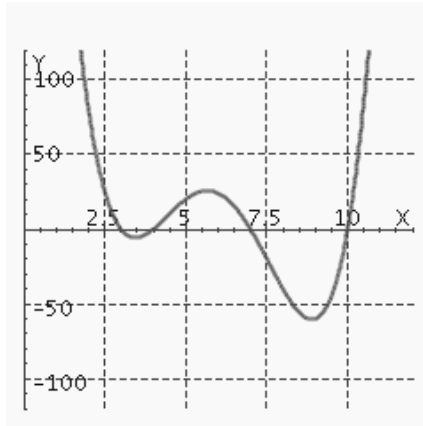


1 Verify that the function satisfies the hypotheses of The Mean Value Theorem on the given interval. Then find all numbers c that satisfy the conclusion of The Mean Value Theorem.

$$f(x) = 8x^2 + 6x + 2, [-7, 7]$$

- a. $c = 0$
- b. $c = 8$
- c. $c = 6$
- d. $c = 2$

2 The graph of the first derivative $f'(x)$ of a function f is shown below. At what values of x does f have a local maximum or minimum?



- a. 19
- b. 3
- c. 10
- d. 7
- e. 9
- f. 4

3 Find the inflection points of the following function:

$$f(x) = -6x + 2 - 2\sin x$$

$$0 < x < 3\pi$$

- a. $(\pi, 2), (2\pi, -12\pi + 2)$
- b. $(\pi, -6\pi + 2), (2\pi, -12\pi)$
- c. $(\pi, -6\pi), (2\pi, -12\pi + 2)$
- d. $(\pi, -6\pi), (2\pi, -12\pi)$
- e. $(\pi, -6\pi + 2), (2\pi, -12\pi + 2)$

4 Find the intervals of increase or decrease of the following function:

$$y(x) = x^3 - 9x^2 + 24x$$

- a. f increasing on $(-\infty, 2)$ and $(4, \infty)$, and decreasing on $(2, 4)$
- b. f increasing on $(-\infty, 6)$ and $(12, \infty)$, and decreasing on $(6, 12)$
- c. f decreasing on $(-\infty, 6)$ and $(12, \infty)$, and increasing on $(6, 12)$
- d. f decreasing on $(-\infty, 2)$ and $(4, \infty)$, and increasing on $(2, 4)$

5 How many points of inflection are on the graph of the function:

$$f(x) = 20x^3 + 3x^2 - 2x - 13$$

- a. 1
- b. 4
- c. 3
- d. 2

ANSWER KEY

Name: _____

Class: _____

Date: _____

(copy A)

-
1. a
2. b,c,d,f

3. e
4. a

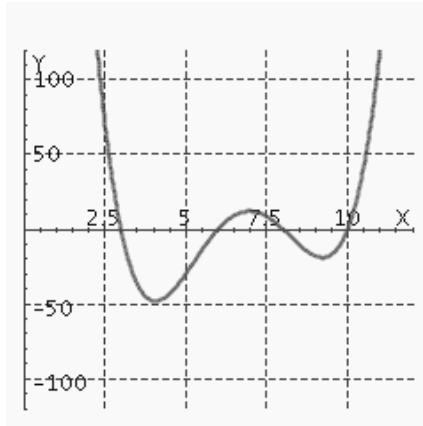
5. a

1 Verify that the function satisfies the hypotheses of The Mean Value Theorem on the given interval. Then find all numbers c that satisfy the conclusion of The Mean Value Theorem.

$$f(x) = 9x^2 + 7x + 6, [-8, 8]$$

- a. $c = 7$
- b. $c = 9$
- c. $c = 6$
- d. $c = 0$

2 The graph of the first derivative $f'(x)$ of a function f is shown below. At what values of x does f have a local maximum or minimum?



- a. 8
- b. 10
- c. 17
- d. 6
- e. 3
- f. 20

3 Find the inflection points of the following function:

$$f(x) = -9x + 5 - 2 \sin x$$

$$0 < x < 3\pi$$

- a. $(\pi, -9\pi)$, $(2\pi, -18\pi + 5)$
- b. $(\pi, -9\pi + 5)$, $(2\pi, -18\pi)$
- c. $(\pi, 5)$, $(2\pi, -18\pi + 5)$
- d. $(\pi, -9\pi + 5)$, $(2\pi, -18\pi + 5)$
- e. $(\pi, -9\pi)$, $(2\pi, -18\pi)$

4 Find the intervals of increase or decrease of the following function:

$$y(x) = x^3 - 9x^2 + 24x$$

- a. f increasing on $(-\infty, 2)$ and $(4, \infty)$, and decreasing on $(2, 4)$
- b. f decreasing on $(-\infty, 2)$ and $(4, \infty)$, and increasing on $(2, 4)$
- c. f increasing on $(-\infty, 6)$ and $(12, \infty)$, and decreasing on $(6, 12)$
- d. f decreasing on $(-\infty, 6)$ and $(12, \infty)$, and increasing on $(6, 12)$

5 How many points of inflection are on the graph of the function:

$$f(x) = 20x^3 + 2x^2 - 4x - 9$$

- a. 4
- b. 1
- c. 2
- d. 3

ANSWER KEY

Name: _____

Class: _____

Date: _____

(copy B)

-
1. d
2. a,b,d,e

3. d
4. a

5. b