# Rubi 4.16.0.4 Integration Test Results

## on the problems in the test-suite directory "5 Inverse trig functions"

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## Test results for the 227 problems in "5.1.2 (d x)^m (a+b arcsin(c x))^n.m"

### Problem 168: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 197 leaves, 16 steps):

$$-\frac{x^2\sqrt{1-c^2x^2}}{2\,b\,c\,(a+b\,\text{ArcSin}[c\,x])^2}-\frac{x}{b^2c^2\,(a+b\,\text{ArcSin}[c\,x])}+\frac{3\,x^3}{2\,b^2\,(a+b\,\text{ArcSin}[c\,x])}-\frac{\text{Cos}\left[\frac{a}{b}\right]\text{CosIntegral}\left[\frac{a+b\,\text{ArcSin}[c\,x]}{b}\right]}{8\,b^3c^3}+\frac{9\,\text{Cos}\left[\frac{3\,a}{b}\right]\text{CosIntegral}\left[\frac{3\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{8\,b^3c^3}-\frac{\text{Sin}\left[\frac{a}{b}\right]\text{SinIntegral}\left[\frac{a+b\,\text{ArcSin}[c\,x]}{b}\right]}{8\,b^3c^3}+\frac{9\,\text{Sin}\left[\frac{3\,a}{b}\right]\text{SinIntegral}\left[\frac{3\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{8\,b^3c^3}$$

Result (type 4, 245 leaves, 16 steps):

$$-\frac{x^2\sqrt{1-c^2x^2}}{2\,b\,c\,(a+b\,\text{ArcSin}[c\,x])^2}-\frac{x}{b^2c^2\,(a+b\,\text{ArcSin}[c\,x])}+\frac{3\,x^3}{2\,b^2\,(a+b\,\text{ArcSin}[c\,x])}-\frac{9\,\text{Cos}\left[\frac{a}{b}\right]\text{CosIntegral}\left[\frac{a}{b}+\text{ArcSin}[c\,x]\right]}{8\,b^3c^3}+\frac{9\,\text{Cos}\left[\frac{3\,a}{b}\right]\text{CosIntegral}\left[\frac{3\,a}{b}+3\,\text{ArcSin}[c\,x]\right]}{8\,b^3c^3}+\frac{\text{Cos}\left[\frac{a}{b}\right]\text{CosIntegral}\left[\frac{a+b\,\text{ArcSin}[c\,x]}{b}\right]}{b^3c^3}-\frac{9\,\text{Sin}\left[\frac{a}{b}\right]\text{SinIntegral}\left[\frac{a}{b}+\text{ArcSin}[c\,x]\right]}{8\,b^3c^3}+\frac{9\,\text{Sin}\left[\frac{3\,a}{b}\right]\text{SinIntegral}\left[\frac{3\,a}{b}+3\,\text{ArcSin}[c\,x]\right]}{8\,b^3c^3}+\frac{\text{Sin}\left[\frac{a}{b}\right]\text{SinIntegral}\left[\frac{a+b\,\text{ArcSin}[c\,x]}{b}\right]}{b^3c^3}$$

# Test results for the 703 problems in "5.1.4 (f x)^m (d+e x^2)^p (a+b arcsin(c x))^n.m"

## Problem 45: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 259 leaves, 19 steps):

$$-\frac{b\,c^3}{3\,d^2\,\sqrt{1-c^2\,x^2}}-\frac{b\,c}{6\,d^2\,x^2\,\sqrt{1-c^2\,x^2}}-\frac{a+b\,\mathrm{ArcSin}[c\,x]}{3\,d^2\,x^3\,\left(1-c^2\,x^2\right)}-\frac{5\,c^2\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)}{3\,d^2\,x\,\left(1-c^2\,x^2\right)}+\frac{5\,c^4\,x\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)}{2\,d^2\,\left(1-c^2\,x^2\right)}-\frac{5\,i\,c^3\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)\,\mathrm{ArcTan}\left[e^{i\,\mathrm{ArcSin}[c\,x]}\right]}{d^2}-\frac{13\,b\,c^3\,\mathrm{ArcTanh}\left[\sqrt{1-c^2\,x^2}\right]}{6\,d^2}+\frac{5\,i\,b\,c^3\,\mathrm{PolyLog}\left[2,-i\,e^{i\,\mathrm{ArcSin}[c\,x]}\right]}{2\,d^2}-\frac{5\,i\,b\,c^3\,\mathrm{PolyLog}\left[2,i\,e^{i\,\mathrm{ArcSin}[c\,x]}\right]}{2\,d^2}$$

Result (type 4, 285 leaves, 19 steps):

$$-\frac{5\,b\,c^3}{6\,d^2\,\sqrt{1-c^2\,x^2}}+\frac{b\,c}{3\,d^2\,x^2\,\sqrt{1-c^2\,x^2}}-\frac{b\,c\,\sqrt{1-c^2\,x^2}}{2\,d^2\,x^2}-\frac{a+b\,\mathrm{ArcSin}[c\,x]}{3\,d^2\,x^3\,\left(1-c^2\,x^2\right)}-\frac{5\,c^2\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)}{3\,d^2\,x\,\left(1-c^2\,x^2\right)}+\frac{5\,c^4\,x\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)}{2\,d^2\,\left(1-c^2\,x^2\right)}-\frac{5\,i\,c^3\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)\,\mathrm{ArcTan}\left[e^{i\,\mathrm{ArcSin}[c\,x]}\right]}{d^2}-\frac{13\,b\,c^3\,\mathrm{ArcTanh}\left[\sqrt{1-c^2\,x^2}\right]}{6\,d^2}+\frac{5\,i\,b\,c^3\,\mathrm{PolyLog}\left[2,-i\,e^{i\,\mathrm{ArcSin}[c\,x]}\right]}{2\,d^2}-\frac{5\,i\,b\,c^3\,\mathrm{PolyLog}\left[2,i\,e^{i\,\mathrm{ArcSin}[c\,x]}\right]}{2\,d^2}$$

## Problem 54: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 317 leaves, 23 steps):

$$\frac{b\,c^3}{12\,d^3\,(1-c^2x^2)^{3/2}}-\frac{b\,c}{6\,d^3\,x^2\,(1-c^2x^2)^{3/2}}-\frac{29\,b\,c^3}{24\,d^3\sqrt{1-c^2x^2}}-\frac{a+b\,\text{ArcSin}[c\,x]}{3\,d^3\,x^3\,(1-c^2x^2)^2}-\frac{7\,c^2\,(a+b\,\text{ArcSin}[c\,x])}{3\,d^3\,x\,(1-c^2x^2)^2}+\frac{35\,c^4\,x\,(a+b\,\text{ArcSin}[c\,x])}{12\,d^3\,(1-c^2x^2)^2}+\frac{35\,c^4\,x\,(a+b\,\text{ArcSin}[c\,x])}{8\,d^3\,(1-c^2x^2)}-\frac{35\,i\,c^3\,(a+b\,\text{ArcSin}[c\,x])\,\text{ArcTan}[e^{i\,\text{ArcSin}[c\,x]}]}{4\,d^3}-\frac{19\,b\,c^3\,\text{ArcTanh}[\sqrt{1-c^2x^2}]}{6\,d^3}+\frac{35\,i\,b\,c^3\,\text{PolyLog}[2,-i\,e^{i\,\text{ArcSin}[c\,x]}]}{8\,d^3}-\frac{35\,i\,b\,c^3\,\text{PolyLog}[2,i\,e^{i\,\text{ArcSin}[c\,x]}]}{8\,d^3}$$

Result (type 4, 369 leaves, 23 steps):

$$-\frac{7\,b\,c^3}{36\,d^3\,(1-c^2x^2)^{3/2}}+\frac{b\,c}{9\,d^3\,x^2\,(1-c^2x^2)^{3/2}}-\frac{49\,b\,c^3}{24\,d^3\sqrt{1-c^2x^2}}+\frac{5\,b\,c}{9\,d^3\,x^2\sqrt{1-c^2x^2}}-\frac{5\,b\,c\sqrt{1-c^2x^2}}{6\,d^3\,x^2}-\frac{a+b\,\text{ArcSin}[c\,x]}{3\,d^3\,x^3\,(1-c^2x^2)^2}-\frac{7\,c^2\,(a+b\,\text{ArcSin}[c\,x])}{3\,d^3\,x\,(1-c^2x^2)^2}+\frac{35\,c^4\,x\,(a+b\,\text{ArcSin}[c\,x])}{12\,d^3\,(1-c^2x^2)^2}+\frac{35\,c^4\,x\,(a+b\,\text{ArcSin}[c\,x])}{8\,d^3\,(1-c^2x^2)}-\frac{35\,i\,c^3\,(a+b\,\text{ArcSin}[c\,x])\,\text{ArcTan}[e^{i\,\text{ArcSin}[c\,x]}]}{4\,d^3}-\frac{19\,b\,c^3\,\text{ArcTanh}[\sqrt{1-c^2x^2}]}{6\,d^3}+\frac{35\,i\,b\,c^3\,\text{PolyLog}[2,-i\,e^{i\,\text{ArcSin}[c\,x]}]}{8\,d^3}-\frac{35\,i\,b\,c^3\,\text{PolyLog}[2,i\,e^{i\,\text{ArcSin}[c\,x]}]}{8\,d^3}$$

## Problem 60: Result optimal but 2 more steps used.

$$\int\frac{\sqrt{d-c^2dx^2}\,(a+b\,\text{ArcSin}[c\,x])}{x^6}\,dx$$

Optimal (type 3, 187 leaves, 4 steps):

$$-\frac{b\,c\sqrt{d-c^2dx^2}}{20\,x^4\sqrt{1-c^2x^2}}+\frac{b\,c^3\sqrt{d-c^2dx^2}}{30\,x^2\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\,\text{ArcSin}[c\,x])}{5\,d\,x^5}-\frac{2\,c^2\,(d-c^2dx^2)^{3/2}\,(a+b\,\text{ArcSin}[c\,x])}{15\,d\,x^3}-\frac{2\,b\,c^5\sqrt{d-c^2dx^2}\,\text{Log}[x]}{15\sqrt{1-c^2x^2}}$$

Result (type 3, 187 leaves, 6 steps):

$$-\frac{b\,c\sqrt{d-c^2dx^2}}{20\,x^4\sqrt{1-c^2x^2}}+\frac{b\,c^3\sqrt{d-c^2dx^2}}{30\,x^2\sqrt{1-c^2x^2}}-\frac{(d-c^2dx^2)^{3/2}\,(a+b\,\text{ArcSin}[c\,x])}{5\,d\,x^5}-\frac{2\,c^2\,(d-c^2dx^2)^{3/2}\,(a+b\,\text{ArcSin}[c\,x])}{15\,d\,x^3}-\frac{2\,b\,c^5\sqrt{d-c^2dx^2}\,\text{Log}[x]}{15\sqrt{1-c^2x^2}}$$

## Problem 61: Result optimal but 3 more steps used.

$$\int\frac{\sqrt{d-c^2dx^2}\,(a+b\,\text{ArcSin}[c\,x])}{x^8}\,dx$$

Optimal (type 3, 263 leaves, 4 steps):

$$-\frac{b c \sqrt{d-c^2 d x^2}}{42 x^6 \sqrt{1-c^2 x^2}}+\frac{b c^3 \sqrt{d-c^2 d x^2}}{140 x^4 \sqrt{1-c^2 x^2}}+\frac{2 b c^5 \sqrt{d-c^2 d x^2}}{105 x^2 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{3/2} \left(a+b \text{ArcSin}[c x]\right)}{7 d x^7}-\frac{4 c^2 \left(d-c^2 d x^2\right)^{3/2} \left(a+b \text{ArcSin}[c x]\right)}{35 d x^5}-\frac{8 c^4 \left(d-c^2 d x^2\right)^{3/2} \left(a+b \text{ArcSin}[c x]\right)}{105 d x^3}-\frac{8 b c^7 \sqrt{d-c^2 d x^2} \text{ Log}[x]}{105 \sqrt{1-c^2 x^2}}$$

Result (type 3, 263 leaves, 7 steps):

$$-\frac{b c \sqrt{d-c^2 d x^2}}{42 x^6 \sqrt{1-c^2 x^2}}+\frac{b c^3 \sqrt{d-c^2 d x^2}}{140 x^4 \sqrt{1-c^2 x^2}}+\frac{2 b c^5 \sqrt{d-c^2 d x^2}}{105 x^2 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{3/2} \left(a+b \text{ArcSin}[c x]\right)}{7 d x^7}-\frac{4 c^2 \left(d-c^2 d x^2\right)^{3/2} \left(a+b \text{ArcSin}[c x]\right)}{35 d x^5}-\frac{8 c^4 \left(d-c^2 d x^2\right)^{3/2} \left(a+b \text{ArcSin}[c x]\right)}{105 d x^3}-\frac{8 b c^7 \sqrt{d-c^2 d x^2} \text{ Log}[x]}{105 \sqrt{1-c^2 x^2}}$$

## Problem 62: Result optimal but 3 more steps used.

$$\int x^5 \sqrt{d-c^2 d x^2} \left(a+b \text{ArcSin}[c x]\right) dx$$

Optimal (type 3, 256 leaves, 3 steps):

$$\frac{8 b x \sqrt{d-c^2 d x^2}}{105 c^5 \sqrt{1-c^2 x^2}}+\frac{4 b x^3 \sqrt{d-c^2 d x^2}}{315 c^3 \sqrt{1-c^2 x^2}}+\frac{b x^5 \sqrt{d-c^2 d x^2}}{175 c \sqrt{1-c^2 x^2}}-\frac{b c x^7 \sqrt{d-c^2 d x^2}}{49 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{3/2} \left(a+b \text{ArcSin}[c x]\right)}{3 c^6 d}+\frac{2 \left(d-c^2 d x^2\right)^{5/2} \left(a+b \text{ArcSin}[c x]\right)}{5 c^6 d^2}-\frac{\left(d-c^2 d x^2\right)^{7/2} \left(a+b \text{ArcSin}[c x]\right)}{7 c^6 d^3}$$

Result (type 3, 256 leaves, 6 steps):

$$\frac{8 b x \sqrt{d-c^2 d x^2}}{105 c^5 \sqrt{1-c^2 x^2}}+\frac{4 b x^3 \sqrt{d-c^2 d x^2}}{315 c^3 \sqrt{1-c^2 x^2}}+\frac{b x^5 \sqrt{d-c^2 d x^2}}{175 c \sqrt{1-c^2 x^2}}-\frac{b c x^7 \sqrt{d-c^2 d x^2}}{49 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{3/2} \left(a+b \text{ArcSin}[c x]\right)}{3 c^6 d}+\frac{2 \left(d-c^2 d x^2\right)^{5/2} \left(a+b \text{ArcSin}[c x]\right)}{5 c^6 d^2}-\frac{\left(d-c^2 d x^2\right)^{7/2} \left(a+b \text{ArcSin}[c x]\right)}{7 c^6 d^3}$$

## Problem 63: Result optimal but 3 more steps used.

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

Optimal (type 3, 183 leaves, 3 steps):

$$\frac{2 b x \sqrt{d-c^2 d x^2}}{15 c^3 \sqrt{1-c^2 x^2}}+\frac{b x^3 \sqrt{d-c^2 d x^2}}{45 c \sqrt{1-c^2 x^2}}-\frac{b c x^5 \sqrt{d-c^2 d x^2}}{25 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{3/2} \left(a+b \text{ArcSin}[c x]\right)}{3 c^4 d}+\frac{\left(d-c^2 d x^2\right)^{5/2} \left(a+b \text{ArcSin}[c x]\right)}{5 c^4 d^2}$$

Result (type 3, 183 leaves, 6 steps):

$$\frac{2 b x \sqrt{d-c^2 d x^2}}{15 c^3 \sqrt{1-c^2 x^2}}+\frac{b x^3 \sqrt{d-c^2 d x^2}}{45 c \sqrt{1-c^2 x^2}}-\frac{b c x^5 \sqrt{d-c^2 d x^2}}{25 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{3/2} (a+b \operatorname{ArcSin}[c x])}{3 c^4 d}+\frac{\left(d-c^2 d x^2\right)^{5/2} (a+b \operatorname{ArcSin}[c x])}{5 c^4 d^2}$$

## Problem 74: Result optimal but 2 more steps used.

$$\int \frac{\left(d-c^2 d x^2\right)^{3/2} (a+b \operatorname{ArcSin}[c x])}{x^8} \, dx$$

Optimal (type 3, 231 leaves, 5 steps):

$$-\frac{b c d \sqrt{d-c^2 d x^2}}{42 x^6 \sqrt{1-c^2 x^2}}+\frac{2 b c^3 d \sqrt{d-c^2 d x^2}}{35 x^4 \sqrt{1-c^2 x^2}}-\frac{b c^5 d \sqrt{d-c^2 d x^2}}{70 x^2 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{5/2} (a+b \operatorname{ArcSin}[c x])}{7 d x^7}-\frac{2 c^2 \left(d-c^2 d x^2\right)^{5/2} (a+b \operatorname{ArcSin}[c x])}{35 d x^5}+\frac{2 b c^7 d \sqrt{d-c^2 d x^2} \operatorname{Log}[x]}{35 \sqrt{1-c^2 x^2}}$$

Result (type 3, 231 leaves, 7 steps):

$$-\frac{b c d \sqrt{d-c^2 d x^2}}{42 x^6 \sqrt{1-c^2 x^2}}+\frac{2 b c^3 d \sqrt{d-c^2 d x^2}}{35 x^4 \sqrt{1-c^2 x^2}}-\frac{b c^5 d \sqrt{d-c^2 d x^2}}{70 x^2 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{5/2} (a+b \operatorname{ArcSin}[c x])}{7 d x^7}-\frac{2 c^2 \left(d-c^2 d x^2\right)^{5/2} (a+b \operatorname{ArcSin}[c x])}{35 d x^5}+\frac{2 b c^7 d \sqrt{d-c^2 d x^2} \operatorname{Log}[x]}{35 \sqrt{1-c^2 x^2}}$$

## Problem 75: Result optimal but 3 more steps used.

$$\int \frac{\left(d-c^2 d x^2\right)^{3/2} (a+b \operatorname{ArcSin}[c x])}{x^{10}} \, dx$$

Optimal (type 3, 308 leaves, 5 steps):

$$-\frac{b c d \sqrt{d-c^2 d x^2}}{72 x^8 \sqrt{1-c^2 x^2}}+\frac{5 b c^3 d \sqrt{d-c^2 d x^2}}{189 x^6 \sqrt{1-c^2 x^2}}-\frac{b c^5 d \sqrt{d-c^2 d x^2}}{420 x^4 \sqrt{1-c^2 x^2}}-\frac{2 b c^7 d \sqrt{d-c^2 d x^2}}{315 x^2 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{5/2} (a+b \operatorname{ArcSin}[c x])}{9 d x^9}-\frac{4 c^2 \left(d-c^2 d x^2\right)^{5/2} (a+b \operatorname{ArcSin}[c x])}{63 d x^7}-\frac{8 c^4 \left(d-c^2 d x^2\right)^{5/2} (a+b \operatorname{ArcSin}[c x])}{315 d x^5}+\frac{8 b c^9 d \sqrt{d-c^2 d x^2} \operatorname{Log}[x]}{315 \sqrt{1-c^2 x^2}}$$

Result (type 3, 308 leaves, 8 steps):

$$-\frac{b c d \sqrt{d-c^2 d x^2}}{72 x^8 \sqrt{1-c^2 x^2}}+\frac{5 b c^3 d \sqrt{d-c^2 d x^2}}{189 x^6 \sqrt{1-c^2 x^2}}-\frac{b c^5 d \sqrt{d-c^2 d x^2}}{420 x^4 \sqrt{1-c^2 x^2}}-\frac{2 b c^7 d \sqrt{d-c^2 d x^2}}{315 x^2 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{5/2} (a+b \text{ArcSin}[c x])}{9 d x^9}-$$
$$\frac{4 c^2 \left(d-c^2 d x^2\right)^{5/2} (a+b \text{ArcSin}[c x])}{63 d x^7}-\frac{8 c^4 \left(d-c^2 d x^2\right)^{5/2} (a+b \text{ArcSin}[c x])}{315 d x^5}+\frac{8 b c^9 d \sqrt{d-c^2 d x^2} \text{Log}[x]}{315 \sqrt{1-c^2 x^2}}$$

## Problem 76: Result optimal but 4 more steps used.

$$\int \frac{\left(d-c^2 d x^2\right)^{3/2} (a+b \text{ArcSin}[c x])}{x^{12}} \, dx$$

Optimal (type 3, 385 leaves, 5 steps):

$$-\frac{b c d \sqrt{d-c^2 d x^2}}{110 x^{10} \sqrt{1-c^2 x^2}}+\frac{b c^3 d \sqrt{d-c^2 d x^2}}{66 x^8 \sqrt{1-c^2 x^2}}-\frac{b c^5 d \sqrt{d-c^2 d x^2}}{1386 x^6 \sqrt{1-c^2 x^2}}-\frac{b c^7 d \sqrt{d-c^2 d x^2}}{770 x^4 \sqrt{1-c^2 x^2}}-$$
$$\frac{4 b c^9 d \sqrt{d-c^2 d x^2}}{1155 x^2 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{5/2} (a+b \text{ArcSin}[c x])}{11 d x^{11}}-\frac{2 c^2 \left(d-c^2 d x^2\right)^{5/2} (a+b \text{ArcSin}[c x])}{33 d x^9}-$$
$$\frac{8 c^4 \left(d-c^2 d x^2\right)^{5/2} (a+b \text{ArcSin}[c x])}{231 d x^7}-\frac{16 c^6 \left(d-c^2 d x^2\right)^{5/2} (a+b \text{ArcSin}[c x])}{1155 d x^5}+\frac{16 b c^{11} d \sqrt{d-c^2 d x^2} \text{Log}[x]}{1155 \sqrt{1-c^2 x^2}}$$

Result (type 3, 385 leaves, 9 steps):

$$-\frac{b c d \sqrt{d-c^2 d x^2}}{110 x^{10} \sqrt{1-c^2 x^2}}+\frac{b c^3 d \sqrt{d-c^2 d x^2}}{66 x^8 \sqrt{1-c^2 x^2}}-\frac{b c^5 d \sqrt{d-c^2 d x^2}}{1386 x^6 \sqrt{1-c^2 x^2}}-\frac{b c^7 d \sqrt{d-c^2 d x^2}}{770 x^4 \sqrt{1-c^2 x^2}}-$$
$$\frac{4 b c^9 d \sqrt{d-c^2 d x^2}}{1155 x^2 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{5/2} (a+b \text{ArcSin}[c x])}{11 d x^{11}}-\frac{2 c^2 \left(d-c^2 d x^2\right)^{5/2} (a+b \text{ArcSin}[c x])}{33 d x^9}-$$
$$\frac{8 c^4 \left(d-c^2 d x^2\right)^{5/2} (a+b \text{ArcSin}[c x])}{231 d x^7}-\frac{16 c^6 \left(d-c^2 d x^2\right)^{5/2} (a+b \text{ArcSin}[c x])}{1155 d x^5}+\frac{16 b c^{11} d \sqrt{d-c^2 d x^2} \text{Log}[x]}{1155 \sqrt{1-c^2 x^2}}$$

## Problem 77: Result optimal but 3 more steps used.

$$\int x^7 \left(d-c^2 d x^2\right)^{3/2} (a+b \text{ArcSin}[c x]) \, dx$$

Optimal (type 3, 375 leaves, 4 steps):

$$\frac{16 b d x \sqrt{d-c^2 d x^2}}{1155 c^7 \sqrt{1-c^2 x^2}}+\frac{8 b d x^3 \sqrt{d-c^2 d x^2}}{3465 c^5 \sqrt{1-c^2 x^2}}+\frac{2 b d x^5 \sqrt{d-c^2 d x^2}}{1925 c^3 \sqrt{1-c^2 x^2}}+$$
$$\frac{b d x^7 \sqrt{d-c^2 d x^2}}{1617 c \sqrt{1-c^2 x^2}}-\frac{4 b c d x^9 \sqrt{d-c^2 d x^2}}{297 \sqrt{1-c^2 x^2}}+\frac{b c^3 d x^{11} \sqrt{d-c^2 d x^2}}{121 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{5/2} (a+b \text{ArcSin}[c x])}{5 c^8 d}+$$
$$\frac{3 \left(d-c^2 d x^2\right)^{7/2} (a+b \text{ArcSin}[c x])}{7 c^8 d^2}-\frac{\left(d-c^2 d x^2\right)^{9/2} (a+b \text{ArcSin}[c x])}{3 c^8 d^3}+\frac{\left(d-c^2 d x^2\right)^{11/2} (a+b \text{ArcSin}[c x])}{11 c^8 d^4}$$

Result (type 3, 375 leaves, 7 steps):

$$\frac{16 b d x \sqrt{d-c^2 d x^2}}{1155 c^7 \sqrt{1-c^2 x^2}}+\frac{8 b d x^3 \sqrt{d-c^2 d x^2}}{3465 c^5 \sqrt{1-c^2 x^2}}+\frac{2 b d x^5 \sqrt{d-c^2 d x^2}}{1925 c^3 \sqrt{1-c^2 x^2}}+$$
$$\frac{b d x^7 \sqrt{d-c^2 d x^2}}{1617 c \sqrt{1-c^2 x^2}}-\frac{4 b c d x^9 \sqrt{d-c^2 d x^2}}{297 \sqrt{1-c^2 x^2}}+\frac{b c^3 d x^{11} \sqrt{d-c^2 d x^2}}{121 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{5/2} (a+b \text{ArcSin}[c x])}{5 c^8 d}+$$
$$\frac{3 \left(d-c^2 d x^2\right)^{7/2} (a+b \text{ArcSin}[c x])}{7 c^8 d^2}-\frac{\left(d-c^2 d x^2\right)^{9/2} (a+b \text{ArcSin}[c x])}{3 c^8 d^3}+\frac{\left(d-c^2 d x^2\right)^{11/2} (a+b \text{ArcSin}[c x])}{11 c^8 d^4}$$

## Problem 78: Result optimal but 3 more steps used.

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

Optimal (type 3, 301 leaves, 4 steps):

$$\frac{8 b d x \sqrt{d-c^2 d x^2}}{315 c^5 \sqrt{1-c^2 x^2}}+\frac{4 b d x^3 \sqrt{d-c^2 d x^2}}{945 c^3 \sqrt{1-c^2 x^2}}+\frac{b d x^5 \sqrt{d-c^2 d x^2}}{525 c \sqrt{1-c^2 x^2}}-\frac{10 b c d x^7 \sqrt{d-c^2 d x^2}}{441 \sqrt{1-c^2 x^2}}+\frac{b c^3 d x^9 \sqrt{d-c^2 d x^2}}{81 \sqrt{1-c^2 x^2}}-$$
$$\frac{\left(d-c^2 d x^2\right)^{5/2} (a+b \text{ArcSin}[c x])}{5 c^6 d}+\frac{2 \left(d-c^2 d x^2\right)^{7/2} (a+b \text{ArcSin}[c x])}{7 c^6 d^2}-\frac{\left(d-c^2 d x^2\right)^{9/2} (a+b \text{ArcSin}[c x])}{9 c^6 d^3}$$

Result (type 3, 301 leaves, 7 steps):

$$\frac{8 b d x \sqrt{d-c^2 d x^2}}{315 c^5 \sqrt{1-c^2 x^2}}+\frac{4 b d x^3 \sqrt{d-c^2 d x^2}}{945 c^3 \sqrt{1-c^2 x^2}}+\frac{b d x^5 \sqrt{d-c^2 d x^2}}{525 c \sqrt{1-c^2 x^2}}-\frac{10 b c d x^7 \sqrt{d-c^2 d x^2}}{441 \sqrt{1-c^2 x^2}}+\frac{b c^3 d x^9 \sqrt{d-c^2 d x^2}}{81 \sqrt{1-c^2 x^2}}-$$
$$\frac{\left(d-c^2 d x^2\right)^{5/2} (a+b \text{ArcSin}[c x])}{5 c^6 d}+\frac{2 \left(d-c^2 d x^2\right)^{7/2} (a+b \text{ArcSin}[c x])}{7 c^6 d^2}-\frac{\left(d-c^2 d x^2\right)^{9/2} (a+b \text{ArcSin}[c x])}{9 c^6 d^3}$$

## Problem 79: Result optimal but 3 more steps used.

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

Optimal (type 3, 227 leaves, 4 steps):

$$\frac{2\,b\,d\,x\,\sqrt{d-c^2\,d\,x^2}}{35\,c^3\,\sqrt{1-c^2\,x^2}}+\frac{b\,d\,x^3\,\sqrt{d-c^2\,d\,x^2}}{105\,c\,\sqrt{1-c^2\,x^2}}-\frac{8\,b\,c\,d\,x^5\,\sqrt{d-c^2\,d\,x^2}}{175\,\sqrt{1-c^2\,x^2}}+\frac{b\,c^3\,d\,x^7\,\sqrt{d-c^2\,d\,x^2}}{49\,\sqrt{1-c^2\,x^2}}-\frac{\left(d-c^2\,d\,x^2\right)^{5/2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)}{5\,c^4\,d}+\frac{\left(d-c^2\,d\,x^2\right)^{7/2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)}{7\,c^4\,d^2}$$

Result (type 3, 227 leaves, 7 steps):

$$\frac{2\,b\,d\,x\,\sqrt{d-c^2\,d\,x^2}}{35\,c^3\,\sqrt{1-c^2\,x^2}}+\frac{b\,d\,x^3\,\sqrt{d-c^2\,d\,x^2}}{105\,c\,\sqrt{1-c^2\,x^2}}-\frac{8\,b\,c\,d\,x^5\,\sqrt{d-c^2\,d\,x^2}}{175\,\sqrt{1-c^2\,x^2}}+\frac{b\,c^3\,d\,x^7\,\sqrt{d-c^2\,d\,x^2}}{49\,\sqrt{1-c^2\,x^2}}-\frac{\left(d-c^2\,d\,x^2\right)^{5/2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)}{5\,c^4\,d}+\frac{\left(d-c^2\,d\,x^2\right)^{7/2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)}{7\,c^4\,d^2}$$

## Problem 91: Result optimal but 2 more steps used.

$$\int \frac{\left(d-c^2\,d\,x^2\right)^{5/2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)}{x^{10}}\,dx$$

Optimal (type 3, 282 leaves, 6 steps):

$$-\frac{b\,c^3\,d^2\,\sqrt{d-c^2\,d\,x^2}}{189\,x^6\,\sqrt{1-c^2\,x^2}}+\frac{b\,c^5\,d^2\,\sqrt{d-c^2\,d\,x^2}}{42\,x^4\,\sqrt{1-c^2\,x^2}}-\frac{b\,c^7\,d^2\,\sqrt{d-c^2\,d\,x^2}}{21\,x^2\,\sqrt{1-c^2\,x^2}}-\frac{b\,c\,d^2\,\left(1-c^2\,x^2\right)^{7/2}\,\sqrt{d-c^2\,d\,x^2}}{72\,x^8}-\frac{\left(d-c^2\,d\,x^2\right)^{7/2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)}{9\,d\,x^9}-\frac{2\,c^2\,\left(d-c^2\,d\,x^2\right)^{7/2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)}{63\,d\,x^7}-\frac{2\,b\,c^9\,d^2\,\sqrt{d-c^2\,d\,x^2}\,\text{Log}[x]}{63\,\sqrt{1-c^2\,x^2}}$$

Result (type 3, 282 leaves, 8 steps):

$$-\frac{b\,c^3\,d^2\,\sqrt{d-c^2\,d\,x^2}}{189\,x^6\,\sqrt{1-c^2\,x^2}}+\frac{b\,c^5\,d^2\,\sqrt{d-c^2\,d\,x^2}}{42\,x^4\,\sqrt{1-c^2\,x^2}}-\frac{b\,c^7\,d^2\,\sqrt{d-c^2\,d\,x^2}}{21\,x^2\,\sqrt{1-c^2\,x^2}}-\frac{b\,c\,d^2\,\left(1-c^2\,x^2\right)^{7/2}\,\sqrt{d-c^2\,d\,x^2}}{72\,x^8}-\frac{\left(d-c^2\,d\,x^2\right)^{7/2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)}{9\,d\,x^9}-\frac{2\,c^2\,\left(d-c^2\,d\,x^2\right)^{7/2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)}{63\,d\,x^7}-\frac{2\,b\,c^9\,d^2\,\sqrt{d-c^2\,d\,x^2}\,\text{Log}[x]}{63\,\sqrt{1-c^2\,x^2}}$$

## Problem 92: Result optimal but 3 more steps used.

$$\int \frac{\left(d-c^2\,d\,x^2\right)^{5/2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)}{x^{12}}\,dx$$

Optimal (type 3, 361 leaves, 5 steps):

$$-\frac{b c d^2 \sqrt{d-c^2 d x^2}}{110 x^{10} \sqrt{1-c^2 x^2}}+\frac{23 b c^3 d^2 \sqrt{d-c^2 d x^2}}{792 x^8 \sqrt{1-c^2 x^2}}-\frac{113 b c^5 d^2 \sqrt{d-c^2 d x^2}}{4158 x^6 \sqrt{1-c^2 x^2}}+\frac{b c^7 d^2 \sqrt{d-c^2 d x^2}}{924 x^4 \sqrt{1-c^2 x^2}}+\frac{2 b c^9 d^2 \sqrt{d-c^2 d x^2}}{693 x^2 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{7/2} (a+b \text{ArcSin}[c x])}{11 d x^{11}}-\frac{4 c^2 \left(d-c^2 d x^2\right)^{7/2} (a+b \text{ArcSin}[c x])}{99 d x^9}-\frac{8 c^4 \left(d-c^2 d x^2\right)^{7/2} (a+b \text{ArcSin}[c x])}{693 d x^7}-\frac{8 b c^{11} d^2 \sqrt{d-c^2 d x^2} \text{Log}[x]}{693 \sqrt{1-c^2 x^2}}$$

Result (type 3, 361 leaves, 8 steps):

$$-\frac{b c d^2 \sqrt{d-c^2 d x^2}}{110 x^{10} \sqrt{1-c^2 x^2}}+\frac{23 b c^3 d^2 \sqrt{d-c^2 d x^2}}{792 x^8 \sqrt{1-c^2 x^2}}-\frac{113 b c^5 d^2 \sqrt{d-c^2 d x^2}}{4158 x^6 \sqrt{1-c^2 x^2}}+\frac{b c^7 d^2 \sqrt{d-c^2 d x^2}}{924 x^4 \sqrt{1-c^2 x^2}}+\frac{2 b c^9 d^2 \sqrt{d-c^2 d x^2}}{693 x^2 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{7/2} (a+b \text{ArcSin}[c x])}{11 d x^{11}}-\frac{4 c^2 \left(d-c^2 d x^2\right)^{7/2} (a+b \text{ArcSin}[c x])}{99 d x^9}-\frac{8 c^4 \left(d-c^2 d x^2\right)^{7/2} (a+b \text{ArcSin}[c x])}{693 d x^7}-\frac{8 b c^{11} d^2 \sqrt{d-c^2 d x^2} \text{Log}[x]}{693 \sqrt{1-c^2 x^2}}$$

## Problem 93: Result optimal but 3 more steps used.

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

Optimal (type 3, 354 leaves, 4 steps):

$$\frac{8 b d^2 x \sqrt{d-c^2 d x^2}}{693 c^5 \sqrt{1-c^2 x^2}}+\frac{4 b d^2 x^3 \sqrt{d-c^2 d x^2}}{2079 c^3 \sqrt{1-c^2 x^2}}+\frac{b d^2 x^5 \sqrt{d-c^2 d x^2}}{1155 c \sqrt{1-c^2 x^2}}-\frac{113 b c d^2 x^7 \sqrt{d-c^2 d x^2}}{4851 \sqrt{1-c^2 x^2}}+\frac{23 b c^3 d^2 x^9 \sqrt{d-c^2 d x^2}}{891 \sqrt{1-c^2 x^2}}-\frac{b c^5 d^2 x^{11} \sqrt{d-c^2 d x^2}}{121 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{7/2} (a+b \text{ArcSin}[c x])}{7 c^6 d}+\frac{2 \left(d-c^2 d x^2\right)^{9/2} (a+b \text{ArcSin}[c x])}{9 c^6 d^2}-\frac{\left(d-c^2 d x^2\right)^{11/2} (a+b \text{ArcSin}[c x])}{11 c^6 d^3}$$

Result (type 3, 354 leaves, 7 steps):

$$\frac{8 b d^2 x \sqrt{d-c^2 d x^2}}{693 c^5 \sqrt{1-c^2 x^2}}+\frac{4 b d^2 x^3 \sqrt{d-c^2 d x^2}}{2079 c^3 \sqrt{1-c^2 x^2}}+\frac{b d^2 x^5 \sqrt{d-c^2 d x^2}}{1155 c \sqrt{1-c^2 x^2}}-\frac{113 b c d^2 x^7 \sqrt{d-c^2 d x^2}}{4851 \sqrt{1-c^2 x^2}}+\frac{23 b c^3 d^2 x^9 \sqrt{d-c^2 d x^2}}{891 \sqrt{1-c^2 x^2}}-\frac{b c^5 d^2 x^{11} \sqrt{d-c^2 d x^2}}{121 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{7/2} (a+b \text{ArcSin}[c x])}{7 c^6 d}+\frac{2 \left(d-c^2 d x^2\right)^{9/2} (a+b \text{ArcSin}[c x])}{9 c^6 d^2}-\frac{\left(d-c^2 d x^2\right)^{11/2} (a+b \text{ArcSin}[c x])}{11 c^6 d^3}$$

## Problem 94: Result optimal but 3 more steps used.

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

Optimal (type 3, 278 leaves, 4 steps):

$$\frac{2 b d^2 x \sqrt{d-c^2 d x^2}}{63 c^3 \sqrt{1-c^2 x^2}}+\frac{b d^2 x^3 \sqrt{d-c^2 d x^2}}{189 c \sqrt{1-c^2 x^2}}-\frac{b c d^2 x^5 \sqrt{d-c^2 d x^2}}{21 \sqrt{1-c^2 x^2}}+\frac{19 b c^3 d^2 x^7 \sqrt{d-c^2 d x^2}}{441 \sqrt{1-c^2 x^2}}-\frac{b c^5 d^2 x^9 \sqrt{d-c^2 d x^2}}{81 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{7/2} (a+b \operatorname{ArcSin}[c x])}{7 c^4 d}+\frac{\left(d-c^2 d x^2\right)^{9/2} (a+b \operatorname{ArcSin}[c x])}{9 c^4 d^2}$$

Result (type 3, 278 leaves, 7 steps):

$$\frac{2 b d^2 x \sqrt{d-c^2 d x^2}}{63 c^3 \sqrt{1-c^2 x^2}}+\frac{b d^2 x^3 \sqrt{d-c^2 d x^2}}{189 c \sqrt{1-c^2 x^2}}-\frac{b c d^2 x^5 \sqrt{d-c^2 d x^2}}{21 \sqrt{1-c^2 x^2}}+\frac{19 b c^3 d^2 x^7 \sqrt{d-c^2 d x^2}}{441 \sqrt{1-c^2 x^2}}-\frac{b c^5 d^2 x^9 \sqrt{d-c^2 d x^2}}{81 \sqrt{1-c^2 x^2}}-\frac{\left(d-c^2 d x^2\right)^{7/2} (a+b \operatorname{ArcSin}[c x])}{7 c^4 d}+\frac{\left(d-c^2 d x^2\right)^{9/2} (a+b \operatorname{ArcSin}[c x])}{9 c^4 d^2}$$

## Problem 100: Result valid but suboptimal antiderivative.

$$\int \sqrt{\pi-c^2 \pi x^2} \, (a+b \operatorname{ArcSin}[c x]) \, dx$$

Optimal (type 3, 68 leaves, 3 steps):

$$-\frac{1}{4} b c \sqrt{\pi} \, x^2+\frac{1}{2} x \sqrt{\pi-c^2 \pi x^2} \, (a+b \operatorname{ArcSin}[c x])+\frac{\sqrt{\pi} \, (a+b \operatorname{ArcSin}[c x])^2}{4 b c}$$

Result (type 3, 116 leaves, 3 steps):

$$-\frac{b c x^2 \sqrt{\pi-c^2 \pi x^2}}{4 \sqrt{1-c^2 x^2}}+\frac{1}{2} x \sqrt{\pi-c^2 \pi x^2} \, (a+b \operatorname{ArcSin}[c x])+\frac{\sqrt{\pi-c^2 \pi x^2} \, (a+b \operatorname{ArcSin}[c x])^2}{4 b c \sqrt{1-c^2 x^2}}$$

## Problem 110: Result optimal but 1 more steps used.

$$\int \frac{x^4 (a+b \operatorname{ArcSin}[c x])}{\sqrt{d-c^2 d x^2}} \, dx$$

Optimal (type 3, 200 leaves, 5 steps):

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

Result (type 3, 200 leaves, 6 steps):

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

## Problem 112: Result optimal but 1 more steps used.

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

Optimal (type 3, 124 leaves, 3 steps):

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

Result (type 3, 124 leaves, 4 steps):

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

## Problem 114: Result optimal but 1 more steps used.

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

Optimal (type 3, 49 leaves, 1 step):

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

Result (type 3, 49 leaves, 2 steps):

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

## Problem 115: Result optimal but 1 more steps used.

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

Optimal (type 4, 145 leaves, 6 steps):

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

Result (type 4, 145 leaves, 7 steps):

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

## Problem 117: Result optimal but 1 more steps used.

$$\int \frac{a+b\,\text{ArcSin}[c\,x]}{x^3\,\sqrt{d-c^2\,d\,x^2}}\,dx$$

Optimal (type 4, 229 leaves, 8 steps):

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

Result (type 4, 229 leaves, 9 steps):

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

## Problem 119: Result valid but suboptimal antiderivative.

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

Optimal (type 3, 221 leaves, 5 steps):

$$-\frac{5\,b\,x\,\sqrt{d-c^2\,d\,x^2}}{3\,c^5\,d^2\,\sqrt{1-c^2\,x^2}}-\frac{b\,x^3\,\sqrt{d-c^2\,d\,x^2}}{9\,c^3\,d^2\,\sqrt{1-c^2\,x^2}}+\frac{a+b\,\text{ArcSin}[c\,x]}{c^6\,d\,\sqrt{d-c^2\,d\,x^2}}+\frac{2\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)}{c^6\,d^2}-\frac{\left(d-c^2\,d\,x^2\right)^{3/2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)}{3\,c^6\,d^3}-\frac{b\,\sqrt{d-c^2\,d\,x^2}\,\text{ArcTanh}[c\,x]}{c^6\,d^2\,\sqrt{1-c^2\,x^2}}$$

Result (type 3, 229 leaves, 8 steps):

$$-\frac{5\,b\,x\,\sqrt{1-c^2\,x^2}}{3\,c^5\,d\,\sqrt{d-c^2\,d\,x^2}}-\frac{b\,x^3\,\sqrt{1-c^2\,x^2}}{9\,c^3\,d\,\sqrt{d-c^2\,d\,x^2}}+\frac{x^4\,\left(a+b\,\text{ArcSin}[c\,x]\right)}{c^2\,d\,\sqrt{d-c^2\,d\,x^2}}+\frac{8\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)}{3\,c^6\,d^2}+\frac{4\,x^2\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)}{3\,c^4\,d^2}-\frac{b\,\sqrt{1-c^2\,x^2}\,\text{ArcTanh}[c\,x]}{c^6\,d\,\sqrt{d-c^2\,d\,x^2}}$$

## Problem 120: Result optimal but 1 more steps used.

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

Optimal (type 3, 214 leaves, 7 steps):

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

Result (type 3, 214 leaves, 8 steps):

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

## Problem 121: Result valid but suboptimal antiderivative.

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

Optimal (type 3, 142 leaves, 4 steps):

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

Result (type 3, 146 leaves, 5 steps):

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

## Problem 122: Result optimal but 1 more steps used.

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

Optimal (type 3, 135 leaves, 3 steps):

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

Result (type 3, 135 leaves, 4 steps):

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

## Problem 125: Result optimal but 1 more steps used.

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

Optimal (type 4, 220 leaves, 8 steps):

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

Result (type 4, 220 leaves, 9 steps):

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

## Problem 126: Result valid but suboptimal antiderivative.

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

Optimal (type 3, 150 leaves, 5 steps):

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

Result (type 3, 150 leaves, 7 steps):

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

## Problem 127: Result optimal but 1 more steps used.

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

Optimal (type 4, 316 leaves, 11 steps):

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

Result (type 4, 316 leaves, 12 steps):

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

## Problem 128: Result valid but suboptimal antiderivative.

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

Optimal (type 3, 238 leaves, 5 steps):

$$-\frac{b c \sqrt{d-c^2 d x^2}}{6 d^2 x^2 \sqrt{1-c^2 x^2}}-\frac{a+b \text{ArcSin}[c x]}{3 d x^3 \sqrt{d-c^2 d x^2}}-\frac{4 c^2 (a+b \text{ArcSin}[c x])}{3 d x \sqrt{d-c^2 d x^2}}+\frac{8 c^4 x (a+b \text{ArcSin}[c x])}{3 d \sqrt{d-c^2 d x^2}}+\frac{5 b c^3 \sqrt{d-c^2 d x^2} \text{Log}[x]}{3 d^2 \sqrt{1-c^2 x^2}}+\frac{b c^3 \sqrt{d-c^2 d x^2} \text{Log}[1-c^2 x^2]}{2 d^2 \sqrt{1-c^2 x^2}}$$

Result (type 3, 238 leaves, 11 steps):

$$-\frac{b c \sqrt{1-c^2 x^2}}{6 d x^2 \sqrt{d-c^2 d x^2}}-\frac{a+b \text{ArcSin}[c x]}{3 d x^3 \sqrt{d-c^2 d x^2}}-\frac{4 c^2 (a+b \text{ArcSin}[c x])}{3 d x \sqrt{d-c^2 d x^2}}+\frac{8 c^4 x (a+b \text{ArcSin}[c x])}{3 d \sqrt{d-c^2 d x^2}}+\frac{5 b c^3 \sqrt{1-c^2 x^2} \text{Log}[x]}{3 d \sqrt{d-c^2 d x^2}}+\frac{b c^3 \sqrt{1-c^2 x^2} \text{Log}[1-c^2 x^2]}{2 d \sqrt{d-c^2 d x^2}}$$

## Problem 129: Result optimal but 1 more steps used.

$$\int \frac{x^6 (a+b \text{ArcSin}[c x])}{(d-c^2 d x^2)^{5/2}} \, dx$$

Optimal (type 3, 293 leaves, 11 steps):

$$-\frac{b}{6 c^7 d^2 \sqrt{1-c^2 x^2} \sqrt{d-c^2 d x^2}}+\frac{b x^2 \sqrt{1-c^2 x^2}}{4 c^5 d^2 \sqrt{d-c^2 d x^2}}+\frac{x^5 (a+b \text{ArcSin}[c x])}{3 c^2 d (d-c^2 d x^2)^{3/2}}-\frac{5 x^3 (a+b \text{ArcSin}[c x])}{3 c^4 d^2 \sqrt{d-c^2 d x^2}}-\frac{5 x \sqrt{d-c^2 d x^2} (a+b \text{ArcSin}[c x])}{2 c^6 d^3}+\frac{5 \sqrt{1-c^2 x^2} (a+b \text{ArcSin}[c x])^2}{4 b c^7 d^2 \sqrt{d-c^2 d x^2}}-\frac{7 b \sqrt{1-c^2 x^2} \text{Log}[1-c^2 x^2]}{6 c^7 d^2 \sqrt{d-c^2 d x^2}}$$

Result (type 3, 293 leaves, 12 steps):

$$-\frac{b}{6 c^7 d^2 \sqrt{1-c^2 x^2} \sqrt{d-c^2 d x^2}}+\frac{b x^2 \sqrt{1-c^2 x^2}}{4 c^5 d^2 \sqrt{d-c^2 d x^2}}+\frac{x^5 (a+b \text{ArcSin}[c x])}{3 c^2 d (d-c^2 d x^2)^{3/2}}-\frac{5 x^3 (a+b \text{ArcSin}[c x])}{3 c^4 d^2 \sqrt{d-c^2 d x^2}}-\frac{5 x \sqrt{d-c^2 d x^2} (a+b \text{ArcSin}[c x])}{2 c^6 d^3}+\frac{5 \sqrt{1-c^2 x^2} (a+b \text{ArcSin}[c x])^2}{4 b c^7 d^2 \sqrt{d-c^2 d x^2}}-\frac{7 b \sqrt{1-c^2 x^2} \text{Log}[1-c^2 x^2]}{6 c^7 d^2 \sqrt{d-c^2 d x^2}}$$

## Problem 130: Result valid but suboptimal antiderivative.

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

Optimal (type 3, 219 leaves, 5 steps):

$$-\frac{b x \sqrt{d-c^2 d x^2}}{6 c^5 d^3 \left(1-c^2 x^2\right)^{3/2}}+\frac{b x \sqrt{d-c^2 d x^2}}{c^5 d^3 \sqrt{1-c^2 x^2}}+\frac{a+b \text{ArcSin}[c x]}{3 c^6 d \left(d-c^2 d x^2\right)^{3/2}}-\frac{2 (a+b \text{ArcSin}[c x])}{c^6 d^2 \sqrt{d-c^2 d x^2}}-\frac{\sqrt{d-c^2 d x^2} (a+b \text{ArcSin}[c x])}{c^6 d^3}+\frac{11 b \sqrt{d-c^2 d x^2} \text{ArcTanh}[c x]}{6 c^6 d^3 \sqrt{1-c^2 x^2}}$$

Result (type 3, 234 leaves, 9 steps):

$$-\frac{b x^3}{6 c^3 d^2 \sqrt{1-c^2 x^2} \sqrt{d-c^2 d x^2}}+\frac{5 b x \sqrt{1-c^2 x^2}}{6 c^5 d^2 \sqrt{d-c^2 d x^2}}+\frac{x^4 (a+b \text{ArcSin}[c x])}{3 c^2 d \left(d-c^2 d x^2\right)^{3/2}}-\frac{4 x^2 (a+b \text{ArcSin}[c x])}{3 c^4 d^2 \sqrt{d-c^2 d x^2}}-\frac{8 \sqrt{d-c^2 d x^2} (a+b \text{ArcSin}[c x])}{3 c^6 d^3}+\frac{11 b \sqrt{1-c^2 x^2} \text{ArcTanh}[c x]}{6 c^6 d^2 \sqrt{d-c^2 d x^2}}$$

## Problem 131: Result optimal but 1 more steps used.

$$\int \frac{x^4 (a+b \text{ArcSin}[c x])}{\left(d-c^2 d x^2\right)^{5/2}} \, dx$$

Optimal (type 3, 212 leaves, 7 steps):

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

Result (type 3, 212 leaves, 8 steps):

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

## Problem 132: Result valid but suboptimal antiderivative.

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

Optimal (type 3, 150 leaves, 4 steps):

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

Result (type 3, 155 leaves, 5 steps):

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

## Problem 136: Result optimal but 1 more steps used.

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

Optimal (type 4, 291 leaves, 11 steps):

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

Result (type 4, 291 leaves, 12 steps):

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

## Problem 137: Result valid but suboptimal antiderivative.

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

Optimal (type 3, 224 leaves, 5 steps):

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

Result (type 3, 224 leaves, 8 steps):

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

## Problem 138: Result optimal but 1 more steps used.

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

Optimal (type 4, 433 leaves, 15 steps):

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

Result (type 4, 433 leaves, 16 steps):

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

## Problem 139: Result valid but suboptimal antiderivative.

$$\int \frac{a+b \text{ArcSin}[c x]}{x^4 \left(d-c^2 d x^2\right)^{5/2}} \, dx$$

Optimal (type 3, 310 leaves, 5 steps):

$$-\frac{b c^3 \sqrt{d-c^2 d x^2}}{6 d^3 \left(1-c^2 x^2\right)^{3/2}}-\frac{b c \sqrt{d-c^2 d x^2}}{6 d^3 x^2 \sqrt{1-c^2 x^2}}-\frac{a+b \operatorname{ArcSin}[c x]}{3 d x^3 \left(d-c^2 d x^2\right)^{3/2}}-\frac{2 c^2 (a+b \operatorname{ArcSin}[c x])}{d x \left(d-c^2 d x^2\right)^{3/2}}+$$
$$\frac{8 c^4 x (a+b \operatorname{ArcSin}[c x])}{3 d \left(d-c^2 d x^2\right)^{3/2}}+\frac{16 c^4 x (a+b \operatorname{ArcSin}[c x])}{3 d^2 \sqrt{d-c^2 d x^2}}+\frac{8 b c^3 \sqrt{d-c^2 d x^2} \operatorname{Log}[x]}{3 d^3 \sqrt{1-c^2 x^2}}+\frac{4 b c^3 \sqrt{d-c^2 d x^2} \operatorname{Log}\left[1-c^2 x^2\right]}{3 d^3 \sqrt{1-c^2 x^2}}$$

Result (type 3, 310 leaves, 12 steps):

$$-\frac{b c^3}{6 d^2 \sqrt{1-c^2 x^2} \sqrt{d-c^2 d x^2}}-\frac{b c \sqrt{1-c^2 x^2}}{6 d^2 x^2 \sqrt{d-c^2 d x^2}}-\frac{a+b \operatorname{ArcSin}[c x]}{3 d x^3 \left(d-c^2 d x^2\right)^{3/2}}-\frac{2 c^2 (a+b \operatorname{ArcSin}[c x])}{d x \left(d-c^2 d x^2\right)^{3/2}}+$$
$$\frac{8 c^4 x (a+b \operatorname{ArcSin}[c x])}{3 d \left(d-c^2 d x^2\right)^{3/2}}+\frac{16 c^4 x (a+b \operatorname{ArcSin}[c x])}{3 d^2 \sqrt{d-c^2 d x^2}}+\frac{8 b c^3 \sqrt{1-c^2 x^2} \operatorname{Log}[x]}{3 d^2 \sqrt{d-c^2 d x^2}}+\frac{4 b c^3 \sqrt{1-c^2 x^2} \operatorname{Log}\left[1-c^2 x^2\right]}{3 d^2 \sqrt{d-c^2 d x^2}}$$

## Problem 142: Result optimal but 1 more steps used.

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

Optimal (type 5, 137 leaves, 1 step):

$$\frac{2 (f x)^{5/2} \sqrt{1-c^2 x^2} (a+b \operatorname{ArcSin}[c x]) \operatorname{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2 x^2\right]}{5 f \sqrt{d-c^2 d x^2}}-$$
$$\frac{4 b c (f x)^{7/2} \sqrt{1-c^2 x^2} \operatorname{HypergeometricPFQ}\left[\left\{1,\frac{7}{4},\frac{7}{4}\right\},\left\{\frac{9}{4},\frac{11}{4}\right\},c^2 x^2\right]}{35 f^2 \sqrt{d-c^2 d x^2}}$$

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

$$\frac{2 (f x)^{5/2} \sqrt{1-c^2 x^2} (a+b \operatorname{ArcSin}[c x]) \operatorname{Hypergeometric2F1}\left[\frac{1}{2},\frac{5}{4},\frac{9}{4},c^2 x^2\right]}{5 f \sqrt{d-c^2 d x^2}}-$$
$$\frac{4 b c (f x)^{7/2} \sqrt{1-c^2 x^2} \operatorname{HypergeometricPFQ}\left[\left\{1,\frac{7}{4},\frac{7}{4}\right\},\left\{\frac{9}{4},\frac{11}{4}\right\},c^2 x^2\right]}{35 f^2 \sqrt{d-c^2 d x^2}}$$

## Problem 152: Result optimal but 1 more steps used.

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

Optimal (type 5, 163 leaves, 1 step):

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

Result (type 5, 163 leaves, 2 steps):

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

## Problem 153: Result optimal but 1 more steps used.

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

Optimal (type 5, 272 leaves, 3 steps):

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

Result (type 5, 272 leaves, 4 steps):

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

## Problem 154: Result optimal but 1 more steps used.

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

Optimal (type 5, 408 leaves, 5 steps):

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

Result (type 5, 408 leaves, 6 steps):

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

## Problem 235: Result optimal but 1 more steps used.

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

Optimal (type 3, 337 leaves, 10 steps):

$$\frac{15\,b^2\,x\,(1-c^2\,x^2)}{64\,c^4\,\sqrt{d-c^2\,d\,x^2}}+\frac{b^2\,x^3\,(1-c^2\,x^2)}{32\,c^2\,\sqrt{d-c^2\,d\,x^2}}-\frac{15\,b^2\,\sqrt{1-c^2\,x^2}\,\text{ArcSin}[c\,x]}{64\,c^5\,\sqrt{d-c^2\,d\,x^2}}+\frac{3\,b\,x^2\,\sqrt{1-c^2\,x^2}\,(a+b\,\text{ArcSin}[c\,x])}{8\,c^3\,\sqrt{d-c^2\,d\,x^2}}+\frac{b\,x^4\,\sqrt{1-c^2\,x^2}\,(a+b\,\text{ArcSin}[c\,x])}{8\,c\,\sqrt{d-c^2\,d\,x^2}}-\frac{3\,x\,\sqrt{d-c^2\,d\,x^2}\,(a+b\,\text{ArcSin}[c\,x])^2}{8\,c^4\,d}-\frac{x^3\,\sqrt{d-c^2\,d\,x^2}\,(a+b\,\text{ArcSin}[c\,x])^2}{4\,c^2\,d}+\frac{\sqrt{1-c^2\,x^2}\,(a+b\,\text{ArcSin}[c\,x])^3}{8\,b\,c^5\,\sqrt{d-c^2\,d\,x^2}}$$

Result (type 3, 337 leaves, 11 steps):

$$\frac{15 b^2 x \left(1-c^2 x^2\right)}{64 c^4 \sqrt{d-c^2 d x^2}}+\frac{b^2 x^3 \left(1-c^2 x^2\right)}{32 c^2 \sqrt{d-c^2 d x^2}}-\frac{15 b^2 \sqrt{1-c^2 x^2}\, \text{ArcSin}[c x]}{64 c^5 \sqrt{d-c^2 d x^2}}+\frac{3 b x^2 \sqrt{1-c^2 x^2} \left(a+b \text{ArcSin}[c x]\right)}{8 c^3 \sqrt{d-c^2 d x^2}}+\frac{b x^4 \sqrt{1-c^2 x^2} \left(a+b \text{ArcSin}[c x]\right)}{8 c \sqrt{d-c^2 d x^2}}-\frac{3 x \sqrt{d-c^2 d x^2} \left(a+b \text{ArcSin}[c x]\right)^2}{8 c^4 d}-\frac{x^3 \sqrt{d-c^2 d x^2} \left(a+b \text{ArcSin}[c x]\right)^2}{4 c^2 d}+\frac{\sqrt{1-c^2 x^2} \left(a+b \text{ArcSin}[c x]\right)^3}{8 b c^5 \sqrt{d-c^2 d x^2}}$$

## Problem 237: Result optimal but 1 more steps used.

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

Optimal (type 3, 206 leaves, 5 steps):

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

Result (type 3, 213 leaves, 6 steps):

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

## Problem 239: Result optimal but 1 more steps used.

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

Optimal (type 3, 49 leaves, 1 step):

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

Result (type 3, 49 leaves, 2 steps):

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

## Problem 240: Result optimal but 1 more steps used.

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

Optimal (type 4, 257 leaves, 8 steps):

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

Result (type 4, 257 leaves, 9 steps):

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

## Problem 242: Result optimal but 1 more steps used.

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

Optimal (type 4, 402 leaves, 13 steps):

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

Result (type 4, 402 leaves, 14 steps):

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

## Problem 245: Result optimal but 1 more steps used.

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

Optimal (type 4, 424 leaves, 14 steps):

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

Result (type 4, 424 leaves, 15 steps):

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

## Problem 247: Result optimal but 1 more steps used.

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

Optimal (type 4, 250 leaves, 7 steps):

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

Result (type 4, 250 leaves, 8 steps):

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

## Problem 250: Result optimal but 1 more steps used.

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

Optimal (type 4, 467 leaves, 15 steps):

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

Result (type 4, 467 leaves, 16 steps):

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

## Problem 252: Result optimal but 1 more steps used.

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

Optimal (type 4, 634 leaves, 26 steps):

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

Result (type 4, 634 leaves, 27 steps):

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

## Problem 255: Result optimal but 1 more steps used.

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

Optimal (type 4, 421 leaves, 16 steps):

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

Result (type 4, 421 leaves, 17 steps):

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

## Problem 260: Result optimal but 1 more steps used.

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

Optimal (type 4, 577 leaves, 24 steps):

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

Result (type 4, 577 leaves, 25 steps):

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

## Problem 262: Result optimal but 1 more steps used.

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

Optimal (type 4, 752 leaves, 38 steps):

$$\frac{b^2 c^2}{3 d^2 \sqrt{d - c^2 d x^2}} - \frac{b c\,(a + b\,\mathrm{ArcSin}[c\,x])}{d^2 x \sqrt{1 - c^2 x^2}\,\sqrt{d - c^2 d x^2}} + \frac{2 b c^3 x\,(a + b\,\mathrm{ArcSin}[c\,x])}{3 d^2 \sqrt{1 - c^2 x^2}\,\sqrt{d - c^2 d x^2}} + \frac{5 c^2\,(a + b\,\mathrm{ArcSin}[c\,x])^2}{6 d\,(d - c^2 d x^2)^{3/2}} -$$
$$\frac{(a + b\,\mathrm{ArcSin}[c\,x])^2}{2 d x^2\,(d - c^2 d x^2)^{3/2}} + \frac{5 c^2\,(a + b\,\mathrm{ArcSin}[c\,x])^2}{2 d^2 \sqrt{d - c^2 d x^2}} + \frac{26\,i\,b c^2 \sqrt{1 - c^2 x^2}\,(a + b\,\mathrm{ArcSin}[c\,x])\,\mathrm{ArcTan}\left[e^{i\,\mathrm{ArcSin}[c\,x]}\right]}{3 d^2 \sqrt{d - c^2 d x^2}} -$$
$$\frac{5 c^2 \sqrt{1 - c^2 x^2}\,(a + b\,\mathrm{ArcSin}[c\,x])^2\,\mathrm{ArcTanh}\left[e^{i\,\mathrm{ArcSin}[c\,x]}\right]}{d^2 \sqrt{d - c^2 d x^2}} - \frac{b^2 c^2 \sqrt{1 - c^2 x^2}\,\mathrm{ArcTanh}\left[\sqrt{1 - c^2 x^2}\right]}{d^2 \sqrt{d - c^2 d x^2}} +$$
$$\frac{5\,i\,b c^2 \sqrt{1 - c^2 x^2}\,(a + b\,\mathrm{ArcSin}[c\,x])\,\mathrm{PolyLog}\left[2, -e^{i\,\mathrm{ArcSin}[c\,x]}\right]}{d^2 \sqrt{d - c^2 d x^2}} - \frac{13\,i\,b^2 c^2 \sqrt{1 - c^2 x^2}\,\mathrm{PolyLog}\left[2, -i\,e^{i\,\mathrm{ArcSin}[c\,x]}\right]}{3 d^2 \sqrt{d - c^2 d x^2}} +$$
$$\frac{13\,i\,b^2 c^2 \sqrt{1 - c^2 x^2}\,\mathrm{PolyLog}\left[2, i\,e^{i\,\mathrm{ArcSin}[c\,x]}\right]}{3 d^2 \sqrt{d - c^2 d x^2}} - \frac{5\,i\,b c^2 \sqrt{1 - c^2 x^2}\,(a + b\,\mathrm{ArcSin}[c\,x])\,\mathrm{PolyLog}\left[2, e^{i\,\mathrm{ArcSin}[c\,x]}\right]}{d^2 \sqrt{d - c^2 d x^2}} -$$
$$\frac{5 b^2 c^2 \sqrt{1 - c^2 x^2}\,\mathrm{PolyLog}\left[3, -e^{i\,\mathrm{ArcSin}[c\,x]}\right]}{d^2 \sqrt{d - c^2 d x^2}} + \frac{5 b^2 c^2 \sqrt{1 - c^2 x^2}\,\mathrm{PolyLog}\left[3, e^{i\,\mathrm{ArcSin}[c\,x]}\right]}{d^2 \sqrt{d - c^2 d x^2}}$$

Result (type 4, 752 leaves, 39 steps):

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

$$\frac{\left(a+b \text{ArcSin}[c x]\right)^2}{2 d x^2 \left(d-c^2 d x^2\right)^{3/2}}+\frac{5 c^2 \left(a+b \text{ArcSin}[c x]\right)^2}{2 d^2 \sqrt{d-c^2 d x^2}}+\frac{26 i b c^2 \sqrt{1-c^2 x^2} \left(a+b \text{ArcSin}[c x]\right) \text{ArcTan}\left[e^{i \text{ArcSin}[c x]}\right]}{3 d^2 \sqrt{d-c^2 d x^2}}-$$

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

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

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

$$\frac{5 b^2 c^2 \sqrt{1-c^2 x^2} \text{PolyLog}\left[3,-e^{i \text{ArcSin}[c x]}\right]}{d^2 \sqrt{d-c^2 d x^2}}+\frac{5 b^2 c^2 \sqrt{1-c^2 x^2} \text{PolyLog}\left[3,e^{i \text{ArcSin}[c x]}\right]}{d^2 \sqrt{d-c^2 d x^2}}$$

## Problem 272: Result optimal but 1 more steps used.

$$\int \frac{\text{ArcSin}[a x]^2}{\sqrt{c-a^2 c x^2}} \, dx$$

Optimal (type 3, 42 leaves, 1 step):

$$\frac{\sqrt{1-a^2 x^2} \text{ArcSin}[a x]^3}{3 a \sqrt{c-a^2 c x^2}}$$

Result (type 3, 42 leaves, 2 steps):

$$\frac{\sqrt{1-a^2 x^2} \text{ArcSin}[a x]^3}{3 a \sqrt{c-a^2 c x^2}}$$

## Problem 276: Unable to integrate problem.

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

Optimal (type 5, 1312 leaves, 23 steps):

$$\frac{2 b^2 c^2 d^3 x^{3+m}}{(3+m)(7+m)^2}+\frac{30 b^2 c^2 d^3 x^{3+m}}{(3+m)^2(5+m)(7+m)^2}+\frac{36 b^2 c^2 d^3 x^{3+m}}{(3+m)^2(5+m)^2(7+m)}+\frac{12 b^2 c^2 d^3 x^{3+m}}{(3+m)(5+m)^2(7+m)}+$$

$$\frac{48 b^2 c^2 d^3 x^{3+m}}{(3+m)^3(5+m)(7+m)}+\frac{10 b^2 c^2 d^3 x^{3+m}}{(7+m)^2(15+8 m+m^2)}-\frac{10 b^2 c^4 d^3 x^{5+m}}{(5+m)^2(7+m)^2}-\frac{4 b^2 c^4 d^3 x^{5+m}}{(5+m)(7+m)^2}-\frac{12 b^2 c^4 d^3 x^{5+m}}{(5+m)^3(7+m)}+\frac{2 b^2 c^6 d^3 x^{7+m}}{(7+m)^3}-$$

$$\frac{36 b c d^3 x^{2+m}\sqrt{1-c^2 x^2}\,(a+b\,\text{ArcSin}[c x])}{(3+m)(5+m)^2(7+m)}-\frac{48 b c d^3 x^{2+m}\sqrt{1-c^2 x^2}\,(a+b\,\text{ArcSin}[c x])}{(3+m)^2(5+m)(7+m)}-\frac{30 b c d^3 x^{2+m}\sqrt{1-c^2 x^2}\,(a+b\,\text{ArcSin}[c x])}{(7+m)^2(15+8 m+m^2)}-$$

$$\frac{10 b c d^3 x^{2+m}(1-c^2 x^2)^{3/2}(a+b\,\text{ArcSin}[c x])}{(5+m)(7+m)^2}-\frac{12 b c d^3 x^{2+m}(1-c^2 x^2)^{3/2}(a+b\,\text{ArcSin}[c x])}{(5+m)^2(7+m)}-\frac{2 b c d^3 x^{2+m}(1-c^2 x^2)^{5/2}(a+b\,\text{ArcSin}[c x])}{(7+m)^2}+$$

$$\frac{48 d^3 x^{1+m}(a+b\,\text{ArcSin}[c x])^2}{(5+m)(7+m)(3+4 m+m^2)}+\frac{24 d^3 x^{1+m}(1-c^2 x^2)(a+b\,\text{ArcSin}[c x])^2}{(7+m)(15+8 m+m^2)}+\frac{6 d^3 x^{1+m}(1-c^2 x^2)^2(a+b\,\text{ArcSin}[c x])^2}{(5+m)(7+m)}+$$

$$\frac{d^3 x^{1+m}(1-c^2 x^2)^3(a+b\,\text{ArcSin}[c x])^2}{7+m}-\frac{48 b c d^3 x^{2+m}(a+b\,\text{ArcSin}[c x])\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2 x^2\right]}{(2+m)(3+m)^2(5+m)(7+m)}-$$

$$\frac{30 b c d^3 x^{2+m}(a+b\,\text{ArcSin}[c x])\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2 x^2\right]}{(5+m)(7+m)^2(6+5 m+m^2)}-$$

$$\frac{36 b c d^3 x^{2+m}(a+b\,\text{ArcSin}[c x])\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2 x^2\right]}{(5+m)^2(7+m)(6+5 m+m^2)}-$$

$$\frac{96 b c d^3 x^{2+m}(a+b\,\text{ArcSin}[c x])\,\text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2 x^2\right]}{(5+m)(7+m)(6+11 m+6 m^2+m^3)}+$$

$$\frac{30 b^2 c^2 d^3 x^{3+m}\,\text{HypergeometricPFQ}\left[\left\{1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2}\right\},\left\{2+\frac{m}{2},\frac{5}{2}+\frac{m}{2}\right\},c^2 x^2\right]}{(2+m)(3+m)^2(5+m)(7+m)^2}+$$

$$\frac{36 b^2 c^2 d^3 x^{3+m}\,\text{HypergeometricPFQ}\left[\left\{1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2}\right\},\left\{2+\frac{m}{2},\frac{5}{2}+\frac{m}{2}\right\},c^2 x^2\right]}{(2+m)(3+m)^2(5+m)^2(7+m)}+$$

$$\frac{48 b^2 c^2 d^3 x^{3+m}\,\text{HypergeometricPFQ}\left[\left\{1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2}\right\},\left\{2+\frac{m}{2},\frac{5}{2}+\frac{m}{2}\right\},c^2 x^2\right]}{(2+m)(3+m)^3(5+m)(7+m)}+$$

$$\frac{96 b^2 c^2 d^3 x^{3+m}\,\text{HypergeometricPFQ}\left[\left\{1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2}\right\},\left\{2+\frac{m}{2},\frac{5}{2}+\frac{m}{2}\right\},c^2 x^2\right]}{(3+m)^2(5+m)(7+m)(2+3 m+m^2)}$$

Result (type 8, 29 leaves, 0 steps):

$$\text{Unintegrable}\left[x^m\,(d-c^2 d x^2)^3\,(a+b\,\text{ArcSin}[c x])^2,x\right]$$

# Problem 277: Unable to integrate problem.

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

Optimal (type 5, 756 leaves, 13 steps):

$$\frac{6 b^2 c^2 d^2 x^{3+m}}{(3+m)^2 (5+m)^2}+\frac{2 b^2 c^2 d^2 x^{3+m}}{(3+m) (5+m)^2}+\frac{8 b^2 c^2 d^2 x^{3+m}}{(3+m)^3 (5+m)}-\frac{2 b^2 c^4 d^2 x^{5+m}}{(5+m)^3}-$$
$$\frac{6 b c d^2 x^{2+m} \sqrt{1-c^2 x^2} (a+b \text{ArcSin}[c x])}{(3+m) (5+m)^2}-\frac{8 b c d^2 x^{2+m} \sqrt{1-c^2 x^2} (a+b \text{ArcSin}[c x])}{(3+m)^2 (5+m)}-$$
$$\frac{2 b c d^2 x^{2+m} \left(1-c^2 x^2\right)^{3/2} (a+b \text{ArcSin}[c x])}{(5+m)^2}+\frac{8 d^2 x^{1+m} (a+b \text{ArcSin}[c x])^2}{(5+m) \left(3+4 m+m^2\right)}+\frac{4 d^2 x^{1+m} \left(1-c^2 x^2\right) (a+b \text{ArcSin}[c x])^2}{15+8 m+m^2}+$$
$$\frac{d^2 x^{1+m} \left(1-c^2 x^2\right)^2 (a+b \text{ArcSin}[c x])^2}{5+m}-\frac{8 b c d^2 x^{2+m} (a+b \text{ArcSin}[c x]) \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2 x^2\right]}{(2+m) (3+m)^2 (5+m)}-$$
$$\frac{6 b c d^2 x^{2+m} (a+b \text{ArcSin}[c x]) \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2 x^2\right]}{(5+m)^2 \left(6+5 m+m^2\right)}-\frac{16 b c d^2 x^{2+m} (a+b \text{ArcSin}[c x]) \text{Hypergeometric2F1}\left[\frac{1}{2},\frac{2+m}{2},\frac{4+m}{2},c^2 x^2\right]}{(5+m) \left(6+11 m+6 m^2+m^3\right)}+$$
$$\frac{6 b^2 c^2 d^2 x^{3+m} \text{HypergeometricPFQ}\left[\left\{1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2}\right\},\left\{2+\frac{m}{2},\frac{5}{2}+\frac{m}{2}\right\},c^2 x^2\right]}{(2+m) (3+m)^2 (5+m)^2}+$$
$$\frac{8 b^2 c^2 d^2 x^{3+m} \text{HypergeometricPFQ}\left[\left\{1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2}\right\},\left\{2+\frac{m}{2},\frac{5}{2}+\frac{m}{2}\right\},c^2 x^2\right]}{(2+m) (3+m)^3 (5+m)}+$$
$$\frac{16 b^2 c^2 d^2 x^{3+m} \text{HypergeometricPFQ}\left[\left\{1,\frac{3}{2}+\frac{m}{2},\frac{3}{2}+\frac{m}{2}\right\},\left\{2+\frac{m}{2},\frac{5}{2}+\frac{m}{2}\right\},c^2 x^2\right]}{(3+m)^2 (5+m) \left(2+3 m+m^2\right)}$$

Result (type 8, 29 leaves, 0 steps):

$$\text{Unintegrable}\left[x^m \left(d-c^2 d x^2\right)^2 (a+b \text{ArcSin}[c x])^2,x\right]$$

# Problem 278: Unable to integrate problem.

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

Optimal (type 5, 371 leaves, 6 steps):

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

$$\frac{2 b c d x^{2+m} (a+b \text{ArcSin}[c x])\ \text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{2+m}{2}, \frac{4+m}{2}, c^2 x^2\right]}{(2+m)\ (3+m)^2} - \frac{4 b c d x^{2+m} (a+b \text{ArcSin}[c x])\ \text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{2+m}{2}, \frac{4+m}{2}, c^2 x^2\right]}{6+11 m+6 m^2+m^3} +$$

$$\frac{2 b^2 c^2 d x^{3+m} \text{HypergeometricPFQ}\left[\left\{1, \frac{3}{2}+\frac{m}{2}, \frac{3}{2}+\frac{m}{2}\right\}, \left\{2+\frac{m}{2}, \frac{5}{2}+\frac{m}{2}\right\}, c^2 x^2\right]}{(2+m)\ (3+m)^3} +$$

$$\frac{4 b^2 c^2 d x^{3+m} \text{HypergeometricPFQ}\left[\left\{1, \frac{3}{2}+\frac{m}{2}, \frac{3}{2}+\frac{m}{2}\right\}, \left\{2+\frac{m}{2}, \frac{5}{2}+\frac{m}{2}\right\}, c^2 x^2\right]}{(3+m)^2\ (2+3 m+m^2)}$$

Result (type 8, 27 leaves, 0 steps):

$$\text{Unintegrable}\left[x^m (d-c^2 d x^2)\ (a+b \text{ArcSin}[c x])^2, x\right]$$

## Problem 282: Result valid but suboptimal antiderivative.

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

Optimal (type 8, 957 leaves, 12 steps):

$$\frac{10 b^2 c^2 d^2 x^{3+m} \sqrt{d-c^2 d x^2}}{(4+m)^3\ (6+m)} + \frac{2 b^2 c^2 d^2 (52+15 m+m^2)\ x^{3+m} \sqrt{d-c^2 d x^2}}{(4+m)^2\ (6+m)^3} - \frac{2 b^2 c^4 d^2 x^{5+m} \sqrt{d-c^2 d x^2}}{(6+m)^3} -$$

$$\frac{30 b c d^2 x^{2+m} \sqrt{d-c^2 d x^2}\ (a+b \text{ArcSin}[c x])}{(2+m)^2\ (4+m)\ (6+m) \sqrt{1-c^2 x^2}} - \frac{10 b c d^2 x^{2+m} \sqrt{d-c^2 d x^2}\ (a+b \text{ArcSin}[c x])}{(6+m)\ (8+6 m+m^2) \sqrt{1-c^2 x^2}} - \frac{2 b c d^2 x^{2+m} \sqrt{d-c^2 d x^2}\ (a+b \text{ArcSin}[c x])}{(12+8 m+m^2) \sqrt{1-c^2 x^2}} +$$

$$\frac{10 b c^3 d^2 x^{4+m} \sqrt{d-c^2 d x^2}\ (a+b \text{ArcSin}[c x])}{(4+m)^2\ (6+m) \sqrt{1-c^2 x^2}} + \frac{4 b c^3 d^2 x^{4+m} \sqrt{d-c^2 d x^2}\ (a+b \text{ArcSin}[c x])}{(4+m)\ (6+m) \sqrt{1-c^2 x^2}} - \frac{2 b c^5 d^2 x^{6+m} \sqrt{d-c^2 d x^2}\ (a+b \text{ArcSin}[c x])}{(6+m)^2 \sqrt{1-c^2 x^2}} +$$

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

$$\frac{30 b^2 c^2 d^2 x^{3+m} \sqrt{d-c^2 d x^2}\ \text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{3+m}{2}, \frac{5+m}{2}, c^2 x^2\right]}{(2+m)^2\ (3+m)\ (4+m)\ (6+m) \sqrt{1-c^2 x^2}} + \frac{10 b^2 c^2 d^2 (10+3 m)\ x^{3+m} \sqrt{d-c^2 d x^2}\ \text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{3+m}{2}, \frac{5+m}{2}, c^2 x^2\right]}{(2+m)\ (3+m)\ (4+m)^3\ (6+m) \sqrt{1-c^2 x^2}} +$$

$$\frac{2 b^2 c^2 d^2 (264+130 m+15 m^2)\ x^{3+m} \sqrt{d-c^2 d x^2}\ \text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{3+m}{2}, \frac{5+m}{2}, c^2 x^2\right]}{(2+m)\ (3+m)\ (4+m)^2\ (6+m)^3 \sqrt{1-c^2 x^2}} + \frac{15 d^3 \text{Unintegrable}\left[\frac{x^m (a+b \text{ArcSin}[c x])^2}{\sqrt{d-c^2 d x^2}}, x\right]}{(6+m)\ (8+6 m+m^2)}$$

Result (type 8, 31 leaves, 0 steps):

$$\text{Unintegrable}\left[x^m \left(d - c^2 d x^2\right)^{5/2} (a + b \,\text{ArcSin}[c x])^2, x\right]$$

## Problem 283: Result valid but suboptimal antiderivative.

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

Optimal (type 8, 499 leaves, 7 steps):

$$\frac{2 b^2 c^2 d x^{3+m} \sqrt{d - c^2 d x^2}}{(4+m)^3} - \frac{6 b c d x^{2+m} \sqrt{d - c^2 d x^2} (a + b \,\text{ArcSin}[c x])}{(2+m)^2 (4+m) \sqrt{1 - c^2 x^2}} - \frac{2 b c d x^{2+m} \sqrt{d - c^2 d x^2} (a + b \,\text{ArcSin}[c x])}{\left(8 + 6 m + m^2\right) \sqrt{1 - c^2 x^2}} +$$
$$\frac{2 b c^3 d x^{4+m} \sqrt{d - c^2 d x^2} (a + b \,\text{ArcSin}[c x])}{(4+m)^2 \sqrt{1 - c^2 x^2}} + \frac{3 d x^{1+m} \sqrt{d - c^2 d x^2} (a + b \,\text{ArcSin}[c x])^2}{8 + 6 m + m^2} +$$
$$\frac{x^{1+m} \left(d - c^2 d x^2\right)^{3/2} (a + b \,\text{ArcSin}[c x])^2}{4+m} + \frac{6 b^2 c^2 d x^{3+m} \sqrt{d - c^2 d x^2} \,\text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{3+m}{2}, \frac{5+m}{2}, c^2 x^2\right]}{(2+m)^2 (3+m) (4+m) \sqrt{1 - c^2 x^2}} +$$
$$\frac{2 b^2 c^2 d (10 + 3 m) x^{3+m} \sqrt{d - c^2 d x^2} \,\text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{3+m}{2}, \frac{5+m}{2}, c^2 x^2\right]}{(2+m) (3+m) (4+m)^3 \sqrt{1 - c^2 x^2}} + \frac{3 d^2 \,\text{Unintegrable}\left[\frac{x^m (a+b \,\text{ArcSin}[c x])^2}{\sqrt{d - c^2 d x^2}}, x\right]}{8 + 6 m + m^2}$$

Result (type 8, 31 leaves, 0 steps):

$$\text{Unintegrable}\left[x^m \left(d - c^2 d x^2\right)^{3/2} (a + b \,\text{ArcSin}[c x])^2, x\right]$$

## Problem 284: Result valid but suboptimal antiderivative.

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

Optimal (type 8, 203 leaves, 3 steps):

$$-\frac{2 b c x^{2+m} \sqrt{d - c^2 d x^2} (a + b \,\text{ArcSin}[c x])}{(2+m)^2 \sqrt{1 - c^2 x^2}} + \frac{x^{1+m} \sqrt{d - c^2 d x^2} (a + b \,\text{ArcSin}[c x])^2}{2+m} +$$
$$\frac{2 b^2 c^2 x^{3+m} \sqrt{d - c^2 d x^2} \,\text{Hypergeometric2F1}\left[\frac{1}{2}, \frac{3+m}{2}, \frac{5+m}{2}, c^2 x^2\right]}{(2+m)^2 (3+m) \sqrt{1 - c^2 x^2}} + \frac{d \,\text{Unintegrable}\left[\frac{x^m (a+b \,\text{ArcSin}[c x])^2}{\sqrt{d - c^2 d x^2}}, x\right]}{2+m}$$

Result (type 8, 31 leaves, 0 steps):

$$\text{Unintegrable}\left[x^m \sqrt{d - c^2 d x^2} \, (a + b \,\text{ArcSin}[c x])^2, x\right]$$

## Problem 298: Result optimal but 1 more steps used.

$$\int \frac{\text{ArcSin}[a\,x]^3}{\sqrt{c - a^2\,c\,x^2}}\,dx$$

Optimal (type 3, 42 leaves, 1 step):

$$\frac{\sqrt{1 - a^2\,x^2}\;\text{ArcSin}[a\,x]^4}{4\,a\,\sqrt{c - a^2\,c\,x^2}}$$

Result (type 3, 42 leaves, 2 steps):

$$\frac{\sqrt{1 - a^2\,x^2}\;\text{ArcSin}[a\,x]^4}{4\,a\,\sqrt{c - a^2\,c\,x^2}}$$

## Problem 383: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 150 leaves, 14 steps):

$$-\frac{x\,\left(1 - c^2\,x^2\right)}{b\,c\,\left(a + b\,\text{ArcSin}[c\,x]\right)} + \frac{\text{Cos}\left[\frac{a}{b}\right]\,\text{CosIntegral}\left[\frac{a+b\,\text{ArcSin}[c\,x]}{b}\right]}{4\,b^2\,c^2} + \frac{3\,\text{Cos}\left[\frac{3\,a}{b}\right]\,\text{CosIntegral}\left[\frac{3\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{4\,b^2\,c^2} + \frac{\text{Sin}\left[\frac{a}{b}\right]\,\text{SinIntegral}\left[\frac{a+b\,\text{ArcSin}[c\,x]}{b}\right]}{4\,b^2\,c^2} + \frac{3\,\text{Sin}\left[\frac{3\,a}{b}\right]\,\text{SinIntegral}\left[\frac{3\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{4\,b^2\,c^2}$$

Result (type 4, 198 leaves, 14 steps):

$$-\frac{x\,\left(1 - c^2\,x^2\right)}{b\,c\,\left(a + b\,\text{ArcSin}[c\,x]\right)} - \frac{3\,\text{Cos}\left[\frac{a}{b}\right]\,\text{CosIntegral}\left[\frac{a}{b} + \text{ArcSin}[c\,x]\right]}{4\,b^2\,c^2} + \frac{3\,\text{Cos}\left[\frac{3\,a}{b}\right]\,\text{CosIntegral}\left[\frac{3\,a}{b} + 3\,\text{ArcSin}[c\,x]\right]}{4\,b^2\,c^2} + \frac{\text{Cos}\left[\frac{a}{b}\right]\,\text{CosIntegral}\left[\frac{a+b\,\text{ArcSin}[c\,x]}{b}\right]}{b^2\,c^2} - \frac{3\,\text{Sin}\left[\frac{a}{b}\right]\,\text{SinIntegral}\left[\frac{a}{b} + \text{ArcSin}[c\,x]\right]}{4\,b^2\,c^2} + \frac{3\,\text{Sin}\left[\frac{3\,a}{b}\right]\,\text{SinIntegral}\left[\frac{3\,a}{b} + 3\,\text{ArcSin}[c\,x]\right]}{4\,b^2\,c^2} + \frac{\text{Sin}\left[\frac{a}{b}\right]\,\text{SinIntegral}\left[\frac{a+b\,\text{ArcSin}[c\,x]}{b}\right]}{b^2\,c^2}$$

## Problem 444: Result optimal but 1 more steps used.

$$\int \frac{\sqrt{\text{ArcSin}[a\,x]}}{\sqrt{c-a^2\,c\,x^2}}\,dx$$

Optimal (type 3, 44 leaves, 1 step):

$$\frac{2\,\sqrt{1-a^2\,x^2}\;\text{ArcSin}[a\,x]^{3/2}}{3\,a\,\sqrt{c-a^2\,c\,x^2}}$$

Result (type 3, 44 leaves, 2 steps):

$$\frac{2\,\sqrt{1-a^2\,x^2}\;\text{ArcSin}[a\,x]^{3/2}}{3\,a\,\sqrt{c-a^2\,c\,x^2}}$$

## Problem 449: Result optimal but 1 more steps used.

$$\int \frac{\text{ArcSin}[a\,x]^{3/2}}{\sqrt{c-a^2\,c\,x^2}}\,dx$$

Optimal (type 3, 44 leaves, 1 step):

$$\frac{2\,\sqrt{1-a^2\,x^2}\;\text{ArcSin}[a\,x]^{5/2}}{5\,a\,\sqrt{c-a^2\,c\,x^2}}$$

Result (type 3, 44 leaves, 2 steps):

$$\frac{2\,\sqrt{1-a^2\,x^2}\;\text{ArcSin}[a\,x]^{5/2}}{5\,a\,\sqrt{c-a^2\,c\,x^2}}$$

## Problem 453: Result optimal but 1 more steps used.

$$\int \frac{\text{ArcSin}[a\,x]^{5/2}}{\sqrt{c-a^2\,c\,x^2}}\,dx$$

Optimal (type 3, 44 leaves, 1 step):

$$\frac{2\,\sqrt{1-a^2\,x^2}\;\text{ArcSin}[a\,x]^{7/2}}{7\,a\,\sqrt{c-a^2\,c\,x^2}}$$

Result (type 3, 44 leaves, 2 steps):

$$\frac{2\sqrt{1-a^2x^2}\,\text{ArcSin}[a\,x]^{7/2}}{7\,a\sqrt{c-a^2c\,x^2}}$$

## Problem 457: Result optimal but 1 more steps used.

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

Optimal (type 3, 42 leaves, 1 step):

$$\frac{2\,a\sqrt{1-\frac{x^2}{a^2}}\,\text{ArcSin}\left[\frac{x}{a}\right]^{3/2}}{3\sqrt{a^2-x^2}}$$

Result (type 3, 42 leaves, 2 steps):

$$\frac{2\,a\sqrt{1-\frac{x^2}{a^2}}\,\text{ArcSin}\left[\frac{x}{a}\right]^{3/2}}{3\sqrt{a^2-x^2}}$$

## Problem 462: Result optimal but 1 more steps used.

$$\int \frac{\text{ArcSin}\left[\frac{x}{a}\right]^{3/2}}{\sqrt{a^2-x^2}}\,dx$$

Optimal (type 3, 42 leaves, 1 step):

$$\frac{2\,a\sqrt{1-\frac{x^2}{a^2}}\,\text{ArcSin}\left[\frac{x}{a}\right]^{5/2}}{5\sqrt{a^2-x^2}}$$

Result (type 3, 42 leaves, 2 steps):

$$\frac{2\,a\sqrt{1-\frac{x^2}{a^2}}\,\text{ArcSin}\left[\frac{x}{a}\right]^{5/2}}{5\sqrt{a^2-x^2}}$$

## Problem 465: Result optimal but 1 more steps used.

$$\int \frac{\left(c-a^2 c x^2\right)^{5/2}}{\sqrt{\text{ArcSin}[a x]}} \, dx$$

Optimal (type 4, 244 leaves, 9 steps):

$$\frac{5 c^2 \sqrt{c-a^2 c x^2} \sqrt{\text{ArcSin}[a x]}}{8 a \sqrt{1-a^2 x^2}}+\frac{3 c^2 \sqrt{\frac{\pi}{2}} \sqrt{c-a^2 c x^2} \, \text{FresnelC}\left[2 \sqrt{\frac{2}{\pi}} \sqrt{\text{ArcSin}[a x]}\right]}{16 a \sqrt{1-a^2 x^2}}+$$
$$\frac{c^2 \sqrt{\frac{\pi}{3}} \sqrt{c-a^2 c x^2} \, \text{FresnelC}\left[2 \sqrt{\frac{3}{\pi}} \sqrt{\text{ArcSin}[a x]}\right]}{32 a \sqrt{1-a^2 x^2}}+\frac{15 c^2 \sqrt{\pi} \sqrt{c-a^2 c x^2} \, \text{FresnelC}\left[\frac{2 \sqrt{\text{ArcSin}[a x]}}{\sqrt{\pi}}\right]}{32 a \sqrt{1-a^2 x^2}}$$

Result (type 4, 244 leaves, 10 steps):

$$\frac{5 c^2 \sqrt{c-a^2 c x^2} \sqrt{\text{ArcSin}[a x]}}{8 a \sqrt{1-a^2 x^2}}+\frac{3 c^2 \sqrt{\frac{\pi}{2}} \sqrt{c-a^2 c x^2} \, \text{FresnelC}\left[2 \sqrt{\frac{2}{\pi}} \sqrt{\text{ArcSin}[a x]}\right]}{16 a \sqrt{1-a^2 x^2}}+$$
$$\frac{c^2 \sqrt{\frac{\pi}{3}} \sqrt{c-a^2 c x^2} \, \text{FresnelC}\left[2 \sqrt{\frac{3}{\pi}} \sqrt{\text{ArcSin}[a x]}\right]}{32 a \sqrt{1-a^2 x^2}}+\frac{15 c^2 \sqrt{\pi} \sqrt{c-a^2 c x^2} \, \text{FresnelC}\left[\frac{2 \sqrt{\text{ArcSin}[a x]}}{\sqrt{\pi}}\right]}{32 a \sqrt{1-a^2 x^2}}$$

## Problem 466: Result optimal but 1 more steps used.

$$\int \frac{\left(c-a^2 c x^2\right)^{3/2}}{\sqrt{\text{ArcSin}[a x]}} \, dx$$

Optimal (type 4, 170 leaves, 7 steps):

$$\frac{3 c \sqrt{c-a^2 c x^2} \sqrt{\text{ArcSin}[a x]}}{4 a \sqrt{1-a^2 x^2}}+\frac{c \sqrt{\frac{\pi}{2}} \sqrt{c-a^2 c x^2} \, \text{FresnelC}\left[2 \sqrt{\frac{2}{\pi}} \sqrt{\text{ArcSin}[a x]}\right]}{8 a \sqrt{1-a^2 x^2}}+\frac{c \sqrt{\pi} \sqrt{c-a^2 c x^2} \, \text{FresnelC}\left[\frac{2 \sqrt{\text{ArcSin}[a x]}}{\sqrt{\pi}}\right]}{2 a \sqrt{1-a^2 x^2}}$$

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

$$\frac{3\,c\,\sqrt{c-a^2\,c\,x^2}\,\sqrt{\text{ArcSin}[a\,x]}}{4\,a\,\sqrt{1-a^2\,x^2}}+\frac{c\,\sqrt{\frac{\pi}{2}}\,\sqrt{c-a^2\,c\,x^2}\,\text{FresnelC}\left[2\,\sqrt{\frac{2}{\pi}}\,\sqrt{\text{ArcSin}[a\,x]}\right]}{8\,a\,\sqrt{1-a^2\,x^2}}+\frac{c\,\sqrt{\pi}\,\sqrt{c-a^2\,c\,x^2}\,\text{FresnelC}\left[\frac{2\,\sqrt{\text{ArcSin}[a\,x]}}{\sqrt{\pi}}\right]}{2\,a\,\sqrt{1-a^2\,x^2}}$$

## Problem 467: Result optimal but 1 more steps used.

$$\int \frac{\sqrt{c-a^2\,c\,x^2}}{\sqrt{\text{ArcSin}[a\,x]}}\,dx$$

Optimal (type 4, 99 leaves, 5 steps):

$$\frac{\sqrt{c-a^2\,c\,x^2}\,\sqrt{\text{ArcSin}[a\,x]}}{a\,\sqrt{1-a^2\,x^2}}+\frac{\sqrt{\pi}\,\sqrt{c-a^2\,c\,x^2}\,\text{FresnelC}\left[\frac{2\,\sqrt{\text{ArcSin}[a\,x]}}{\sqrt{\pi}}\right]}{2\,a\,\sqrt{1-a^2\,x^2}}$$

