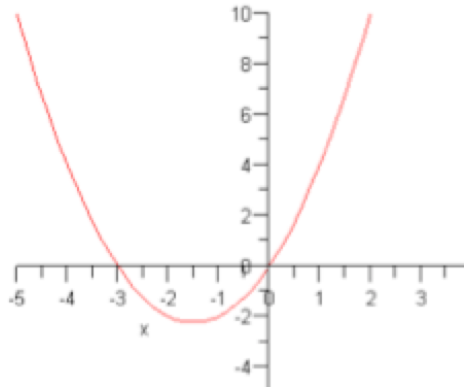
PreCalculus Honors Name:_____
Dr. Quattrin
Polynomials Test
CALCULATOR ALLOWED Score _____
Round to 3 decimal places. Show all work.

1. The **derivative of *f*** is graphed below. Give the value of x where f has a relative minimum point.



a. -3 b. $-\frac{3}{2}$ c. 0 d. 1 e. No such value

2. A farmer with 890 ft of fencing wants to enclose a rectangular area and then divide it into four pens with fencing parallel to one side of the rectangle. What is the largest possible total area of the four pens?

a. 19,805.5 ft^2 b. 19,825.5 ft^2 c. 19,801.5 ft^2

d. 19,902.5 ft^2 e. 19,791.5 ft^2

3. Find the point on the graph of $y = \sqrt[3]{x^2}$ between $(1, 1)$ and $(9, 4)$ at which the tangent to the graph has the same slope as the line through $(1, 1)$ and $(9, 4)$

a. $(1, 1)$ b. $\left(2, \sqrt[3]{4}\right)$ c. $\left(\frac{3}{4}, 2\right)$

d. $\left(\frac{64}{27}, \frac{16}{9}\right)$ e. None of the above

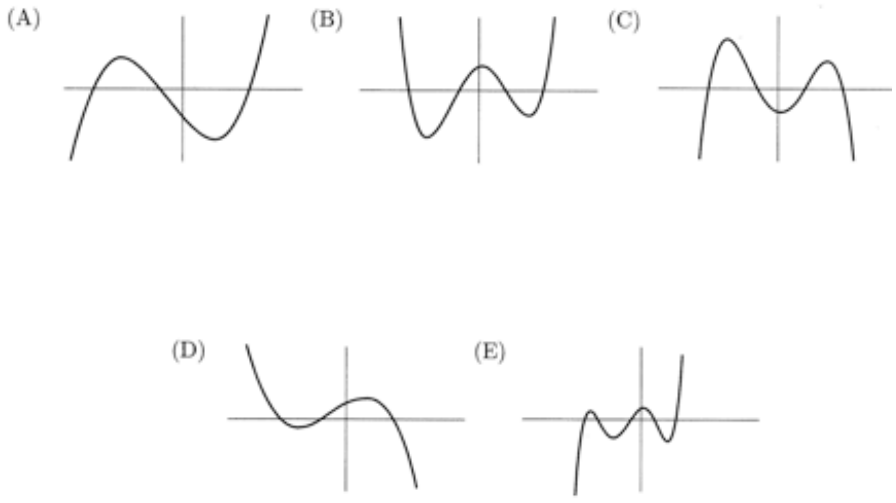
4. Consider the function $f(x)=\frac{x^4}{2}-\frac{x^5}{10}$. $f'(x)$, the *derivative* of *f,* attains its maximum value at $x=$

a) 0 b) 3 c) 4 d) 5 e) Never

5. The function g is given by $g(x)=4x^3+3x^2-6x+1$. What is the absolute minimum value of g on the closed interval $x\in[-1,2]$?

a) -7 b) $-\frac{3}{4}$ c) 0 d) 2 e) 6

6. If $f'(x)=(x-a)(x-b)(x-c)$ and $a<b<c$, then which of the following could be the graph of $f(x)$?



PreCalculus Honors Name:_____ _____
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Polynomials Test-- CALCULATOR ALLOWED
Round to 3 decimal places. Score _____
Show all work.

1. Find the zeros and extreme points of $y = -3x^3 + 2x^2 + 147x - 98$. Show the algebraic work to support the zeros and critical values.

2. Find the zeros and extreme points of $y = 2x^3 - x^4$ on $x \in [-1, 3]$. 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?

4a. Find the zeros, algebraically, of $y = x^4 - 3x^3 - 16x^2 + 48x$.

4b. Find the extreme points, graphically, of $y = x^4 - 3x^3 - 16x^2 + 48x$. Show the derivative before using your calculator.

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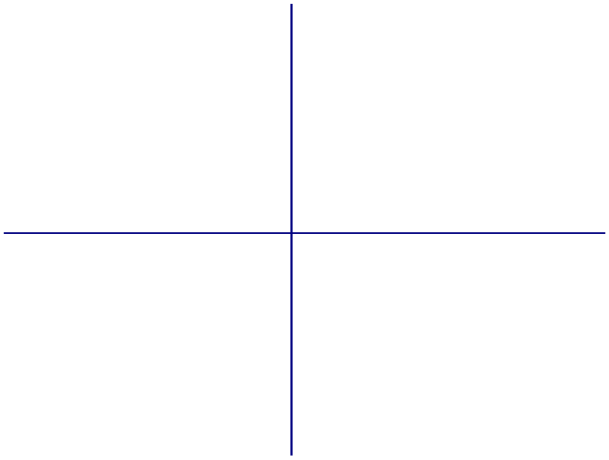
5. Make a sign pattern for the function $f'(x)$ if f is increasing from $-\infty$ to -3, increasing from -3 to 5, and decreasing from 5 to ∞. Be sure to label the sign pattern appropriately. Then, determine whether each critical value represents a max, a min, or neither. Explain how you know for each.

6. Find the traits and **sketch** $y = 2x^3 - x^4$ on $x \in [-1, 3]$.

Domain: Range:

Y – Int: End Behavior:

Zeros: Extreme Values:



7. Find the traits and **sketch** of $y = -3x^3 + 2x^2 + 147x - 98$.

Domain: Range:

Y – Int: End Behavior:

Zeros: Extreme Values: