{e}^{\mathbb{i}\,\text{ArcSin}[c\,x]}}{c\,\sqrt{d}\,+\sqrt{c^2\,d+e}}\Big]-$$

$$2\,\text{PolyLog}\Big[3,\,\frac{\sqrt{e}\,\,\mathbb{e}^{\mathbb{i}\,\text{ArcSin}[c\,x]}}{c\,\sqrt{d}\,-\sqrt{c^2\,d+e}}\Big]+2\,\text{PolyLog}\Big[3,\,\frac{\sqrt{e}\,\,\mathbb{e}^{\mathbb{i}\,\text{ArcSin}[c\,x]}}{-c\,\sqrt{d}\,+\sqrt{c^2\,d+e}}\Big]+$$

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

Summary of Integration Test Results

108 integration problems



A - 101 optimal antiderivatives

B - 4 more than twice size of optimal antiderivatives

C - 3 unnecessarily complex antiderivatives

D - 0 unable to integrate problems

E - 0 integration timeouts