

← MAT2601_ONL8FA_ONL8F_21 - Calculus, Fall 2021

Week 1 Homework MAT 2601 (Homework)

 INSTRUCTOR
 Erin Cawley
 SOUTH COLLEGE

Current Score

QUESTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
POINTS	-/5	-/5	-/5	-/5	-/5	-/5	-/5	-/5	-/5	-/5	-/5	-/5	-/5	-/5	-/5	-/5	-/5	-/5	-/5

TOTAL SCORE

-/100

0.0%

Due Date

TUE, OCT 5, 2021

11:59 PM EDT

 Request Extension

Assignment Submission & Scoring

Assignment Submission

For this assignment, you submit answers by questions. You are required to use a new randomization after every 3 question submissions.

Assignment Scoring

Your best submission for each question part is used for your score.

1. [-/5 Points]

DETAILS

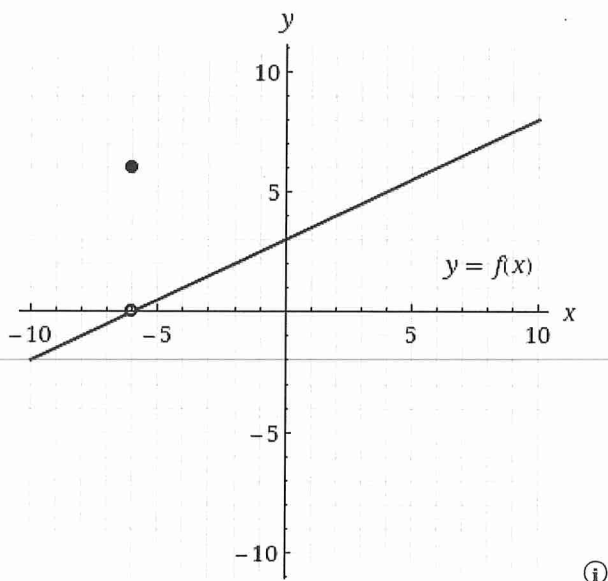
HARMATHAP12 9.1.005. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

A graph of $y = f(x)$ is shown and a c -value is given. Use the graph to find the following, whenever they exist. (If the limit is infinite, enter ' ∞ ' or ' $-\infty$ ', as appropriate. If the limit does not otherwise exist, enter DNE.)

$$c = -6$$



(a) $\lim_{x \rightarrow c} f(x)$

(b) $f(c)$

Need Help?

Read It

2. [-/5 Points]

DETAILS

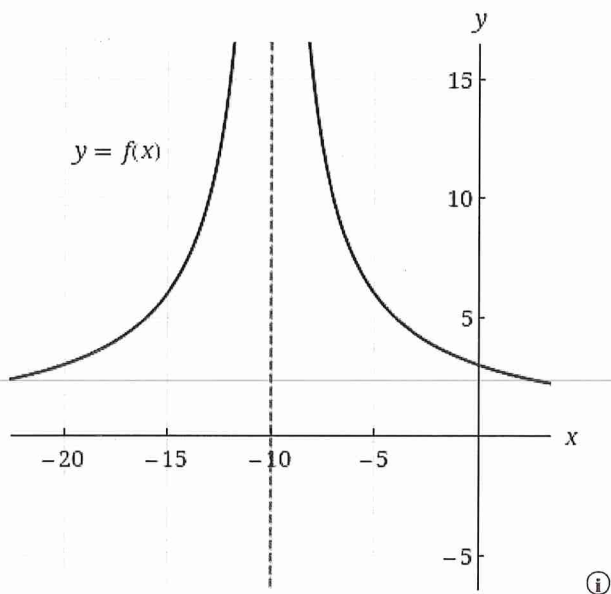
HARMATHAP12 9.1.008. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Use the graph of $y = f(x)$ and the given c -value to find the following, whenever they exist. (If the limit is infinite, enter ' ∞ ' or ' $-\infty$ ', as appropriate. If the limit does not otherwise exist, enter DNE.)

$$c = -10$$



(a) $\lim_{x \rightarrow c^-} f(x)$

(b) $\lim_{x \rightarrow c^+} f(x)$

(c) $\lim_{x \rightarrow c} f(x)$

(d) $f(c)$

3. [-/5 Points]

DETAILS

HARMATHAP12 9.1.011. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Complete the table and predict the limit, if it exists. (Round your answers to three decimal places. If the limit is infinite, enter ' ∞ ' or ' $-\infty$ ', as appropriate. If the limit does not otherwise exist, enter DNE.)

$$f(x) = \frac{12 - 4x - x^2}{x - 2}$$

x	$f(x)$
1.9	
1.99	
1.999	
2.001	
2.01	
2.1	

$$\lim_{x \rightarrow 2} f(x) =$$

4. [-/5 Points]

DETAILS

HARMATHAP12 9.1.051. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

If $\lim_{x \rightarrow 4} f(x) = 5$ and $\lim_{x \rightarrow 4} g(x) = -2$, find the following.

(a) $\lim_{x \rightarrow 4} [f(x) + g(x)]$

(b) $\lim_{x \rightarrow 4} [f(x) - g(x)]$

(c) $\lim_{x \rightarrow 4} [f(x) \cdot g(x)]$

(d) $\lim_{x \rightarrow 4} \frac{g(x)}{f(x)}$

Need Help?

Read It

5. [-/5 Points]

DETAILS

HARMATHAP12 9.1.020. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Use properties of limits and algebraic methods to find the limit, if it exists. (If the limit is infinite, enter ' ∞ ' or ' $-\infty$ ', as appropriate. If the limit does not otherwise exist, enter DNE.)

$$\lim_{x \rightarrow -1/2} \frac{8x - 8}{4x^2 + 2}$$

Need Help?

Read It

Watch It

6. [-/5 Points]

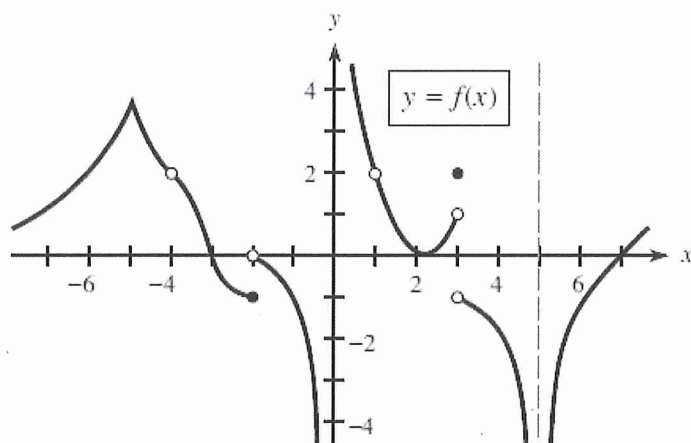
DETAILS

HARMATHAP12 9.2.001. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Consider the following figure.



For each given x -value, use the figure to determine whether the function is continuous or discontinuous at that x -value. If the function is discontinuous, state which of the three conditions that define continuity is not satisfied. (Select all that apply.)

(a) $x = -5$ ☐ f is continuous.☐ $\lim_{x \rightarrow -5} f(x)$ does not exist.☐ $f(-5)$ does not exist☐ $\lim_{x \rightarrow -5} f(x) \neq f(-5)$.(b) $x = 0$ ☐ f is continuous.☐ $\lim_{x \rightarrow 0} f(x)$ does not exist.☐ $f(0)$ does not exist☐ $\lim_{x \rightarrow 0} f(x) \neq f(0)$.(c) $x = 1$ ☐ f is continuous.☐ $\lim_{x \rightarrow 1} f(x)$ does not exist.☐ $f(1)$ does not exist☐ $\lim_{x \rightarrow 1} f(x) \neq f(1)$.(d) $x = 3$ ☐ f is continuous.☐ $\lim_{x \rightarrow 3} f(x)$ does not exist.☐ $f(3)$ does not exist☐ $\lim_{x \rightarrow 3} f(x) \neq f(3)$.

Need Help?

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7. [-/5 Points]

DETAILS

HARMATHAP12 9.2.005. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Determine whether the function is continuous or discontinuous at the given x -value. Examine the three conditions in the definition of continuity.

$$y = \frac{x^2 - x - 56}{x^2 + 7x}, \quad x = -7$$

- ☐ The function is continuous at $x = -7$.
- ☐ The function is discontinuous at $x = -7$.

Need Help?

Read It

8. [-/5 Points]

DETAILS

HARMATHAP12 9.2.008. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Determine whether the function is continuous or discontinuous at the given x -value. Examine the three conditions in the definition of continuity.

$$f(x) = \begin{cases} x^2 + 5 & \text{if } x \leq 1 \\ 5x^2 - 2 & \text{if } x > 1 \end{cases}, \quad x = 1$$

- ☐ The function is continuous at $x = 1$.
- ☐ The function is discontinuous at $x = 1$.

Need Help?

Read It

Watch It

9. [-/5 Points]

DETAILS

HARMATHAP12 9.2.013. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Determine whether the given function is continuous. You can verify your conclusions by graphing the function with a graphing utility.

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

- ☐ The function is continuous.
- ☐ The function is not continuous.

If it is not, identify where it is discontinuous. You can verify your conclusion by graphing the function with a graphing utility. (If the function is continuous, enter CONTINUOUS.)

$x =$

Need Help?

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10. [-/5 Points]

DETAILS

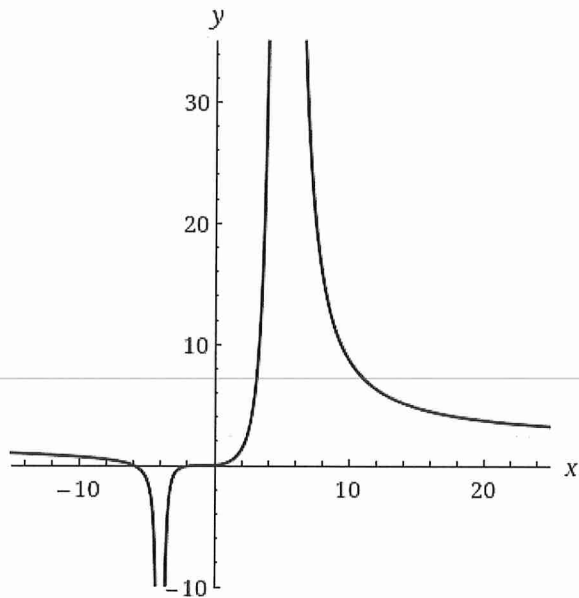
HARMATHAP12 9.2.023. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Consider the following function and its graph.

$$f(x) = \frac{2(x+1)^3(x+6)}{(x-5)^2(x+4)^2}$$



Use the graph to determine the following, as well as you can. Check your conclusions by using the function to determine items (a)–(d) analytically.

(a) vertical asymptotes (Enter your answers as a comma-separated list of equations.)

(b) $\lim_{x \rightarrow \infty} f(x)$

(c) $\lim_{x \rightarrow -\infty} f(x)$

(d) horizontal asymptotes (Enter your answers as a comma-separated list of equations.)

Need Help?

Read It

Watch It

11. [-/5 Points]

DETAILS

HARMATHAP12 9.3.001. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

For the given function find the average rate of change over each specified interval.

$$f(x) = x^2 + x - 12$$

(a) $[0, 4]$

(b) $[-4, 10]$

Need Help?

Read It

Watch It

12. [-/5 Points]

DETAILS

HARMATHAP12 9.3.007.MI. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

We are given $f(x) = 9x^2$ and $f'(x) = 18x$.

(a) Find the instantaneous rate of change of $f(x)$ at $x = 2$.

(b) Find the slope of the tangent to the graph of $y = f(x)$ at $x = 2$.

(c) Find the point on the graph of $y = f(x)$ at $x = 2$.

$(x, y) = ($

)

Need Help?

