## Algebra II Worksheet \#5 Unit 8 page 1

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 $\mathbf{3 x}+\mathbf{2 y}=\mathbf{1 2}$. 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 $\mathbf{x}+\mathbf{4 y}=\mathbf{4 0}$. 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.

## Algebra II Worksheet \#5 Unit 8 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?