Result (type 4, 99 leaves, 6 steps):

$$\frac{\sqrt{c-a^2\,c\,x^2}\,\sqrt{\text{ArcSin}[a\,x]}}{a\,\sqrt{1-a^2\,x^2}}+\frac{\sqrt{\pi}\,\sqrt{c-a^2\,c\,x^2}\,\text{FresnelC}\left[\frac{2\,\sqrt{\text{ArcSin}[a\,x]}}{\sqrt{\pi}}\right]}{2\,a\,\sqrt{1-a^2\,x^2}}$$

## Problem 468: Result optimal but 1 more steps used.

$$\int \frac{1}{\sqrt{c-a^2\,c\,x^2}\,\sqrt{\text{ArcSin}[a\,x]}}\,dx$$

Optimal (type 3, 42 leaves, 1 step):

$$\frac{2\,\sqrt{1-a^2\,x^2}\,\sqrt{\text{ArcSin}[a\,x]}}{a\,\sqrt{c-a^2\,c\,x^2}}$$

Result (type 3, 42 leaves, 2 steps):

$$\frac{2\,\sqrt{1-a^2\,x^2}\,\sqrt{\text{ArcSin}[a\,x]}}{a\,\sqrt{c-a^2\,c\,x^2}}$$

## Problem 474: Result optimal but 1 more steps used.

$$\int \frac{1}{\sqrt{c-a^2\,c\,x^2}\,\text{ArcSin}[a\,x]^{3/2}}\,dx$$

Optimal (type 3, 42 leaves, 1 step):

$$-\frac{2\sqrt{1-a^2x^2}}{a\sqrt{c-a^2cx^2}\sqrt{\text{ArcSin}[a x]}}$$

Result (type 3, 42 leaves, 2 steps):

$$-\frac{2\sqrt{1-a^2x^2}}{a\sqrt{c-a^2cx^2}\sqrt{\text{ArcSin}[a x]}}$$

## Problem 479: Result optimal but 1 more steps used.

$$\int\frac{1}{\sqrt{c-a^2cx^2}\,\text{ArcSin}[a x]^{5/2}}\,dx$$

Optimal (type 3, 44 leaves, 1 step):

$$-\frac{2\sqrt{1-a^2x^2}}{3a\sqrt{c-a^2cx^2}\,\text{ArcSin}[a x]^{3/2}}$$

Result (type 3, 44 leaves, 2 steps):

$$-\frac{2\sqrt{1-a^2x^2}}{3a\sqrt{c-a^2cx^2}\,\text{ArcSin}[a x]^{3/2}}$$

## Problem 482: Result optimal but 1 more steps used.

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

Optimal (type 4, 259 leaves, 6 steps):

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

Result (type 4, 259 leaves, 7 steps):

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

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

## Problem 483: Result optimal but 1 more steps used.

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

Optimal (type 4, 391 leaves, 9 steps):

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

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

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

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

Result (type 4, 391 leaves, 10 steps):

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

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

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

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

## Problem 484: Result optimal but 1 more steps used.

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

Optimal (type 4, 259 leaves, 6 steps):

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

Result (type 4, 259 leaves, 7 steps):

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

## Problem 485: Rubi result verified and simpler than optimal antiderivative.

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

Optimal (type 8, 218 leaves, 6 steps):

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

Result (type 8, 31 leaves, 0 steps):

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

## Problem 486: Result valid but suboptimal antiderivative.

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

Optimal (type 8, 87 leaves, 3 steps):

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

Result (type 8, 31 leaves, 0 steps):

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

## Problem 487: Result optimal but 1 more steps used.

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

Optimal (type 4, 684 leaves, 12 steps):

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

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

$$\frac{i\,2^{-7-2n}\,d\,e^{-\frac{4ia}{b}}\,\sqrt{d-c^2 d x^2}\,(a+b\,\text{ArcSin}[c\,x])^n\left(-\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\,-\frac{4i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{c^3\,\sqrt{1-c^2 x^2}}-$$

$$\frac{i\,2^{-7-2n}\,d\,e^{\frac{4ia}{b}}\,\sqrt{d-c^2 d x^2}\,(a+b\,\text{ArcSin}[c\,x])^n\left(\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\,\frac{4i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{c^3\,\sqrt{1-c^2 x^2}}+\frac{1}{c^3\,\sqrt{1-c^2 x^2}}$$

$$i\,2^{-7-n}\times 3^{-1-n}\,d\,e^{-\frac{6ia}{b}}\,\sqrt{d-c^2 d x^2}\,(a+b\,\text{ArcSin}[c\,x])^n\left(-\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\,-\frac{6i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]-$$

$$\frac{i\,2^{-7-n}\times 3^{-1-n}\,d\,e^{\frac{6ia}{b}}\,\sqrt{d-c^2 d x^2}\,(a+b\,\text{ArcSin}[c\,x])^n\left(\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\,\frac{6i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{c^3\,\sqrt{1-c^2 x^2}}$$

Result (type 4, 684 leaves, 13 steps):

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

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

$$\frac{i\,2^{-7-2n}\,d\,e^{-\frac{4ia}{b}}\sqrt{d-c^2 d x^2}\,(a+b\,\text{ArcSin}[c\,x])^n\left(-\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,-\frac{4i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{c^3\sqrt{1-c^2x^2}}-$$

$$\frac{i\,2^{-7-2n}\,d\,e^{\frac{4ia}{b}}\sqrt{d-c^2 d x^2}\,(a+b\,\text{ArcSin}[c\,x])^n\left(\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\frac{4i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{c^3\sqrt{1-c^2x^2}}+\frac{1}{c^3\sqrt{1-c^2x^2}}$$

$$i\,2^{-7-n}\times 3^{-1-n}\,d\,e^{-\frac{6ia}{b}}\sqrt{d-c^2 d x^2}\,(a+b\,\text{ArcSin}[c\,x])^n\left(-\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,-\frac{6\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]-$$

$$\frac{i\,2^{-7-n}\times 3^{-1-n}\,d\,e^{\frac{6ia}{b}}\sqrt{d-c^2 d x^2}\,(a+b\,\text{ArcSin}[c\,x])^n\left(\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\frac{6i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{c^3\sqrt{1-c^2x^2}}$$

## Problem 488: Result optimal but 1 more steps used.

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

Optimal (type 4, 595 leaves, 12 steps):

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

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

$$\frac{3^{-n}\,d\,e^{-\frac{3 i a}{b}}\sqrt{d-c^2 d x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n \left(-\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\,-\frac{3\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{32\,c^2\sqrt{1-c^2 x^2}}-$$

$$\frac{3^{-n}\,d\,e^{\frac{3 i a}{b}}\sqrt{d-c^2 d x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n \left(\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\,\frac{3\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{32\,c^2\sqrt{1-c^2 x^2}}-$$

$$\frac{5^{-1-n}\,d\,e^{-\frac{5 i a}{b}}\sqrt{d-c^2 d x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n \left(-\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\,-\frac{5\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{32\,c^2\sqrt{1-c^2 x^2}}-$$

$$\frac{5^{-1-n}\,d\,e^{\frac{5 i a}{b}}\sqrt{d-c^2 d x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n \left(\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\,\frac{5\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{32\,c^2\sqrt{1-c^2 x^2}}$$

Result (type 4, 595 leaves, 13 steps):

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

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

$$\frac{3^{-n}\,d\,e^{-\frac{3 i a}{b}}\sqrt{d-c^2 d x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n \left(-\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\,-\frac{3\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{32\,c^2\sqrt{1-c^2 x^2}}-$$

$$\frac{3^{-n}\,d\,e^{\frac{3 i a}{b}}\sqrt{d-c^2 d x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n \left(\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\,\frac{3\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{32\,c^2\sqrt{1-c^2 x^2}}-$$

$$\frac{5^{-1-n}\,d\,e^{-\frac{5 i a}{b}}\sqrt{d-c^2 d x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n \left(-\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\,-\frac{5\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{32\,c^2\sqrt{1-c^2 x^2}}-$$

$$\frac{5^{-1-n}\,d\,e^{\frac{5 i a}{b}}\sqrt{d-c^2 d x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n \left(\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\,\frac{5\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{32\,c^2\sqrt{1-c^2 x^2}}$$

## Problem 489: Result optimal but 1 more steps used.

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

Optimal (type 4, 466 leaves, 9 steps):

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

Result (type 4, 466 leaves, 10 steps):

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

## Problem 490: Rubi result verified and simpler than optimal antiderivative.

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

Optimal (type 8, 426 leaves, 15 steps):

$$\frac{5\,d^2\,e^{-\frac{i a}{b}}\,\sqrt{1-c^2 x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n\left(-\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,-\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{8\,\sqrt{d-c^2 d\,x^2}}+$$

$$\frac{5\,d^2\,e^{\frac{i a}{b}}\,\sqrt{1-c^2 x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n\left(\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{8\,\sqrt{d-c^2 d\,x^2}}+$$

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

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

Result (type 8, 31 leaves, 0 steps):

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

## Problem 491: Rubi result verified and simpler than optimal antiderivative.

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

Optimal (type 8, 297 leaves, 9 steps):

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

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

Result (type 8, 31 leaves, 0 steps):

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

## Problem 492: Result optimal but 1 more steps used.

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

Optimal (type 4, 906 leaves, 15 steps):

$$\frac{5\,d^2\sqrt{d-c^2 d x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^{1+n}}{128\,b\,c^3\,(1+n)\,\sqrt{1-c^2 x^2}}-\frac{i\,2^{-7-n}\,d^2\,e^{-\frac{2\,i\,a}{b}}\,\sqrt{d-c^2 d x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n\left(-\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,-\frac{2\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{c^3\,\sqrt{1-c^2 x^2}}+$$

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

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

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

$$i\,2^{-7-n}\times 3^{-1-n}\,d^2\,e^{-\frac{6\,i\,a}{b}}\,\sqrt{d-c^2 d x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n\left(-\frac{i\,\left(a+b\,\text{ArcSin}[c\,x]\right)}{b}\right)^{-n}\text{Gamma}\left[1+n,-\frac{6\,i\,\left(a+b\,\text{ArcSin}[c\,x]\right)}{b}\right]-$$

$$\frac{i\,2^{-7-n}\times 3^{-1-n}\,d^2\,e^{\frac{6\,i\,a}{b}}\,\sqrt{d-c^2 d x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n\left(\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\frac{6\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{c^3\,\sqrt{1-c^2 x^2}}+$$

$$\frac{i\,2^{-11-3\,n}\,d^2\,e^{-\frac{8\,i\,a}{b}}\,\sqrt{d-c^2 d x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n\left(-\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,-\frac{8\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{c^3\,\sqrt{1-c^2 x^2}}-$$

$$\frac{i\,2^{-11-3\,n}\,d^2\,e^{\frac{8\,i\,a}{b}}\,\sqrt{d-c^2 d x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n\left(\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\frac{8\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{c^3\,\sqrt{1-c^2 x^2}}$$

Result (type 4, 906 leaves, 16 steps) :

$$\frac{5\, d^2 \sqrt{d - c^2 d x^2}\, (a + b\, \mathrm{ArcSin}[c\, x])^{1+n}}{128\, b\, c^3\, (1 + n) \sqrt{1 - c^2 x^2}} - \frac{\mathrm{i}\, 2^{-7-n} d^2 e^{-\frac{2 i a}{b}} \sqrt{d - c^2 d x^2}\, (a + b\, \mathrm{ArcSin}[c\, x])^n \left(-\frac{\mathrm{i}\, (a+b\, \mathrm{ArcSin}[c\, x])}{b}\right)^{-n} \mathrm{Gamma}\left[1 + n, -\frac{2\, \mathrm{i}\, (a+b\, \mathrm{ArcSin}[c\, x])}{b}\right]}{c^3 \sqrt{1 - c^2 x^2}} +$$

$$\frac{\mathrm{i}\, 2^{-7-n} d^2 e^{\frac{2 i a}{b}} \sqrt{d - c^2 d x^2}\, (a + b\, \mathrm{ArcSin}[c\, x])^n \left(\frac{\mathrm{i}\, (a+b\, \mathrm{ArcSin}[c\, x])}{b}\right)^{-n} \mathrm{Gamma}\left[1 + n, \frac{2\, \mathrm{i}\, (a+b\, \mathrm{ArcSin}[c\, x])}{b}\right]}{c^3 \sqrt{1 - c^2 x^2}} +$$

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

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

$$\mathrm{i}\, 2^{-7-n} \times 3^{-1-n} d^2 e^{-\frac{6 i a}{b}} \sqrt{d - c^2 d x^2}\, (a + b\, \mathrm{ArcSin}[c\, x])^n \left(-\frac{\mathrm{i}\, (a + b\, \mathrm{ArcSin}[c\, x])}{b}\right)^{-n} \mathrm{Gamma}\left[1 + n, -\frac{6\, \mathrm{i}\, (a + b\, \mathrm{ArcSin}[c\, x])}{b}\right] -$$

$$\frac{\mathrm{i}\, 2^{-7-n} \times 3^{-1-n} d^2 e^{\frac{6 i a}{b}} \sqrt{d - c^2 d x^2}\, (a + b\, \mathrm{ArcSin}[c\, x])^n \left(\frac{\mathrm{i}\, (a+b\, \mathrm{ArcSin}[c\, x])}{b}\right)^{-n} \mathrm{Gamma}\left[1 + n, \frac{6\, \mathrm{i}\, (a+b\, \mathrm{ArcSin}[c\, x])}{b}\right]}{c^3 \sqrt{1 - c^2 x^2}} +$$

$$\frac{\mathrm{i}\, 2^{-11-3 n} d^2 e^{-\frac{8 i a}{b}} \sqrt{d - c^2 d x^2}\, (a + b\, \mathrm{ArcSin}[c\, x])^n \left(-\frac{\mathrm{i}\, (a+b\, \mathrm{ArcSin}[c\, x])}{b}\right)^{-n} \mathrm{Gamma}\left[1 + n, -\frac{8\, \mathrm{i}\, (a+b\, \mathrm{ArcSin}[c\, x])}{b}\right]}{c^3 \sqrt{1 - c^2 x^2}} -$$

$$\frac{\mathrm{i}\, 2^{-11-3 n} d^2 e^{\frac{8 i a}{b}} \sqrt{d - c^2 d x^2}\, (a + b\, \mathrm{ArcSin}[c\, x])^n \left(\frac{\mathrm{i}\, (a+b\, \mathrm{ArcSin}[c\, x])}{b}\right)^{-n} \mathrm{Gamma}\left[1 + n, \frac{8\, \mathrm{i}\, (a+b\, \mathrm{ArcSin}[c\, x])}{b}\right]}{c^3 \sqrt{1 - c^2 x^2}}$$

## Problem 493: Result optimal but 1 more steps used.

$$\int x\, (d - c^2 d x^2)^{5/2} (a + b\, \mathrm{ArcSin}[c\, x])^n\, dx$$

Optimal (type 4, 815 leaves, 15 steps):

$$-\frac{5\,d^2\,e^{-\frac{i a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n\,\left(-\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\,\text{Gamma}\left[1+n,\,-\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{128\,c^2\,\sqrt{1-c^2\,x^2}}-$$

$$\frac{5\,d^2\,e^{\frac{i a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n\,\left(\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\,\text{Gamma}\left[1+n,\,\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{128\,c^2\,\sqrt{1-c^2\,x^2}}-$$

$$\frac{3^{1-n}\,d^2\,e^{-\frac{3 i a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n\,\left(-\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\,\text{Gamma}\left[1+n,\,-\frac{3\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{128\,c^2\,\sqrt{1-c^2\,x^2}}-$$

$$\frac{3^{1-n}\,d^2\,e^{\frac{3 i a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n\,\left(\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\,\text{Gamma}\left[1+n,\,\frac{3\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{128\,c^2\,\sqrt{1-c^2\,x^2}}-$$

$$\frac{5^{-n}\,d^2\,e^{-\frac{5 i a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n\,\left(-\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\,\text{Gamma}\left[1+n,\,-\frac{5\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{128\,c^2\,\sqrt{1-c^2\,x^2}}-$$

$$\frac{5^{-n}\,d^2\,e^{\frac{5 i a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n\,\left(\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\,\text{Gamma}\left[1+n,\,\frac{5\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{128\,c^2\,\sqrt{1-c^2\,x^2}}-$$

$$\frac{7^{-1-n}\,d^2\,e^{-\frac{7 i a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n\,\left(-\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\,\text{Gamma}\left[1+n,\,-\frac{7\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{128\,c^2\,\sqrt{1-c^2\,x^2}}-$$

$$\frac{7^{-1-n}\,d^2\,e^{\frac{7 i a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\text{ArcSin}[c\,x]\right)^n\,\left(\frac{i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right)^{-n}\,\text{Gamma}\left[1+n,\,\frac{7\,i\,(a+b\,\text{ArcSin}[c\,x])}{b}\right]}{128\,c^2\,\sqrt{1-c^2\,x^2}}$$

Result (type 4, 815 leaves, 16 steps) :

$$-\frac{5\,d^2\,e^{-\frac{i a}{b}}\sqrt{d-c^2 d x^2}\,(a+b\,\text{ArcSin}[c x])^n\left(-\frac{i (a+b\,\text{ArcSin}[c x])}{b}\right)^{-n}\text{Gamma}\left[1+n,-\frac{i (a+b\,\text{ArcSin}[c x])}{b}\right]}{128\,c^2\sqrt{1-c^2 x^2}}-$$

$$\frac{5\,d^2\,e^{\frac{i a}{b}}\sqrt{d-c^2 d x^2}\,(a+b\,\text{ArcSin}[c x])^n\left(\frac{i (a+b\,\text{ArcSin}[c x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\frac{i (a+b\,\text{ArcSin}[c x])}{b}\right]}{128\,c^2\sqrt{1-c^2 x^2}}-$$

$$\frac{3^{1-n}\,d^2\,e^{-\frac{3 i a}{b}}\sqrt{d-c^2 d x^2}\,(a+b\,\text{ArcSin}[c x])^n\left(-\frac{i (a+b\,\text{ArcSin}[c x])}{b}\right)^{-n}\text{Gamma}\left[1+n,-\frac{3 i (a+b\,\text{ArcSin}[c x])}{b}\right]}{128\,c^2\sqrt{1-c^2 x^2}}-$$

$$\frac{3^{1-n}\,d^2\,e^{\frac{3 i a}{b}}\sqrt{d-c^2 d x^2}\,(a+b\,\text{ArcSin}[c x])^n\left(\frac{i (a+b\,\text{ArcSin}[c x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\frac{3 i (a+b\,\text{ArcSin}[c x])}{b}\right]}{128\,c^2\sqrt{1-c^2 x^2}}-$$

$$\frac{5^{-n}\,d^2\,e^{-\frac{5 i a}{b}}\sqrt{d-c^2 d x^2}\,(a+b\,\text{ArcSin}[c x])^n\left(-\frac{i (a+b\,\text{ArcSin}[c x])}{b}\right)^{-n}\text{Gamma}\left[1+n,-\frac{5 i (a+b\,\text{ArcSin}[c x])}{b}\right]}{128\,c^2\sqrt{1-c^2 x^2}}-$$

$$\frac{5^{-n}\,d^2\,e^{\frac{5 i a}{b}}\sqrt{d-c^2 d x^2}\,(a+b\,\text{ArcSin}[c x])^n\left(\frac{i (a+b\,\text{ArcSin}[c x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\frac{5 i (a+b\,\text{ArcSin}[c x])}{b}\right]}{128\,c^2\sqrt{1-c^2 x^2}}-$$

$$\frac{7^{-1-n}\,d^2\,e^{-\frac{7 i a}{b}}\sqrt{d-c^2 d x^2}\,(a+b\,\text{ArcSin}[c x])^n\left(-\frac{i (a+b\,\text{ArcSin}[c x])}{b}\right)^{-n}\text{Gamma}\left[1+n,-\frac{7 i (a+b\,\text{ArcSin}[c x])}{b}\right]}{128\,c^2\sqrt{1-c^2 x^2}}-$$

$$\frac{7^{-1-n}\,d^2\,e^{\frac{7 i a}{b}}\sqrt{d-c^2 d x^2}\,(a+b\,\text{ArcSin}[c x])^n\left(\frac{i (a+b\,\text{ArcSin}[c x])}{b}\right)^{-n}\text{Gamma}\left[1+n,\frac{7 i (a+b\,\text{ArcSin}[c x])}{b}\right]}{128\,c^2\sqrt{1-c^2 x^2}}$$

## Problem 494: Result optimal but 1 more steps used.

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

Optimal (type 4, 698 leaves, 12 steps):

$$\frac{5\,d^2\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)^{1+n}}{16\,b\,c\,(1+n)\,\sqrt{1-c^2\,x^2}}-\frac{15\,\mathrm{i}\,2^{-7-n}\,d^2\,e^{-\frac{2\,\mathrm{i}\,a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)^n\left(-\frac{\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right)^{-n}\mathrm{Gamma}\left[1+n,\,-\frac{2\,\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right]}{c\,\sqrt{1-c^2\,x^2}}+$$

$$\frac{15\,\mathrm{i}\,2^{-7-n}\,d^2\,e^{\frac{2\,\mathrm{i}\,a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)^n\left(\frac{\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right)^{-n}\mathrm{Gamma}\left[1+n,\,\frac{2\,\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right]}{c\,\sqrt{1-c^2\,x^2}}-$$

$$\frac{3\,\mathrm{i}\,2^{-7-2\,n}\,d^2\,e^{-\frac{4\,\mathrm{i}\,a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)^n\left(-\frac{\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right)^{-n}\mathrm{Gamma}\left[1+n,\,-\frac{4\,\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right]}{c\,\sqrt{1-c^2\,x^2}}+$$

$$\frac{3\,\mathrm{i}\,2^{-7-2\,n}\,d^2\,e^{\frac{4\,\mathrm{i}\,a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)^n\left(\frac{\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right)^{-n}\mathrm{Gamma}\left[1+n,\,\frac{4\,\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right]}{c\,\sqrt{1-c^2\,x^2}}-\frac{1}{c\,\sqrt{1-c^2\,x^2}}$$

$$\mathrm{i}\,2^{-7-n}\times 3^{-1-n}\,d^2\,e^{-\frac{6\,\mathrm{i}\,a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)^n\left(-\frac{\mathrm{i}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)}{b}\right)^{-n}\mathrm{Gamma}\left[1+n,\,-\frac{6\,\mathrm{i}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)}{b}\right]+$$

$$\frac{\mathrm{i}\,2^{-7-n}\times 3^{-1-n}\,d^2\,e^{\frac{6\,\mathrm{i}\,a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)^n\left(\frac{\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right)^{-n}\mathrm{Gamma}\left[1+n,\,\frac{6\,\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right]}{c\,\sqrt{1-c^2\,x^2}}$$

Result (type 4, 698 leaves, 13 steps):

$$\frac{5\,d^2\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)^{1+n}}{16\,b\,c\,(1+n)\,\sqrt{1-c^2\,x^2}}-\frac{15\,\mathrm{i}\,2^{-7-n}\,d^2\,e^{-\frac{2\,\mathrm{i}\,a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)^n\left(-\frac{\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right)^{-n}\mathrm{Gamma}\left[1+n,\,-\frac{2\,\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right]}{c\,\sqrt{1-c^2\,x^2}}+$$

$$\frac{15\,\mathrm{i}\,2^{-7-n}\,d^2\,e^{\frac{2\,\mathrm{i}\,a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)^n\left(\frac{\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right)^{-n}\mathrm{Gamma}\left[1+n,\,\frac{2\,\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right]}{c\,\sqrt{1-c^2\,x^2}}-$$

$$\frac{3\,\mathrm{i}\,2^{-7-2\,n}\,d^2\,e^{-\frac{4\,\mathrm{i}\,a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)^n\left(-\frac{\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right)^{-n}\mathrm{Gamma}\left[1+n,\,-\frac{4\,\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right]}{c\,\sqrt{1-c^2\,x^2}}+$$

$$\frac{3\,\mathrm{i}\,2^{-7-2\,n}\,d^2\,e^{\frac{4\,\mathrm{i}\,a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)^n\left(\frac{\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right)^{-n}\mathrm{Gamma}\left[1+n,\,\frac{4\,\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right]}{c\,\sqrt{1-c^2\,x^2}}-\frac{1}{c\,\sqrt{1-c^2\,x^2}}$$

$$\mathrm{i}\,2^{-7-n}\times 3^{-1-n}\,d^2\,e^{-\frac{6\,\mathrm{i}\,a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)^n\left(-\frac{\mathrm{i}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)}{b}\right)^{-n}\mathrm{Gamma}\left[1+n,\,-\frac{6\,\mathrm{i}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)}{b}\right]+$$

$$\frac{\mathrm{i}\,2^{-7-n}\times 3^{-1-n}\,d^2\,e^{\frac{6\,\mathrm{i}\,a}{b}}\,\sqrt{d-c^2\,d\,x^2}\,\left(a+b\,\mathrm{ArcSin}[c\,x]\right)^n\left(\frac{\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right)^{-n}\mathrm{Gamma}\left[1+n,\,\frac{6\,\mathrm{i}\,(a+b\,\mathrm{ArcSin}[c\,x])}{b}\right]}{c\,\sqrt{1-c^2\,x^2}}$$

## Problem 495: Rubi result verified and simpler than optimal antiderivative.

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

Optimal (type 8, 826 leaves, 27 steps):

$$\frac{11 d^3 e^{-\frac{i a}{b}} \sqrt{1-c^2 x^2} (a+b \operatorname{ArcSin}[c x])^n \left(-\frac{i (a+b \operatorname{ArcSin}[c x])}{b}\right)^{-n} \operatorname{Gamma}\left[1+n,-\frac{i (a+b \operatorname{ArcSin}[c x])}{b}\right]}{16 \sqrt{d-c^2 d x^2}}+$$
$$\frac{11 d^3 e^{\frac{i a}{b}} \sqrt{1-c^2 x^2} (a+b \operatorname{ArcSin}[c x])^n \left(\frac{i (a+b \operatorname{ArcSin}[c x])}{b}\right)^{-n} \operatorname{Gamma}\left[1+n,\frac{i (a+b \operatorname{ArcSin}[c x])}{b}\right]}{16 \sqrt{d-c^2 d x^2}}-$$
$$\frac{5\times 3^{-1-n} d^3 e^{-\frac{3 i a}{b}} \sqrt{1-c^2 x^2} (a+b \operatorname{ArcSin}[c x])^n \left(-\frac{i (a+b \operatorname{ArcSin}[c x])}{b}\right)^{-n} \operatorname{Gamma}\left[1+n,-\frac{3 i (a+b \operatorname{ArcSin}[c x])}{b}\right]}{32 \sqrt{d-c^2 d x^2}}+$$
$$\frac{3^{-n} d^3 e^{-\frac{3 i a}{b}} \sqrt{1-c^2 x^2} (a+b \operatorname{ArcSin}[c x])^n \left(-\frac{i (a+b \operatorname{ArcSin}[c x])}{b}\right)^{-n} \operatorname{Gamma}\left[1+n,-\frac{3 i (a+b \operatorname{ArcSin}[c x])}{b}\right]}{8 \sqrt{d-c^2 d x^2}}-$$
$$\frac{5\times 3^{-1-n} d^3 e^{\frac{3 i a}{b}} \sqrt{1-c^2 x^2} (a+b \operatorname{ArcSin}[c x])^n \left(\frac{i (a+b \operatorname{ArcSin}[c x])}{b}\right)^{-n} \operatorname{Gamma}\left[1+n,\frac{3 i (a+b \operatorname{ArcSin}[c x])}{b}\right]}{32 \sqrt{d-c^2 d x^2}}+$$
$$\frac{3^{-n} d^3 e^{\frac{3 i a}{b}} \sqrt{1-c^2 x^2} (a+b \operatorname{ArcSin}[c x])^n \left(\frac{i (a+b \operatorname{ArcSin}[c x])}{b}\right)^{-n} \operatorname{Gamma}\left[1+n,\frac{3 i (a+b \operatorname{ArcSin}[c x])}{b}\right]}{8 \sqrt{d-c^2 d x^2}}+$$
$$\frac{5^{-1-n} d^3 e^{-\frac{5 i a}{b}} \sqrt{1-c^2 x^2} (a+b \operatorname{ArcSin}[c x])^n \left(-\frac{i (a+b \operatorname{ArcSin}[c x])}{b}\right)^{-n} \operatorname{Gamma}\left[1+n,-\frac{5 i (a+b \operatorname{ArcSin}[c x])}{b}\right]}{32 \sqrt{d-c^2 d x^2}}+$$
$$\frac{5^{-1-n} d^3 e^{\frac{5 i a}{b}} \sqrt{1-c^2 x^2} (a+b \operatorname{ArcSin}[c x])^n \left(\frac{i (a+b \operatorname{ArcSin}[c x])}{b}\right)^{-n} \operatorname{Gamma}\left[1+n,\frac{5 i (a+b \operatorname{ArcSin}[c x])}{b}\right]}{32 \sqrt{d-c^2 d x^2}}+d^3 \operatorname{Unintegrable}\left[\frac{(a+b \operatorname{ArcSin}[c x])^n}{x \sqrt{d-c^2 d x^2}},x\right]$$

Result (type 8, 31 leaves, 0 steps):

$$\operatorname{Unintegrable}\left[\frac{\left(d-c^2 d x^2\right)^{5/2} (a+b \operatorname{ArcSin}[c x])^n}{x},x\right]$$

## Problem 496: Rubi result verified and simpler than optimal antiderivative.

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

Optimal (type 8, 501 leaves, 18 steps):

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

Result (type 8, 31 leaves, 0 steps):

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

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# Test results for the 474 problems in "5.1.5 Inverse sine functions.m"

## Problem 229: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 248 leaves, 18 steps):

$$-\frac{e^2 (c+d x)^2 \sqrt{1-(c+d x)^2}}{2 b d (a+b \text{ArcSin}[c+d x])^2}-\frac{e^2 (c+d x)}{b^2 d (a+b \text{ArcSin}[c+d x])}+\frac{3 e^2 (c+d x)^3}{2 b^2 d (a+b \text{ArcSin}[c+d x])}-\frac{e^2 \text{Cos}\left[\frac{a}{b}\right] \text{CosIntegral}\left[\frac{a+b \text{ArcSin}[c+d x]}{b}\right]}{8 b^3 d}+$$
$$\frac{9 e^2 \text{Cos}\left[\frac{3 a}{b}\right] \text{CosIntegral}\left[\frac{3 (a+b \text{ArcSin}[c+d x])}{b}\right]}{8 b^3 d}-\frac{e^2 \text{Sin}\left[\frac{a}{b}\right] \text{SinIntegral}\left[\frac{a+b \text{ArcSin}[c+d x]}{b}\right]}{8 b^3 d}+\frac{9 e^2 \text{Sin}\left[\frac{3 a}{b}\right] \text{SinIntegral}\left[\frac{3 (a+b \text{ArcSin}[c+d x])}{b}\right]}{8 b^3 d}$$

