

DERIVATIVE RULES	
Derivative of a Constant Function	$c' = 0$
The Power Rule <i>n</i> is any real number	$(x^n)' = nx^{n-1}$
The Constant Multiple Rule	$[cf]' = cf' \quad c : \text{constant}$
The Sum and Difference Rule	$(f \pm g)' = f' \pm g'$
Exponential Functions	$(a^x)' = \ln(a)a^x \quad \text{Special case: } y = e^x \quad (e^x)' = e^x$
Product Rule	$(f \cdot g)' = f \cdot g' + g \cdot f'$
Quotient Rule	$\left(\frac{f}{g}\right)' = \frac{gf' - fg'}{g^2}$
Trigonometric Functions	$(\sin x)' = \cos x \qquad (\cos x)' = -\sin x$ $(\tan x)' = \sec^2 x \qquad (\csc x)' = -\csc x \cot x$ $(\sec x)' = \sec x \tan x \qquad (\cot x)' = -\csc^2 x$
Chain Rule	$(f \circ g)' = f'(g) \cdot g'$
Chain Rule with Power Rule	$(g(x)^n)' = ng(x)^{n-1} g'(x)$
Chain Rule with Trigonometric Functions	$\sin(g(x))' = \cos(g(x)) \cdot g'(x)$ $\cos(g(x))' = -\sin(g(x)) \cdot g'(x)$ $\tan(g(x))' = \sec^2(g(x)) \cdot g'(x)$
Chain Rule with Exponential	$(a^{g(x)})' = \ln(a)a^{g(x)} g'(x) \quad (e^{g(x)})' = e^{g(x)} g'(x)$