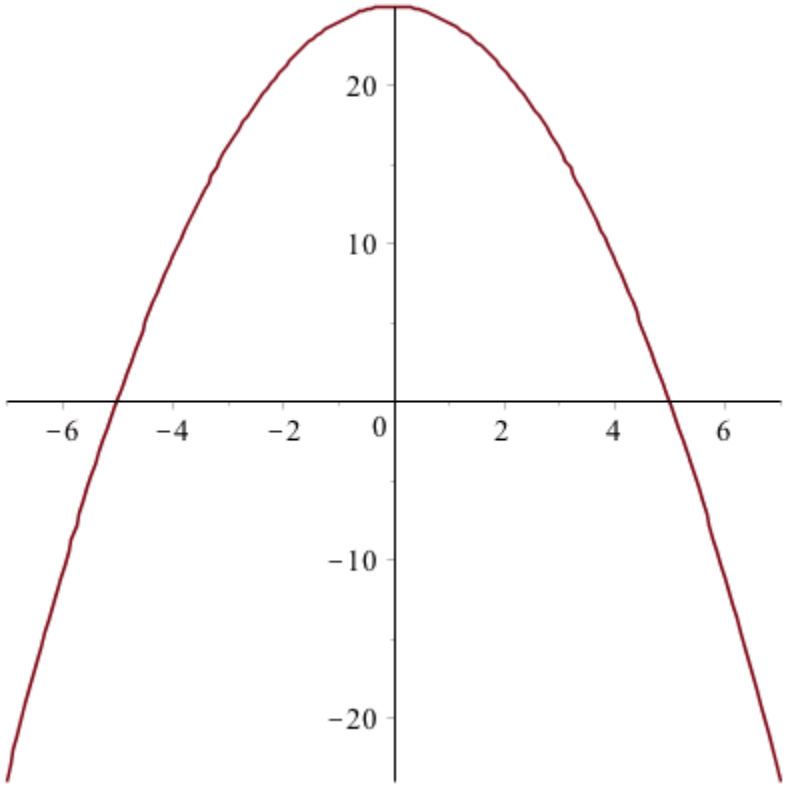
PRINTABLE VERSION

Quiz 12

Question 1

The graph of $f'(x)$,the derivative of $f(x)$, is shown below. Find the critical number(s) of $f(x)$.



a) $x = -5$

b) $x = 0$

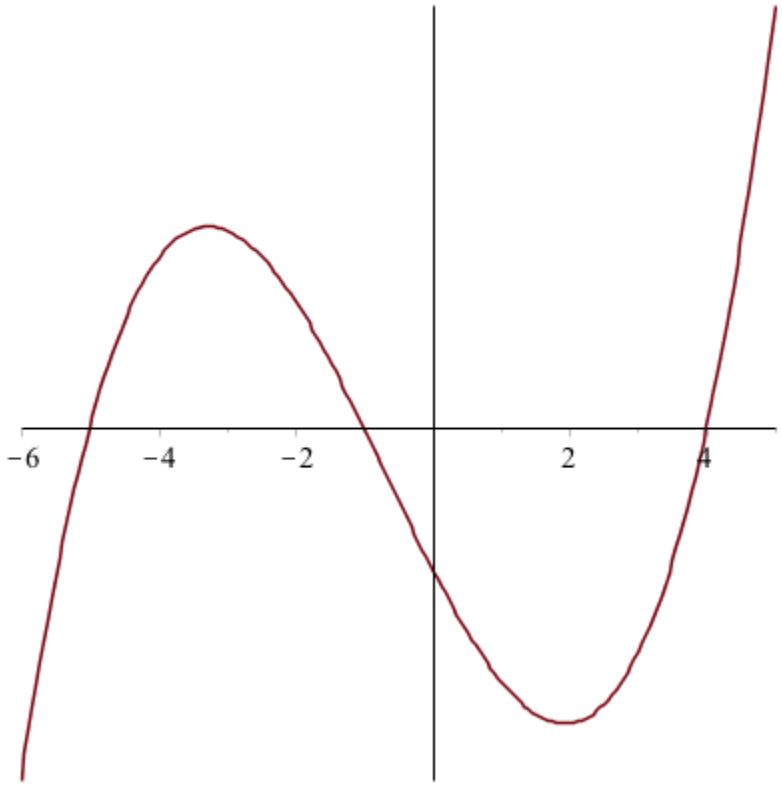
c) $x = 5$

d) $x = \{-5, 5\}$

e) $x = \{-5, 0, 5\}$

Question 2

Suppose that $c = -1$ is a critical number for a function f. Determine if $f(c)$ is a local maximum, local minimum or neither if the graph of $f'(x)$ is shown below.



