

NAME: _____

DATE: 10/26/2017

ASSIGNMENT: Geometric Calculus

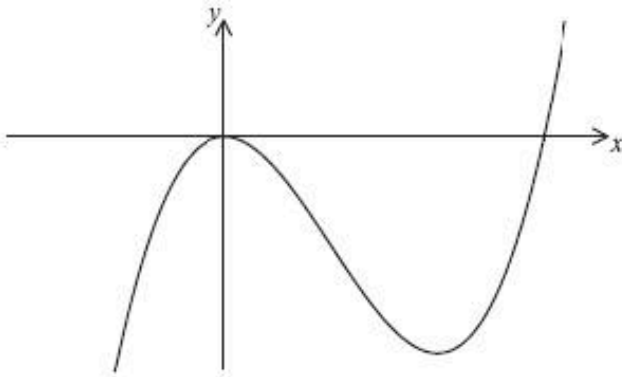
DIRECTIONS: Sometimes we need to understand what coordinates would create the largest area rectangle within a curve. If we want to *maximize* area, we need to take the derivative of the area function for that rectangle. The length is the distance traveled on the x-axis, and the width is the y-value. This y-value is the function value after “y =”.

1.) What are the coordinates of the rectangle with the largest area constrained by the curve $y = 20 - x^4$. What is the area of this rectangle? *[4 marks]*

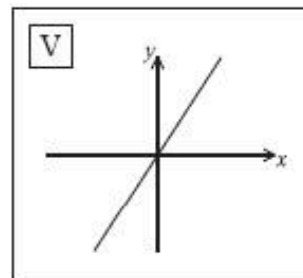
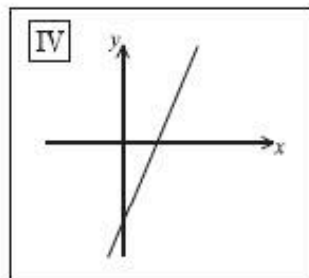
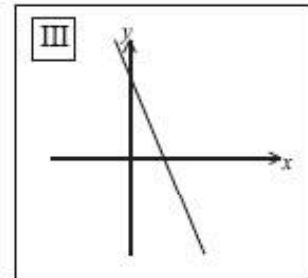
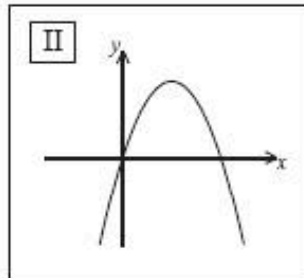
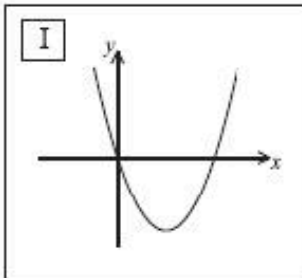
2.) Kyara constructs a box with a base length that is 3 times the base width. The material used to build the top and bottom cost \$10/ft² and the material used to build the sides cost \$6/ft². If the box must have a volume of 50ft³, determine the dimensions that will minimize the cost to build the box. *[6 marks]*

The following diagram shows the graph of a function f .

3.)



Consider the following diagrams.



Complete the table below, noting which one of the diagrams above represents the graph of

(a) $f'(x)$;

(b) $f''(x)$.

NAME: _____

DATE: 10/26/2017

Answer key (show all calculations to receive full marks)

1.) $(1.41, 0)$; $(-1.41, 0)$; $(1.41, 16)$; $(-1.41, 16)$

2.) $L = 5.65$; $W = 1.88$; $H = 4.71$