Inverse Trigonometric Derivatives and Corresponding Antiderivatives

Derivatives of Inverse Trigonometric Functions

$$\frac{d}{dx}[\arcsin x] = \frac{1}{\sqrt{1-x^2}} \qquad \frac{d}{dx}[\arccos x] = \frac{-1}{\sqrt{1-x^2}}$$

$$\frac{d}{dx}[\arctan x] = \frac{1}{1+x^2} \qquad \frac{d}{dx}[\operatorname{arccot} x] = \frac{-1}{1+x^2}$$

$$\frac{d}{dx}[\operatorname{arcsec} x] = \frac{1}{|x|\sqrt{x^2-1}} \qquad \frac{d}{dx}[\operatorname{arccsc} x] = \frac{-1}{|x|\sqrt{x^2-1}}$$

Integrals Associated with Inverse Trigonometric Functions

$$\int \frac{dx}{\sqrt{a^2-x^2}} = \arcsin\frac{x}{a} + C \qquad \left(\text{or } -\arccos\frac{x}{a} + C\right)$$

$$\int \frac{dx}{a^2+x^2} = \frac{1}{a}\arctan\frac{x}{a} + C \qquad \left(\text{or } -\frac{1}{a}\operatorname{arccot}\frac{x}{a} + C\right)$$

$$\int \frac{dx}{x\sqrt{x^2-a^2}} = \frac{1}{a}\operatorname{arcsec}\frac{|x|}{a} + C \qquad \left(\text{or } -\frac{1}{a}\operatorname{arccsc}\frac{|x|}{a} + C\right)$$