

Round to 3 decimal places. Show all work.

1. Consider the function $f(x) = 12 - x^2$ for $0 \leq x \leq 2\sqrt{3}$. Let $A(t)$ be the area of the triangle formed by the coordinate axes and the tangent to the graph of f at the point $(t, 12 - t^2)$. For what value of t is $A(t)$ a minimum?

- a. 0 b. 1 c. 2 d. 3 e. $2\sqrt{3}$

2. An object moves along the x -axis so that at time t , $t > 0$, its position is given by $x(t) = t^4 + t^3 - 30t^2 + 88t$. At the instant when the acceleration becomes zero, the velocity of the object is approximately

- a. 244 b. 12 c. 0 d. -12 e. -24

3. Find the point on the graph of $y = \sqrt{x}$ between $(1, 1)$ and $(9, 3)$ at which the tangent to the graph has the same slope as the line through $(1, 1)$ and $(9, 3)$

- a. $(1, 1)$ b. $(2, \sqrt{2})$ c. $(3, \sqrt{3})$
d. $(4, 2)$ e. None of the above

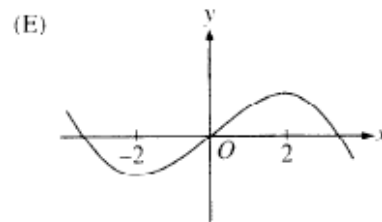
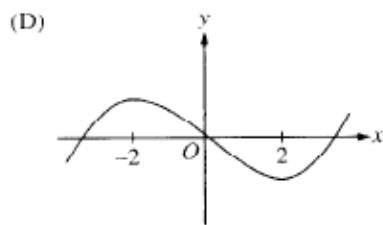
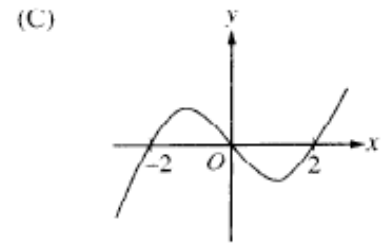
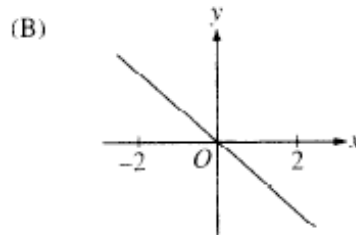
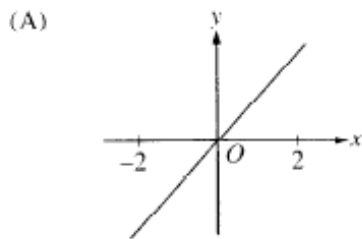
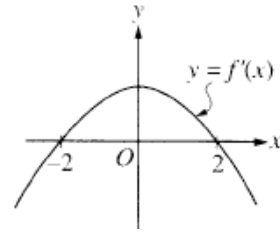
4. The function $f(x) = x^4 - 18x^2$ has a relative minimum at $x =$

- a. 0 and 3 only b. 0 and -3 only c. -3 and 3 only
d. 0 only e. $-3, 0,$ and 3

5. Find the maximum value of $f(x) = 2x^3 + 3x^2 - 12x + 4$ on the closed interval $[0, 2]$.

- a) -3 b) 0 c) 2 d) 4 e) 8

6. Suppose the function f has the graph shown to the right. Which of the following could be the graph of the derivative of f ?



PreCalculus Honors

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Polynomials Test-- CALCULATOR ALLOWED

Round to 3 decimal places.

Score _____

Show all work.

1. Find the zeros, critical values, and extreme values of $y = x^4 - 5x^2 + 4$. Show the algebraic work to support the zeros and critical values.

2. Find the zeros, critical values, and extreme values of $y = 2x^3 + x^2 - 4x + 8$ on $x \in [0, 7]$. Show the derivative and algebra to support the critical values.

3. A farmer with 1400 feet of fencing is wants to enclose a rectangular area and then divide it into five pens with fencing parallel to the **horizontal** side of the rectangle. What is the largest possible total area of the five pens?

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Polynomials Test—CALCULATOR NOT ALLOWED

Show all work.

Score _____

3. Sketch a sign pattern for the function $f'(x)$ if f is decreasing from $-\infty$ to -5 , increasing from -5 to 5 , and decreasing from 5 to ∞ . Be sure to label the sign pattern appropriately. Then, determine whether each critical value represents a max, a min, or neither. Explain how you know for each.

10. Find the traits and **sketch** $y = x^4 - 5x^2 + 4$.

Domain:

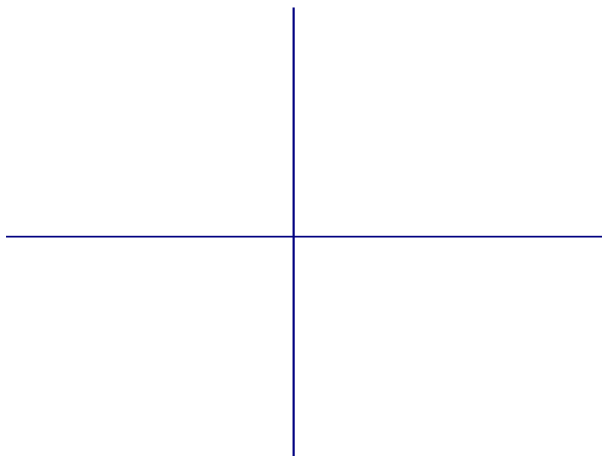
Range:

Y – Int:

End Behavior:

Zeros:

Extreme Values:



11. Find the traits and **sketch** of $y = 2x^3 + x^2 - 4x + 8$ on $x \in [0, 7]$..

Domain:

Range:

Y – Int:

End Behavior:

Zeros:

Extreme Values:

