Rubi 3 Test Suite Results

Indefinite Integration Problems Involving Inverse Hyperbolic Functions

Unable to integrate:

$$\left\{\frac{x}{\sqrt{-1+x}\sqrt{1+x}}\frac{x}{\sqrt{1+x}\operatorname{ArcCosh}[x]}, x, -3, 3\right\}$$

CoshIntegral[ArcCosh[x]]

$$2\, \text{Subst}\Big[\text{Int}\Big[\frac{1}{\sqrt{2+x^2}\,\,\text{ArcCosh}\big[1+x^2\big]}\,,\,\, x\Big]\,,\,\, x\,,\,\, \sqrt{-1+x}\,\,\Big] + 2\, \text{Subst}\Big[\text{Int}\Big[\frac{x^2}{\sqrt{2+x^2}\,\,\,\text{ArcCosh}\big[1+x^2\big]}\,,\,\, x\Big]\,,\,\, x\,,\,\, \sqrt{-1+x}\,\,\Big]$$

Unable to integrate:

$$\left\{\frac{\operatorname{ArcTanh}\left[a+b\,x\right]^{2}}{x},\,x,\,-3,\,3\right\}$$

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

$$\label{eq:arcTanh} \text{ArcTanh} \left[a + b \, x \right]^2 \\ \text{Log} \left[1 + \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{\frac{1+a}{b}} \ \sqrt{1 - \left(a + b \, x \right)^2}} \, \right] \\ + 2 \, \text{ArcTanh} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{\frac{1+a}{b}} \ \sqrt{1 - \left(a + b \, x \right)^2}} \, \right] \\ + 2 \, \text{ArcTanh} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{\frac{1+a}{b}} \ \sqrt{1 - \left(a + b \, x \right)^2}} \, \right] \\ + 2 \, \text{ArcTanh} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{\frac{1+a}{b}} \ \sqrt{1 - \left(a + b \, x \right)^2}} \, \right] \\ + 2 \, \text{ArcTanh} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - \left(a + b \, x \right)^2}} \, \right] \\ + 2 \, \text{ArcTanh} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - \left(a + b \, x \right)^2}} \, \right] \\ + 2 \, \text{ArcTanh} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - \left(a + b \, x \right)^2}} \, \right] \\ + 2 \, \text{ArcTanh} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - \left(a + b \, x \right)^2}} \, \right] \\ + 2 \, \text{ArcTanh} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - \left(a + b \, x \right)^2}} \, \right] \\ + 2 \, \text{ArcTanh} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - \left(a + b \, x \right)^2}} \, \right] \\ + 2 \, \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - \left(a + b \, x \right)^2}} \, \right] \\ + 2 \, \text{ArcTanh} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - \left(a + b \, x \right)^2}} \, \right] \\ + 2 \, \text{ArcTanh} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - \left(a + b \, x \right)^2}} \, \right] \\ + 2 \, \text{ArcTanh} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - \left(a + b \, x \right)^2}} \, \right] \\ + 2 \, \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - \left(a + b \, x \right)^2}} \, \right] \\ + 2 \, \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - \left(a + b \, x$$

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

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

$$- \text{Subst} \Big[\, \text{Int} \, \Big[\, \frac{x^2 \, \text{Sech} \, [\, x \,]^{\, 2}}{\text{a} - \text{Tanh} \, [\, x \,]} \, \, , \, \, x \Big] \, , \, \, x \, , \, \, \text{ArcTanh} \, [\, \text{a} + \text{b} \, \, x \,] \, \Big]$$

Unable to integrate:

$$\left\{\frac{\operatorname{ArcCoth}[a+bx]^2}{x}, x, -2, 2\right\}$$

$$-\frac{2}{3} \operatorname{ArcCoth} \left[a + b \, x \right]^{3} - \operatorname{ArcCoth} \left[a + b \, x \right]^{2} \operatorname{Log} \left[\frac{2}{1 + a + b \, x} \right] + \operatorname{ArcCoth} \left[a + b \, x \right]^{2} \operatorname{Log} \left[1 - \frac{\sqrt{\frac{1 - a}{b}} \left(1 + a + b \, x \right)}{\sqrt{\frac{1 + a}{b}} \sqrt{1 - \left(a + b \, x \right)^{2}}} \right] + \operatorname{ArcCoth} \left[a + b \, x \right]^{2} \operatorname{Log} \left[1 - \frac{\sqrt{\frac{1 - a}{b}} \left(1 + a + b \, x \right)}{\sqrt{\frac{1 + a}{b}} \sqrt{1 - \left(a + b \, x \right)^{2}}} \right] + \operatorname{ArcCoth} \left[a + b \, x \right]^{2} \operatorname{Log} \left[1 - \frac{\sqrt{\frac{1 - a}{b}} \left(1 + a + b \, x \right)}{\sqrt{\frac{1 - a}{b}} \sqrt{1 - \left(a + b \, x \right)^{2}}} \right] + \operatorname{ArcCoth} \left[a + b \, x \right]^{2} \operatorname{Log} \left[1 - \frac{\sqrt{\frac{1 - a}{b}} \left(1 + a + b \, x \right)}{\sqrt{\frac{1 - a}{b}} \sqrt{1 - \left(a + b \, x \right)^{2}}} \right] + \operatorname{ArcCoth} \left[a + b \, x \right]^{2} \operatorname{Log} \left[1 - \frac{\sqrt{\frac{1 - a}{b}} \left(1 + a + b \, x \right)}{\sqrt{\frac{1 - a}{b}} \sqrt{1 - \left(a + b \, x \right)^{2}}} \right] + \operatorname{ArcCoth} \left[a + b \, x \right]^{2} \operatorname{Log} \left[1 - \frac{\sqrt{\frac{1 - a}{b}} \left(1 + a + b \, x \right)}{\sqrt{\frac{1 - a}{b}} \sqrt{1 - \left(a + b \, x \right)^{2}}} \right] + \operatorname{ArcCoth} \left[a + b \, x \right]^{2} \operatorname{Log} \left[1 - \frac{\sqrt{\frac{1 - a}{b}} \left(1 + a + b \, x \right)}{\sqrt{\frac{1 - a}{b}} \sqrt{1 - \left(a + b \, x \right)^{2}}} \right] + \operatorname{ArcCoth} \left[a + b \, x \right]^{2} \operatorname{Log} \left[1 - \frac{\sqrt{\frac{1 - a}{b}} \left(1 + a + b \, x \right)}{\sqrt{\frac{1 - a}{b}} \sqrt{1 - \left(a + b \, x \right)^{2}}} \right] + \operatorname{ArcCoth} \left[a + b \, x \right]^{2} \operatorname{Log} \left[1 - \frac{\sqrt{\frac{1 - a}{b}} \left(1 + a + b \, x \right)}{\sqrt{\frac{1 - a}{b}} \sqrt{1 - \left(a + b \, x \right)^{2}}} \right] + \operatorname{ArcCoth} \left[a + b \, x \right]^{2} \operatorname{Log} \left[1 - \frac{\sqrt{\frac{1 - a}{b}} \left(1 + a + b \, x \right)}{\sqrt{\frac{1 - a}{b}} \sqrt{1 - \left(a + b \, x \right)^{2}}} \right] + \operatorname{ArcCoth} \left[a + b \, x \right]^{2} \operatorname{Log} \left[1 - \frac{a + b \, x}{b} \right]^{2} \operatorname{Log} \left[1 - \frac{a + b \, x}{b} \right]^{2} \operatorname{Log} \left[1 - \frac{a + b \, x}{b} \right]^{2} \operatorname{Log} \left[1 - \frac{a + b \, x}{b} \right]^{2} \operatorname{Log} \left[1 - \frac{a + b \, x}{b} \right]^{2} \operatorname{Log} \left[1 - \frac{a + b \, x}{b} \right]^{2} \operatorname{Log} \left[1 - \frac{a + b \, x}{b} \right]^{2} \operatorname{Log} \left[1 - \frac{a + b \, x}{b} \right]^{2} \operatorname{Log} \left[1 - \frac{a + b \, x}{b} \right]^{2} \operatorname{Log} \left[1 - \frac{a + b \, x}{b} \right]^{2} \operatorname{Log} \left[1 - \frac{a + b \, x}{b} \right]^{2} \operatorname{Log} \left[1 - \frac{a + b \, x}{b} \right]^{2} \operatorname{Log} \left[1 - \frac{a + b \, x}{b} \right]^{2} \operatorname{Log} \left[1 - \frac{a + b \, x}{b} \right]^{2} \operatorname{Log} \left[1 - \frac{a + b \, x}{b} \right]^{2} \operatorname{Log} \left[1 - \frac{a + b \, x}{b} \right]^{2} \operatorname{L$$

