

Name: _____

Class: MAT1320 - Fall 2015

Class #: _____

Section #: _____

Instructor: Benoit Dionne

Assignment: Assignment 2 (Fall 2015)

Question 1: (1 point)

Compute

$$\lim_{t \rightarrow 2} \left(\frac{1}{t-2} - \frac{4}{t^2-4} \right) = \underline{\hspace{2cm}}$$

Question 2: (1 point)Find the values of m and n such that the function f defined by

$$f(x) = \begin{cases} \frac{2(4-x^2)}{x-2} & \text{for } x < 2, \\ 3x + m & \text{for } 2 \leq x \leq 3, \\ 2x^2 - 3x + n & \text{for } x > 3 \end{cases}$$

is continuous.

$m = \underline{\hspace{2cm}}$

$n = \underline{\hspace{2cm}}$

Question 3: (1 point)

The limit

$$\lim_{x \rightarrow 3} \frac{8^4x - 8^{12}}{3-x}$$

is equal to the derivative of a function f at a point a (that is, $f'(a)$).(i) What is the function f in this case?

$f(x) = \underline{\hspace{2cm}}$

(ii) What is the value of a ?

$a = \underline{\hspace{2cm}}$

Question 4: (1 point)

In this question, we calculate the value of the derivative of $f(x) = 4x^3 - 4x$ at $x = 2$ using the definition of the derivative.

Please fill in the blanks with the correct expression or value:

$$f(2) = \underline{\hspace{2cm}}$$

$$f(x) - f(2) = \underline{\hspace{2cm}}$$

Simplify the expression $\frac{f(x) - f(2)}{x - 2} = \underline{\hspace{2cm}}$

Now calculate $f'(2) = \lim_{x \rightarrow 2} \frac{f(x) - f(2)}{x - 2} = \underline{\hspace{2cm}}$

Question 5: (1 point)

Find the derivative of

$$f(x) = \frac{1}{4}(x^4 + 1)$$

$$f'(x) = \underline{\hspace{2cm}}.$$

Question 6: (1 point)

Find the derivative of the function $f(t) = t^{1/3} - 3e^t + 3$.

$$f'(t) = \underline{\hspace{2cm}}$$

Question 7: (1 point)

Find the derivative of

$$y = \frac{x^2 - 3x + 5}{\sqrt{x}}$$

$$\frac{dy}{dx} = \underline{\hspace{2cm}}.$$

Question 8: (1 point)

Find the points on the curve

$$y = x^3 + 6x^2 - 15x - 2$$

at which the tangent is horizontal. Give the corresponding list of values for x by separating each value by a semi-colon if there are multiple entries.

Answer= _____ .

Question 9: (1 point)

Find the derivative of

$$f(x) = \frac{1 - xe^x}{2 + e^x}$$

$f'(x) =$ _____

Question 10: (1 point)

Set $h(x) = \frac{1 + f(x)}{g(x)}$, where f and g are functions that satisfy

$$f(2) = 2, f'(2) = 4, g(2) = 5 \text{ and } g'(2) = 1.$$

Find $h'(2) =$ _____

Question 11: (1 point)

Find an equation of the tangent line to the curve

$$y = 6x \sin(x)$$

at the point $(\pi/2, 3\pi)$. Express your answer in the form $y = mx + b$.
