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

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

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

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

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

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

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

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

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

Hyperbolic

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

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

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

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

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