$$\label{eq:arcCoth} \text{ArcCoth} \left[a + b \, x \right]^2 \\ \text{Log} \left[1 + \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{\frac{1+a}{b}} \ \sqrt{1 - (a + b \, x)^2}} \right] \\ + 2 \\ \text{ArcCoth} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{\frac{1+a}{b}} \ \sqrt{1 - (a + b \, x)^2}} \right] \\ + 2 \\ \text{ArcCoth} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{\frac{1+a}{b}} \ \sqrt{1 - (a + b \, x)^2}} \right] \\ + 2 \\ \text{ArcCoth} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{\frac{1+a}{b}} \ \sqrt{1 - (a + b \, x)^2}} \right] \\ + 2 \\ \text{ArcCoth} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - (a + b \, x)^2}} \right] \\ + 2 \\ \text{ArcCoth} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - (a + b \, x)^2}} \right] \\ + 2 \\ \text{ArcCoth} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - (a + b \, x)^2}} \right] \\ + 2 \\ \text{ArcCoth} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - (a + b \, x)^2}} \right] \\ + 2 \\ \text{ArcCoth} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - (a + b \, x)^2}} \right] \\ + 2 \\ \text{ArcCoth} \left[a + b \, x \right] \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - (a + b \, x)^2}} \right] \\ + 2 \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - (a + b \, x)^2}} \right] \\ + 2 \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - (a + b \, x)^2}} \right] \\ + 2 \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - (a + b \, x)^2}} \right] \\ + 2 \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - (a + b \, x)^2}} \right] \\ + 2 \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - (a + b \, x)^2}} \right] \\ + 2 \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - (a + b \, x)^2}} \right] \\ + 2 \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 - (a + b \, x)^2}} \right] \\ + 2 \\ \text{PolyLog} \left[2 \, , \, - \frac{\sqrt{\frac{1-a}{b}} \ \left(1 + a + b \, x \right)}{\sqrt{1 -$$

$$2 \operatorname{ArcCoth}[a+b\,x] \operatorname{PolyLog}\!\left[2, \, \frac{\sqrt{\frac{1-a}{b}} \, \left(1+a+b\,x\right)}{\sqrt{\frac{1+a}{b}} \, \sqrt{1-\left(a+b\,x\right)^2}}\right] + \operatorname{ArcCoth}[a+b\,x] \operatorname{PolyLog}\!\left[2, \, 1-\frac{2}{1+a+b\,x}\right] - \left(\frac{1+a}{b} + \frac{1}{b} +$$

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

$$- Subst \Big[\, Int \Big[\, \frac{x^2 \, Csch \, [\, x \,]^{\, 2}}{-a + Coth \, [\, x \,]} \, , \, \, x \Big] \, , \, \, x \, , \, \, ArcCoth \, [\, a + b \, x \,] \, \Big]$$