

C12 - 2.1 - M8 Secant Slopes WS

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

Find the secant slopes for the following: Sketch a graph of each slope.

$y = x^2$; @ (1,1) and:

(2,4)

(1.5,2.25)

(1.1,1.21)

(1.01,1.0201)

(1.001,1.002001)

Estimate the tangent slope at (1,1)

Use the definition of the derivative to find the slope at (1,1)

Now use Power Rule.

C12 - 2.1 - Definition of Derivative Equation Graph HMK

Find of the derivative using the definition of the derivative.

$$f(x) = 2x$$

$$y = x^2$$

$$f(x) = x^2 + 1$$

$$f(x) = x^3$$

C12 - 2.1 - Definition of Derivative Equation Graph HMK

Find of the derivative using the definition of the derivative.

$$y = \frac{1}{x}$$

$$y = \frac{1}{x^2}$$

$$f(x) = \sqrt{x}$$

$$f(x) = \frac{1}{\sqrt{x}}$$

C12 - 2.2 - Power Rule Derivatives HMK

Find the derivative using the power rule

$$y = x^2$$

$$f(x) = 5$$

$$y = x^3$$

$$y = 2x^2$$

$$y = x^{-2}$$

$$y = \frac{1}{x^2}$$

$$y = 9^2$$

$$y = \sqrt{x}$$

$$y = \frac{1}{x}$$

$$y = 2x^{\frac{1}{4}}$$

C12 - 2.2 - Power Rule Derivatives HMK

Find of the derivative using the power rule

$$y = x^2 + 2x$$

$$f(x) = 2\sqrt{x}$$

$$y = 5x^3 + 2x^2$$

$$y = x^3 - \sqrt{x}$$

$$y = x^{-2} + 2x$$

$$y = \frac{1}{\sqrt{x}}$$

$$y = \sqrt[3]{x}$$

$$y = \frac{5}{x^2}$$

$$y = \frac{1}{2x}$$

$$y = \frac{1}{2x^2}$$

C12 - 2.3 - Product/Quotient Rule Derivatives

Find the derivative using the product rule

$$y = (2x + 2)(x^2 - 2)$$

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

Find the derivative using the quotient rule

$$y = \frac{3x}{x - 1}$$

$$y = \frac{2x^2}{x^2 - 1}$$

C12 - 2.4 - Chain Rule Derivatives

Find the derivative using the chain rule

$$y = (2x + 2)^2$$

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

$$y = \frac{(3x - 1)^2}{x + 1}$$

$$y = \frac{(2x^2 + 1)^3}{(2x + 2)^2}$$

C12 - 2.4 - Implicit Differentiation HW

Find the derivative using implicit differentiation

$$x^2 + y^2 = 9$$

$$x^3 - y^3 - 2 = 0$$

$$x^2 + xy = 2$$

$$x^2y^2 - 2x = 5$$

C12 - 2.5 - Equation of Tangent

Find the equation of the tangent using both the definition of the derivative and the power rule. Sketch both graphs.

$$x^2 - 1; (1,0)$$

$$\sqrt{x}; x = 4$$

C12 - 2.5 - Equation of Tangent

Find the equation of the tangent using both the definition of the derivative and the power rule. Sketch both graphs.

$$\frac{1}{x}; x = 1$$

$$x^3; x = -1$$

C12 - 2.6 - Graph derivatives and Reverse

