

Math 1496 Calc 1 - Homework #4

Pg. 129, #87 and 89

Pg. 139-140, #41, 43, 59, 63 and 69

Pg. 150-152, #9, 11, 17, 19, 43, 51, 67 and 109

Pg. 164, # 13, 29, 47, 59, 61 and 127

Pg. 129, Determine the differentiability of the following

#87

$$f(x) = \begin{cases} (x-1)^3, & x \leq 1 \\ (x-1)^2, & x > 1 \end{cases}$$

#89

$$f(x) = \begin{cases} x^2 + 1, & x \leq 2 \\ 4x - 3, & x > 2 \end{cases}$$

Pg. 139, Find the derivative of the following

$$\#41 \quad f(x) = x^2 + 5 - 3x^{-2}$$

$$\#43 \quad g(t) = t^2 - \frac{4}{t^3}$$

59 Find the equation of the tangent at the given point

$$f(x) = -2x^4 + 5x^2 - 3 \quad (1, 0)$$

Determine the point(s) (if any) where the graph has a horizontal tangent

$$\#63 \quad y = x^4 - 2x^2 + 3$$

$$\#69 \quad y = x + \sin x, \quad 0 \leq x < 2\pi$$

Pg. 150-152, Find the derivative of the following (evaluate if a point c is given)

$$\#9 \quad f(x) = e^x \cos x$$

$$\#11 \quad f(x) = \frac{x}{x-5}$$

$$\#17 \quad f(x) = (x^3 + 4x)(3x^2 + 2x - 5), \quad c = 0$$

$$\#19 \quad f(x) = \frac{x^2 - 4}{x - 3}, \quad c = 1$$

$$\#43 \quad f(t) = t^2 \sin t$$

$$\#51 \quad y = \frac{3(1 - \sin x)}{2 \cos x}$$

67 Find the equation of the tangent at the given point

$$f(x) = (x^3 + 4x - 1)(x - 2), \quad (1, -4)$$

#109 Find the given higher order derivative of the following

$$f'(x) = x^3 - x^{2/5}, \quad f^{(3)}(x)$$

Pg. 164, Find the derivative of the following

$$\#13 \quad y = (2x - 7)^3$$

$$\#29 \quad g(x) = \left(\frac{x+5}{x^2+2} \right)^2$$

$$\#47 \quad y = \sin(3x^2 + \cos x)$$

$$\#59 \quad y = e^{\sqrt{x}},$$

$$\#61 \quad g(t) = (e^{-t} + e^t)^3$$

#127 Find the second derivative of the following

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

Due: Monday Sept. 21, 2020