12/9/2019 Table of Derivatives



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### Table of Derivatives

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#### Power of x.

$$\frac{\mathbf{d}}{\mathbf{dx}} c = 0 \quad \frac{\mathbf{d}}{\mathbf{dx}} x = 1 \quad \frac{\mathbf{d}}{\mathbf{dx}} x^{n} = n x^{(n-1)}$$
Proof

### Exponential / Logarithmic

$$\begin{array}{|c|c|c|c|}\hline & \frac{d}{dx} e^{x} = e^{x} & \frac{d}{dx} b^{x} = b^{x} \ln(b) & \frac{d}{dx} \ln(x) = 1/x \\ \hline & \frac{Proof}{} & \frac{Proof}{} & \frac{Proof}{} \\ \hline \end{array}$$

### Trigonometric

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

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

$$\frac{Proof}{}$$

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

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

$$\frac{Proof}{}$$

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

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

$$\frac{Proof}{}$$

# **Inverse Trigonometric**

$$\frac{\frac{d}{dx} \arcsin x}{\sqrt{1 - x^2}} = \frac{1}{\sqrt{1 - x^2}}$$

$$\frac{\frac{d}{dx} \arccos x}{\sqrt{1 - x^2}} = \frac{-1}{|x| \sqrt{1 - x^2}}$$

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## Hyperbolic

$\frac{d}{dx}$ sinh x = cosh x Proof	$\frac{d}{dx}\operatorname{csch} x = -\coth x \operatorname{csch} x$ $\frac{\operatorname{Proof}}{}$
$\frac{d}{dx} \cosh x = \sinh x$ $\frac{\text{Proof}}{}$	$\frac{d}{dx}$ sech x = - tanh x sech x Proof
$\frac{d}{dx}$ tanh x = 1 - tanh <sup>2</sup> x <u>Proof</u>	$\frac{\frac{d}{dx} \coth x = 1 - \coth^2 x}{\frac{Proof}}$

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