

The Derivative Rules
(all the rules in one packet)

Constant Rule: (c is any number)

$$\frac{d}{dx}(c) = 0$$

Constant Multiple Rule: (c is any number)

$$\frac{d}{dx}(c \cdot f(x)) = c \cdot \frac{d}{dx}f(x) = c \cdot f'(x)$$

Sum and Difference Rule:

$$\frac{d}{dx}(f(x) \pm g(x)) = \frac{d}{dx}(f(x)) \pm \frac{d}{dx}(g(x)) = f'(x) \pm g'(x)$$

Power Rule:

$$\frac{d}{dx}(x^n) = nx^{n-1}$$

Exponential Rule:

$$\frac{d}{dx}(e^x) = e^x$$

Logarithmic Rule:

$$\frac{d}{dx}(\ln(x)) = \frac{1}{x}$$

Chain Rule:

$$\frac{d}{dx}(f(g(x))) = f'(g(x)) \cdot g'(x)$$

Product Rule:

$$\frac{d}{dx}(f(x) \cdot g(x)) = f'(x) \cdot g(x) + f(x) \cdot g'(x)$$

Quotient Rule:

$$\frac{d}{dx}\left(\frac{f(x)}{g(x)}\right) = \frac{f'(x) \cdot g(x) - f(x) \cdot g'(x)}{(g(x))^2}$$