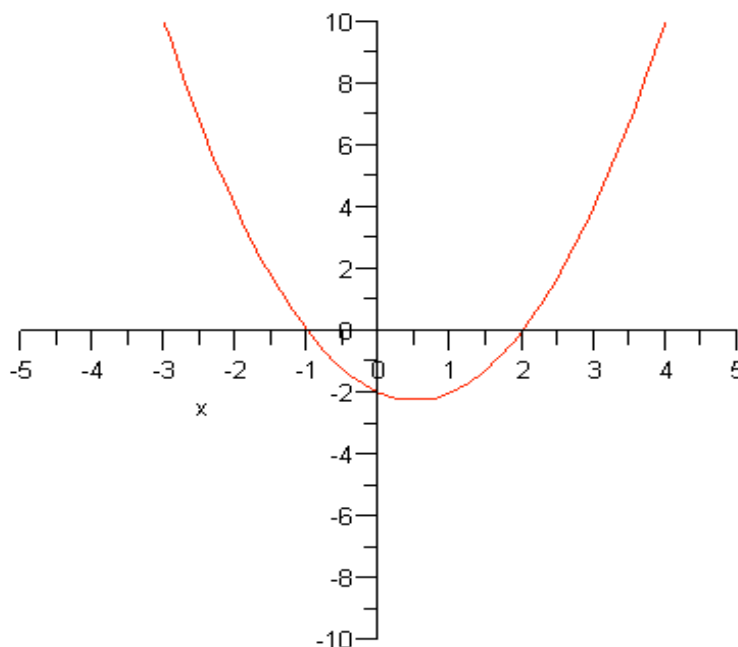


Round to 3 decimal places. Show all work.

1. The graph of the derivative of $f(x)$ is shown.



At what value of x does $f(x)$ have a local maximum?

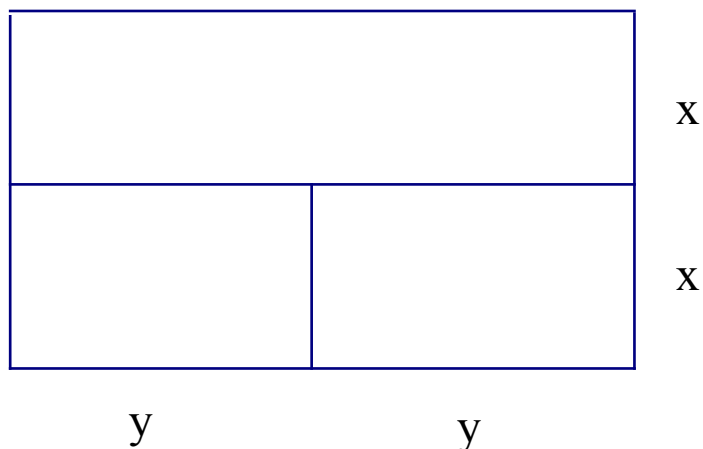
- a) $\frac{1}{2}$ b) -1 c) 2 d) 1 e) None of these

2. Give the approximate location of a local maximum for the function

$$f(x) = 5x^3 + 4x^2 - 2x$$

- a) $(-0.719, 1.584)$ b) $(0.186, -0.202)$ c) $(-0.719, 1.647)$
d) $(0.186, -0.139)$ e) $(-0.719, -0.202)$

3. A farmer has 100 yards of fence to enclose a field, subdivide it into two equal pens, and further subdivide one of those pens into two equal fields as shown below.



What value of y produces the maximum total area?

- a) 12.5 b) 10 c) $\frac{100}{11}$ d) $\frac{25}{3}$ e) None of these

4. Find the x -value of the point on the graph of $y = -2x^2 + x - 2$ between $(1, -3)$ and $(3, -17)$ at which the tangent to the graph has the same slope as the line through $(1, -3)$ and $(3, -17)$.

