

# Derivatives of Common Functions

## Derivatives of Exponential and Logarithmic Functions

$f(x)$	$f'(x)$
$e^x$	$e^x$
$e^{g(x)}$	$e^{g(x)} \cdot g'(x)$
$b^{g(x)}$	$b^{g(x)} \cdot g'(x) \cdot \ln b$
$\ln x$	$\frac{1}{x}$
$\ln(g(x))$	$\frac{g'(x)}{g(x)}$
$\log_b x$	$\frac{1}{x \cdot \ln b}$
$\log_b(g(x))$	$\frac{g'(x)}{g(x)} \cdot \frac{1}{\ln b}$

## Derivatives of Trigonometric Functions

$f(x)$	$f'(x)$
$\sin x$	$\cos x$
$\cos x$	$-\sin x$
$\tan x$	$\sec^2 x$
$\cot x$	$-\csc^2 x$
$\sec x$	$\sec x \tan x$
$\csc x$	$-\csc x \cot x$

## Derivatives of Hyperbolic Functions

$f(x)$	$f'(x)$
$\sinh x$	$\cosh x$
$\cosh x$	$\sinh x$
$\tanh x$	$\operatorname{sech}^2 x$
$\coth x$	$-\operatorname{csch}^2 x$
$\operatorname{sech} x$	$-\operatorname{sech} x \tanh x$
$\operatorname{csch} x$	$-\operatorname{csch} x \coth x$

# Derivatives of Common Functions

## Derivatives of Inverse Trigonometric Functions

$f(x)$	$f'(x)$
$\sin^{-1} x$	$\frac{1}{\sqrt{1-x^2}}$
$\cos^{-1} x$	$-\frac{1}{\sqrt{1-x^2}}$
$\tan^{-1} x$	$\frac{1}{1+x^2}$
$\cot^{-1} x$	$-\frac{1}{1+x^2}$
$\sec^{-1} x$	$\frac{1}{x\sqrt{x^2-1}}$
$\csc^{-1} x$	$-\frac{1}{x\sqrt{x^2-1}}$

## Derivatives of Inverse Hyperbolic Functions

$f(x)$	$f'(x)$
$\sinh^{-1} x$	$\frac{1}{\sqrt{1+x^2}}$
$\cosh^{-1} x$	$\frac{1}{\sqrt{x^2-1}}$
$\tanh^{-1} x$	$\frac{1}{1-x^2}$
$\coth^{-1} x$	$\frac{1}{1-x^2}$
$\operatorname{sech}^{-1} x$	$-\frac{1}{x\sqrt{1-x^2}}$
$\operatorname{csch}^{-1} x$	$-\frac{1}{ x \sqrt{x^2+1}}$