

## Table of Derivatives

Throughout this table,  $a$  and  $b$  are constants, independent of  $x$ .

$F(x)$	$F'(x) = \frac{dF}{dx}$
$af(x) + bg(x)$	$af'(x) + bg'(x)$
$f(x) + g(x)$	$f'(x) + g'(x)$
$f(x) - g(x)$	$f'(x) - g'(x)$
$af(x)$	$af'(x)$
$f(x)g(x)$	$f'(x)g(x) + f(x)g'(x)$
$f(x)g(x)h(x)$	$f'(x)g(x)h(x) + f(x)g'(x)h(x) + f(x)g(x)h'(x)$
$\frac{f(x)}{g(x)}$	$\frac{f'(x)g(x) - f(x)g'(x)}{g(x)^2}$
$\frac{1}{g(x)}$	$-\frac{g'(x)}{g(x)^2}$
$f(g(x))$	$f'(g(x))g'(x)$
1	0
$a$	0
$x^a$	$ax^{a-1}$
$g(x)^a$	$ag(x)^{a-1}g'(x)$
$\sin x$	$\cos x$
$\sin g(x)$	$g'(x) \cos g(x)$
$\cos x$	$-\sin x$
$\cos g(x)$	$-g'(x) \sin g(x)$
$\tan x$	$\sec^2 x$
$\csc x$	$-\csc x \cot x$
$\sec x$	$\sec x \tan x$
$\cot x$	$-\csc^2 x$
$e^x$	$e^x$
$e^{g(x)}$	$g'(x)e^{g(x)}$
$a^x$	$(\ln a) a^x$
$\ln x$	$\frac{1}{x}$
$\ln g(x)$	$\frac{g'(x)}{g(x)}$
$\log_a x$	$\frac{1}{x \ln a}$
$\arcsin x$	$\frac{1}{\sqrt{1-x^2}}$
$\arcsin g(x)$	$\frac{g'(x)}{\sqrt{1-g(x)^2}}$
$\arccos x$	$-\frac{1}{\sqrt{1-x^2}}$
$\arctan x$	$\frac{1}{1+x^2}$
$\arctan g(x)$	$\frac{g'(x)}{1+g(x)^2}$
$\operatorname{arccsc} x$	$-\frac{1}{x\sqrt{1-x^2}}$
$\operatorname{arcsec} x$	$\frac{1}{x\sqrt{1-x^2}}$
$\operatorname{arccot} x$	$-\frac{1}{1+x^2}$

## Table of Indefinite Integrals

Throughout this table,  $a$  and  $b$  are given constants, independent of  $x$   
and  $C$  is an arbitrary constant.

$f(x)$	$F(x) = \int f(x) dx$
$af(x) + bg(x)$	$a \int f(x) dx + b \int g(x) dx + C$
$f(x) + g(x)$	$\int f(x) dx + \int g(x) dx + C$
$f(x) - g(x)$	$\int f(x) dx - \int g(x) dx + C$
$af(x)$	$a \int f(x) dx + C$
$u(x)v'(x)$	$u(x)v(x) - \int u'(x)v(x) dx + C$
$f(y(x))y'(x)$	$F(y(x))$ where $F(y) = \int f(y) dy$
1	$x + C$
$a$	$ax + C$
$x^a$	$\frac{x^{a+1}}{a+1} + C$ if $a \neq -1$
$\frac{1}{x}$	$\ln  x  + C$
$g(x)^a g'(x)$	$\frac{g(x)^{a+1}}{a+1} + C$ if $a \neq -1$
$\sin x$	$-\cos x + C$
$g'(x) \sin g(x)$	$-\cos g(x) + C$
$\cos x$	$\sin x + C$
$\tan x$	$\ln  \sec x  + C$
$\csc x$	$\ln  \csc x - \cot x  + C$
$\sec x$	$\ln  \sec x + \tan x  + C$
$\cot x$	$\ln  \sin x  + C$
$\sec^2 x$	$\tan x + C$
$\csc^2 x$	$-\cot x + C$
$\sec x \tan x$	$\sec x + C$
$\csc x \cot x$	$-\csc x + C$
$e^x$	$e^x + C$
$e^{g(x)} g'(x)$	$e^{g(x)} + C$
$e^{ax}$	$\frac{1}{a} e^{ax} + C$
$a^x$	$\frac{1}{\ln a} a^x + C$
$\ln x$	$x \ln x - x + C$
$\frac{1}{\sqrt{1-x^2}}$	$\arcsin x + C$
$\frac{g'(x)}{\sqrt{1-g(x)^2}}$	$\arcsin g(x) + C$
$\frac{1}{\sqrt{a^2-x^2}}$	$\arcsin \frac{x}{a} + C$
$\frac{1}{1+x^2}$	$\arctan x + C$
$\frac{g'(x)}{1+g(x)^2}$	$\arctan g(x) + C$
$\frac{1}{a^2+x^2}$	$\frac{1}{a} \arctan \frac{x}{a} + C$
$\frac{1}{x\sqrt{1-x^2}}$	$\operatorname{arcsec} x + C$