3A Optimization Homework

Name _____ PER _____ DATE _____

Directions: On a separate piece of paper, solve the following problems using the problem-solving strategy (***UPS with a check!***). Check your answers.

1. A farmer has 2400 feet of fencing to fence a field that borders a river. He does not need a fence along the side of the river. Find a function that models the area of the field in terms of one of its sides. What side length will maximize the area?

2. An open box with a square base is to have a volume of 12 feet squared. Find a function that models the surface area of the box in terms of the length *l,* of the base.

3. A property owner wants to fence a garden plot adjacent to a road (see the figure). The fencing next to the road must be sturdier and costs $5 per foot, but the other fencing costs just $3 per foot. The garden is to have an area of 1200 feet squared. Find a function that models the cost of fencing in terms of the width of the fence along the road. If the owner has at most $600 to spend on fencing, find the range of widths he can fence along the road.