Result (type 4, 306 leaves, 18 steps):

$$-\frac{e^2 (c+d x)^2 \sqrt{1-(c+d x)^2}}{2 b d (a+b \text{ArcSin}[c+d x])^2}-\frac{e^2 (c+d x)}{b^2 d (a+b \text{ArcSin}[c+d x])}+\frac{3 e^2 (c+d x)^3}{2 b^2 d (a+b \text{ArcSin}[c+d x])}-\frac{9 e^2 \text{Cos}\left[\frac{a}{b}\right] \text{CosIntegral}\left[\frac{a}{b}+\text{ArcSin}[c+d x]\right]}{8 b^3 d}+\frac{9 e^2 \text{Cos}\left[\frac{3 a}{b}\right] \text{CosIntegral}\left[\frac{3 a}{b}+3 \text{ArcSin}[c+d x]\right]}{8 b^3 d}+\frac{e^2 \text{Cos}\left[\frac{a}{b}\right] \text{CosIntegral}\left[\frac{a+b \text{ArcSin}[c+d x]}{b}\right]}{b^3 d}-\frac{9 e^2 \text{Sin}\left[\frac{a}{b}\right] \text{SinIntegral}\left[\frac{a}{b}+\text{ArcSin}[c+d x]\right]}{8 b^3 d}+\frac{9 e^2 \text{Sin}\left[\frac{3 a}{b}\right] \text{SinIntegral}\left[\frac{3 a}{b}+3 \text{ArcSin}[c+d x]\right]}{8 b^3 d}+\frac{e^2 \text{Sin}\left[\frac{a}{b}\right] \text{SinIntegral}\left[\frac{a+b \text{ArcSin}[c+d x]}{b}\right]}{b^3 d}$$

## Problem 338: Result optimal but 1 more steps used.

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

Optimal (type 3, 46 leaves, 2 steps):

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

Result (type 3, 46 leaves, 3 steps):

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

## Problem 339: Result optimal but 1 more steps used.

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

Optimal (type 3, 46 leaves, 2 steps):

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

Result (type 3, 46 leaves, 3 steps):

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

## Problem 470: Unable to integrate problem.

$$\int\frac{x}{\text{ArcSin}[\text{Sin}[x]]}\,dx$$

Optimal (type 3, 27 leaves, ? steps):

$$\text{ArcSin}[\text{Sin}[x]]+\text{Log}[\text{ArcSin}[\text{Sin}[x]]]\left(-\text{ArcSin}[\text{Sin}[x]]+x\sqrt{\text{Cos}[x]^2}\ \text{Sec}[x]\right)$$

Result (type 8, 9 leaves, 0 steps):

$$\text{CannotIntegrate}\left[\frac{x}{\text{ArcSin}[\text{Sin}[x]]},\,x\right]$$

## Problem 474: Unable to integrate problem.

$$\int\frac{\sqrt{1-x^2}+x\,\text{ArcSin}[x]}{\text{ArcSin}[x]-x^2\,\text{ArcSin}[x]}\,dx$$

Optimal (type 3, 16 leaves, ? steps):

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

Result (type 8, 32 leaves, 1 step):

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

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# Test results for the 227 problems in "5.2.2 (d x)^m (a+b arccos(c x))^n.m"

## Problem 168: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 197 leaves, 16 steps):

$$\frac{x^2\sqrt{1-c^2x^2}}{2bc\left(a+b\,\text{ArcCos}[c\,x]\right)^2}-\frac{x}{b^2c^2\left(a+b\,\text{ArcCos}[c\,x]\right)}+\frac{3x^3}{2b^2\left(a+b\,\text{ArcCos}[c\,x]\right)}-\frac{\text{CosIntegral}\left[\frac{a+b\,\text{ArcCos}[c\,x]}{b}\right]\text{Sin}\left[\frac{a}{b}\right]}{8b^3c^3}-\frac{9\,\text{CosIntegral}\left[\frac{3(a+b\,\text{ArcCos}[c\,x])}{b}\right]\text{Sin}\left[\frac{3a}{b}\right]}{8b^3c^3}+\frac{\text{Cos}\left[\frac{a}{b}\right]\text{SinIntegral}\left[\frac{a+b\,\text{ArcCos}[c\,x]}{b}\right]}{8b^3c^3}+\frac{9\,\text{Cos}\left[\frac{3a}{b}\right]\text{SinIntegral}\left[\frac{3(a+b\,\text{ArcCos}[c\,x])}{b}\right]}{8b^3c^3}$$

Result (type 4, 246 leaves, 16 steps):

$$\frac{x^2\sqrt{1-c^2x^2}}{2bc\left(a+b\,\text{ArcCos}[c\,x]\right)^2}-\frac{x}{b^2c^2\left(a+b\,\text{ArcCos}[c\,x]\right)}+\frac{3x^3}{2b^2\left(a+b\,\text{ArcCos}[c\,x]\right)}-\frac{9\,\text{CosIntegral}\left[\frac{a}{b}+\text{ArcCos}[c\,x]\right]\text{Sin}\left[\frac{a}{b}\right]}{8b^3c^3}+\frac{\text{CosIntegral}\left[\frac{a+b\,\text{ArcCos}[c\,x]}{b}\right]\text{Sin}\left[\frac{a}{b}\right]}{b^3c^3}-\frac{9\,\text{CosIntegral}\left[\frac{3a}{b}+3\,\text{ArcCos}[c\,x]\right]\text{Sin}\left[\frac{3a}{b}\right]}{8b^3c^3}+\frac{9\,\text{Cos}\left[\frac{a}{b}\right]\text{SinIntegral}\left[\frac{a}{b}+\text{ArcCos}[c\,x]\right]}{8b^3c^3}+\frac{9\,\text{Cos}\left[\frac{3a}{b}\right]\text{SinIntegral}\left[\frac{3a}{b}+3\,\text{ArcCos}[c\,x]\right]}{8b^3c^3}-\frac{\text{Cos}\left[\frac{a}{b}\right]\text{SinIntegral}\left[\frac{a+b\,\text{ArcCos}[c\,x]}{b}\right]}{b^3c^3}$$

# Test results for the 33 problems in "5.2.4 (f x)^m (d+e x^2)^p (a+b arccos(c x))^n.m"

# Test results for the 118 problems in "5.2.5 Inverse cosine functions.m"

# Test results for the 166 problems in "5.3.2 (d x)^m (a+b arctan(c x^n))^p.m"

## Problem 74: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int x^7\left(a+b\,\text{ArcTan}[c\,x^2]\right)^2\,dx$$

Optimal (type 3, 124 leaves, 12 steps):

$$\frac{a\,b\,x^2}{4c^3}+\frac{b^2x^4}{24c^2}+\frac{b^2x^2\,\text{ArcTan}[c\,x^2]}{4c^3}-\frac{b\,x^6\left(a+b\,\text{ArcTan}[c\,x^2]\right)}{12c}-\frac{\left(a+b\,\text{ArcTan}[c\,x^2]\right)^2}{8c^4}+\frac{1}{8}x^8\left(a+b\,\text{ArcTan}[c\,x^2]\right)^2-\frac{b^2\,\text{Log}\left[1+c^2x^4\right]}{6c^4}$$

Result (type 4, 731 leaves, 62 steps):

$$\frac{a\,b\,x^2}{8\,c^3}-\frac{23\,i\,b^2\,x^2}{192\,c^3}+\frac{b^2\,x^4}{128\,c^2}-\frac{7\,i\,b^2\,x^6}{576\,c}+\frac{b^2\,x^8}{256}-\frac{3\,b^2\,\left(1-i\,c\,x^2\right)^2}{32\,c^4}+\frac{b^2\,\left(1-i\,c\,x^2\right)^3}{36\,c^4}-\frac{b^2\,\left(1-i\,c\,x^2\right)^4}{256\,c^4}-$$

$$\frac{b^2\,\text{Log}\left[i-c\,x^2\right]}{24\,c^4}-\frac{b^2\,\left(1-i\,c\,x^2\right)\,\text{Log}\left[1-i\,c\,x^2\right]}{16\,c^4}-\frac{b^2\,\text{Log}\left[1-i\,c\,x^2\right]^2}{32\,c^4}-\frac{b\,x^4\,\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^2\right]\right)}{32\,c^2}+$$

$$\frac{i\,b\,x^6\,\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^2\right]\right)}{48\,c}+\frac{1}{64}\,b\,x^8\,\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^2\right]\right)+\frac{1}{32}\,x^8\,\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^2\right]\right)^2+$$

$$\frac{1}{192}\,i\,b\,\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^2\right]\right)\,\left(\frac{48\,\left(1-i\,c\,x^2\right)}{c^4}-\frac{36\,\left(1-i\,c\,x^2\right)^2}{c^4}+\frac{16\,\left(1-i\,c\,x^2\right)^3}{c^4}-\frac{3\,\left(1-i\,c\,x^2\right)^4}{c^4}-\frac{12\,\text{Log}\left[1-i\,c\,x^2\right]}{c^4}\right)+$$

$$\frac{b\,\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^2\right]\right)\,\text{Log}\left[\frac{1}{2}\,\left(1+i\,c\,x^2\right)\right]}{16\,c^4}+\frac{i\,b^2\,x^6\,\text{Log}\left[1+i\,c\,x^2\right]}{24\,c}-\frac{b^2\,\left(1+i\,c\,x^2\right)\,\text{Log}\left[1+i\,c\,x^2\right]}{8\,c^4}-$$

$$\frac{b^2\,\text{Log}\left[\frac{1}{2}\,\left(1-i\,c\,x^2\right)\right]\,\text{Log}\left[1+i\,c\,x^2\right]}{16\,c^4}-\frac{1}{16}\,b\,x^8\,\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^2\right]\right)\,\text{Log}\left[1+i\,c\,x^2\right]+\frac{b^2\,\text{Log}\left[1+i\,c\,x^2\right]^2}{32\,c^4}-$$

$$\frac{1}{32}\,b^2\,x^8\,\text{Log}\left[1+i\,c\,x^2\right]^2+\frac{5\,b^2\,\text{Log}\left[i+c\,x^2\right]}{192\,c^4}-\frac{b^2\,\text{PolyLog}\left[2,\,\frac{1}{2}\,\left(1-i\,c\,x^2\right)\right]}{16\,c^4}-\frac{b^2\,\text{PolyLog}\left[2,\,\frac{1}{2}\,\left(1+i\,c\,x^2\right)\right]}{16\,c^4}$$

## Problem 75: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 154 leaves, 10 steps):

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

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

Result (type 4, 647 leaves, 53 steps):

$$-\frac{i a b x^2}{6 c^2}+\frac{19 b^2 x^2}{72 c^2}-\frac{5 i b^2 x^4}{144 c}+\frac{b^2 x^6}{108}-\frac{i b^2 \left(1-i c x^2\right)^2}{16 c^3}+\frac{i b^2 \left(1-i c x^2\right)^3}{108 c^3}+\frac{i b^2 \operatorname{Log}\left[i-c x^2\right]}{12 c^3}+\frac{i b^2 \left(1-i c x^2\right) \operatorname{Log}\left[1-i c x^2\right]}{12 c^3}-\frac{i b^2 \operatorname{Log}\left[1-i c x^2\right]^2}{24 c^3}+\frac{i b x^4 \left(2 i a-b \operatorname{Log}\left[1-i c x^2\right]\right)}{24 c}+\frac{1}{36} b x^6 \left(2 i a-b \operatorname{Log}\left[1-i c x^2\right]\right)+\frac{1}{24} x^6 \left(2 a+i b \operatorname{Log}\left[1-i c x^2\right]\right)^2+\frac{1}{72} i b \left(2 a+i b \operatorname{Log}\left[1-i c x^2\right]\right) \left(\frac{18 i \left(1-i c x^2\right)}{c^3}-\frac{9 i \left(1-i c x^2\right)^2}{c^3}+\frac{2 i \left(1-i c x^2\right)^3}{c^3}-\frac{6 i \operatorname{Log}\left[1-i c x^2\right]}{c^3}\right)-\frac{i b \left(2 i a-b \operatorname{Log}\left[1-i c x^2\right]\right) \operatorname{Log}\left[\frac{1}{2} \left(1+i c x^2\right)\right]}{12 c^3}+\frac{i b^2 x^4 \operatorname{Log}\left[1+i c x^2\right]}{12 c}-\frac{i b^2 \operatorname{Log}\left[\frac{1}{2} \left(1-i c x^2\right)\right] \operatorname{Log}\left[1+i c x^2\right]}{12 c^3}-\frac{1}{12} b x^6 \left(2 i a-b \operatorname{Log}\left[1-i c x^2\right]\right) \operatorname{Log}\left[1+i c x^2\right]-\frac{i b^2 \operatorname{Log}\left[1+i c x^2\right]^2}{24 c^3}-\frac{1}{24} b^2 x^6 \operatorname{Log}\left[1+i c x^2\right]^2-\frac{i b^2 \operatorname{Log}\left[i+c x^2\right]}{72 c^3}+\frac{i b^2 \operatorname{PolyLog}\left[2,\frac{1}{2} \left(1-i c x^2\right)\right]}{12 c^3}-\frac{i b^2 \operatorname{PolyLog}\left[2,\frac{1}{2} \left(1+i c x^2\right)\right]}{12 c^3}$$

## Problem 76: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 90 leaves, 7 steps):

$$-\frac{a b x^2}{2 c}-\frac{b^2 x^2 \operatorname{ArcTan}\left[c x^2\right]}{2 c}+\frac{\left(a+b \operatorname{ArcTan}\left[c x^2\right]\right)^2}{4 c^2}+\frac{1}{4} x^4 \left(a+b \operatorname{ArcTan}\left[c x^2\right]\right)^2+\frac{b^2 \operatorname{Log}\left[1+c^2 x^4\right]}{4 c^2}$$

Result (type 4, 612 leaves, 44 steps):

$$-\frac{3 a b x^2}{4 c}+\frac{b^2 x^4}{16}+\frac{b^2 \left(1-i c x^2\right)^2}{32 c^2}+\frac{b^2 \left(1+i c x^2\right)^2}{32 c^2}-\frac{b^2 \operatorname{Log}\left[i-c x^2\right]}{16 c^2}+\frac{3 b^2 \left(1-i c x^2\right) \operatorname{Log}\left[1-i c x^2\right]}{8 c^2}+\frac{1}{16} b x^4 \left(2 i a-b \operatorname{Log}\left[1-i c x^2\right]\right)+\frac{i b \left(1-i c x^2\right)^2 \left(2 a+i b \operatorname{Log}\left[1-i c x^2\right]\right)}{16 c^2}+\frac{\left(1-i c x^2\right) \left(2 a+i b \operatorname{Log}\left[1-i c x^2\right]\right)^2}{8 c^2}-\frac{\left(1-i c x^2\right)^2 \left(2 a+i b \operatorname{Log}\left[1-i c x^2\right]\right)^2}{16 c^2}-\frac{b \left(2 i a-b \operatorname{Log}\left[1-i c x^2\right]\right) \operatorname{Log}\left[\frac{1}{2} \left(1+i c x^2\right)\right]}{8 c^2}-\frac{1}{16} b^2 x^4 \operatorname{Log}\left[1+i c x^2\right]+\frac{3 b^2 \left(1+i c x^2\right) \operatorname{Log}\left[1+i c x^2\right]}{8 c^2}-\frac{b^2 \left(1+i c x^2\right)^2 \operatorname{Log}\left[1+i c x^2\right]}{16 c^2}+\frac{b^2 \operatorname{Log}\left[\frac{1}{2} \left(1-i c x^2\right)\right] \operatorname{Log}\left[1+i c x^2\right]}{8 c^2}-\frac{1}{8} b x^4 \left(2 i a-b \operatorname{Log}\left[1-i c x^2\right]\right) \operatorname{Log}\left[1+i c x^2\right]-\frac{b^2 \left(1+i c x^2\right) \operatorname{Log}\left[1+i c x^2\right]^2}{8 c^2}+\frac{b^2 \left(1+i c x^2\right)^2 \operatorname{Log}\left[1+i c x^2\right]^2}{16 c^2}-\frac{b^2 \operatorname{Log}\left[i+c x^2\right]}{16 c^2}+\frac{b^2 \operatorname{PolyLog}\left[2,\frac{1}{2} \left(1-i c x^2\right)\right]}{8 c^2}+\frac{b^2 \operatorname{PolyLog}\left[2,\frac{1}{2} \left(1+i c x^2\right)\right]}{8 c^2}$$

## Problem 77: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 101 leaves, 6 steps):

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

Result (type 4, 255 leaves, 28 steps):

$$\frac{i\,(1-i\,c\,x^2)\,(2\,a+i\,b\,\text{Log}[1-i\,c\,x^2])^2}{8\,c}+\frac{i\,b\,(2\,i\,a-b\,\text{Log}[1-i\,c\,x^2])\,\text{Log}\left[\frac{1}{2}\,(1+i\,c\,x^2)\right]}{4\,c}+\frac{i\,b^2\,\text{Log}\left[\frac{1}{2}\,(1-i\,c\,x^2)\right]\,\text{Log}[1+i\,c\,x^2]}{4\,c}-$$
$$\frac{1}{4}\,b\,x^2\,(2\,i\,a-b\,\text{Log}[1-i\,c\,x^2])\,\text{Log}[1+i\,c\,x^2]+\frac{i\,b^2\,(1+i\,c\,x^2)\,\text{Log}[1+i\,c\,x^2]^2}{8\,c}-\frac{i\,b^2\,\text{PolyLog}\left[2,\,\frac{1}{2}\,(1-i\,c\,x^2)\right]}{4\,c}+\frac{i\,b^2\,\text{PolyLog}\left[2,\,\frac{1}{2}\,(1+i\,c\,x^2)\right]}{4\,c}$$

## Problem 79: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 97 leaves, 5 steps):

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

Result (type 4, 290 leaves, 24 steps):

$$2\,a\,b\,c\,\text{Log}[x]-\frac{(1-i\,c\,x^2)\,(2\,a+i\,b\,\text{Log}[1-i\,c\,x^2])^2}{8\,x^2}+\frac{1}{4}\,i\,b\,c\,(2\,i\,a-b\,\text{Log}[1-i\,c\,x^2])\,\text{Log}\left[\frac{1}{2}\,(1+i\,c\,x^2)\right]+$$
$$\frac{1}{4}\,i\,b^2\,c\,\text{Log}\left[\frac{1}{2}\,(1-i\,c\,x^2)\right]\,\text{Log}[1+i\,c\,x^2]+\frac{b\,(2\,i\,a-b\,\text{Log}[1-i\,c\,x^2])\,\text{Log}[1+i\,c\,x^2]}{4\,x^2}+\frac{b^2\,(1+i\,c\,x^2)\,\text{Log}[1+i\,c\,x^2]^2}{8\,x^2}+$$
$$\frac{1}{2}\,i\,b^2\,c\,\text{PolyLog}[2,\,-i\,c\,x^2]-\frac{1}{2}\,i\,b^2\,c\,\text{PolyLog}[2,\,i\,c\,x^2]-\frac{1}{4}\,i\,b^2\,c\,\text{PolyLog}\left[2,\,\frac{1}{2}\,(1-i\,c\,x^2)\right]+\frac{1}{4}\,i\,b^2\,c\,\text{PolyLog}\left[2,\,\frac{1}{2}\,(1+i\,c\,x^2)\right]$$

## Problem 80: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 87 leaves, 9 steps):

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

Result (type 4, 419 leaves, 46 steps):

$$b^2\,c^2\,\text{Log}[x]-\frac{1}{4}\,b^2\,c^2\,\text{Log}\left[\mathrm{i}-c\,x^2\right]+\frac{\mathrm{i}\,b\,c\,\left(2\,\mathrm{i}\,a-b\,\text{Log}\left[1-\mathrm{i}\,c\,x^2\right]\right)}{8\,x^2}-\frac{b\,c\,\left(1-\mathrm{i}\,c\,x^2\right)\,\left(2\,a+\mathrm{i}\,b\,\text{Log}\left[1-\mathrm{i}\,c\,x^2\right]\right)}{8\,x^2}-$$
$$\frac{1}{16}\,c^2\,\left(2\,a+\mathrm{i}\,b\,\text{Log}\left[1-\mathrm{i}\,c\,x^2\right]\right)^2-\frac{\left(2\,a+\mathrm{i}\,b\,\text{Log}\left[1-\mathrm{i}\,c\,x^2\right]\right)^2}{16\,x^4}+\frac{1}{8}\,b\,c^2\,\left(2\,\mathrm{i}\,a-b\,\text{Log}\left[1-\mathrm{i}\,c\,x^2\right]\right)\,\text{Log}\left[\frac{1}{2}\,\left(1+\mathrm{i}\,c\,x^2\right)\right]+$$
$$\frac{\mathrm{i}\,b^2\,c\,\text{Log}\left[1+\mathrm{i}\,c\,x^2\right]}{4\,x^2}-\frac{1}{8}\,b^2\,c^2\,\text{Log}\left[\frac{1}{2}\,\left(1-\mathrm{i}\,c\,x^2\right)\right]\,\text{Log}\left[1+\mathrm{i}\,c\,x^2\right]+\frac{b\,\left(2\,\mathrm{i}\,a-b\,\text{Log}\left[1-\mathrm{i}\,c\,x^2\right]\right)\,\text{Log}\left[1+\mathrm{i}\,c\,x^2\right]}{8\,x^4}+\frac{1}{16}\,b^2\,c^2\,\text{Log}\left[1+\mathrm{i}\,c\,x^2\right]^2+$$
$$\frac{b^2\,\text{Log}\left[1+\mathrm{i}\,c\,x^2\right]^2}{16\,x^4}-\frac{1}{8}\,b^2\,c^2\,\text{Log}\left[\mathrm{i}+c\,x^2\right]-\frac{1}{8}\,b^2\,c^2\,\text{PolyLog}\left[2,\,\frac{1}{2}\,\left(1-\mathrm{i}\,c\,x^2\right)\right]-\frac{1}{8}\,b^2\,c^2\,\text{PolyLog}\left[2,\,\frac{1}{2}\,\left(1+\mathrm{i}\,c\,x^2\right)\right]$$

## Problem 86: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 149 leaves, 9 steps):

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

Result (type 4, 951 leaves, 155 steps):

$$\frac{3\,i\,b^2\,(1-i\,c\,x^2)^2\,(2\,i\,a-b\,\mathrm{Log}[1-i\,c\,x^2])}{64\,c^2}+\frac{3\,i\,b\,(1-i\,c\,x^2)^2\,(2\,i\,a-b\,\mathrm{Log}[1-i\,c\,x^2])^2}{64\,c^2}+\frac{3\,b^2\,(1-i\,c\,x^2)^2\,(2\,a+i\,b\,\mathrm{Log}[1-i\,c\,x^2])}{64\,c^2}-$$

$$\frac{3\,i\,b\,(1-i\,c\,x^2)\,(2\,a+i\,b\,\mathrm{Log}[1-i\,c\,x^2])^2}{16\,c^2}+\frac{3\,i\,b\,(1-i\,c\,x^2)^2\,(2\,a+i\,b\,\mathrm{Log}[1-i\,c\,x^2])^2}{64\,c^2}+\frac{(1-i\,c\,x^2)\,(2\,a+i\,b\,\mathrm{Log}[1-i\,c\,x^2])^3}{16\,c^2}-$$

$$\frac{(1-i\,c\,x^2)^2\,(2\,a+i\,b\,\mathrm{Log}[1-i\,c\,x^2])^3}{32\,c^2}-\frac{3\,i\,b^2\,(2\,i\,a-b\,\mathrm{Log}[1-i\,c\,x^2])\,\mathrm{Log}[\frac{1}{2}\,(1+i\,c\,x^2)]}{8\,c^2}+\frac{3\,i\,b\,(2\,i\,a-b\,\mathrm{Log}[1-i\,c\,x^2])^2\,\mathrm{Log}[\frac{1}{2}\,(1+i\,c\,x^2)]}{32\,c^2}+$$

$$\frac{3\,i\,b\,(2\,a+i\,b\,\mathrm{Log}[1-i\,c\,x^2])^2\,\mathrm{Log}[\frac{1}{2}\,(1+i\,c\,x^2)]}{32\,c^2}-\frac{3\,i\,b^3\,\mathrm{Log}[\frac{1}{2}\,(1-i\,c\,x^2)]\,\mathrm{Log}[1+i\,c\,x^2]}{8\,c^2}+\frac{3\,b^2\,x^2\,(2\,i\,a-b\,\mathrm{Log}[1-i\,c\,x^2])\,\mathrm{Log}[1+i\,c\,x^2]}{8\,c}+$$

$$\frac{3}{32}\,i\,b\,x^4\,(2\,i\,a-b\,\mathrm{Log}[1-i\,c\,x^2])^2\,\mathrm{Log}[1+i\,c\,x^2]-\frac{3\,i\,b\,(2\,a+i\,b\,\mathrm{Log}[1-i\,c\,x^2])^2\,\mathrm{Log}[1+i\,c\,x^2]}{32\,c^2}-\frac{3\,i\,b^3\,(1+i\,c\,x^2)\,\mathrm{Log}[1+i\,c\,x^2]^2}{16\,c^2}+$$

$$\frac{3}{32}\,i\,b^2\,x^4\,(2\,i\,a-b\,\mathrm{Log}[1-i\,c\,x^2])\,\mathrm{Log}[1+i\,c\,x^2]^2-\frac{3\,b^2\,(2\,a+i\,b\,\mathrm{Log}[1-i\,c\,x^2])\,\mathrm{Log}[1+i\,c\,x^2]^2}{32\,c^2}+\frac{i\,b^3\,(1+i\,c\,x^2)\,\mathrm{Log}[1+i\,c\,x^2]^3}{16\,c^2}-$$

$$\frac{i\,b^3\,(1+i\,c\,x^2)^2\,\mathrm{Log}[1+i\,c\,x^2]^3}{32\,c^2}+\frac{3\,i\,b^3\,\mathrm{PolyLog}[2,\,\frac{1}{2}\,(1-i\,c\,x^2)]}{8\,c^2}-\frac{3\,i\,b^2\,(2\,i\,a-b\,\mathrm{Log}[1-i\,c\,x^2])\,\mathrm{PolyLog}[2,\,\frac{1}{2}\,(1-i\,c\,x^2)]}{16\,c^2}-$$

$$\frac{3\,b^2\,(2\,a+i\,b\,\mathrm{Log}[1-i\,c\,x^2])\,\mathrm{PolyLog}[2,\,\frac{1}{2}\,(1-i\,c\,x^2)]}{16\,c^2}-\frac{3\,i\,b^3\,\mathrm{PolyLog}[2,\,\frac{1}{2}\,(1+i\,c\,x^2)]}{8\,c^2}$$

## Problem 87: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 144 leaves, 6 steps):

$$\frac{i\,(a+b\,\mathrm{ArcTan}[c\,x^2])^3}{2\,c}+\frac{1}{2}\,x^2\,(a+b\,\mathrm{ArcTan}[c\,x^2])^3+\frac{3\,b\,(a+b\,\mathrm{ArcTan}[c\,x^2])^2\,\mathrm{Log}[\frac{2}{1+i\,c\,x^2}]}{2\,c}+$$

$$\frac{3\,i\,b^2\,(a+b\,\mathrm{ArcTan}[c\,x^2])\,\mathrm{PolyLog}[2,\,1-\frac{2}{1+i\,c\,x^2}]}{2\,c}+\frac{3\,b^3\,\mathrm{PolyLog}[3,\,1-\frac{2}{1+i\,c\,x^2}]}{4\,c}$$

Result (type 4, 545 leaves, 82 steps):

$$\frac{3\,b\,(1-i\,c\,x^2)\,(2\,i\,a-b\,\text{Log}[1-i\,c\,x^2])^2}{16\,c}+\frac{3\,b\,(1-i\,c\,x^2)\,(2\,a+i\,b\,\text{Log}[1-i\,c\,x^2])^2}{16\,c}+\frac{i\,(1-i\,c\,x^2)\,(2\,a+i\,b\,\text{Log}[1-i\,c\,x^2])^3}{16\,c}+$$
$$\frac{3\,b\,(2\,i\,a-b\,\text{Log}[1-i\,c\,x^2])^2\,\text{Log}\left[\frac{1}{2}\,(1+i\,c\,x^2)\right]}{8\,c}-\frac{3\,b\,(2\,i\,a-b\,\text{Log}[1-i\,c\,x^2])^2\,\text{Log}[1+i\,c\,x^2]}{16\,c}+$$
$$\frac{3}{16}\,i\,b\,x^2\,(2\,i\,a-b\,\text{Log}[1-i\,c\,x^2])^2\,\text{Log}[1+i\,c\,x^2]+\frac{3\,b^3\,\text{Log}\left[\frac{1}{2}\,(1-i\,c\,x^2)\right]\,\text{Log}[1+i\,c\,x^2]^2}{8\,c}+\frac{3\,b^2\,(2\,i\,a-b\,\text{Log}[1-i\,c\,x^2])\,\text{Log}[1+i\,c\,x^2]^2}{16\,c}+$$
$$\frac{3}{16}\,i\,b^2\,x^2\,(2\,i\,a-b\,\text{Log}[1-i\,c\,x^2])\,\text{Log}[1+i\,c\,x^2]^2+\frac{b^3\,(1+i\,c\,x^2)\,\text{Log}[1+i\,c\,x^2]^3}{16\,c}-\frac{3\,b^2\,(2\,i\,a-b\,\text{Log}[1-i\,c\,x^2])\,\text{PolyLog}\left[2,\frac{1}{2}\,(1-i\,c\,x^2)\right]}{4\,c}+$$
$$\frac{3\,b^3\,\text{Log}[1+i\,c\,x^2]\,\text{PolyLog}\left[2,\frac{1}{2}\,(1+i\,c\,x^2)\right]}{4\,c}-\frac{3\,b^3\,\text{PolyLog}\left[3,\frac{1}{2}\,(1-i\,c\,x^2)\right]}{4\,c}-\frac{3\,b^3\,\text{PolyLog}\left[3,\frac{1}{2}\,(1+i\,c\,x^2)\right]}{4\,c}$$

## Problem 89: Unable to integrate problem.

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

Optimal (type 4, 138 leaves, 6 steps):

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

Result (type 8, 347 leaves, 16 steps):

$$\frac{3}{16}\,b\,c\,\text{Log}[i\,c\,x^2]\,(2\,a+i\,b\,\text{Log}[1-i\,c\,x^2])^2-\frac{(1-i\,c\,x^2)\,(2\,a+i\,b\,\text{Log}[1-i\,c\,x^2])^3}{16\,x^2}-$$
$$\frac{3}{16}\,b^3\,c\,\text{Log}[-i\,c\,x^2]\,\text{Log}[1+i\,c\,x^2]^2-\frac{i\,b^3\,(1+i\,c\,x^2)\,\text{Log}[1+i\,c\,x^2]^3}{16\,x^2}+\frac{3}{8}\,i\,b^2\,c\,(2\,a+i\,b\,\text{Log}[1-i\,c\,x^2])\,\text{PolyLog}[2,1-i\,c\,x^2]-$$
$$\frac{3}{8}\,b^3\,c\,\text{Log}[1+i\,c\,x^2]\,\text{PolyLog}[2,1+i\,c\,x^2]+\frac{3}{8}\,b^3\,c\,\text{PolyLog}[3,1-i\,c\,x^2]+\frac{3}{8}\,b^3\,c\,\text{PolyLog}[3,1+i\,c\,x^2]+$$
$$\frac{3}{8}\,i\,b\,\text{Unintegrable}\left[\frac{(-2\,i\,a+b\,\text{Log}[1-i\,c\,x^2])^2\,\text{Log}[1+i\,c\,x^2]}{x^3},x\right]-\frac{3}{8}\,i\,b^2\,\text{Unintegrable}\left[\frac{(-2\,i\,a+b\,\text{Log}[1-i\,c\,x^2])\,\text{Log}[1+i\,c\,x^2]^2}{x^3},x\right]$$