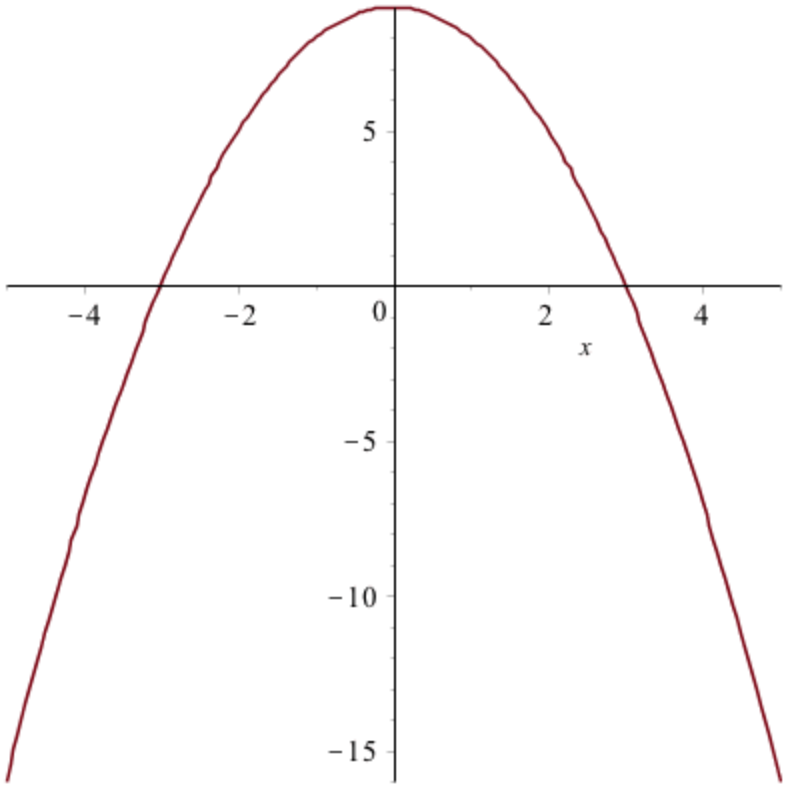
a) Neither

b) Local Minimum

c) Local Maximum

Question 3

The graph of f' is shown. Find the intervals on which f decreases.



a) $(-\infty, \infty)$

b) $(-\infty, 0)$

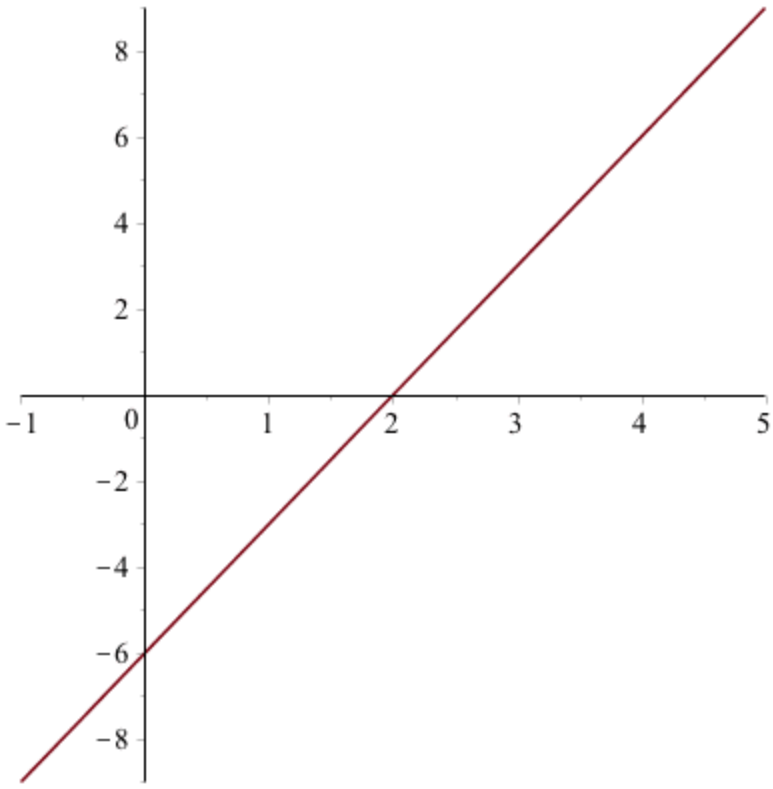
c) f is not decreasing anywhere.