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Master It

13. [-/5 Points]

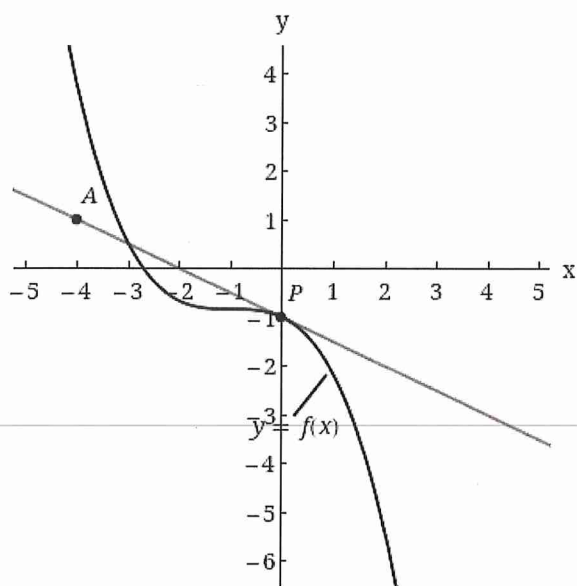
DETAILS

HARMATHAP12 9.3.011. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

The tangent line to the graph of $f(x)$ at $x = 0$ is shown. On the tangent line, P is the point of tangency and A is another point on the line.



i

(a) Find the coordinates of the points P and A .

(

$P(x, y) =$

)

(

$A(x, y) =$

)

(b) Use the coordinates of P and A to find the slope of the tangent line. (Give an exact answer. Do not round.)

(c) Find $f'(0)$. (Give an exact answer. Do not round.)

(d) Find the instantaneous rate of change of $f(x)$ at P . (Give an exact answer. Do not round.)

Need Help?

Read It

Watch It

14. [-/5 Points]

DETAILS

HARMATHAP12 9.3.017. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Consider the following.

$$p(q) = 2q^2 + q + 8$$

(a) Find the derivative, by using the definition.

$$p'(q) =$$

(b) Find the instantaneous rate of change of the function at any value.

$$p'(q) =$$

Find the instantaneous rate of change of the function at the value $q = 9$.

$$p'(9) =$$

(c) Find the slope of the tangent at the value $q = 9$.

Need Help?

Read It

15. [-/5 Points]

DETAILS

HARMATHAP12 9.3.030. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

If the instantaneous rate of change of $g(x)$ at $(-1, -3)$ is $1/2$, write the equation of the line tangent to the graph of $g(x)$ at $x = -1$. (Let x be the independent variable and y be the dependent variable.)

Need Help?

Read It

16. [-/5 Points]

DETAILS

HARMATHAP12 9.4.005. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Find the derivative of the function.

$$y = 5 - 9x + 7x^2$$

$y' =$

Need Help?

Read It

17. [-/5 Points]

DETAILS

HARMATHAP12 9.4.014.MI. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Find the derivative of the function.

$$h(x) = 16x^{12} + 6x^6 - 2x^3 + 19x - 7$$

$h'(x) =$

Need Help?

Read It

Watch It

Master It

18. [-/5 Points]

DETAILS

HARMATHAP12 9.4.021.EP. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Find the derivative of each function.

$$\frac{d}{dt}(3t^{17/3}) =$$

$$\frac{d}{dt}(-2t^{7/4}) =$$

$$\frac{d}{dt}(-t^{1/2}) =$$

$$\frac{d}{dt}(5) =$$

Consider the following function.

$$z = 3t^{17/3} - 2t^{7/4} - t^{1/2} + 5$$

Find the derivative of the function.

$$z' =$$

Need Help?

Read It

19. [-/5 Points]

DETAILS

HARMATHAP12 9.4.025. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Find the derivative of the function.

$$g(x) = \frac{3}{x^6} + \frac{2}{x^2} + 9\sqrt[3]{x}$$

$$g'(x) =$$

Need Help?

