Table of derivatives

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The *derivative* of a function $f : \mathbb{R} \to \mathbb{R}$ is defined as

$$\frac{df}{dx}(x_0) = \lim_{h \to 0} \frac{f(x_0 + h) - f(x_0)}{h}.$$

The derivative of linear combinations.
If f, g are functions and $c \in \mathbb{R}$ then $\frac{df + c \cdot g}{dx} = \frac{df}{dx} + c \cdot \frac{dg}{dx}$
The derivative of a product.
If f, g are functions $\frac{df \cdot g}{dx} = g \cdot \frac{df}{dx} + f \cdot \frac{dg}{dx}$
The chain rule.
If f, g are functions $\frac{dg(f)}{dx} = \frac{dg}{df} \cdot \frac{df}{dx}$
Derivatives of common functions.

$\frac{dx^k}{dx} = kx^{k-1}, k \in \mathbb{R}$	$\frac{da^x}{dx} = a^x \ln_a(x)$	$\frac{d\ln_a(x)}{dx} = \frac{1}{\ln(a) \cdot x}$
$\frac{d\sin(x)}{dx} = cos(x)$	$\frac{d\cos(x)}{dx} = -sin(x)$	$\frac{d\tan}{dx} = sec(x)^2$
$\frac{d\cot(x)}{dx} = -csc(x)^2$	$\frac{d\sec(x)}{dx} = \sec(x) \cdot \tan(x)$	$\frac{d\csc}{dx} = -\csc(x) \cdot \cot(x)$
$\frac{d\arcsin(x)}{dx} = \frac{1}{\sqrt{1-x^2}}$	$\frac{d\arccos(x)}{dx} = \frac{-1}{\sqrt{1-x^2}}$	$\frac{d\arctan}{dx} = \frac{1}{1+x^2}$
$\frac{darccot(x)}{dx} = \frac{-1}{1+x^2}$	$\frac{darcsec(x)}{dx} = \frac{1}{\lvert x\rvert\sqrt{1-x^2}}$	$\frac{darccsc}{dx} = \frac{-1}{\lvert x\rvert\sqrt{1-x^2}}$

Recall that the absolute value function is defined in the following way

$$|x| = \begin{cases} x & \text{if } x > 0 \\ -x & \text{otherwise} \end{cases}$$