d) $(-\infty, -3)$ and $(3, \infty)$

e) $(0, \infty)$

Question 4

The graph of f' is shown. Find the intervals on which f increases.



a) $(-\infty, \infty)$

b) $(-\infty, 2)$

c) f is not increasing anywhere.

d) (0∞)

e) $(2, \infty)$

Question 5

Find the critical numbers of $f(x) = 4x^3 + 12x + 1$ and classify all local extreme values.

a) Critical no. 0; local max $f(0) = 1$.

b) No critical numbers, no local extreme values.

c) Critical nos. ±1; local max $f(-1) = -15$; local min $f(1) = 17$.

d) Critical no. 0; local min $f(0) = 1$.

e) Critical nos. ±1; local max $f(1) = 17$; local min $f(-1) = -15$.

Question 6

Find the critical numbers of $f(x) = \dfrac{5 - 4x}{2 + x}$ and classify all local extreme values.

a) Critical nos. -2, $\dfrac{5}{4}$; local min $f(-2) = 0$; local max $f\left(\dfrac{5}{4}\right) = 0$.

b) Critical no. 0; local max $f(0) = 0$.

c) Critical no. $\dfrac{5}{4}$; local min $f\left(\dfrac{5}{4}\right) = 0$.

d) No critical numbers, no extreme values.

e) Critical nos. 0, $\dfrac{5}{4}$; local min $f\left(\dfrac{5}{4}\right) = 0$; local max $f(0) = \dfrac{5}{2}$.

Question 7

Find the critical numbers of $f(x) = x^2 - 12x + 7$ and classify all extreme values given $0 \leq x \leq 8$.

a) Critical no. 0; local max $f(0) = 7$.

b) No critical numbers, no extreme values.

c) Critical nos. 0 and 6; local and absolute min $f(6) = -29$; absolute max $f(8) = -25$.

d) Critical no. 6 and 8; local max $f(8) = f(6) = -25$.

e) Critical no. 6; absolute max $f(0) = 7$; local and absolute min $f(6) = -29$.

Question 8

Find the critical numbers of $f(x) = \dfrac{2x}{x^2 + 16}$ and classify the extreme values given: $-5 \leq x \leq 3$.

a) No critical numbers, no extreme values.

b) Critical nos. 4 and -4; local and absolute min $f(-4)$; local and absolute max $f(4)$.

c) Critical no. -4; local and absolute min $f(-4)$; absolute max $f(3)$.

d) Critical no. -4; absolute min $f(3)$; local min $f(-4)$; absolute max $f(0)$.

e) Critical no. 0; local and absolute max $f(0)$.

Question 9

Find the critical numbers of $f(x) = 5\sqrt{3}(\cos)x + 5\sin^2 x$ and classify the extreme values given: $0 \leq x \leq \pi$.

a) Critical nos. 0 and π; local and absolute min $f(0) = 5\sqrt{3}$; local and

absolute max $f(\pi) = -5\sqrt{3}$.

b) Critical nos. 0 and $\frac{\pi}{6}$; local and absolute max $f\left(\frac{\pi}{6}\right) = \frac{35}{4}$