- (a) $x = \frac{1}{2}$
 (b) $x = \frac{5}{4}$
 (c) $x = \frac{3}{2}$
 (d) $x = 2$
 (e) $x = \frac{9}{4}$

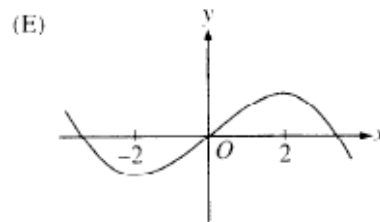
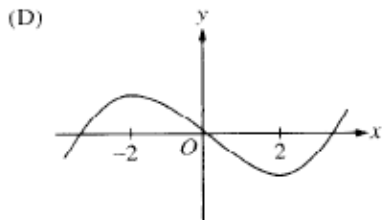
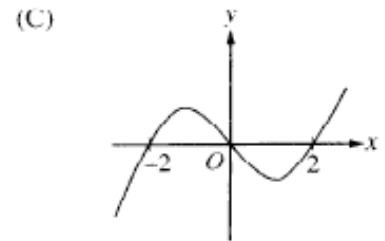
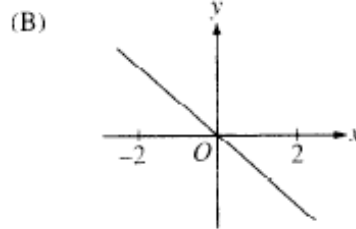
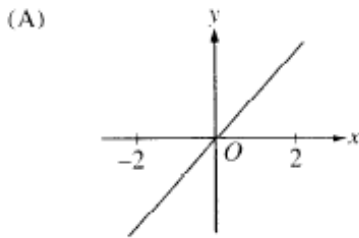
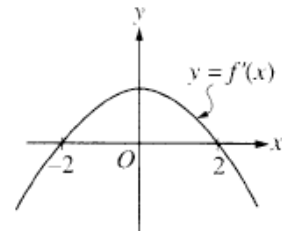
5. The function $f(x) = x^4 - 18x^2$ has a relative maximum at $x =$

- (a) 0 and 3 only
- (b) 0 and -3 only
- (c) -3 and 3 only
- (d) 0 only
- (e) -3, 0, and 3

6. Find the minimum 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

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



Honors PreCalculus '17

Name: _____

Dr. Quattrin

Polynomials Test-- CALCULATOR ALLOWED

Round to 3 decimal places.

Score _____

Show all work.

1. Find the zeros and extreme points of $y = 3x^3 - 19x^2 + 16x + 20$. Show the algebraic work to support the zeros and critical values.

2. Find the zeros and extreme points of $y = 3x^4 - 5x^3$ on $x \in [-1, 3]$. Show the derivative and algebra to support the critical values.

3. Given that the area of a triangle can be calculated with the formula $A = \frac{1}{2}ab \sin \theta$, what value of θ will maximize the area of a triangle (given that a and b are constants)?

4a. Find the zeros, algebraically, of $y = -5x^3 + 3x^2 + 20x - 12$.

4b. Find the extreme points, graphically, of $y = -5x^3 + 3x^2 + 20x - 12$. Show the derivative before using your calculator.

5. Make a sign pattern for the function $f'(x)$ if f is increasing from $-\infty$ to -2 , increasing from -2 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.

6. Find the traits and **sketch** $y = 3x^4 - 5x^3$ on $x \in [-1, 3]$.

Domain:

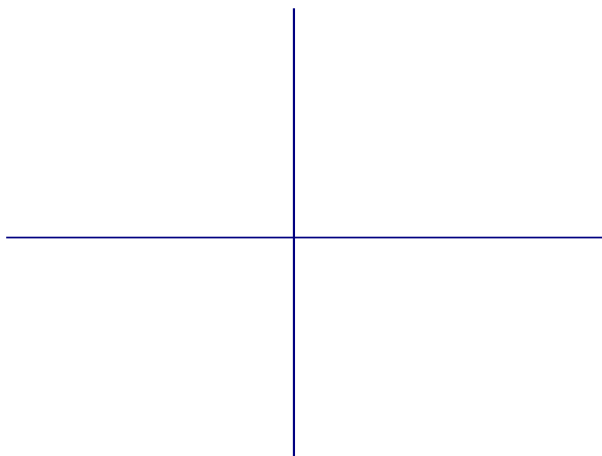
Range:

 Y – Int:

End Behavior:

Zeros:

Extreme Values:



7. Find the traits and **sketch** of $y = -5x^3 + 3x^2 + 20x - 12$.

Domain:

Range:

Y – Int:

End Behavior:

Zeros:

Extreme Values:

