

Some Derivative Problems for Chapter 3

Differentiate the following functions

(1)

$$f(x) = 3x^2 - \cos(x) + e^{2x} - 12$$

(2)

$$g(x) = \csc(3x) + \frac{3}{x^4}$$

(3)

$$h(x) = \ln(x) + \log_2(x) - \ln(\pi)$$

(4)

$$f(x) = \frac{\ln(5x)}{\tan(x^2)}$$

(5)

$$g(x) = (5e^{4x})(\sqrt{x^5})$$

(6)

$$f(x) = 2x^8 + \frac{2}{\sqrt{x}} - 3$$

(7)

$$g(x) = \csc(x) + \frac{2}{x^2} + x^\pi$$

(8)

$$f(x) = \arctan(x^2 - 3x) + e^{\sin(x)}$$

(9)

$$f(x) = \sin(\sin(\sin(x)))$$

(10)

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

2

(11)

$$g(x) = \sec(x) + \frac{5}{x^3 + 1}$$

(12)

$$g(x) = \frac{\tan^2(x)}{\ln(\ln(\cos(x)))}$$

(13)

$$h(x) = x^{5x^2+3x}$$

Find $\frac{dy}{dx}$ for the following expressions

(1)

$$x \cos(y) + y \sin(x) = 4073.8^{32}$$

(2)

$$\tan(2y) - \ln(x^5) = 6y + x$$

(3)

$$\arctan(3y) - \ln(x^5) = 6y$$

Find the equation of the tangent line to the curve $y = \sin(5\ln(x^3))$ at the point

(1,0)