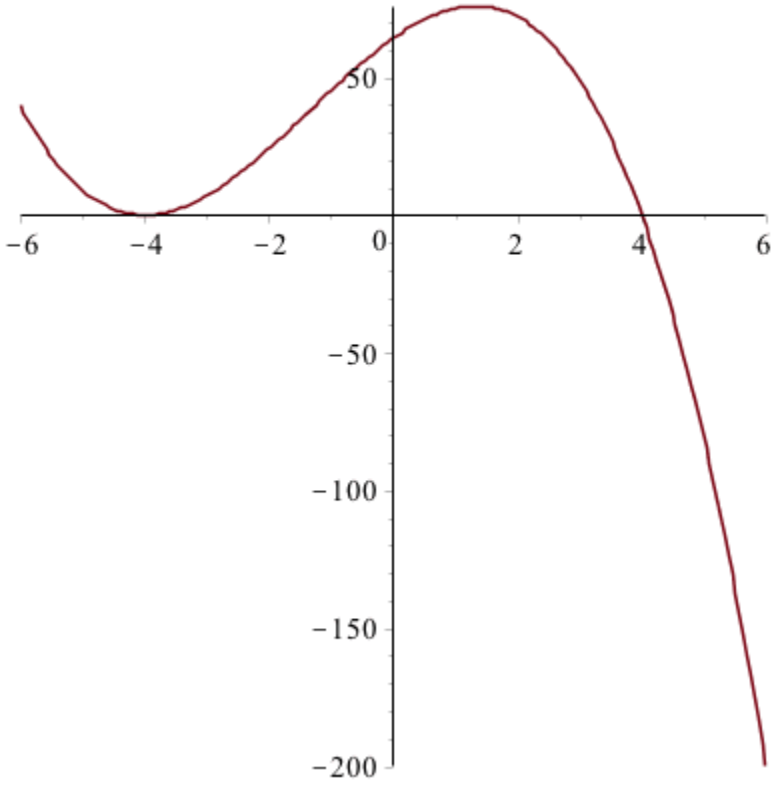
c) No critical numbers, no extreme values.

d) Critical no. $\frac{\pi}{6}$; local max $f\left(\frac{\pi}{6}\right) = \frac{35}{4}$

e) Critical no. $\frac{\pi}{6}$; absolute min $f(\pi) = -5\sqrt{3}$; local and absolute max $f\left(\frac{\pi}{6}\right) = \frac{35}{4}$

Question 10

Read Carefully! The graph of f' (the derivative of f) is shown below. Classify the smallest critical number for f.



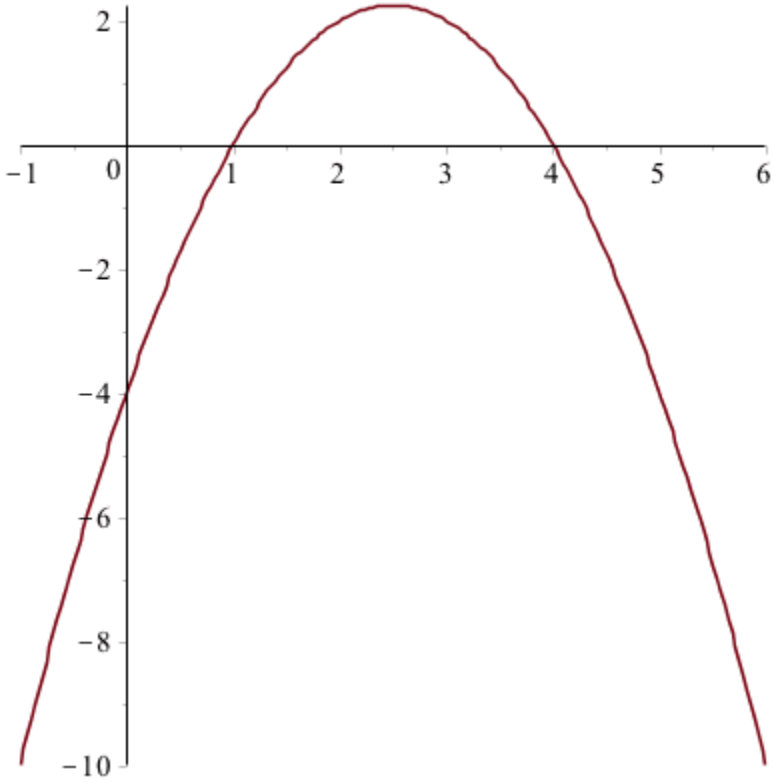
a) local maximum

b) local minimum

c) neither

Question 11

Read Carefully! The graph of f' (the derivative of f) is shown below. Classify the smallest critical number for f.



a) local maximum

b) neither

c) local minimum