Algebra/Trigonometry Section 3.1 Name:_____

Please do all your work on a separate piece of paper. Please show all setup and work!

Sketch the graph of the quadratic function without using a graphing utility. Identify the vertex and x-intercepts.

1. $f(x) = x^2 - 5$
2. $f(x) = (x + 5)^2 - 6$
3. $f(x) = -x^2 - 4x + 1$
4. $f(x) = -\frac{1}{3}x^2 + 3x - 6$

Find the quadratic function that has the indicated vertex and whose graph passes through the given point.

5. Vertex: (4, -1) Point: (2 , 3)

6. Vertex: (2, 3) Point: (0 , 2)

7. Vertex: (- 2 , - 2) Point: (- 1 , 0)

8. Vertex: $(\frac{5}{2}, -\frac{3}{4})$ Point: (-2, 4)

Word problems

9. Find the maximum number of units sold that produces a maximum revenue $R = 100x - 0.0002x^2$ where R is the total revenue (in dollars) and x is the number of units sold.

10. A manufacturer of lighting fixtures has daily production costs of $C = 800 - 10x + 0.25x^2$ where C is the total cost (in dollars) and x is the number of units produced. How many fixtures should be produced each day to yield a minimum cost?

11. Find two positive real numbers whose product is a maximum if the sum of the numbers is 110.