## Problem 90: Unable to integrate problem.

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

Optimal (type 4, 149 leaves, 8 steps):

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

Result (type 8, 533 leaves, 29 steps):

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

## Problem 93: Result optimal but 1 more steps used.

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

Optimal (type 5, 75 leaves, 2 steps):

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

Result (type 5, 75 leaves, 3 steps):

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

## Problem 113: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int x^{11}\left(a+b\,\mathrm{ArcTan}\left[c\,x^3\right]\right)^2\,dx$$

Optimal (type 3, 124 leaves, 12 steps):

$$\frac{a\,b\,x^3}{6\,c^3}+\frac{b^2\,x^6}{36\,c^2}+\frac{b^2\,x^3\,\mathrm{ArcTan}\left[c\,x^3\right]}{6\,c^3}-\frac{b\,x^9\,\left(a+b\,\mathrm{ArcTan}\left[c\,x^3\right]\right)}{18\,c}-\frac{\left(a+b\,\mathrm{ArcTan}\left[c\,x^3\right]\right)^2}{12\,c^4}+\frac{1}{12}\,x^{12}\,\left(a+b\,\mathrm{ArcTan}\left[c\,x^3\right]\right)^2-\frac{b^2\,\mathrm{Log}\left[1+c^2\,x^6\right]}{9\,c^4}$$

Result (type 4, 731 leaves, 62 steps):

$$\frac{a\,b\,x^3}{12\,c^3}-\frac{23\,i\,b^2\,x^3}{288\,c^3}+\frac{b^2\,x^6}{192\,c^2}-\frac{7\,i\,b^2\,x^9}{864\,c}+\frac{b^2\,x^{12}}{384}-\frac{b^2\,\left(1-i\,c\,x^3\right)^2}{16\,c^4}+\frac{b^2\,\left(1-i\,c\,x^3\right)^3}{54\,c^4}-\frac{b^2\,\left(1-i\,c\,x^3\right)^4}{384\,c^4}-$$
$$\frac{b^2\,\mathrm{Log}\left[i-c\,x^3\right]}{36\,c^4}-\frac{b^2\,\left(1-i\,c\,x^3\right)\,\mathrm{Log}\left[1-i\,c\,x^3\right]}{24\,c^4}-\frac{b^2\,\mathrm{Log}\left[1-i\,c\,x^3\right]^2}{48\,c^4}-\frac{b\,x^6\,\left(2\,i\,a-b\,\mathrm{Log}\left[1-i\,c\,x^3\right]\right)}{48\,c^2}+$$
$$\frac{i\,b\,x^9\,\left(2\,i\,a-b\,\mathrm{Log}\left[1-i\,c\,x^3\right]\right)}{72\,c}+\frac{1}{96}\,b\,x^{12}\,\left(2\,i\,a-b\,\mathrm{Log}\left[1-i\,c\,x^3\right]\right)+\frac{1}{48}\,x^{12}\,\left(2\,a+i\,b\,\mathrm{Log}\left[1-i\,c\,x^3\right]\right)^2+$$
$$\frac{1}{288}\,i\,b\,\left(2\,a+i\,b\,\mathrm{Log}\left[1-i\,c\,x^3\right]\right)\,\left(\frac{48\,\left(1-i\,c\,x^3\right)}{c^4}-\frac{36\,\left(1-i\,c\,x^3\right)^2}{c^4}+\frac{16\,\left(1-i\,c\,x^3\right)^3}{c^4}-\frac{3\,\left(1-i\,c\,x^3\right)^4}{c^4}-\frac{12\,\mathrm{Log}\left[1-i\,c\,x^3\right]}{c^4}\right)+$$
$$\frac{b\,\left(2\,i\,a-b\,\mathrm{Log}\left[1-i\,c\,x^3\right]\right)\,\mathrm{Log}\left[\frac{1}{2}\,\left(1+i\,c\,x^3\right)\right]}{24\,c^4}+\frac{i\,b^2\,x^9\,\mathrm{Log}\left[1+i\,c\,x^3\right]}{36\,c}-\frac{b^2\,\left(1+i\,c\,x^3\right)\,\mathrm{Log}\left[1+i\,c\,x^3\right]}{12\,c^4}-$$
$$\frac{b^2\,\mathrm{Log}\left[\frac{1}{2}\,\left(1-i\,c\,x^3\right)\right]\,\mathrm{Log}\left[1+i\,c\,x^3\right]}{24\,c^4}-\frac{1}{24}\,b\,x^{12}\,\left(2\,i\,a-b\,\mathrm{Log}\left[1-i\,c\,x^3\right]\right)\,\mathrm{Log}\left[1+i\,c\,x^3\right]+\frac{b^2\,\mathrm{Log}\left[1+i\,c\,x^3\right]^2}{48\,c^4}-$$
$$\frac{1}{48}\,b^2\,x^{12}\,\mathrm{Log}\left[1+i\,c\,x^3\right]^2+\frac{5\,b^2\,\mathrm{Log}\left[i+c\,x^3\right]}{288\,c^4}-\frac{b^2\,\mathrm{PolyLog}\left[2,\frac{1}{2}\,\left(1-i\,c\,x^3\right)\right]}{24\,c^4}-\frac{b^2\,\mathrm{PolyLog}\left[2,\frac{1}{2}\,\left(1+i\,c\,x^3\right)\right]}{24\,c^4}$$

## Problem 114: Result valid but suboptimal antiderivative.

$$\int x^8\left(a+b\,\mathrm{ArcTan}\left[c\,x^3\right]\right)^2\,dx$$

Optimal (type 4, 154 leaves, 10 steps):

$$\frac{b^2 x^3}{9 c^2}-\frac{b^2 \text{ArcTan}\left[c x^3\right]}{9 c^3}-\frac{b x^6 \left(a+b \text{ArcTan}\left[c x^3\right]\right)}{9 c}-\frac{i \left(a+b \text{ArcTan}\left[c x^3\right]\right)^2}{9 c^3}+$$
$$\frac{1}{9} x^9 \left(a+b \text{ArcTan}\left[c x^3\right]\right)^2-\frac{2 b \left(a+b \text{ArcTan}\left[c x^3\right]\right) \text{Log}\left[\frac{2}{1+i c x^3}\right]}{9 c^3}-\frac{i b^2 \text{PolyLog}\left[2, 1-\frac{2}{1+i c x^3}\right]}{9 c^3}$$

Result (type 4, 647 leaves, 53 steps):

$$-\frac{i a b x^3}{9 c^2}+\frac{19 b^2 x^3}{108 c^2}-\frac{5 i b^2 x^6}{216 c}+\frac{b^2 x^9}{162}-\frac{i b^2 \left(1-i c x^3\right)^2}{24 c^3}+\frac{i b^2 \left(1-i c x^3\right)^3}{162 c^3}+\frac{i b^2 \text{Log}\left[i-c x^3\right]}{18 c^3}+\frac{i b^2 \left(1-i c x^3\right) \text{Log}\left[1-i c x^3\right]}{18 c^3}-$$
$$\frac{i b^2 \text{Log}\left[1-i c x^3\right]^2}{36 c^3}+\frac{i b x^6 \left(2 i a-b \text{Log}\left[1-i c x^3\right]\right)}{36 c}+\frac{1}{54} b x^9 \left(2 i a-b \text{Log}\left[1-i c x^3\right]\right)+\frac{1}{36} x^9 \left(2 a+i b \text{Log}\left[1-i c x^3\right]\right)^2+$$
$$\frac{1}{108} i b \left(2 a+i b \text{Log}\left[1-i c x^3\right]\right) \left(\frac{18 i \left(1-i c x^3\right)}{c^3}-\frac{9 i \left(1-i c x^3\right)^2}{c^3}+\frac{2 i \left(1-i c x^3\right)^3}{c^3}-\frac{6 i \text{Log}\left[1-i c x^3\right]}{c^3}\right)-$$
$$\frac{i b \left(2 i a-b \text{Log}\left[1-i c x^3\right]\right) \text{Log}\left[\frac{1}{2} \left(1+i c x^3\right)\right]}{18 c^3}+\frac{i b^2 x^6 \text{Log}\left[1+i c x^3\right]}{18 c}-\frac{i b^2 \text{Log}\left[\frac{1}{2} \left(1-i c x^3\right)\right] \text{Log}\left[1+i c x^3\right]}{18 c^3}-$$
$$\frac{1}{18} b x^9 \left(2 i a-b \text{Log}\left[1-i c x^3\right]\right) \text{Log}\left[1+i c x^3\right]-\frac{i b^2 \text{Log}\left[1+i c x^3\right]^2}{36 c^3}-\frac{1}{36} b^2 x^9 \text{Log}\left[1+i c x^3\right]^2-$$
$$\frac{i b^2 \text{Log}\left[i+c x^3\right]}{108 c^3}+\frac{i b^2 \text{PolyLog}\left[2, \frac{1}{2} \left(1-i c x^3\right)\right]}{18 c^3}-\frac{i b^2 \text{PolyLog}\left[2, \frac{1}{2} \left(1+i c x^3\right)\right]}{18 c^3}$$

## Problem 115: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

$$\int x^5 \left(a+b \text{ArcTan}\left[c x^3\right]\right)^2 dx$$

Optimal (type 3, 90 leaves, 7 steps):

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

Result (type 4, 612 leaves, 44 steps):

$$-\frac{a\,b\,x^3}{2\,c}+\frac{b^2\,x^6}{24}+\frac{b^2\,\left(1-i\,c\,x^3\right)^2}{48\,c^2}+\frac{b^2\,\left(1+i\,c\,x^3\right)^2}{48\,c^2}-\frac{b^2\,\text{Log}\left[i-c\,x^3\right]}{24\,c^2}+\frac{b^2\,\left(1-i\,c\,x^3\right)\,\text{Log}\left[1-i\,c\,x^3\right]}{4\,c^2}+\frac{1}{24}\,b\,x^6\,\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)+$$
$$\frac{i\,b\,\left(1-i\,c\,x^3\right)^2\,\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^3\right]\right)}{24\,c^2}+\frac{\left(1-i\,c\,x^3\right)\,\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^2}{12\,c^2}-\frac{\left(1-i\,c\,x^3\right)^2\,\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^2}{24\,c^2}-$$
$$\frac{b\,\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)\,\text{Log}\left[\frac{1}{2}\,\left(1+i\,c\,x^3\right)\right]}{12\,c^2}-\frac{1}{24}\,b^2\,x^6\,\text{Log}\left[1+i\,c\,x^3\right]+\frac{b^2\,\left(1+i\,c\,x^3\right)\,\text{Log}\left[1+i\,c\,x^3\right]}{4\,c^2}-\frac{b^2\,\left(1+i\,c\,x^3\right)^2\,\text{Log}\left[1+i\,c\,x^3\right]}{24\,c^2}+$$
$$\frac{b^2\,\text{Log}\left[\frac{1}{2}\,\left(1-i\,c\,x^3\right)\right]\,\text{Log}\left[1+i\,c\,x^3\right]}{12\,c^2}-\frac{1}{12}\,b\,x^6\,\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)\,\text{Log}\left[1+i\,c\,x^3\right]-\frac{b^2\,\left(1+i\,c\,x^3\right)\,\text{Log}\left[1+i\,c\,x^3\right]^2}{12\,c^2}+$$
$$\frac{b^2\,\left(1+i\,c\,x^3\right)^2\,\text{Log}\left[1+i\,c\,x^3\right]^2}{24\,c^2}-\frac{b^2\,\text{Log}\left[i+c\,x^3\right]}{24\,c^2}+\frac{b^2\,\text{PolyLog}\left[2,\,\frac{1}{2}\,\left(1-i\,c\,x^3\right)\right]}{12\,c^2}+\frac{b^2\,\text{PolyLog}\left[2,\,\frac{1}{2}\,\left(1+i\,c\,x^3\right)\right]}{12\,c^2}$$

## Problem 116: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 104 leaves, 6 steps):

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

Result (type 4, 255 leaves, 28 steps):

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

## Problem 118: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 100 leaves, 5 steps):

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

Result (type 4, 290 leaves, 24 steps):

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

## Problem 119: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 87 leaves, 9 steps):

$$-\frac{b\,c\,(a+b\,\text{ArcTan}[c\,x^3])}{3\,x^3}-\frac{1}{6}\,c^2\,(a+b\,\text{ArcTan}[c\,x^3])^2-\frac{(a+b\,\text{ArcTan}[c\,x^3])^2}{6\,x^6}+b^2\,c^2\,\text{Log}[x]-\frac{1}{6}\,b^2\,c^2\,\text{Log}[1+c^2\,x^6]$$

Result (type 4, 419 leaves, 46 steps):

$$b^2\,c^2\,\text{Log}[x]-\frac{1}{6}\,b^2\,c^2\,\text{Log}[i-c\,x^3]+\frac{i\,b\,c\,(2\,i\,a-b\,\text{Log}[1-i\,c\,x^3])}{12\,x^3}-\frac{b\,c\,(1-i\,c\,x^3)\,(2\,a+i\,b\,\text{Log}[1-i\,c\,x^3])}{12\,x^3}-\frac{1}{24}\,c^2\,(2\,a+i\,b\,\text{Log}[1-i\,c\,x^3])^2-\frac{(2\,a+i\,b\,\text{Log}[1-i\,c\,x^3])^2}{24\,x^6}+\frac{1}{12}\,b\,c^2\,(2\,i\,a-b\,\text{Log}[1-i\,c\,x^3])\,\text{Log}\left[\frac{1}{2}\,(1+i\,c\,x^3)\right]+\frac{i\,b^2\,c\,\text{Log}[1+i\,c\,x^3]}{6\,x^3}-\frac{1}{12}\,b^2\,c^2\,\text{Log}\left[\frac{1}{2}\,(1-i\,c\,x^3)\right]\,\text{Log}[1+i\,c\,x^3]+\frac{b\,(2\,i\,a-b\,\text{Log}[1-i\,c\,x^3])\,\text{Log}[1+i\,c\,x^3]}{12\,x^6}+\frac{1}{24}\,b^2\,c^2\,\text{Log}[1+i\,c\,x^3]^2+\frac{b^2\,\text{Log}[1+i\,c\,x^3]^2}{24\,x^6}-\frac{1}{12}\,b^2\,c^2\,\text{Log}[i+c\,x^3]-\frac{1}{12}\,b^2\,c^2\,\text{PolyLog}\left[2,\frac{1}{2}\,(1-i\,c\,x^3)\right]-\frac{1}{12}\,b^2\,c^2\,\text{PolyLog}\left[2,\frac{1}{2}\,(1+i\,c\,x^3)\right]$$

## Problem 120: Result valid but suboptimal antiderivative.

$$\int \frac{(a+b\,\text{ArcTan}[c\,x^3])^2}{x^{10}}\,dx$$

Optimal (type 4, 154 leaves, 9 steps):

$$-\frac{b^2 c^2}{9 x^3}-\frac{1}{9} b^2 c^3 \text{ArcTan}\left[c x^3\right]-\frac{b c \left(a+b \text{ArcTan}\left[c x^3\right]\right)}{9 x^6}+\frac{1}{9} i c^3 \left(a+b \text{ArcTan}\left[c x^3\right]\right)^2-\frac{\left(a+b \text{ArcTan}\left[c x^3\right]\right)^2}{9 x^9}-\frac{2}{9} b c^3 \left(a+b \text{ArcTan}\left[c x^3\right]\right) \text{Log}\left[2-\frac{2}{1-i c x^3}\right]+\frac{1}{9} i b^2 c^3 \text{PolyLog}\left[2,-1+\frac{2}{1-i c x^3}\right]$$

Result (type 4, 536 leaves, 59 steps):

$$-\frac{b^2 c^2}{9 x^3}-\frac{2}{3} a b c^3 \text{Log}[x]+\frac{1}{18} i b^2 c^3 \text{Log}\left[i-c x^3\right]+\frac{i b c \left(2 i a-b \text{Log}\left[1-i c x^3\right]\right)}{36 x^6}+\frac{b c^2 \left(2 i a-b \text{Log}\left[1-i c x^3\right]\right)}{18 x^3}-\frac{b c \left(2 a+i b \text{Log}\left[1-i c x^3\right]\right)}{36 x^6}-\frac{i b c^2 \left(1-i c x^3\right) \left(2 a+i b \text{Log}\left[1-i c x^3\right]\right)}{18 x^3}-\frac{1}{36} i c^3 \left(2 a+i b \text{Log}\left[1-i c x^3\right]\right)^2-\frac{\left(2 a+i b \text{Log}\left[1-i c x^3\right]\right)^2}{36 x^9}-\frac{1}{18} i b c^3 \left(2 i a-b \text{Log}\left[1-i c x^3\right]\right) \text{Log}\left[\frac{1}{2} \left(1+i c x^3\right)\right]+\frac{i b^2 c \text{Log}\left[1+i c x^3\right]}{18 x^6}-\frac{1}{18} i b^2 c^3 \text{Log}\left[\frac{1}{2} \left(1-i c x^3\right)\right] \text{Log}\left[1+i c x^3\right]+\frac{b \left(2 i a-b \text{Log}\left[1-i c x^3\right]\right) \text{Log}\left[1+i c x^3\right]}{18 x^9}-\frac{1}{36} i b^2 c^3 \text{Log}\left[1+i c x^3\right]^2+\frac{b^2 \text{Log}\left[1+i c x^3\right]^2}{36 x^9}-\frac{1}{9} i b^2 c^3 \text{PolyLog}\left[2,-i c x^3\right]+\frac{1}{9} i b^2 c^3 \text{PolyLog}\left[2,i c x^3\right]+\frac{1}{18} i b^2 c^3 \text{PolyLog}\left[2,\frac{1}{2} \left(1-i c x^3\right)\right]-\frac{1}{18} i b^2 c^3 \text{PolyLog}\left[2,\frac{1}{2} \left(1+i c x^3\right)\right]$$

## Problem 121: Result valid but suboptimal antiderivative.

$$\int x^8 \left(a+b \text{ArcTan}\left[c x^3\right]\right)^3 dx$$

Optimal (type 4, 240 leaves, 13 steps):

$$\frac{a b^2 x^3}{3 c^2}+\frac{b^3 x^3 \text{ArcTan}\left[c x^3\right]}{3 c^2}-\frac{b \left(a+b \text{ArcTan}\left[c x^3\right]\right)^2}{6 c^3}-\frac{b x^6 \left(a+b \text{ArcTan}\left[c x^3\right]\right)^2}{6 c}-\frac{i \left(a+b \text{ArcTan}\left[c x^3\right]\right)^3}{9 c^3}+\frac{1}{9} x^9 \left(a+b \text{ArcTan}\left[c x^3\right]\right)^3-\frac{b \left(a+b \text{ArcTan}\left[c x^3\right]\right)^2 \text{Log}\left[\frac{2}{1+i c x^3}\right]}{3 c^3}-\frac{b^3 \text{Log}\left[1+c^2 x^6\right]}{6 c^3}-\frac{i b^2 \left(a+b \text{ArcTan}\left[c x^3\right]\right) \text{PolyLog}\left[2,1-\frac{2}{1+i c x^3}\right]}{3 c^3}-\frac{b^3 \text{PolyLog}\left[3,1-\frac{2}{1+i c x^3}\right]}{6 c^3}$$

Result (type 4, 1867 leaves, 239 steps):

$$\frac{2\,a\,b^2\,x^3}{3\,c^2}+\frac{7\,i\,b^3\,x^3}{216\,c^2}-\frac{23\,b^3\,x^6}{432\,c}+\frac{1}{324}\,i\,b^3\,x^9-\frac{b^3\left(1-i\,c\,x^3\right)^2}{48\,c^3}-\frac{b^3\left(1+i\,c\,x^3\right)^2}{24\,c^3}+\frac{b^3\left(1+i\,c\,x^3\right)^3}{324\,c^3}+\frac{7\,b^3\,\text{Log}\left[i-c\,x^3\right]}{108\,c^3}-\frac{b^3\left(1-i\,c\,x^3\right)\text{Log}\left[1-i\,c\,x^3\right]}{3\,c^3}+$$

$$\frac{b^3\,\text{Log}\left[1-i\,c\,x^3\right]^2}{72\,c^3}-\frac{b^2\,x^6\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)}{24\,c}-\frac{b^2\left(1-i\,c\,x^3\right)^2\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)}{48\,c^3}-\frac{1}{72}\,i\,b\,x^9\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^2-$$

$$\frac{b\left(1-i\,c\,x^3\right)^2\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^2}{48\,c^3}-\frac{i\,b^2\left(1-i\,c\,x^3\right)^2\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^3\right]\right)}{16\,c^3}+\frac{i\,b^2\left(1-i\,c\,x^3\right)^3\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^3\right]\right)}{108\,c^3}-$$

$$\frac{b\left(1-i\,c\,x^3\right)\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^2}{8\,c^3}+\frac{b\left(1-i\,c\,x^3\right)^2\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^2}{16\,c^3}-\frac{b\left(1-i\,c\,x^3\right)^3\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^2}{72\,c^3}-$$

$$\frac{i\left(1-i\,c\,x^3\right)\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^3}{24\,c^3}+\frac{i\left(1-i\,c\,x^3\right)^2\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^3}{24\,c^3}-\frac{i\left(1-i\,c\,x^3\right)^3\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^3}{72\,c^3}+$$

$$\frac{1}{216}\,i\,b^2\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)\left(\frac{18\,i\left(1-i\,c\,x^3\right)}{c^3}-\frac{9\,i\left(1-i\,c\,x^3\right)^2}{c^3}+\frac{2\,i\left(1-i\,c\,x^3\right)^3}{c^3}-\frac{6\,i\,\text{Log}\left[1-i\,c\,x^3\right]}{c^3}\right)+$$

$$\frac{b^2\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)\text{Log}\left[\frac{1}{2}\left(1+i\,c\,x^3\right)\right]}{12\,c^3}-\frac{b\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^2\text{Log}\left[\frac{1}{2}\left(1+i\,c\,x^3\right)\right]}{24\,c^3}+$$

$$\frac{b\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^2\text{Log}\left[\frac{1}{2}\left(1+i\,c\,x^3\right)\right]}{24\,c^3}+\frac{b^3\,x^6\,\text{Log}\left[1+i\,c\,x^3\right]}{18\,c}-\frac{1}{108}\,i\,b^3\,x^9\,\text{Log}\left[1+i\,c\,x^3\right]-\frac{11\,b^3\left(1+i\,c\,x^3\right)\text{Log}\left[1+i\,c\,x^3\right]}{36\,c^3}+$$

$$\frac{b^3\left(1+i\,c\,x^3\right)^2\text{Log}\left[1+i\,c\,x^3\right]}{12\,c^3}-\frac{b^3\left(1+i\,c\,x^3\right)^3\text{Log}\left[1+i\,c\,x^3\right]}{108\,c^3}-\frac{b^3\,\text{Log}\left[\frac{1}{2}\left(1-i\,c\,x^3\right)\right]\text{Log}\left[1+i\,c\,x^3\right]}{12\,c^3}+$$

$$\frac{b^2\,x^6\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)\text{Log}\left[1+i\,c\,x^3\right]}{12\,c}+\frac{1}{24}\,i\,b\,x^9\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^2\text{Log}\left[1+i\,c\,x^3\right]-\frac{b\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^2\text{Log}\left[1+i\,c\,x^3\right]}{24\,c^3}-$$

$$\frac{b^3\,\text{Log}\left[1+i\,c\,x^3\right]^2}{72\,c^3}+\frac{1}{72}\,i\,b^3\,x^9\,\text{Log}\left[1+i\,c\,x^3\right]^2+\frac{b^3\left(1+i\,c\,x^3\right)\text{Log}\left[1+i\,c\,x^3\right]^2}{8\,c^3}-\frac{b^3\left(1+i\,c\,x^3\right)^2\text{Log}\left[1+i\,c\,x^3\right]^2}{12\,c^3}+\frac{b^3\left(1+i\,c\,x^3\right)^3\text{Log}\left[1+i\,c\,x^3\right]^2}{72\,c^3}-$$

$$\frac{b^3\,\text{Log}\left[\frac{1}{2}\left(1-i\,c\,x^3\right)\right]\text{Log}\left[1+i\,c\,x^3\right]^2}{12\,c^3}+\frac{1}{24}\,i\,b^2\,x^9\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)\text{Log}\left[1+i\,c\,x^3\right]^2-\frac{i\,b^2\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^3\right]\right)\text{Log}\left[1+i\,c\,x^3\right]^2}{24\,c^3}-$$

$$\frac{b^3\left(1+i\,c\,x^3\right)\text{Log}\left[1+i\,c\,x^3\right]^3}{24\,c^3}+\frac{b^3\left(1+i\,c\,x^3\right)^2\text{Log}\left[1+i\,c\,x^3\right]^3}{24\,c^3}-\frac{b^3\left(1+i\,c\,x^3\right)^3\text{Log}\left[1+i\,c\,x^3\right]^3}{72\,c^3}+\frac{b^3\,\text{Log}\left[i+c\,x^3\right]}{24\,c^3}-$$

$$\frac{b^3\,\text{PolyLog}\left[2,\frac{1}{2}\left(1-i\,c\,x^3\right)\right]}{12\,c^3}+\frac{b^2\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)\text{PolyLog}\left[2,\frac{1}{2}\left(1-i\,c\,x^3\right)\right]}{12\,c^3}+\frac{i\,b^2\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^3\right]\right)\text{PolyLog}\left[2,\frac{1}{2}\left(1-i\,c\,x^3\right)\right]}{12\,c^3}-$$

$$\frac{b^3\,\text{PolyLog}\left[2,\frac{1}{2}\left(1+i\,c\,x^3\right)\right]}{12\,c^3}-\frac{b^3\,\text{Log}\left[1+i\,c\,x^3\right]\text{PolyLog}\left[2,\frac{1}{2}\left(1+i\,c\,x^3\right)\right]}{6\,c^3}+\frac{b^3\,\text{PolyLog}\left[3,\frac{1}{2}\left(1-i\,c\,x^3\right)\right]}{6\,c^3}+\frac{b^3\,\text{PolyLog}\left[3,\frac{1}{2}\left(1+i\,c\,x^3\right)\right]}{6\,c^3}$$

## Problem 122: Result valid but suboptimal antiderivative.

$$\int x^5 \left(a+b \operatorname{ArcTan}\left[c x^3\right]\right)^3 dx$$

Optimal (type 4, 147 leaves, 9 steps):

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

Result (type 4, 951 leaves, 155 steps):

$$\frac{i b^2 \left(1-i c x^3\right)^2 \left(2 i a-b \operatorname{Log}\left[1-i c x^3\right]\right)}{32 c^2}+\frac{i b \left(1-i c x^3\right)^2 \left(2 i a-b \operatorname{Log}\left[1-i c x^3\right]\right)^2}{32 c^2}+\frac{b^2 \left(1-i c x^3\right)^2 \left(2 a+i b \operatorname{Log}\left[1-i c x^3\right]\right)}{32 c^2}-\frac{i b \left(1-i c x^3\right) \left(2 a+i b \operatorname{Log}\left[1-i c x^3\right]\right)^2}{8 c^2}+\frac{i b \left(1-i c x^3\right)^2 \left(2 a+i b \operatorname{Log}\left[1-i c x^3\right]\right)^2}{32 c^2}+\frac{\left(1-i c x^3\right) \left(2 a+i b \operatorname{Log}\left[1-i c x^3\right]\right)^3}{24 c^2}-\frac{\left(1-i c x^3\right)^2 \left(2 a+i b \operatorname{Log}\left[1-i c x^3\right]\right)^3}{48 c^2}-\frac{i b^2 \left(2 i a-b \operatorname{Log}\left[1-i c x^3\right]\right) \operatorname{Log}\left[\frac{1}{2} \left(1+i c x^3\right)\right]}{4 c^2}+\frac{i b \left(2 i a-b \operatorname{Log}\left[1-i c x^3\right]\right)^2 \operatorname{Log}\left[\frac{1}{2} \left(1+i c x^3\right)\right]}{16 c^2}+\frac{i b \left(2 a+i b \operatorname{Log}\left[1-i c x^3\right]\right)^2 \operatorname{Log}\left[\frac{1}{2} \left(1+i c x^3\right)\right]}{16 c^2}-\frac{i b^3 \operatorname{Log}\left[\frac{1}{2} \left(1-i c x^3\right)\right] \operatorname{Log}\left[1+i c x^3\right]}{4 c^2}+\frac{b^2 x^3 \left(2 i a-b \operatorname{Log}\left[1-i c x^3\right]\right) \operatorname{Log}\left[1+i c x^3\right]}{4 c}+\frac{1}{16} i b x^6 \left(2 i a-b \operatorname{Log}\left[1-i c x^3\right]\right)^2 \operatorname{Log}\left[1+i c x^3\right]-\frac{i b \left(2 a+i b \operatorname{Log}\left[1-i c x^3\right]\right)^2 \operatorname{Log}\left[1+i c x^3\right]}{16 c^2}-\frac{i b^3 \left(1+i c x^3\right) \operatorname{Log}\left[1+i c x^3\right]^2}{8 c^2}+\frac{1}{16} i b^2 x^6 \left(2 i a-b \operatorname{Log}\left[1-i c x^3\right]\right) \operatorname{Log}\left[1+i c x^3\right]^2-\frac{b^2 \left(2 a+i b \operatorname{Log}\left[1-i c x^3\right]\right) \operatorname{Log}\left[1+i c x^3\right]^2}{16 c^2}+\frac{i b^3 \left(1+i c x^3\right) \operatorname{Log}\left[1+i c x^3\right]^3}{24 c^2}-\frac{i b^3 \left(1+i c x^3\right)^2 \operatorname{Log}\left[1+i c x^3\right]^3}{48 c^2}+\frac{i b^3 \operatorname{PolyLog}\left[2, \frac{1}{2} \left(1-i c x^3\right)\right]}{4 c^2}-\frac{i b^2 \left(2 i a-b \operatorname{Log}\left[1-i c x^3\right]\right) \operatorname{PolyLog}\left[2, \frac{1}{2} \left(1-i c x^3\right)\right]}{8 c^2}-\frac{b^2 \left(2 a+i b \operatorname{Log}\left[1-i c x^3\right]\right) \operatorname{PolyLog}\left[2, \frac{1}{2} \left(1-i c x^3\right)\right]}{8 c^2}-\frac{i b^3 \operatorname{PolyLog}\left[2, \frac{1}{2} \left(1+i c x^3\right)\right]}{4 c^2}$$

