Written Homework

Your carefully written solutions to the following questions will be due at the beginning of class on **Tuesday, October 21**. Show all of your work, and explain your steps as if you were teaching someone else how to solve these problems.

1. For each equation of a parabola below, find the coordinates of the vertex using the vertex formula, and find the x-intercepts using the quadratic formula. Then use those three points to sketch a careful graph of the parabola. Give exact answers when you write down the coordinates of the intercepts, but use decimal approximations to decide where to graph those points in your sketch.
   (a) \( y = x^2 - 4x + 2 \)
   (b) \( y = -3x^2 - 2x + 8 \)

2. The profit of a company selling Things is given by the equation
   \[ P = -2Q^2 + 300Q - 800 \text{ dollars}, \]
   where \( Q \) is the number of Things produced and sold.
   (a) Find the break-even values for this business (that is, find out how many Things the company should produce and sell to ‘break even’). Round your answers to the nearest whole numbers.
   (b) Find the number of Things the company should produce and sell in order to maximize its profit.
   (c) What is the maximum profit the company can make?

3. Find an equation for a parabola that has the graph shown at right.
Daily Practice Problems

You should do the suggested reading below and attempt these exercises after class each day. You *will not submit* solutions to these questions for grading, but you may use them as notes during the weekly quizzes on Fridays.

After class on **Monday, October 13**, read Section 7.5 (up to page 535) and work the following exercises:
Section 7.5, # 7, 9, 11, 13

After class on **Tuesday, October 14**, read Section 7.5 (up to page 539) and work the following exercises:
Section 7.5, # 39, 43, 47

After class on **Wednesday, October 15**, finish reading Section 7.5 and work the following exercises:
Section 7.5, # 17, 19, 31