Derivatives & Antiderivatives

General Rules

Linearity	$(af)' = af'$	$\int af = a\int f$	Linearity
	$(f+g)' = f'+g'$	$\int (f+g) = \int f + \int g$	
Product Rule	$(fg)' = f'g + fg'$	...	
Division Rule	$\left(\frac{f}{g}\right)' = \frac{f'g - fg'}{g^2}$	...	
Chain Rule	$(f \circ g)' = (f' \circ g)g'$	...	

Above: $a \in \mathbb{R}$ is a constant, and f and g functions.

Elementary Functions

$f(x)$	$f'(x)$	$\int f(x)\mathrm{d}x$
a	0	$ax + C$
x	1	$\frac{x^2}{2} + C$
x^α	$\alpha x^{\alpha-1}$	$\frac{x^{\alpha+1}}{\alpha+1} + C \ (\alpha \neq -1)$ $\ln\lvert x\rvert + C \ (\alpha = -1)$
$\ln x$	$\frac{1}{x}$	$\ldots + C$
e^x	e^x	$e^x + C$
$\log_b x$	$\frac{1}{(\ln b)x}$	$\ldots + C$
b^x	$(\ln b)b^x$	$\frac{1}{\ln b}b^x + C$
$\sin x$	$\cos x$	$-\cos x + C$
$\cos x$	$-\sin x$	$\sin x + C$
$\tan x$	$\frac{1}{\cos^2 x} = 1 + \tan^2 x$	$\ldots + C$
$\arcsin(x)$	$\frac{1}{\sqrt{1-x^2}}$	$\ldots + C$
$\arccos(x)$	$\frac{-1}{\sqrt{1-x^2}}$	$\ldots + C$
$\arctan(x)$	$\frac{1}{1+x^2}$	$\ldots + C$

Above: $a \in \mathbb{R}$, $b > 0$ and $\alpha \in \mathbb{R}$ are constants, and C the antiderivative constant.