

Derivatives of Standard Functions

Exponential

$$\frac{d}{dx} e^x = e^x$$

$$\frac{d}{dx} a^x = a^x \ln(a)$$

$$\frac{d}{dx} \ln(x) = \frac{1}{x}$$

$$\frac{d}{dx} \log_a(x) = \frac{1}{x \ln(a)}$$

Trigonometric

$$\frac{d}{dx} \sin(x) = \cos(x)$$

$$\frac{d}{dx} \cos(x) = -\sin(x)$$

$$\frac{d}{dx} \tan(x) = \sec^2(x)$$

$$\frac{d}{dx} \cot(x) = -\csc^2(x)$$

$$\frac{d}{dx} \sin^{-1}(ax) = \frac{a}{\sqrt{1-a^2x^2}}$$

$$\frac{d}{dx} \cos^{-1}(ax) = -\frac{a}{\sqrt{1-a^2x^2}}$$

Hyperbolic

$$\frac{d}{dx} \sinh(x) = \cosh(x)$$

$$\frac{d}{dx} \cosh(x) = \sinh(x)$$

$$\frac{d}{dx} \tanh(x) = (\operatorname{sech}(x))^2$$

$$\frac{d}{dx} \sinh^{-1}(ax) = \frac{a}{\sqrt{1+a^2x^2}}$$

$$\frac{d}{dx} \cosh^{-1}(ax) = \frac{a}{\sqrt{a^2x^2-1}}$$