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20. [-/5 Points]

DETAILS

HARMATHAP12 9.4.027.EP. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Consider the following.

$$y = x^3 - 5x^2 + 6$$

Evaluate y when $x = 1$.

$$y(1) = \boxed{}$$

Find y' .

$$y' =$$

Evaluate y' when $x = 1$.

$$y'(1) = \boxed{}$$

Write the equation of the tangent line to the curve at $x = 1$. As a check, graph both the function and the tangent line.

Need Help?

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← MAT2601_ONL8FA_ONL8F_21 - Calculus, Fall 2021

Week 1 Quiz MAT 2601 (Homework)

INSTRUCTOR

Erin Cawley
SOUTH COLLEGE

Current Score

QUESTION

1

2

3

4

5

6

7

8

9

10

POINTS

-/10

-/10

-/10

-/10

-/10

-/10

-/10

-/10

-/10

-/10

TOTAL SCORE

-/100

0.0%

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Request Extension

Assignment Submission & Scoring

Assignment Submission

For this assignment, you submit answers by questions. You are required to use a new randomization after every 3 question submissions.

Assignment Scoring

Your best submission for each question part is used for your score.

1. [-/10 Points]

DETAILS

HARMATHAP12 9.1.033. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Use properties of limits and algebraic methods to find the limit, if it exists. (If the limit is infinite, enter ' ∞ ' or ' $-\infty$ ', as appropriate. If the limit does not otherwise exist, enter DNE.)

$$\lim_{x \rightarrow -1} f(x), \text{ where } f(x) = \begin{cases} x^2 + \frac{9}{x} & \text{if } x \leq -1 \\ 8x^3 - x - 1 & \text{if } x > -1 \end{cases}$$

Need Help?

Read It

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2. [-/10 Points]

DETAILS

HARMATHAP12 9.1.053. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

If $\lim_{x \rightarrow 2} [f(x) + g(x)] = 9$ and $\lim_{x \rightarrow 2} g(x) = 10$ find the following.

(a) $\lim_{x \rightarrow 2} f(x)$

(b) $\lim_{x \rightarrow 2} \{[f(x)]^2 - [g(x)]^2\}$

(c) $\lim_{x \rightarrow 2} \frac{3g(x)}{f(x) - g(x)}$

Need Help?

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3. [-/10 Points]

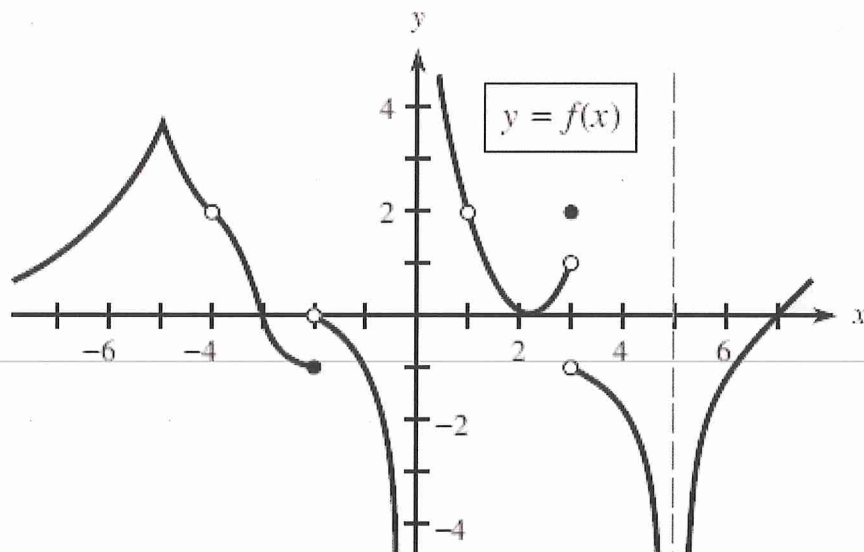
DETAILS

HARMATHAP12 9.2.002. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Consider the following figure.



i

For each given x -value, use the figure to determine whether the function is continuous or discontinuous at that x -value. If the function is discontinuous, state which of the three conditions that define continuity is not satisfied. (Select all that apply.)

