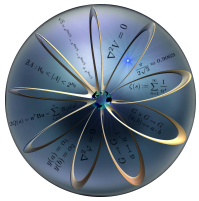

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table of derivatives

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Below are some tables of some real-valued functions and their corresponding derivatives:

Basic rules

$f(x)$	$\frac{df(x)}{dx} = f'(x)$
$f(x) + g(x)$	$f'(x) + g'(x)$
$f(x)g(x)$	$f'(x)g(x) + f(x)g'(x)$
$\frac{f(x)}{g(x)}$, $g \neq 0$	$\frac{f'(x)g(x) - f(x)g'(x)}{g(x)^2}$
$f(g(x))$	$f'(g(x))g'(x)$
$f^{-1}(x)$	$\frac{1}{f'(f^{-1}(x))}$

`http://planetmath.org/Polynomial`**Polynomials and powers**

$f(x)$	$f'(x)$	applicable domain
$c \in \mathbb{R}$	0	$x \in \mathbb{R}$
x^r	rx^{r-1}	$x \in \mathbb{R}$
$\sqrt{x}$	$\frac{1}{2\sqrt{x}}$	$x > 0$
$\lvert x \rvert$	$\frac{x}{\lvert x \rvert} = \frac{\lvert x \rvert}{x}$	$x \neq 0$

Exponential and logarithmic functions

$f(x)$	$f'(x)$	applicable domain
$\exp(x) = e^x$	$\exp(x) = e^x$	$x \in \mathbb{R}$
a^x	$a^x \ln a$	$x \in \mathbb{R}$
$\ln x$	$\dfrac{1}{x}$	$x > 0$
x^x	$x^x(1 + \ln x)$	$x > 0$

`http://planetmath.org/Trigonometry`**Trigonometric functions**

$f(x)$	$f'(x)$	applicable domain
$\sin x$	$\cos x$	$x \in \mathbb{R}$
$\cos x$	$-\sin x$	$x \in \mathbb{R}$
$\tan x$	$\sec^2 x$	$x \neq n\pi + \dfrac{\pi}{2}$, $n \in \mathbb{Z}$
$\cot x$	$-\csc^2 x$	$x \neq n\pi$, $n \in \mathbb{Z}$
$\sec x$	$\sec x \tan x$	$x \neq n\pi + \dfrac{\pi}{2}$, $n \in \mathbb{Z}$
$\csc x$	$-\csc x \cot x$	$x \neq n\pi$, $n \in \mathbb{Z}$
$\arcsin x$	$\dfrac{1}{\sqrt{1-x^2}}$	$\lvert x\rvert < 1$
$\arccos x$	$-\dfrac{1}{\sqrt{1-x^2}}$	$\lvert x\rvert < 1$
$\arctan x$	$\dfrac{1}{1+x^2}$	$x \in \mathbb{R}$

http://planetmath.org/HyperbolicFunctions**Hyperbolic functions**

$f(x)$	$f'(x)$	applicable domain
$\sinh x$	$\cosh x$	$x \in \mathbb{R}$
$\cosh x$	$\sinh x$	$x \in \mathbb{R}$
$\tanh x$	$\operatorname{sech}^2 x$	$x \in \mathbb{R}$
$\coth x$	$-\operatorname{csch}^2 x$	$x \neq 0$
$\operatorname{sech} x$	$-\operatorname{sech} x \tanh x$	$x \in \mathbb{R}$
$\operatorname{csch} x$	$-\operatorname{csch} x \coth x$	$x \neq 0$
$\operatorname{arsinh} x$	$\frac{1}{\sqrt{x^2+1}}$	$x \neq 0$
$\operatorname{arcosh} x$	$\frac{1}{\sqrt{x^2-1}}$	$\lvert x\rvert > 1$
$\operatorname{artanh} x$	$\frac{1}{1-x^2}$	$-1 < x < 1$
$\operatorname{arcoth} x$	$\frac{1}{1-x^2}$	$\lvert x\rvert > 1$

Other functions

(see error function, logarithmic integral, sine integral, Gudermannian, Hermite polynomials)

$f(x)$	$f'(x)$	applicable domain
$\operatorname{Erf} x$	$\frac{2}{\sqrt{\pi}} e^{-x^2}$	$x \in \mathbb{R}$
$\operatorname{Li} x$	$\frac{1}{\ln x}$	$x > 1$
$\operatorname{Si} x$	$\operatorname{sinc} x$	$x \in \mathbb{R}$
$\operatorname{gd} x$	$\frac{1}{\cosh x}$	$x \in \mathbb{R}$
$\operatorname{gd}^{-1} x$	$\frac{1}{\cos x}$	$\lvert x \rvert < \frac{\pi}{2}$
$H_n(x)$	$2nH_{n-1}(x)$	$x \in \mathbb{R}$

Instructions on how to add a function and its derivative. Open the entry in edit mode. Using the appropriate table for your function (or make a new table if applicable), make a copy of the two lines of comment (starting with %) in the code (within the tabular environment) and paste it immediately before the comment. For functions outside of the "Basic rules" section, include the appropriate domain. Uncomment the lines (take out the % symbols) after completing. Preview before saving the entry.