## Problem 123: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 139 leaves, 6 steps):

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

Result (type 4, 545 leaves, 82 steps):

$$\frac{b\left(1-i\,c\,x^3\right)\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^2}{8\,c}+\frac{b\left(1-i\,c\,x^3\right)\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^2}{8\,c}+\frac{i\left(1-i\,c\,x^3\right)\left(2\,a+i\,b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^3}{24\,c}+$$
$$\frac{b\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^2\text{Log}\left[\frac{1}{2}\left(1+i\,c\,x^3\right)\right]}{4\,c}-\frac{b\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^2\text{Log}\left[1+i\,c\,x^3\right]}{8\,c}+$$
$$\frac{1}{8}i\,b\,x^3\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)^2\text{Log}\left[1+i\,c\,x^3\right]+\frac{b^3\,\text{Log}\left[\frac{1}{2}\left(1-i\,c\,x^3\right)\right]\text{Log}\left[1+i\,c\,x^3\right]^2}{4\,c}+\frac{b^2\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)\text{Log}\left[1+i\,c\,x^3\right]^2}{8\,c}+$$
$$\frac{1}{8}i\,b^2\,x^3\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)\text{Log}\left[1+i\,c\,x^3\right]^2+\frac{b^3\left(1+i\,c\,x^3\right)\text{Log}\left[1+i\,c\,x^3\right]^3}{24\,c}-\frac{b^2\left(2\,i\,a-b\,\text{Log}\left[1-i\,c\,x^3\right]\right)\text{PolyLog}\left[2,\frac{1}{2}\left(1-i\,c\,x^3\right)\right]}{2\,c}+$$
$$\frac{b^3\,\text{Log}\left[1+i\,c\,x^3\right]\text{PolyLog}\left[2,\frac{1}{2}\left(1+i\,c\,x^3\right)\right]}{2\,c}-\frac{b^3\,\text{PolyLog}\left[3,\frac{1}{2}\left(1-i\,c\,x^3\right)\right]}{2\,c}-\frac{b^3\,\text{PolyLog}\left[3,\frac{1}{2}\left(1+i\,c\,x^3\right)\right]}{2\,c}$$

## Problem 125: Unable to integrate problem.

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

Optimal (type 4, 133 leaves, 6 steps):

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

Result (type 8, 347 leaves, 16 steps):

$$\frac{1}{8} b c \text{Log}[i c x^3] (2 a + i b \text{Log}[1 - i c x^3])^2 - \frac{(1 - i c x^3) (2 a + i b \text{Log}[1 - i c x^3])^3}{24 x^3} - \frac{1}{8} b^3 c \text{Log}[-i c x^3] \text{Log}[1 + i c x^3]^2 - \frac{i b^3 (1 + i c x^3) \text{Log}[1 + i c x^3]^3}{24 x^3} + \frac{1}{4} i b^2 c (2 a + i b \text{Log}[1 - i c x^3]) \text{PolyLog}[2, 1 - i c x^3] - \frac{1}{4} b^3 c \text{Log}[1 + i c x^3] \text{PolyLog}[2, 1 + i c x^3] + \frac{1}{4} b^3 c \text{PolyLog}[3, 1 - i c x^3] + \frac{1}{4} b^3 c \text{PolyLog}[3, 1 + i c x^3] + \frac{3}{8} i b \text{Unintegrable}\left[\frac{(-2 i a + b \text{Log}[1 - i c x^3])^2 \text{Log}[1 + i c x^3]}{x^4}, x\right] - \frac{3}{8} i b^2 \text{Unintegrable}\left[\frac{(-2 i a + b \text{Log}[1 - i c x^3]) \text{Log}[1 + i c x^3]^2}{x^4}, x\right]$$

## Problem 126: Unable to integrate problem.

$$\int \frac{(a + b \text{ArcTan}[c x^3])^3}{x^7} \, dx$$

Optimal (type 4, 146 leaves, 8 steps):

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

Result (type 8, 533 leaves, 29 steps):

$$\frac{3}{4} a b^2 c^2 \text{Log}[x] - \frac{b c (1 - i c x^3) (2 a + i b \text{Log}[1 - i c x^3])^2}{16 x^3} + \frac{1}{16} i b c^2 \text{Log}[i c x^3] (2 a + i b \text{Log}[1 - i c x^3])^2 - \frac{1}{48} c^2 (2 a + i b \text{Log}[1 - i c x^3])^3 - \frac{(2 a + i b \text{Log}[1 - i c x^3])^3}{48 x^6} + \frac{b^3 c (1 + i c x^3) \text{Log}[1 + i c x^3]^2}{16 x^3} + \frac{1}{16} i b^3 c^2 \text{Log}[-i c x^3] \text{Log}[1 + i c x^3]^2 - \frac{1}{48} i b^3 c^2 \text{Log}[1 + i c x^3]^3 - \frac{i b^3 \text{Log}[1 + i c x^3]^3}{48 x^6} + \frac{1}{8} i b^3 c^2 \text{PolyLog}[2, -i c x^3] - \frac{1}{8} i b^3 c^2 \text{PolyLog}[2, i c x^3] - \frac{1}{8} b^2 c^2 (2 a + i b \text{Log}[1 - i c x^3]) \text{PolyLog}[2, 1 - i c x^3] + \frac{1}{8} i b^3 c^2 \text{Log}[1 + i c x^3] \text{PolyLog}[2, 1 + i c x^3] + \frac{1}{8} i b^3 c^2 \text{PolyLog}[3, 1 - i c x^3] - \frac{1}{8} i b^3 c^2 \text{PolyLog}[3, 1 + i c x^3] + \frac{3}{8} i b \text{Unintegrable}\left[\frac{(-2 i a + b \text{Log}[1 - i c x^3])^2 \text{Log}[1 + i c x^3]}{x^7}, x\right] - \frac{3}{8} i b^2 \text{Unintegrable}\left[\frac{(-2 i a + b \text{Log}[1 - i c x^3]) \text{Log}[1 + i c x^3]^2}{x^7}, x\right]$$

## Problem 129: Result optimal but 1 more steps used.

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

Optimal (type 5, 75 leaves, 2 steps):

$$\frac{(d\,x)^{1+m}\,\left(a+b\,\text{ArcTan}\left[c\,x^3\right]\right)}{d\,(1+m)}-\frac{3\,b\,c\,(d\,x)^{4+m}\,\text{Hypergeometric2F1}\left[1,\frac{4+m}{6},\frac{10+m}{6},-c^2\,x^6\right]}{d^4\,(1+m)\,(4+m)}$$

Result (type 5, 75 leaves, 3 steps):

$$\frac{(d\,x)^{1+m}\,\left(a+b\,\text{ArcTan}\left[c\,x^3\right]\right)}{d\,(1+m)}-\frac{3\,b\,c\,(d\,x)^{4+m}\,\text{Hypergeometric2F1}\left[1,\frac{4+m}{6},\frac{10+m}{6},-c^2\,x^6\right]}{d^4\,(1+m)\,(4+m)}$$

## Problem 140: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 122 leaves, 14 steps):

$$\frac{1}{12}\,b^2\,c^2\,x^2-\frac{1}{2}\,b\,c^3\,x\,\left(a+b\,\text{ArcCot}\left[\frac{x}{c}\right]\right)+\frac{1}{6}\,b\,c\,x^3\,\left(a+b\,\text{ArcCot}\left[\frac{x}{c}\right]\right)-\frac{1}{4}\,c^4\,\left(a+b\,\text{ArcCot}\left[\frac{x}{c}\right]\right)^2+\frac{1}{4}\,x^4\,\left(a+b\,\text{ArcCot}\left[\frac{x}{c}\right]\right)^2-\frac{1}{3}\,b^2\,c^4\,\text{Log}\left[1+\frac{c^2}{x^2}\right]-\frac{2}{3}\,b^2\,c^4\,\text{Log}[x]$$

Result (type 4, 862 leaves, 88 steps):

$$-\frac{1}{4}\,a\,b\,c^3\,x-\frac{1}{8}\,i\,a\,b\,c^2\,x^2+\frac{1}{12}\,b^2\,c^2\,x^2+\frac{1}{12}\,a\,b\,c\,x^3-\frac{11}{48}\,b^2\,c^4\,\text{Log}\left[i-\frac{c}{x}\right]-\frac{1}{8}\,i\,b^2\,c^3\,x\,\text{Log}\left[1-\frac{i\,c}{x}\right]+\frac{1}{16}\,b^2\,c^2\,x^2\,\text{Log}\left[1-\frac{i\,c}{x}\right]+$$
$$\frac{1}{24}\,i\,b^2\,c\,x^3\,\text{Log}\left[1-\frac{i\,c}{x}\right]-\frac{1}{8}\,b\,c^3\,\left(1-\frac{i\,c}{x}\right)\,x\,\left(2\,a+i\,b\,\text{Log}\left[1-\frac{i\,c}{x}\right]\right)+\frac{1}{16}\,i\,b\,c^2\,x^2\,\left(2\,a+i\,b\,\text{Log}\left[1-\frac{i\,c}{x}\right]\right)+$$
$$\frac{1}{24}\,b\,c\,x^3\,\left(2\,a+i\,b\,\text{Log}\left[1-\frac{i\,c}{x}\right]\right)-\frac{1}{16}\,c^4\,\left(2\,a+i\,b\,\text{Log}\left[1-\frac{i\,c}{x}\right]\right)^2+\frac{1}{16}\,x^4\,\left(2\,a+i\,b\,\text{Log}\left[1-\frac{i\,c}{x}\right]\right)^2+\frac{1}{4}\,i\,b^2\,c^3\,x\,\text{Log}\left[1+\frac{i\,c}{x}\right]-$$
$$\frac{1}{12}\,i\,b^2\,c\,x^3\,\text{Log}\left[1+\frac{i\,c}{x}\right]-\frac{1}{4}\,i\,a\,b\,x^4\,\text{Log}\left[1+\frac{i\,c}{x}\right]+\frac{1}{8}\,b^2\,x^4\,\text{Log}\left[1-\frac{i\,c}{x}\right]\,\text{Log}\left[1+\frac{i\,c}{x}\right]+\frac{1}{16}\,b^2\,c^4\,\text{Log}\left[1+\frac{i\,c}{x}\right]^2-$$
$$\frac{1}{16}\,b^2\,x^4\,\text{Log}\left[1+\frac{i\,c}{x}\right]^2-\frac{5}{48}\,b^2\,c^4\,\text{Log}\left[i+\frac{c}{x}\right]+\frac{1}{4}\,i\,a\,b\,c^4\,\text{Log}[c-i\,x]-\frac{5}{48}\,b^2\,c^4\,\text{Log}[c-i\,x]-\frac{1}{8}\,b^2\,c^4\,\text{Log}\left[1-\frac{i\,c}{x}\right]\,\text{Log}[c-i\,x]-$$
$$\frac{5}{48}\,b^2\,c^4\,\text{Log}[c+i\,x]-\frac{1}{8}\,b^2\,c^4\,\text{Log}\left[1+\frac{i\,c}{x}\right]\,\text{Log}[c+i\,x]+\frac{1}{8}\,b^2\,c^4\,\text{Log}\left[\frac{c-i\,x}{2\,c}\right]\,\text{Log}[c+i\,x]+\frac{1}{8}\,b^2\,c^4\,\text{Log}[c-i\,x]\,\text{Log}\left[\frac{c+i\,x}{2\,c}\right]-$$
$$\frac{1}{4}\,i\,a\,b\,c^4\,\text{Log}[x]-\frac{11}{24}\,b^2\,c^4\,\text{Log}[x]-\frac{1}{8}\,b^2\,c^4\,\text{Log}[c+i\,x]\,\text{Log}\left[-\frac{i\,x}{c}\right]-\frac{1}{8}\,b^2\,c^4\,\text{Log}[c-i\,x]\,\text{Log}\left[\frac{i\,x}{c}\right]+\frac{1}{8}\,b^2\,c^4\,\text{PolyLog}\left[2,\frac{c-i\,x}{2\,c}\right]+$$
$$\frac{1}{8}\,b^2\,c^4\,\text{PolyLog}\left[2,\frac{c+i\,x}{2\,c}\right]+\frac{1}{8}\,b^2\,c^4\,\text{PolyLog}\left[2,-\frac{i\,c}{x}\right]+\frac{1}{8}\,b^2\,c^4\,\text{PolyLog}\left[2,\frac{i\,c}{x}\right]-\frac{1}{8}\,b^2\,c^4\,\text{PolyLog}\left[2,1-\frac{i\,x}{c}\right]-\frac{1}{8}\,b^2\,c^4\,\text{PolyLog}\left[2,1+\frac{i\,x}{c}\right]$$

## Problem 141: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 152 leaves, 9 steps):

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

Result (type 4, 787 leaves, 73 steps):

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

## Problem 142: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 82 leaves, 9 steps):

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

Result (type 4, 663 leaves, 58 steps):

$$\frac{1}{2} a b c x + \frac{1}{4} b^2 c^2 \text{Log}\left[i - \frac{c}{x}\right] + \frac{1}{4} i b^2 c x \text{Log}\left[1 - \frac{i c}{x}\right] + \frac{1}{4} b c \left(1 - \frac{i c}{x}\right) x \left(2 a + i b \text{Log}\left[1 - \frac{i c}{x}\right]\right) + \frac{1}{8} c^2 \left(2 a + i b \text{Log}\left[1 - \frac{i c}{x}\right]\right)^2 + \frac{1}{8} x^2 \left(2 a + i b \text{Log}\left[1 - \frac{i c}{x}\right]\right)^2 - \frac{1}{2} i b^2 c x \text{Log}\left[1 + \frac{i c}{x}\right] - \frac{1}{2} i a b x^2 \text{Log}\left[1 + \frac{i c}{x}\right] + \frac{1}{4} b^2 x^2 \text{Log}\left[1 - \frac{i c}{x}\right] \text{Log}\left[1 + \frac{i c}{x}\right] - \frac{1}{8} b^2 c^2 \text{Log}\left[1 + \frac{i c}{x}\right]^2 - \frac{1}{8} b^2 x^2 \text{Log}\left[1 + \frac{i c}{x}\right]^2 - \frac{1}{2} i a b c^2 \text{Log}[c - i x] + \frac{1}{4} b^2 c^2 \text{Log}[c - i x] + \frac{1}{4} b^2 c^2 \text{Log}\left[1 - \frac{i c}{x}\right] \text{Log}[c - i x] + \frac{1}{4} b^2 c^2 \text{Log}[c + i x] + \frac{1}{4} b^2 c^2 \text{Log}\left[1 + \frac{i c}{x}\right] \text{Log}[c + i x] - \frac{1}{4} b^2 c^2 \text{Log}\left[\frac{c - i x}{2 c}\right] \text{Log}[c + i x] - \frac{1}{4} b^2 c^2 \text{Log}[c - i x] \text{Log}\left[\frac{c + i x}{2 c}\right] + \frac{1}{2} i a b c^2 \text{Log}[x] + \frac{1}{2} b^2 c^2 \text{Log}[x] + \frac{1}{4} b^2 c^2 \text{Log}[c + i x] \text{Log}\left[-\frac{i x}{c}\right] + \frac{1}{4} b^2 c^2 \text{Log}[c - i x] \text{Log}\left[\frac{i x}{c}\right] - \frac{1}{4} b^2 c^2 \text{PolyLog}\left[2, \frac{c - i x}{2 c}\right] - \frac{1}{4} b^2 c^2 \text{PolyLog}\left[2, \frac{c + i x}{2 c}\right] - \frac{1}{4} b^2 c^2 \text{PolyLog}\left[2, -\frac{i c}{x}\right] - \frac{1}{4} b^2 c^2 \text{PolyLog}\left[2, \frac{i c}{x}\right] + \frac{1}{4} b^2 c^2 \text{PolyLog}\left[2, 1 - \frac{i x}{c}\right] + \frac{1}{4} b^2 c^2 \text{PolyLog}\left[2, 1 + \frac{i x}{c}\right]$$

## Problem 143: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 83 leaves, 6 steps):

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

Result (type 4, 478 leaves, 31 steps):

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

## Problem 145: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 96 leaves, 6 steps):

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

Result (type 4, 259 leaves, 28 steps):

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

## Problem 146: Result unnecessarily involves higher level functions and more than twice size of optimal antiderivative.

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

Optimal (type 3, 84 leaves, 7 steps):

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

Result (type 4, 836 leaves, 66 steps):

$$-\frac{b^2\left(1-\frac{i\,c}{x}\right)^2}{16\,c^2}-\frac{b^2\left(1+\frac{i\,c}{x}\right)^2}{16\,c^2}-\frac{i\,a\,b}{4\,x^2}-\frac{b^2}{8\,x^2}+\frac{3\,a\,b}{2\,c\,x}+\frac{i\,a\,b\,\text{Log}\left[i-\frac{c}{x}\right]}{2\,c^2}+\frac{b^2\,\text{Log}\left[i-\frac{c}{x}\right]}{8\,c^2}-\frac{3\,b^2\left(1-\frac{i\,c}{x}\right)\text{Log}\left[1-\frac{i\,c}{x}\right]}{4\,c^2}+$$
$$\frac{b^2\,\text{Log}\left[1-\frac{i\,c}{x}\right]}{8\,x^2}-\frac{i\,b\left(1-\frac{i\,c}{x}\right)^2\left(2\,a+i\,b\,\text{Log}\left[1-\frac{i\,c}{x}\right]\right)}{8\,c^2}-\frac{\left(1-\frac{i\,c}{x}\right)\left(2\,a+i\,b\,\text{Log}\left[1-\frac{i\,c}{x}\right]\right)^2}{4\,c^2}+\frac{\left(1-\frac{i\,c}{x}\right)^2\left(2\,a+i\,b\,\text{Log}\left[1-\frac{i\,c}{x}\right]\right)^2}{8\,c^2}-$$
$$\frac{3\,b^2\left(1+\frac{i\,c}{x}\right)\text{Log}\left[1+\frac{i\,c}{x}\right]}{4\,c^2}+\frac{b^2\left(1+\frac{i\,c}{x}\right)^2\text{Log}\left[1+\frac{i\,c}{x}\right]}{8\,c^2}+\frac{i\,a\,b\,\text{Log}\left[1+\frac{i\,c}{x}\right]}{2\,x^2}+\frac{b^2\,\text{Log}\left[1+\frac{i\,c}{x}\right]}{8\,x^2}-\frac{b^2\,\text{Log}\left[1-\frac{i\,c}{x}\right]\text{Log}\left[1+\frac{i\,c}{x}\right]}{4\,x^2}+$$
$$\frac{b^2\left(1+\frac{i\,c}{x}\right)\text{Log}\left[1+\frac{i\,c}{x}\right]^2}{4\,c^2}-\frac{b^2\left(1+\frac{i\,c}{x}\right)^2\text{Log}\left[1+\frac{i\,c}{x}\right]^2}{8\,c^2}+\frac{b^2\,\text{Log}\left[i+\frac{c}{x}\right]}{8\,c^2}-\frac{b^2\,\text{Log}\left[1-\frac{i\,c}{x}\right]\text{Log}\left[c-i\,x\right]}{4\,c^2}-\frac{b^2\,\text{Log}\left[1+\frac{i\,c}{x}\right]\text{Log}\left[c+i\,x\right]}{4\,c^2}+$$
$$\frac{b^2\,\text{Log}\left[\frac{c-i\,x}{2\,c}\right]\text{Log}\left[c+i\,x\right]}{4\,c^2}+\frac{b^2\,\text{Log}\left[c-i\,x\right]\text{Log}\left[\frac{c+i\,x}{2\,c}\right]}{4\,c^2}-\frac{b^2\,\text{Log}\left[c+i\,x\right]\text{Log}\left[-\frac{i\,x}{c}\right]}{4\,c^2}-\frac{b^2\,\text{Log}\left[c-i\,x\right]\text{Log}\left[\frac{i\,x}{c}\right]}{4\,c^2}+\frac{b^2\,\text{PolyLog}\left[2,\frac{c-i\,x}{2\,c}\right]}{4\,c^2}+$$
$$\frac{b^2\,\text{PolyLog}\left[2,\frac{c+i\,x}{2\,c}\right]}{4\,c^2}+\frac{b^2\,\text{PolyLog}\left[2,-\frac{i\,c}{x}\right]}{4\,c^2}+\frac{b^2\,\text{PolyLog}\left[2,\frac{i\,c}{x}\right]}{4\,c^2}-\frac{b^2\,\text{PolyLog}\left[2,1-\frac{i\,x}{c}\right]}{4\,c^2}-\frac{b^2\,\text{PolyLog}\left[2,1+\frac{i\,x}{c}\right]}{4\,c^2}$$

## Problem 147: Unable to integrate problem.

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

Optimal (type 4, 214 leaves, 17 steps):

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

Result (type 8, 1568 leaves, 139 steps):

$$-\frac{3}{8} a^2 b c^3 x-\frac{5}{16} i a b^2 c^3 x+\frac{1}{16} b^3 c^3 x-\frac{3}{16} i a^2 b c^2 x^2+\frac{3}{16} a b^2 c^2 x^2+\frac{1}{8} a^2 b c x^3+\frac{3}{8} i b^3 \text{CannotIntegrate}\left[x^3 \text{Log}\left[1-\frac{i c}{x}\right]^2 \text{Log}\left[1+\frac{i c}{x}\right],x\right]-$$

$$\frac{3}{8} i b^3 \text{CannotIntegrate}\left[x^3 \text{Log}\left[1-\frac{i c}{x}\right] \text{Log}\left[1+\frac{i c}{x}\right]^2,x\right]-\frac{11}{16} a b^2 c^4 \text{Log}\left[i-\frac{c}{x}\right]-\frac{1}{32} i b^3 c^4 \text{Log}\left[i-\frac{c}{x}\right]-\frac{3}{8} i a b^2 c^3 x \text{Log}\left[1-\frac{i c}{x}\right]+$$

$$\frac{3}{16} a b^2 c^2 x^2 \text{Log}\left[1-\frac{i c}{x}\right]+\frac{1}{8} i a b^2 c x^3 \text{Log}\left[1-\frac{i c}{x}\right]+\frac{5}{32} i b^2 c^3 \left(1-\frac{i c}{x}\right) x \left(2 a+i b \text{Log}\left[1-\frac{i c}{x}\right]\right)+\frac{1}{32} b^2 c^2 x^2 \left(2 a+i b \text{Log}\left[1-\frac{i c}{x}\right]\right)+$$

$$\frac{5}{64} i b c^4 \left(2 a+i b \text{Log}\left[1-\frac{i c}{x}\right]\right)^2-\frac{3}{32} b c^3 \left(1-\frac{i c}{x}\right) x \left(2 a+i b \text{Log}\left[1-\frac{i c}{x}\right]\right)^2+\frac{3}{64} i b c^2 x^2 \left(2 a+i b \text{Log}\left[1-\frac{i c}{x}\right]\right)^2+$$

$$\frac{1}{32} b c x^3 \left(2 a+i b \text{Log}\left[1-\frac{i c}{x}\right]\right)^2-\frac{1}{32} c^4 \left(2 a+i b \text{Log}\left[1-\frac{i c}{x}\right]\right)^3+\frac{1}{32} x^4 \left(2 a+i b \text{Log}\left[1-\frac{i c}{x}\right]\right)^3+\frac{3}{4} i a b^2 c^3 x \text{Log}\left[1+\frac{i c}{x}\right]-$$

$$\frac{5}{32} b^3 c^3 \left(1+\frac{i c}{x}\right) x \text{Log}\left[1+\frac{i c}{x}\right]-\frac{1}{32} i b^3 c^2 x^2 \text{Log}\left[1+\frac{i c}{x}\right]-\frac{1}{4} i a b^2 c x^3 \text{Log}\left[1+\frac{i c}{x}\right]-\frac{3}{8} i a^2 b x^4 \text{Log}\left[1+\frac{i c}{x}\right]+$$

$$\frac{3}{8} a b^2 x^4 \text{Log}\left[1-\frac{i c}{x}\right] \text{Log}\left[1+\frac{i c}{x}\right]+\frac{3}{16} a b^2 c^4 \text{Log}\left[1+\frac{i c}{x}\right]^2+\frac{5}{64} i b^3 c^4 \text{Log}\left[1+\frac{i c}{x}\right]^2+\frac{3}{32} b^3 c^3 \left(1+\frac{i c}{x}\right) x \text{Log}\left[1+\frac{i c}{x}\right]^2+$$

$$\frac{3}{64} i b^3 c^2 x^2 \text{Log}\left[1+\frac{i c}{x}\right]^2-\frac{1}{32} b^3 c x^3 \text{Log}\left[1+\frac{i c}{x}\right]^2-\frac{3}{16} a b^2 x^4 \text{Log}\left[1+\frac{i c}{x}\right]^2-\frac{1}{32} i b^3 c^4 \text{Log}\left[1+\frac{i c}{x}\right]^3+\frac{1}{32} i b^3 x^4 \text{Log}\left[1+\frac{i c}{x}\right]^3+$$

$$\frac{1}{32} i b^3 c^4 \text{Log}\left[i+\frac{c}{x}\right]+\frac{3}{8} i a^2 b c^4 \text{Log}[c-i x]-\frac{5}{16} a b^2 c^4 \text{Log}[c-i x]-\frac{3}{8} a b^2 c^4 \text{Log}\left[1-\frac{i c}{x}\right] \text{Log}[c-i x]-\frac{5}{16} a b^2 c^4 \text{Log}[c+i x]-$$

$$\frac{3}{8} a b^2 c^4 \text{Log}\left[1+\frac{i c}{x}\right] \text{Log}[c+i x]+\frac{3}{8} a b^2 c^4 \text{Log}\left[\frac{c-i x}{2 c}\right] \text{Log}[c+i x]+\frac{3}{8} a b^2 c^4 \text{Log}[c-i x] \text{Log}\left[\frac{c+i x}{2 c}\right]+\frac{3}{32} i b^3 c^4 \text{Log}\left[1+\frac{i c}{x}\right]^2 \text{Log}\left[-\frac{i c}{x}\right]+$$

$$\frac{3}{32} i b c^4 \left(2 a+i b \text{Log}\left[1-\frac{i c}{x}\right]\right)^2 \text{Log}\left[\frac{i c}{x}\right]-\frac{11}{8} a b^2 c^4 \text{Log}[x]-\frac{3}{8} a b^2 c^4 \text{Log}[c+i x] \text{Log}\left[-\frac{i x}{c}\right]-\frac{3}{8} a b^2 c^4 \text{Log}[c-i x] \text{Log}\left[\frac{i x}{c}\right]-$$

$$\frac{3}{16} b^2 c^4 \left(2 a+i b \text{Log}\left[1-\frac{i c}{x}\right]\right) \text{PolyLog}\left[2,1-\frac{i c}{x}\right]+\frac{3}{16} i b^3 c^4 \text{Log}\left[1+\frac{i c}{x}\right] \text{PolyLog}\left[2,1+\frac{i c}{x}\right]+\frac{3}{8} a b^2 c^4 \text{PolyLog}\left[2,\frac{c-i x}{2 c}\right]+$$

$$\frac{3}{8} a b^2 c^4 \text{PolyLog}\left[2,\frac{c+i x}{2 c}\right]+\frac{3}{8} a b^2 c^4 \text{PolyLog}\left[2,-\frac{i c}{x}\right]+\frac{11}{32} i b^3 c^4 \text{PolyLog}\left[2,-\frac{i c}{x}\right]-\frac{11}{32} i b^3 c^4 \text{PolyLog}\left[2,\frac{i c}{x}\right]-$$

$$\frac{3}{8} a b^2 c^4 \text{PolyLog}\left[2,1-\frac{i x}{c}\right]-\frac{3}{8} a b^2 c^4 \text{PolyLog}\left[2,1+\frac{i x}{c}\right]+\frac{3}{16} i b^3 c^4 \text{PolyLog}\left[3,1-\frac{i c}{x}\right]-\frac{3}{16} i b^3 c^4 \text{PolyLog}\left[3,1+\frac{i c}{x}\right]$$

## Problem 148: Unable to integrate problem.

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

Optimal (type 4, 229 leaves, 15 steps) :

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

Result (type 8, 1323 leaves, 103 steps):

$$-\frac{1}{2} \mathrm{i} a^2 b c^2 x+\frac{3}{4} a b^2 c^2 x+\frac{1}{4} a^2 b c x^2+\frac{3}{8} \mathrm{i} b^3\,\text{CannotIntegrate}\left[x^2 \text{Log}\left[1-\frac{\mathrm{i} c}{x}\right]^2 \text{Log}\left[1+\frac{\mathrm{i} c}{x}\right],x\right]-$$
$$\frac{3}{8} \mathrm{i} b^3\,\text{CannotIntegrate}\left[x^2 \text{Log}\left[1-\frac{\mathrm{i} c}{x}\right] \text{Log}\left[1+\frac{\mathrm{i} c}{x}\right]^2,x\right]-\frac{3}{4} \mathrm{i} a b^2 c^3 \text{Log}\left[\mathrm{i}-\frac{c}{x}\right]+\frac{1}{2} a b^2 c^2 x \text{Log}\left[1-\frac{\mathrm{i} c}{x}\right]+\frac{1}{4} \mathrm{i} a b^2 c x^2 \text{Log}\left[1-\frac{\mathrm{i} c}{x}\right]+$$
$$\frac{1}{8} b^2 c^2 \left(1-\frac{\mathrm{i} c}{x}\right) x \left(2 a+\mathrm{i} b \text{Log}\left[1-\frac{\mathrm{i} c}{x}\right]\right)+\frac{1}{16} b c^3 \left(2 a+\mathrm{i} b \text{Log}\left[1-\frac{\mathrm{i} c}{x}\right]\right)^2+\frac{1}{8} \mathrm{i} b c^2 \left(1-\frac{\mathrm{i} c}{x}\right) x \left(2 a+\mathrm{i} b \text{Log}\left[1-\frac{\mathrm{i} c}{x}\right]\right)^2+$$
$$\frac{1}{16} b c x^2 \left(2 a+\mathrm{i} b \text{Log}\left[1-\frac{\mathrm{i} c}{x}\right]\right)^2+\frac{1}{24} \mathrm{i} c^3 \left(2 a+\mathrm{i} b \text{Log}\left[1-\frac{\mathrm{i} c}{x}\right]\right)^3+\frac{1}{24} x^3 \left(2 a+\mathrm{i} b \text{Log}\left[1-\frac{\mathrm{i} c}{x}\right]\right)^3-\frac{1}{8} \mathrm{i} b^3 c^2 \left(1+\frac{\mathrm{i} c}{x}\right) x \text{Log}\left[1+\frac{\mathrm{i} c}{x}\right]-$$
$$\frac{1}{2} \mathrm{i} a b^2 c x^2 \text{Log}\left[1+\frac{\mathrm{i} c}{x}\right]-\frac{1}{2} \mathrm{i} a^2 b x^3 \text{Log}\left[1+\frac{\mathrm{i} c}{x}\right]+\frac{1}{2} a b^2 x^3 \text{Log}\left[1-\frac{\mathrm{i} c}{x}\right] \text{Log}\left[1+\frac{\mathrm{i} c}{x}\right]+\frac{1}{4} \mathrm{i} a b^2 c^3 \text{Log}\left[1+\frac{\mathrm{i} c}{x}\right]^2-$$
$$\frac{1}{16} b^3 c^3 \text{Log}\left[1+\frac{\mathrm{i} c}{x}\right]^2+\frac{1}{8} \mathrm{i} b^3 c^2 \left(1+\frac{\mathrm{i} c}{x}\right) x \text{Log}\left[1+\frac{\mathrm{i} c}{x}\right]^2-\frac{1}{16} b^3 c x^2 \text{Log}\left[1+\frac{\mathrm{i} c}{x}\right]^2-\frac{1}{4} a b^2 x^3 \text{Log}\left[1+\frac{\mathrm{i} c}{x}\right]^2+\frac{1}{24} b^3 c^3 \text{Log}\left[1+\frac{\mathrm{i} c}{x}\right]^3+$$
$$\frac{1}{24} \mathrm{i} b^3 x^3 \text{Log}\left[1+\frac{\mathrm{i} c}{x}\right]^3-\frac{1}{2} a^2 b c^3 \text{Log}[c-\mathrm{i} x]+\frac{1}{4} \mathrm{i} a b^2 c^3 \text{Log}[c-\mathrm{i} x]-\frac{1}{2} \mathrm{i} a b^2 c^3 \text{Log}\left[1-\frac{\mathrm{i} c}{x}\right] \text{Log}[c-\mathrm{i} x]-\frac{1}{4} \mathrm{i} a b^2 c^3 \text{Log}[c+\mathrm{i} x]+$$
$$\frac{1}{2} \mathrm{i} a b^2 c^3 \text{Log}\left[1+\frac{\mathrm{i} c}{x}\right] \text{Log}[c+\mathrm{i} x]-\frac{1}{2} \mathrm{i} a b^2 c^3 \text{Log}\left[\frac{c-\mathrm{i} x}{2 c}\right] \text{Log}[c+\mathrm{i} x]+\frac{1}{2} \mathrm{i} a b^2 c^3 \text{Log}[c-\mathrm{i} x] \text{Log}\left[\frac{c+\mathrm{i} x}{2 c}\right]-\frac{1}{8} b^3 c^3 \text{Log}\left[1+\frac{\mathrm{i} c}{x}\right]^2 \text{Log}\left[-\frac{\mathrm{i} c}{x}\right]+$$
$$\frac{1}{8} b c^3 \left(2 a+\mathrm{i} b \text{Log}\left[1-\frac{\mathrm{i} c}{x}\right]\right)^2 \text{Log}\left[\frac{\mathrm{i} c}{x}\right]+\frac{1}{4} b^3 c^3 \text{Log}[x]+\frac{1}{2} \mathrm{i} a b^2 c^3 \text{Log}[c+\mathrm{i} x] \text{Log}\left[-\frac{\mathrm{i} x}{c}\right]-\frac{1}{2} \mathrm{i} a b^2 c^3 \text{Log}[c-\mathrm{i} x] \text{Log}\left[\frac{\mathrm{i} x}{c}\right]+$$
$$\frac{1}{4} \mathrm{i} b^2 c^3 \left(2 a+\mathrm{i} b \text{Log}\left[1-\frac{\mathrm{i} c}{x}\right]\right) \text{PolyLog}\left[2,1-\frac{\mathrm{i} c}{x}\right]-\frac{1}{4} b^3 c^3 \text{Log}\left[1+\frac{\mathrm{i} c}{x}\right] \text{PolyLog}\left[2,1+\frac{\mathrm{i} c}{x}\right]+\frac{1}{2} \mathrm{i} a b^2 c^3 \text{PolyLog}\left[2,\frac{c-\mathrm{i} x}{2 c}\right]-$$
$$\frac{1}{2} \mathrm{i} a b^2 c^3 \text{PolyLog}\left[2,\frac{c+\mathrm{i} x}{2 c}\right]+\frac{1}{2} \mathrm{i} a b^2 c^3 \text{PolyLog}\left[2,-\frac{\mathrm{i} c}{x}\right]-\frac{3}{8} b^3 c^3 \text{PolyLog}\left[2,-\frac{\mathrm{i} c}{x}\right]-\frac{3}{8} b^3 c^3 \text{PolyLog}\left[2,\frac{\mathrm{i} c}{x}\right]-$$
$$\frac{1}{2} \mathrm{i} a b^2 c^3 \text{PolyLog}\left[2,1-\frac{\mathrm{i} x}{c}\right]+\frac{1}{2} \mathrm{i} a b^2 c^3 \text{PolyLog}\left[2,1+\frac{\mathrm{i} x}{c}\right]+\frac{1}{4} b^3 c^3 \text{PolyLog}\left[3,1-\frac{\mathrm{i} c}{x}\right]+\frac{1}{4} b^3 c^3 \text{PolyLog}\left[3,1+\frac{\mathrm{i} c}{x}\right]$$