(a) $x = -2$ ☐ f is continuous.☐ $\lim_{x \rightarrow -2} f(x)$ does not exist.☐ $f(-2)$ does not exist.☐ $\lim_{x \rightarrow -2} f(x) \neq f(-2)$.(b) $x = 2$ ☐ f is continuous.☐ $\lim_{x \rightarrow 2} f(x)$ does not exist.☐ $f(2)$ does not exist.☐ $\lim_{x \rightarrow 2} f(x) \neq f(2)$.(c) $x = 5$ ☐ f is continuous.☐ $\lim_{x \rightarrow 5} f(x)$ does not exist.☐ $f(5)$ does not exist.

$\lim_{x \rightarrow 5} f(x) \neq f(5).$

(d) $x = -4$

☐ f is continuous.

$\lim_{x \rightarrow -4} f(x)$ does not exist.

☐ $f(-4)$ does not exist.

$\lim_{x \rightarrow -4} f(x) \neq f(-4).$

Need Help?

Read It

4. [-/10 Points]

DETAILS

HARMATHAP12 9.2.040.MI. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Suppose that the average number of minutes M that it takes a new employee to assemble one unit of a product is given by

$$M = \frac{54 + 49t}{2t + 1}$$

where t is the number of days on the job.

(a) Is this function continuous for all values of t ?

- ☐ Yes, this function is continuous for all values of t .
- ☐ No, this function is not continuous for all values of t .

(b) Is this function continuous at $t = 14$?

- ☐ Yes, this function is continuous at $t = 14$.
- ☐ No, this function is not continuous at $t = 14$.

(c) Is this function continuous for all $t \geq 0$?

- ☐ Yes, this function is continuous for all $t \geq 0$.
- ☐ No, this function is not continuous for all $t \geq 0$.

(d) What is the domain for this application? (Enter your answer using interval notation.)

Need Help?

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5. [-/10 Points]

DETAILS

HARMATHAP12 9.3.008. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

In Example 6 in this section, we were given $f(x) = 3x^2 + 2x + 11$ and found $f'(x) = 6x + 2$.

- (a) Find the instantaneous rate of change of $f(x)$ at $x = 2$.

- (b) Find the slope of the tangent to the graph of $y = f(x)$ at $x = 2$.

- (c) Find the point on the graph of $y = f(x)$ at $x = 2$.

$(x, y) = ($

$2, 17)$

$)$

Need Help?

Read It

6. [-/10 Points]

DETAILS

HARMATHAP12 9.3.015. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Consider the following.

$$f(x) = 4x^2 + 3x - 20$$

(a) Find the derivative, by using the definition.

$$f'(x) =$$

(b) Find the instantaneous rate of change of the function at any value.

$$f'(x) =$$

Find the instantaneous rate of change of the function at the value $x = -4$.

$$f'(-4) =$$

(c) Find the slope of the tangent at the value $x = -4$.

Need Help?

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7. [-/10 Points]

DETAILS

HARMATHAP12 9.3.029. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

If the instantaneous rate of change of $f(x)$ at $(3, -4)$ is 6, write the equation of the line tangent to the graph of $f(x)$ at $x = 3$. (Let x be the independent variable and y be the dependent variable.)

Need Help?

Read It

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8. [-/10 Points]

DETAILS

HARMATHAP12 9.4.015. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

For the function $y = 4x^2 + 7x + 4$, at the point $x = 5$, find the following.

(a) the slope of the tangent to the curve

(b) the instantaneous rate of change of the function

Need Help?

Read It

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9. [-/10 Points]

DETAILS

HARMATHAP12 9.4.009. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Find the derivative of the function.

$$y = 11x^5 - 4x^3 + 3x - 9$$

 $y' =$

Need Help?

Read It

Watch It

10. [-/10 Points]

DETAILS

HARMATHAP12 9.4.026.MI. 0/15 Submissions Used

MY NOTES

ASK YOUR TEACHER

Find the derivative of the function.

$$h(x) = \frac{5}{x^5} - \frac{9}{x^9} + 4\sqrt{x}$$

 $h'(x) =$

Need Help?

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