1. (1 pt) Consider the function $f(x) = 7 - 3x^2$ on the interval $[-3, 6]$. Find the average or mean slope of the function on this interval, i.e.

$$\frac{f(6) - f(-3)}{6 - (-3)} =$$

By the Mean Value Theorem, we know there exists a c in the open interval $(-3, 6)$ such that $f'(c)$ is equal to this mean slope. For this problem, there is only one c that works. Find it.

Answer(s) submitted:

- -9
- 3/2

(correct)

Correct Answers:

- -9
- 1.5

2. (1 pt) Consider the function $f(x) = \frac{1}{x}$ on the interval $[4, 7]$. Find the average or mean slope of the function on this interval.

By the Mean Value Theorem, we know there exists a c in the open interval $(4, 7)$ such that $f'(c)$ is equal to this mean slope. For this problem, there is only one c that works. Find it.

Answer(s) submitted:

- -1/28
- 2sqrt(7)

(correct)

Correct Answers:

- -0.0357142857142857
- 5.29150262212918

3. (1 pt) Consider the function

$$f(x) = -2x^3 + 3x^2 - x - 1$$

Find the average slope of this function on the interval $(4, 7)$.

By the Mean Value Theorem, we know there exists a c in the open interval $(4, 7)$ such that $f'(c)$ is equal to this mean slope. Find the value of c in the interval which works _____

Answer(s) submitted:

- -154
- (1/2)(1+sqrt(103))

(correct)

Correct Answers:

- -154
- 5.57444578254611

4. (1 pt) Consider the function $f(x) = x^2 - 4x + 6$ on the interval $[0, 4]$. Verify that this function satisfies the three hypotheses of Rolle's Theorem on the inverval.
$f(x)$ is _____ on $[0, 4]$;
$f(x)$ is _____ on $(0, 4)$;
and $f(0) = f(4) =$ _____.

Then by Rolle's theorem, there exists a c such that $f'(c) = 0$. Find the value c.
$c =$ _____

Answer(s) submitted:

- continuous
- differentiable
- 6
- 2

(correct)

Correct Answers:

- CONTINUOUS
- DIFFERENTIABLE
- 6
- 2

5. (1 pt) Suppose $f(x)$ is continuous on $[4, 8]$ and $-2 \leq f'(x) \leq 4$ for all x in $(4, 8)$. Use the Mean Value Theorem to estimate $f(8) - f(4)$.

Answer: _____ $\leq f(8) - f(4) \leq$ _____

Answer(s) submitted:

- -8
- 16

(correct)

Correct Answers:

- -2*(8-(4))
- 4*(8-(4))

6. (1 pt) Does there exist a continuous function $f(x)$ such that $f(0) = 3$, $f(2) = 8$ and $f'(x) \leq -3$ for all x in $(0, 2)$?

Answer: (*yes* or *no*) ___
Note: You only have one chance to input your answer.

Answer(s) submitted:

- no

(correct)

Correct Answers:

- NO