## Problem 149: Unable to integrate problem.

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

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

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

Result (type 8, 1058 leaves, 75 steps):

$$\frac{3}{4}\,a^2\,b\,c\,x+\frac{3}{8}\,i\,b^3\,\text{CannotIntegrate}\left[x\,\text{Log}\left[1-\frac{i\,c}{x}\right]^2\text{Log}\left[1+\frac{i\,c}{x}\right],x\right]-\frac{3}{8}\,i\,b^3\,\text{CannotIntegrate}\left[x\,\text{Log}\left[1-\frac{i\,c}{x}\right]\text{Log}\left[1+\frac{i\,c}{x}\right]^2,x\right]+$$
$$\frac{3}{4}\,a\,b^2\,c^2\,\text{Log}\left[i-\frac{c}{x}\right]+\frac{3}{4}\,i\,a\,b^2\,c\,x\,\text{Log}\left[1-\frac{i\,c}{x}\right]+\frac{3}{16}\,b\,c\left(1-\frac{i\,c}{x}\right)x\left(2\,a+i\,b\,\text{Log}\left[1-\frac{i\,c}{x}\right]\right)^2+\frac{1}{16}\,c^2\left(2\,a+i\,b\,\text{Log}\left[1-\frac{i\,c}{x}\right]\right)^3+$$
$$\frac{1}{16}\,x^2\left(2\,a+i\,b\,\text{Log}\left[1-\frac{i\,c}{x}\right]\right)^3-\frac{3}{2}\,i\,a\,b^2\,c\,x\,\text{Log}\left[1+\frac{i\,c}{x}\right]-\frac{3}{4}\,i\,a^2\,b\,x^2\,\text{Log}\left[1+\frac{i\,c}{x}\right]+\frac{3}{4}\,a\,b^2\,x^2\,\text{Log}\left[1-\frac{i\,c}{x}\right]\text{Log}\left[1+\frac{i\,c}{x}\right]-$$
$$\frac{3}{8}\,a\,b^2\,c^2\,\text{Log}\left[1+\frac{i\,c}{x}\right]^2-\frac{3}{16}\,b^3\,c\left(1+\frac{i\,c}{x}\right)x\,\text{Log}\left[1+\frac{i\,c}{x}\right]^2-\frac{3}{8}\,a\,b^2\,x^2\,\text{Log}\left[1+\frac{i\,c}{x}\right]^2+\frac{1}{16}\,i\,b^3\,c^2\,\text{Log}\left[1+\frac{i\,c}{x}\right]^3+\frac{1}{16}\,i\,b^3\,x^2\,\text{Log}\left[1+\frac{i\,c}{x}\right]^3-$$
$$\frac{3}{4}\,i\,a^2\,b\,c^2\,\text{Log}[c-i\,x]+\frac{3}{4}\,a\,b^2\,c^2\,\text{Log}[c-i\,x]+\frac{3}{4}\,a\,b^2\,c^2\,\text{Log}\left[1-\frac{i\,c}{x}\right]\text{Log}[c-i\,x]+\frac{3}{4}\,a\,b^2\,c^2\,\text{Log}[c+i\,x]+\frac{3}{4}\,a\,b^2\,c^2\,\text{Log}\left[1+\frac{i\,c}{x}\right]\text{Log}[c+i\,x]-$$
$$\frac{3}{4}\,a\,b^2\,c^2\,\text{Log}\left[\frac{c-i\,x}{2\,c}\right]\text{Log}[c+i\,x]-\frac{3}{4}\,a\,b^2\,c^2\,\text{Log}[c-i\,x]\,\text{Log}\left[\frac{c+i\,x}{2\,c}\right]-\frac{3}{16}\,i\,b^3\,c^2\,\text{Log}\left[1+\frac{i\,c}{x}\right]^2\text{Log}\left[-\frac{i\,c}{x}\right]-$$
$$\frac{3}{16}\,i\,b\,c^2\left(2\,a+i\,b\,\text{Log}\left[1-\frac{i\,c}{x}\right]\right)^2\text{Log}\left[\frac{i\,c}{x}\right]+\frac{3}{2}\,a\,b^2\,c^2\,\text{Log}[x]+\frac{3}{4}\,a\,b^2\,c^2\,\text{Log}[c+i\,x]\,\text{Log}\left[-\frac{i\,x}{c}\right]+\frac{3}{4}\,a\,b^2\,c^2\,\text{Log}[c-i\,x]\,\text{Log}\left[\frac{i\,x}{c}\right]+$$
$$\frac{3}{8}\,b^2\,c^2\left(2\,a+i\,b\,\text{Log}\left[1-\frac{i\,c}{x}\right]\right)\text{PolyLog}\left[2,1-\frac{i\,c}{x}\right]-\frac{3}{8}\,i\,b^3\,c^2\,\text{Log}\left[1+\frac{i\,c}{x}\right]\text{PolyLog}\left[2,1+\frac{i\,c}{x}\right]-\frac{3}{4}\,a\,b^2\,c^2\,\text{PolyLog}\left[2,\frac{c-i\,x}{2\,c}\right]-$$
$$\frac{3}{4}\,a\,b^2\,c^2\,\text{PolyLog}\left[2,\frac{c+i\,x}{2\,c}\right]-\frac{3}{4}\,a\,b^2\,c^2\,\text{PolyLog}\left[2,-\frac{i\,c}{x}\right]-\frac{3}{8}\,i\,b^3\,c^2\,\text{PolyLog}\left[2,-\frac{i\,c}{x}\right]+\frac{3}{8}\,i\,b^3\,c^2\,\text{PolyLog}\left[2,\frac{i\,c}{x}\right]+$$
$$\frac{3}{4}\,a\,b^2\,c^2\,\text{PolyLog}\left[2,1-\frac{i\,x}{c}\right]+\frac{3}{4}\,a\,b^2\,c^2\,\text{PolyLog}\left[2,1+\frac{i\,x}{c}\right]-\frac{3}{8}\,i\,b^3\,c^2\,\text{PolyLog}\left[3,1-\frac{i\,c}{x}\right]+\frac{3}{8}\,i\,b^3\,c^2\,\text{PolyLog}\left[3,1+\frac{i\,c}{x}\right]$$

## Problem 150: Unable to integrate problem.

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

Optimal (type 4, 119 leaves, 6 steps):

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

Result (type 8, 805 leaves, 43 steps):

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

## Problem 152: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 136 leaves, 6 steps):

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

Result (type 4, 551 leaves, 82 steps):

$$-\frac{3\,b\left(1-\frac{i\,c}{x}\right)\left(2\,i\,a-b\,\mathrm{Log}\left[1-\frac{i\,c}{x}\right]\right)^2}{8\,c}-\frac{3\,b\left(1-\frac{i\,c}{x}\right)\left(2\,a+i\,b\,\mathrm{Log}\left[1-\frac{i\,c}{x}\right]\right)^2}{8\,c}-\frac{i\left(1-\frac{i\,c}{x}\right)\left(2\,a+i\,b\,\mathrm{Log}\left[1-\frac{i\,c}{x}\right]\right)^3}{8\,c}+$$

$$\frac{3\,b\left(2\,i\,a-b\,\mathrm{Log}\left[1-\frac{i\,c}{x}\right]\right)^2\mathrm{Log}\left[1+\frac{i\,c}{x}\right]}{8\,c}-\frac{3\,i\,b\left(2\,i\,a-b\,\mathrm{Log}\left[1-\frac{i\,c}{x}\right]\right)^2\mathrm{Log}\left[1+\frac{i\,c}{x}\right]}{8\,x}-\frac{3\,b^2\left(2\,i\,a-b\,\mathrm{Log}\left[1-\frac{i\,c}{x}\right]\right)\mathrm{Log}\left[1+\frac{i\,c}{x}\right]^2}{8\,c}-$$

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

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

## Problem 153: Unable to integrate problem.

$$\int\frac{\left(a+b\,\mathrm{ArcTan}\left[\frac{c}{x}\right]\right)^3}{x^3}\,dx$$

Optimal (type 4, 147 leaves, 9 steps):

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

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

Result (type 8, 1316 leaves, 81 steps):

$$\frac{3\,\mathrm{i}\,b^3\left(1-\frac{\mathrm{i}\,c}{x}\right)^2}{64\,c^2}-\frac{3\,a\,b^2\left(1+\frac{\mathrm{i}\,c}{x}\right)^2}{16\,c^2}-\frac{3\,\mathrm{i}\,b^3\left(1+\frac{\mathrm{i}\,c}{x}\right)^2}{64\,c^2}-\frac{3\,\mathrm{i}\,a^2\,b}{8\,x^2}-\frac{3\,a\,b^2}{8\,x^2}+\frac{3\,a^2\,b}{4\,c\,x}-\frac{3\,b^3}{2\,c\,x}+\frac{3}{8}\,\mathrm{i}\,b^3\,\text{CannotIntegrate}\left[\frac{\text{Log}\left[1-\frac{\mathrm{i}\,c}{x}\right]^2\,\text{Log}\left[1+\frac{\mathrm{i}\,c}{x}\right]}{x^3},\,x\right]-$$

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

$$\frac{3\,\mathrm{i}\,b^3\left(1-\frac{\mathrm{i}\,c}{x}\right)\text{Log}\left[1-\frac{\mathrm{i}\,c}{x}\right]}{4\,c^2}+\frac{3\,a\,b^2\,\text{Log}\left[1-\frac{\mathrm{i}\,c}{x}\right]}{8\,x^2}-\frac{3\,b^2\left(1-\frac{\mathrm{i}\,c}{x}\right)^2\left(2\,a+\mathrm{i}\,b\,\text{Log}\left[1-\frac{\mathrm{i}\,c}{x}\right]\right)}{32\,c^2}+\frac{3\,\mathrm{i}\,b\left(1-\frac{\mathrm{i}\,c}{x}\right)\left(2\,a+\mathrm{i}\,b\,\text{Log}\left[1-\frac{\mathrm{i}\,c}{x}\right]\right)^2}{8\,c^2}-$$

$$\frac{3\,\mathrm{i}\,b\left(1-\frac{\mathrm{i}\,c}{x}\right)^2\left(2\,a+\mathrm{i}\,b\,\text{Log}\left[1-\frac{\mathrm{i}\,c}{x}\right]\right)^2}{32\,c^2}-\frac{\left(1-\frac{\mathrm{i}\,c}{x}\right)\left(2\,a+\mathrm{i}\,b\,\text{Log}\left[1-\frac{\mathrm{i}\,c}{x}\right]\right)^3}{8\,c^2}+\frac{\left(1-\frac{\mathrm{i}\,c}{x}\right)^2\left(2\,a+\mathrm{i}\,b\,\text{Log}\left[1-\frac{\mathrm{i}\,c}{x}\right]\right)^3}{16\,c^2}-$$

$$\frac{9\,a\,b^2\left(1+\frac{\mathrm{i}\,c}{x}\right)\text{Log}\left[1+\frac{\mathrm{i}\,c}{x}\right]}{4\,c^2}-\frac{3\,\mathrm{i}\,b^3\left(1+\frac{\mathrm{i}\,c}{x}\right)\text{Log}\left[1+\frac{\mathrm{i}\,c}{x}\right]}{4\,c^2}+\frac{3\,a\,b^2\left(1+\frac{\mathrm{i}\,c}{x}\right)^2\text{Log}\left[1+\frac{\mathrm{i}\,c}{x}\right]}{8\,c^2}+\frac{3\,\mathrm{i}\,b^3\left(1+\frac{\mathrm{i}\,c}{x}\right)^2\text{Log}\left[1+\frac{\mathrm{i}\,c}{x}\right]}{32\,c^2}+$$

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

$$\frac{3\,a\,b^2\left(1+\frac{\mathrm{i}\,c}{x}\right)^2\text{Log}\left[1+\frac{\mathrm{i}\,c}{x}\right]^2}{8\,c^2}-\frac{3\,\mathrm{i}\,b^3\left(1+\frac{\mathrm{i}\,c}{x}\right)^2\text{Log}\left[1+\frac{\mathrm{i}\,c}{x}\right]^2}{32\,c^2}-\frac{\mathrm{i}\,b^3\left(1+\frac{\mathrm{i}\,c}{x}\right)\text{Log}\left[1+\frac{\mathrm{i}\,c}{x}\right]^3}{8\,c^2}+\frac{\mathrm{i}\,b^3\left(1+\frac{\mathrm{i}\,c}{x}\right)^2\text{Log}\left[1+\frac{\mathrm{i}\,c}{x}\right]^3}{16\,c^2}+$$

$$\frac{3\,a\,b^2\,\text{Log}\left[\mathrm{i}+\frac{c}{x}\right]}{8\,c^2}-\frac{3\,a\,b^2\,\text{Log}\left[1-\frac{\mathrm{i}\,c}{x}\right]\text{Log}[c-\mathrm{i}\,x]}{4\,c^2}-\frac{3\,a\,b^2\,\text{Log}\left[1+\frac{\mathrm{i}\,c}{x}\right]\text{Log}[c+\mathrm{i}\,x]}{4\,c^2}+\frac{3\,a\,b^2\,\text{Log}\left[\frac{c-\mathrm{i}\,x}{2\,c}\right]\text{Log}[c+\mathrm{i}\,x]}{4\,c^2}+$$

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

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

# Test results for the 31 problems in "5.3.3 (d+e x)^m (a+b arctan(c x^n))^p.m"

## Problem 21: Result optimal but 1 more steps used.

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

Optimal (type 3, 250 leaves, 17 steps):

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

Result (type 3, 250 leaves, 18 steps):

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

## Problem 23: Unable to integrate problem.

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

Optimal (type 4, 501 leaves, 19 steps):

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

Result (type 8, 30 leaves, 2 steps):

$$b\,\text{CannotIntegrate}\left[\frac{\text{ArcTan}\left[c\,x^2\right]}{d+e\,x},x\right]+\frac{a\,\text{Log}[d+e\,x]}{e}$$

## Problem 24: Result optimal but 1 more steps used.

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

Optimal (type 3, 328 leaves, 18 steps):

$$\frac{b c^2 d^3 \operatorname{ArcTan}[c x^2]}{e (c^2 d^4 + e^4)} - \frac{a + b \operatorname{ArcTan}[c x^2]}{e (d + e x)} + \frac{b \sqrt{c} (c d^2 - e^2) \operatorname{ArcTan}[1 - \sqrt{2} \sqrt{c} x]}{\sqrt{2} (c^2 d^4 + e^4)} - \frac{b \sqrt{c} (c d^2 - e^2) \operatorname{ArcTan}[1 + \sqrt{2} \sqrt{c} x]}{\sqrt{2} (c^2 d^4 + e^4)} - \frac{2 b c d e \operatorname{Log}[d + e x]}{c^2 d^4 + e^4} - \frac{b \sqrt{c} (c d^2 + e^2) \operatorname{Log}[1 - \sqrt{2} \sqrt{c} x + c x^2]}{2 \sqrt{2} (c^2 d^4 + e^4)} + \frac{b \sqrt{c} (c d^2 + e^2) \operatorname{Log}[1 + \sqrt{2} \sqrt{c} x + c x^2]}{2 \sqrt{2} (c^2 d^4 + e^4)} + \frac{b c d e \operatorname{Log}[1 + c^2 x^4]}{2 (c^2 d^4 + e^4)}$$

Result (type 3, 328 leaves, 19 steps):

$$\frac{b c^2 d^3 \operatorname{ArcTan}[c x^2]}{e (c^2 d^4 + e^4)} - \frac{a + b \operatorname{ArcTan}[c x^2]}{e (d + e x)} + \frac{b \sqrt{c} (c d^2 - e^2) \operatorname{ArcTan}[1 - \sqrt{2} \sqrt{c} x]}{\sqrt{2} (c^2 d^4 + e^4)} - \frac{b \sqrt{c} (c d^2 - e^2) \operatorname{ArcTan}[1 + \sqrt{2} \sqrt{c} x]}{\sqrt{2} (c^2 d^4 + e^4)} - \frac{2 b c d e \operatorname{Log}[d + e x]}{c^2 d^4 + e^4} - \frac{b \sqrt{c} (c d^2 + e^2) \operatorname{Log}[1 - \sqrt{2} \sqrt{c} x + c x^2]}{2 \sqrt{2} (c^2 d^4 + e^4)} + \frac{b \sqrt{c} (c d^2 + e^2) \operatorname{Log}[1 + \sqrt{2} \sqrt{c} x + c x^2]}{2 \sqrt{2} (c^2 d^4 + e^4)} + \frac{b c d e \operatorname{Log}[1 + c^2 x^4]}{2 (c^2 d^4 + e^4)}$$

## Problem 25: Result valid but suboptimal antiderivative.

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

Optimal (type 4, 1325 leaves, 77 steps):

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

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

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

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

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

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

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

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

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

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

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

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

Result (type 4, 1554 leaves, 110 steps) :

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## Problem 26: Result valid but suboptimal antiderivative.

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

Optimal (type 8, 22 leaves, 0 steps):

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

Result (type 8, 56 leaves, 2 steps):

$$2\, a\, b \,\text{CannotIntegrate}\left[\frac{\text{ArcTan}\left[c\, x^2\right]}{d + e\, x}, x\right] + b^2 \,\text{CannotIntegrate}\left[\frac{\text{ArcTan}\left[c\, x^2\right]^2}{d + e\, x}, x\right] + \frac{a^2 \,\text{Log}[d + e\, x]}{e}$$

## Problem 27: Result valid but suboptimal antiderivative.

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

Optimal (type 8, 22 leaves, 0 steps):

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

Result (type 8, 363 leaves, 21 steps):

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

## Problem 28: Result valid but suboptimal antiderivative.

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

Optimal (type 3, 315 leaves, 24 steps):

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

Result (type 3, 331 leaves, 25 steps):

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

## Problem 29: Result optimal but 1 more steps used.

$$\int (d+e x) \left(a+b \operatorname{ArcTan}\left[c x^3\right]\right) dx$$

Optimal (type 3, 285 leaves, 22 steps):

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

Result (type 3, 285 leaves, 23 steps):

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

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

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

## Problem 30: Unable to integrate problem.

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

Optimal (type 4, 739 leaves, 25 steps):

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

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

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

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

Result (type 8, 30 leaves, 2 steps):

$$b\,\text{CannotIntegrate}\left[\frac{\text{ArcTan}\left[c\,x^3\right]}{d+e\,x},x\right]+\frac{a\,\text{Log}[d+e\,x]}{e}$$

## Problem 31: Result optimal but 1 more steps used.

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

Optimal (type 3, 906 leaves, 34 steps):

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

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

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

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

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

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

Result (type 3, 906 leaves, 35 steps):

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

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

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

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

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

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

# Test results for the 1301 problems in "5.3.4 u (a+b arctan(c x))^p.m"

## Problem 1137: Result valid but suboptimal antiderivative.

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

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

$$\frac{b \left(10 c^6 d^3-20 c^4 d^2 e+15 c^2 d e^2-4 e^3\right) x}{40 c^9}-\frac{b \left(10 c^6 d^3-20 c^4 d^2 e+15 c^2 d e^2-4 e^3\right) x^3}{120 c^7}-\frac{b e \left(20 c^4 d^2-15 c^2 d e+4 e^2\right) x^5}{200 c^5}-\frac{b \left(15 c^2 d-4 e\right) e^2 x^7}{280 c^3}-\frac{b e^3 x^9}{90 c}+\frac{b \left(c^2 d-e\right)^4 \left(c^2 d+4 e\right) \operatorname{ArcTan}[c x]}{40 c^{10} e^2}-\frac{d \left(d+e x^2\right)^4 (a+b \operatorname{ArcTan}[c x])}{8 e^2}+\frac{\left(d+e x^2\right)^5 (a+b \operatorname{ArcTan}[c x])}{10 e^2}$$

Result (type 3, 285 leaves, 8 steps):

$$\frac{b \left(325 c^8 d^4+1815 c^6 d^3 e-4977 c^4 d^2 e^2+4305 c^2 d e^3-1260 e^4\right) x}{12600 c^9 e}+\frac{b \left(5 c^6 d^3+750 c^4 d^2 e-1071 c^2 d e^2+420 e^3\right) x \left(d+e x^2\right)}{12600 c^7 e}-\frac{b \left(25 c^4 d^2-135 c^2 d e+84 e^2\right) x \left(d+e x^2\right)^2}{4200 c^5 e}-\frac{b \left(23 c^2 d-36 e\right) x \left(d+e x^2\right)^3}{2520 c^3 e}-\frac{b x \left(d+e x^2\right)^4}{90 c e}+\frac{b \left(c^2 d-e\right)^4 \left(c^2 d+4 e\right) \operatorname{ArcTan}[c x]}{40 c^{10} e^2}-\frac{d \left(d+e x^2\right)^4 (a+b \operatorname{ArcTan}[c x])}{8 e^2}+\frac{\left(d+e x^2\right)^5 (a+b \operatorname{ArcTan}[c x])}{10 e^2}$$

## Problem 1292: Result valid but suboptimal antiderivative.

$$\int \frac{(a+b \operatorname{ArcTan}[c x]) \left(d+e \operatorname{Log}\left[1+c^2 x^2\right]\right)}{x^2} \, dx$$

Optimal (type 4, 100 leaves, 6 steps):

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

Result (type 4, 92 leaves, 8 steps):

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

## Problem 1294: Result valid but suboptimal antiderivative.

$$\int \frac{(a+b\,\text{ArcTan}[c\,x])\,(d+e\,\text{Log}[1+c^2 x^2])}{x^4}\,dx$$

Optimal (type 4, 189 leaves, 15 steps):

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

Result (type 4, 186 leaves, 17 steps):

$$-\frac{2 c^2 e\,(a+b\,\text{ArcTan}[c\,x])}{3 x}-\frac{c^3 e\,(a+b\,\text{ArcTan}[c\,x])^2}{3 b}-\frac{1}{3} b c^3 d\,\text{Log}[x]+b c^3 e\,\text{Log}[x]-\frac{1}{3} b c^3 e\,\text{Log}[1+c^2 x^2]-\frac{b c\,(1+c^2 x^2)\,(d+e\,\text{Log}[1+c^2 x^2])}{6 x^2}-\frac{(a+b\,\text{ArcTan}[c\,x])\,(d+e\,\text{Log}[1+c^2 x^2])}{3 x^3}+\frac{b c^3\,(d+e\,\text{Log}[1+c^2 x^2])^2}{12 e}+\frac{1}{6} b c^3 e\,\text{PolyLog}[2,-c^2 x^2]$$

## Problem 1296: Result valid but suboptimal antiderivative.

$$\int \frac{(a+b\,\text{ArcTan}[c\,x])\,(d+e\,\text{Log}[1+c^2 x^2])}{x^6}\,dx$$

Optimal (type 4, 248 leaves, 24 steps):

$$-\frac{7 b c^3 e}{60 x^2}-\frac{2 c^2 e\,(a+b\,\text{ArcTan}[c\,x])}{15 x^3}+\frac{2 c^4 e\,(a+b\,\text{ArcTan}[c\,x])}{5 x}+\frac{c^5 e\,(a+b\,\text{ArcTan}[c\,x])^2}{5 b}-\frac{5}{6} b c^5 e\,\text{Log}[x]+\frac{19}{60} b c^5 e\,\text{Log}[1+c^2 x^2]-\frac{b c\,(d+e\,\text{Log}[1+c^2 x^2])}{20 x^4}+\frac{b c^3\,(1+c^2 x^2)\,(d+e\,\text{Log}[1+c^2 x^2])}{10 x^2}-\frac{(a+b\,\text{ArcTan}[c\,x])\,(d+e\,\text{Log}[1+c^2 x^2])}{5 x^5}+\frac{1}{10} b c^5\,(d+e\,\text{Log}[1+c^2 x^2])\,\text{Log}\left[1-\frac{1}{1+c^2 x^2}\right]-\frac{1}{10} b c^5 e\,\text{PolyLog}\left[2,\frac{1}{1+c^2 x^2}\right]$$

Result (type 4, 245 leaves, 26 steps):

$$-\frac{7 b c^3 e}{60 x^2}-\frac{2 c^2 e (a+b \text{ArcTan}[c x])}{15 x^3}+\frac{2 c^4 e (a+b \text{ArcTan}[c x])}{5 x}+\frac{c^5 e (a+b \text{ArcTan}[c x])^2}{5 b}+\frac{1}{5} b c^5 d \text{Log}[x]-$$
$$\frac{5}{6} b c^5 e \text{Log}[x]+\frac{19}{60} b c^5 e \text{Log}\left[1+c^2 x^2\right]-\frac{b c \left(d+e \text{Log}\left[1+c^2 x^2\right]\right)}{20 x^4}+\frac{b c^3 \left(1+c^2 x^2\right) \left(d+e \text{Log}\left[1+c^2 x^2\right]\right)}{10 x^2}-$$
$$\frac{(a+b \text{ArcTan}[c x]) \left(d+e \text{Log}\left[1+c^2 x^2\right]\right)}{5 x^5}-\frac{b c^5 \left(d+e \text{Log}\left[1+c^2 x^2\right]\right)^2}{20 e}-\frac{1}{10} b c^5 e \text{PolyLog}\left[2,-c^2 x^2\right]$$

# Test results for the 70 problems in "5.3.5 u (a+b arctan(c+d x))^p.m"

# Test results for the 385 problems in "5.3.6 Exponentials of inverse tangent.m"

## Problem 344: Result valid but suboptimal antiderivative.

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

Optimal (type 5, 65 leaves, 3 steps):

$$\frac{i e^{n \text{ArcTan}[a x]}}{c n}-\frac{2 i e^{n \text{ArcTan}[a x]} \text{Hypergeometric2F1}\left[1,-\frac{i n}{2},1-\frac{i n}{2},e^{2 i \text{ArcTan}[a x]}\right]}{c n}$$

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

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

## Problem 345: Result valid but suboptimal antiderivative.

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

Optimal (type 5, 90 leaves, 5 steps):

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

Result (type 5, 180 leaves, 5 steps):

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

## Problem 346: Result valid but suboptimal antiderivative.

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

Optimal (type 5, 126 leaves, 6 steps):

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

Result (type 5, 242 leaves, 6 steps):

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

# Test results for the 153 problems in "5.3.7 Inverse tangent functions.m"

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

## Problem 107: Result valid but suboptimal antiderivative.

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

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

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

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

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

Result (type 4, 655 leaves, 37 steps) :

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

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

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

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

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

## Test results for the 174 problems in "5.5.1 u (a+b arcsec(c x))^n.m"

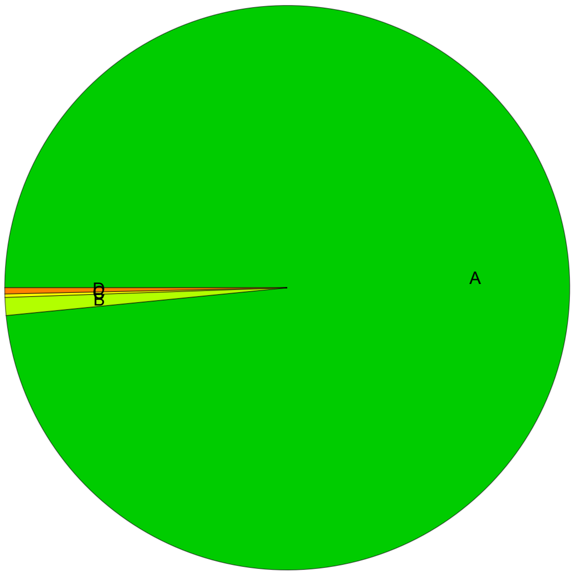
## Test results for the 50 problems in "5.5.2 Inverse secant functions.m"

## Test results for the 178 problems in "5.6.1 u (a+b arccsc(c x))^n.m"

## Test results for the 49 problems in "5.6.2 Inverse cosecant functions.m"

# Summary of Integration Test Results

4585 integration problems




A - 4513 optimal antiderivatives

B - 47 valid but suboptimal antiderivatives

C - 9 unnecessarily complex antiderivatives

D - 16 unable to integrate problems

E - 0 integration timeouts

F - 0 invalid antiderivatives