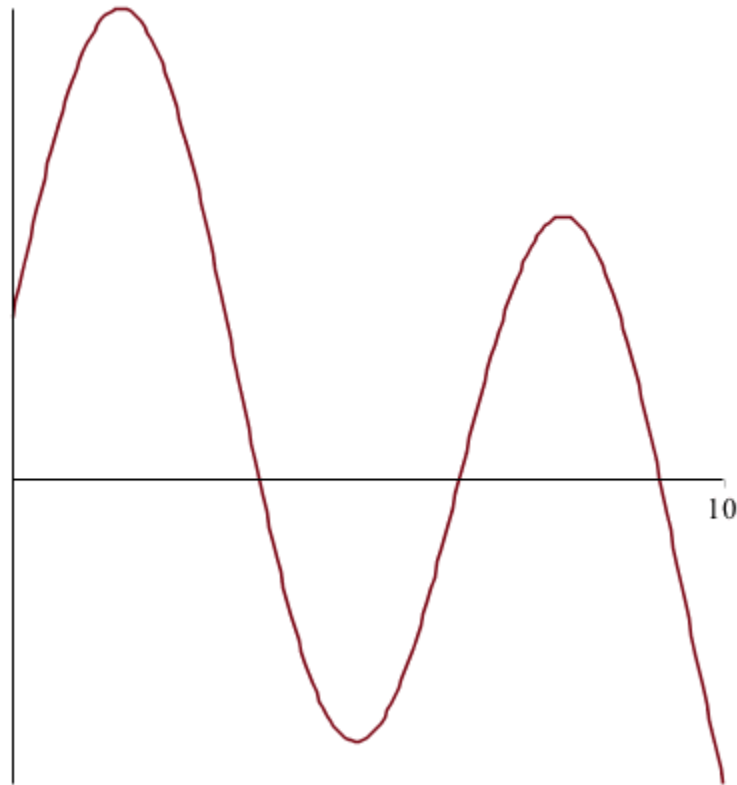


PRINTABLE VERSION

Quiz 11

Question 1

The function f is graphed below on the interval $[0,10]$. Give the **number of values** between 0 and 10 which satisfy the conclusion of the mean value theorem for f .



- a) ☐ 2
- b) ☐ 4
- c) ☐ 3
- d) ☐ 1

e) ☐ 5

Question 2

Determine if Rolles Theorem applies to the function $f(x) = x^3 - 9x$ on $[-3, 0]$. If so, find all numbers c on the interval that satisfy the theorem.

a) ☐ $c = \sqrt{3}$

b) ☐ $c = \sqrt{3}$ and $c = -\sqrt{3}$

c) ☐ $c = -3$

d) ☐ Rolles Theorem does not apply to this function on the given interval.

e) ☐ $c = -\sqrt{3}$

Question 3

Determine if the function $f(x) = 4\sqrt{x} - x$ satisfies the Mean Value Theorem on $[1, 25]$. If so, find all numbers c on the interval that satisfy the theorem.

a) ☐ $c = -9$

b) ☐ $c = 9$

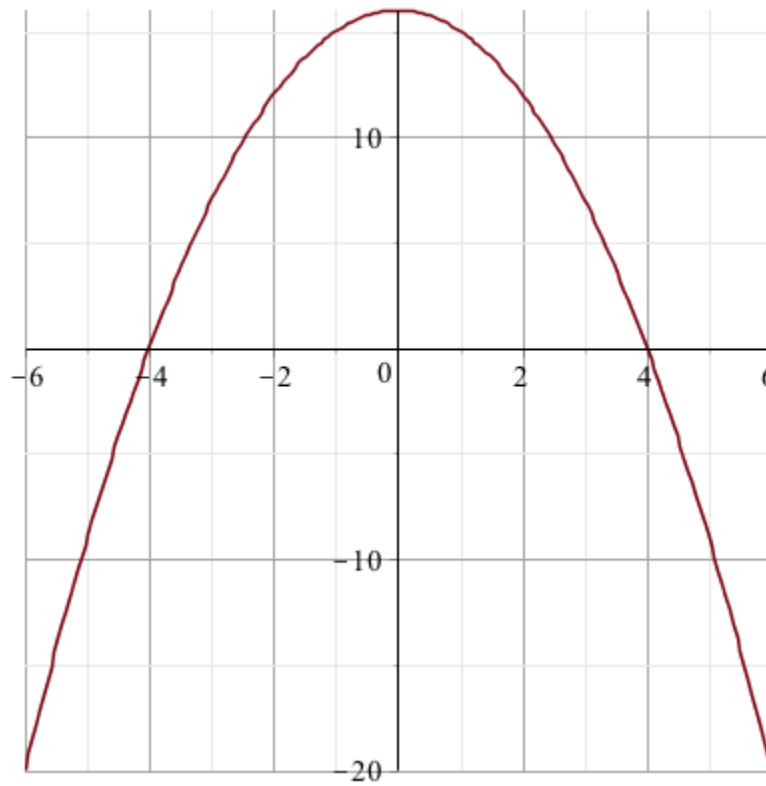
c) ☐ The Mean Value Theorem does not apply to this function on the given interval.

d) ☐ $c = \frac{9}{2}$

e) ☐ $c = 18$

Question 4

The graph of $f(x)$ is shown. Find the x -value(s) where $f'(x) = 0$.



- a) ☐ $x = 0$
- b) ☐ $x = \{-4, 0, 4\}$
- c) ☐ $x = -4$
- d) ☐ $x = 4$
- e) ☐ $x = \{-4, 4\}$

Question 5

Find the intervals on which $f(x) = x^4 + 5x^3$ increases.

- a) ☐ $(-\infty, \infty)$
- b) ☐ $\left(-\infty, -\frac{15}{4}\right)$
- c) ☐ $(0, \infty)$
- d) ☐ $\left(-\frac{15}{4}, 0\right) \cup (0, \infty)$
- e) ☐ $\left(-\infty, -\frac{15}{4}\right) \cup \left(0, \frac{15}{4}\right)$

Question 6

Find the intervals on which $f(x) = \frac{5x}{x^2 + 36}$ decreases.

- a) ☐ $(-6, 6)$
- b) ☐ $(-\infty, -6) \cup (0, 6)$
- c) ☐ $(-\infty, -6) \cup (6, \infty)$
- d) ☐ $(-\infty, \infty)$
- e) ☐ $(6, \infty)$

Question 7

Find the intervals on which $f(x) = \frac{25x^2 + 9}{25x^2 - 9}$ increases.

- a) ☐ $\left(0, \frac{3}{5}\right) \cup \left(\frac{3}{5}, \infty\right)$
- b) ☐ $\left(-\infty, -\frac{3}{5}\right) \cup \left(\frac{3}{5}, \infty\right)$
- c) ☐ $\left(-\infty, -\frac{3}{5}\right) \cup \left(\frac{3}{5}, \infty\right)$
- d) ☐ $\left(-\infty, -\frac{3}{5}\right) \cup \left(-\frac{3}{5}, 0\right)$
- e) ☐ $(-\infty, \infty)$

Question 8

Find the intervals on which $f(x) = 2x^2(6+x)^2$ increases.

- a) ☐ $(3, \infty)$
- b) ☐ $(-6, -3) \cup (0, \infty)$
- c) ☐ $(-\infty, -6) \cup (3, \infty)$
- d) ☐ $(-\infty, \infty)$
- e) ☐ $(-\infty, -6) \cup (-3, 0)$

Question 9

Find the intervals on which $f(x) = 2x - 2\cos(x)$ increases for $0 \leq x \leq 2\pi$.

- a) ☐ $\left[0, \frac{3\pi}{2}\right]$
- b) ☐ $[0, 2\pi]$
- c) ☐ $f(x)$ is never increasing on the given interval.
- d) ☐ $\left[\frac{3\pi}{2}, 2\pi\right]$
- e) ☐ $\left[\frac{\pi}{2}, 2\pi\right]$

Question 10

Find the intervals on which $f(x) = 7 \cos^2(x)$ decreases for $0 \leq x \leq \pi$.

- a) ☐ $\left[\frac{\pi}{2}, \pi\right]$
- b) ☐ $\left[\frac{\pi}{4}, \frac{3\pi}{4}\right]$
- c) ☐ $\left[0, \frac{\pi}{2}\right]$
- d) ☐ $[0, \pi]$
- e) ☐ $f(x)$ is never decreases on the given interval.