Table of derivatives

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Function	Derivative	Why?
scalars	0	Scalars can be seen as a flat line on the number line, and so there is no rate of change
$x^n,\ n \in \mathbb{N} - \{0\}$	$n \cdot x^{n-1}$	This is the result of calculating the derivative directly (substitute $\rightarrow$ expand $\rightarrow$ shorten the result)
$ln(x)$	$\frac{1}{x}$	Why derivative of ln(x) equals 1 over x
e^x	e^x	It really is a special property it uses the fact that $\lim_{x \to 0} \frac{e^x - 1}{x} = 1$
$e^{c \cdot x}$	$c \cdot e^{cx}$	Chain rule and previous derivative
$\mathbb{c}^x$	$\mathbb{c}^x = ln(\mathbb{c}) \cdot \mathbb{c}^x$	Derivative of exponential functions
sin(x)	cos(x)	#TODO
cos(x)	-sin(x)	#TODO
tan(x)	$\frac{1}{cos^2(x)}$	#TODO
$(fg)'$	$f'g + fg'$	Imagine a rectangle. nudges to it's side are most visible as 2 lines of specific length
$\frac{f}{g}$	$\frac{f'g - fg'}{g^2}$	Just notational shorthand for a $(f \cdot \frac{1}{g})$
$arcsin(x)$	$\frac{1}{\sqrt{1-x^2}}$	#TODO
$arccos(x)$	$\frac{-1}{\sqrt{1-x^2}}$	#TODO
$arctan(x)$	$\frac{1}{1-x^2}$	#TODO