Basic Derivative Forms

Basic Derivative Rules

Technique	Function	Derivative
	C	0
Constant Multiplier	$cf(x)$	$cf'(x)$
Sum Rule	$f(x)+g(x)$	$f'(x)+g'(x)$
Product Rule	$f(x)g(x)$	$g(x)f'(x)+f(x)g'(x)$
Quotient Rule	$f(x)/g(x)$	$\frac{g(x)f'(x)-f(x)g'(x)}{g^2(x)}$
Chain Rule	$f(g(x))$	$f'(g(x))g'(x)$

Specific Derivative Patterns

Function	Derivative
x^n	nx^{n-1}
$\sin x$	$\cos x$
$\cos x$	$-\sin x$
$\tan x$	$\sec^2 x$
$\cot x$	$-\csc^2 x$
$\sec x$	$\sec x \tan x$
$\csc x$	$-\csc x \cot x$
$\sinh x$	$\cosh x$
$\cosh x$	$\sinh x$
$\tanh x$	$\text{sech}^2 x$
$\coth x$	$-\text{csch}^2 x$
$\text{sech} x$	$-\text{sech} x \tanh x$
$\text{csch} x$	$-\text{csch} x \coth x$
$\ln x$	$1/x$
e^x	e^x

Function	Derivative
$\sin^{-1} x$	$\frac{1}{\sqrt{1-x^2}}$
$\cos^{-1} x$	$\frac{-1}{\sqrt{1-x^2}}$
$\tan^{-1} x$	$\frac{1}{1+x^2}$
$\cot^{-1} x$	$\frac{-1}{1+x^2}$
$\sec^{-1} x$	$\frac{1}{\lvert x\rvert\sqrt{x^2-1}}$
$\csc^{-1} x$	$\frac{-1}{\lvert x\rvert\sqrt{x^2-1}}$
$\sinh^{-1} x$	$\frac{1}{\sqrt{x^2+1}}$