Algebra 1 Name:_____
MR Problem Solving 10.1-10.3 Teacher:_____Pd:_____Date:_____

1. A company's yearly profits from 1996 to 2006 can be modeled by the function $y = x^2 - 8x + 80$ where y is the profit (in thousands of dollars) and x is the number of years since 1996.
Hint: Graph function on calculator; would the lowest yearly profit be a minimum or maximum?

   a. In what year did the company experience its lowest yearly profit?

   b. What was the lowest yearly profit?

2. Given a rectangle with dimensions $(14 - x)$ and $2x$ find the following:

   a. Write a polynomial which represents the area of the rectangle

   b. Find the value of x that gives the greatest possible area of the rectangle.

   c. What is the greatest possible area of the rectangle?

3. The St. Louis Arch can be modeled by the equation $y = -0.0019x^2 + 0.71x$ where x and y are measured in feet. What is the height at the highest point of the arch?

Hint: Graph function on calculator; would the highest point be a minimum or maximum?

4. The height y (in feet) of a soccer ball after it is kicked can be modeled by the graph of the equation $y = -0.04x^2 + 1.2x$ where x is the horizontal distance (in feet) that the ball travels. The ball is not touched, and it lands on the ground. Find the distance that the ball was kicked.