

3.2-Derivative Rules

Derivative Rules:

If f and g are differentiable functions, then...

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

$$\frac{d}{dx}(cf(x)) =$$

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

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

$$\frac{d}{dx}\left(\frac{f(x)}{g(x)}\right) =$$

Examples:

Compute the derivative of the following:

$$f(x) = x^3 - \frac{5}{4}x^2 + \sqrt{2}x - \frac{3}{7}$$

$$y = (3x - 2)(2x^2 - 5x + 1)$$

Find the equation of the line tangent to $f(x) = \frac{3x}{x^2 + 4}$ at the point where $x = 1$.

The function $f(x) = \begin{cases} x^2 - 4 & \text{if } x < 4 \\ -2x + 20 & \text{if } x \geq 4 \end{cases}$
is continuous at $x = 4$. Is the function differentiable at $x = 4$?

On Your Own: #3, 7, 9, 15, 19, 23, 29, 37, 39, 43, 50, 53, 55, 61, 70, 72