

Use an appropriate second degree function to solve each of the following problems. Show your work and your solutions neatly organized.

**1. A rectangle has two sides on the coordinate axes and one vertex in the first quadrant on the line  $3x + 2y = 12$ . What are the dimensions of the rectangle if its area is a maximum? What is the maximum area?**

**2. A rectangle has two sides on the coordinate axes and one vertex in the first quadrant on the line  $x + 4y = 40$ . What are the dimensions of the rectangle if its area is a maximum? What is the maximum area?**

**3. William wants to fence in a rectangular plot of land and to divide it into two equal areas by a fence connecting the midpoints of two opposite sides. If he has a total of 300 feet of fencing to work with, find the dimensions that will maximize the total area enclosed.**

## General Algebra 2 Worksheet #5 Unit 9 page 2

Use an appropriate second degree function to solve each of the following problems. Show your work and your solutions neatly organized.

4. Mary wants to fence in a rectangular plot of land and to divide it into three equal areas using two lengths of fencing parallel to two opposite sides. If she has a total of 600 feet of fencing to work with, then find the dimensions that will maximize the total area enclosed.

5. The owner of a large apartment building with fifty units has found that if the rent for each unit is \$360 per month, then all of the units will be rented. But one unit will become vacant for each increase of \$10 per month. What rate should be charged per month per unit in order to maximize the total monthly income? What is the maximum monthly income?

6. A television set manufacturer can sell 1000 sets per month for \$500 per set. Marketing research indicates that the company can sell 50 more sets per month for each \$10 decrease in price. What price per set will give the greatest monthly income? What is the maximum monthly income?