

Calculus 1

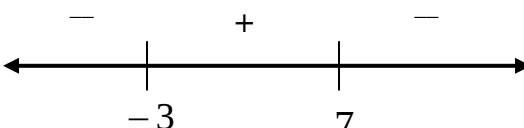
Unit 4 Practice

Input all answers in the Quia!

- Find the critical numbers from the first derivative of $f(x) = x^3 - 27x + 6$.
A) 9 C) -3 E) -9 and 9
B) 3 D) -3 and 3
- Find the minimum value of the function $f(x) = x^3 - 3x + 4$ in $[0, 2]$.
A) 0 C) 2 E) -1
B) 1 D) 4
- Find the maximum value of the function $f(x) = x^3 - 3x^2 - 24x + 9$ in $[-5, 5]$.
A) 5 C) -2 E) 61
B) 37 D) 71
- At what value of x does the function $f(x) = x^2 - 4x + 3$ have a minimum value in the closed interval $[1, 5]$?
A) -1 C) 1 E) 5
B) 0 D) 2
- In what interval(s) is the function $f(x) = \frac{-4}{x-2}$ increasing?
A) $(-\infty, -2)$ C) $(-\infty, \infty)$ E) $(2, \infty)$
B) $(-2, 2)$ D) $(-2, \infty)$
- In what interval(s) is the function $f(x) = -x^2 + 6x - 7$ decreasing?
A) $(-\infty, 3)$ C) $(-3, 3)$ E) $(-\infty, 3)$ and $(3, \infty)$
B) $(3, \infty)$ D) $(-3, \infty)$
- At what value of x does the function $f(x) = x^3 - 3x^2 - 9x$ change from decreasing to increasing?
A) -3 C) 0 E) 1
B) -1 D) 3

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8. In what interval(s) is the graph of $f(x) = \frac{2}{3}x^3 + \frac{1}{2}x^2 - x + 5$ increasing?
- A) $\left(-\frac{1}{2}, 1\right)$ C) $\left(-\frac{1}{2}, \infty\right)$ E) $(-\infty, -1)$ and $\left(\frac{1}{2}, \infty\right)$
 B) $(-\infty, -1)$ D) $(-\infty, \infty)$
9. Find the value of x at which the local minimum for the graph of $f(x) = x^2 - \frac{1}{2}$ can be found.
- A) $x = 1$ C) $x = -\frac{1}{4}$ E) $x = 0$
 B) $x = \frac{1}{4}$ D) $x = -1$
10. The function $f(x) = x^4 - 8x^2$ has
- A) one local minimum and two local maximums
 B) two local minimums and one local maximum
 C) one local maximum and one local minimum
 D) two local maximums and no local minimums
 E) two local minimums and no local maximums
11. If $f'(x)$ yields the number line  at what value(s) of x does $f(x)$ have a local maximum?
- A) -3 C) -3 and 7 E) none of these
 B) 7 D) 5
12. Find the local maximum(s) for the graph of $f(x) = x^3 - 27x + 10$.
- A) $(-3, 64)$ C) $(3, -44)$ E) $(-3, 64)$ and $(3, -44)$
 B) $(-3, 0)$ D) $(3, 0)$

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13. Find the interval(s) where the graph of $f(x) = -2x^3 + 3x^2 - 2x + 4$ is concave down.
- A) $\left(-\infty, \frac{1}{2}\right)$ C) $\left(-\infty, -\frac{1}{2}\right)$ E) $(2, \infty)$
B) $\left(\frac{1}{2}, \infty\right)$ D) $\left(-\frac{1}{2}, \infty\right)$
14. Find the interval(s) on which the graph of $f(x) = x^3 - 6x^2 + 12x - 8$ is concave up.
- A) $(-\infty, 2)$ C) $\left(-\infty, \frac{1}{2}\right)$ E) $(2, \infty)$
B) $\left(\frac{1}{2}, \infty\right)$ D) $\left(-\frac{1}{2}, \infty\right)$
15. Find the interval(s) where the graph of $f(x) = x^4 - 6x^3 - 24x^2 + x + 2$ is concave up.
- A) $(-1, 4)$ C) $(-\infty, -4)$ and $(1, \infty)$ E) $(-\infty, 4)$
B) $(-\infty, -1)$ and $(4, \infty)$ D) $(-4, 1)$
16. Find the interval(s) in which the graph of $f(x) = x^2 - 8x + 6$ is concave up.
- A) $(4, \infty)$ C) $(-\infty, 4)$ E) $(-\infty, -4)$ and $(4, \infty)$
B) $(-4, 4)$ D) $(-\infty, \infty)$
17. How many points of inflection does the graph of the function given by $f(x) = x^8 - 28x^2 + 9$ have?
- A) 1 C) 2 E) 7
B) 0 D) 4
18. At what value of x does the graph of $f(x) = x^3 - 6x^2 + 12x - 8$ have an inflection point?
- A) $x = 0$ C) $x = -2$ E) $x = 2$
B) $x = -1$ D) $x = 1$

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19. At what value(s) of x does $f(x) = 3x^4 - 4x^3 + 2$ have an inflection point?

A) 0 and 1

C) 0 and $-\frac{2}{3}$

E) 1 and $\frac{2}{3}$

B) 0 and $\frac{2}{3}$

D) 0 and -1

20. Find the inflection point for $f(x) = 2x^3 - 6x^2 + 1$.

A) $(1, -3)$

C) $(0, 1)$

E) $(-1, -7)$

B) $(12, 2593)$

D) $(1, 4)$