Extra Max/Min problems.

Correctly solving these problems, if submitted with the second half of your previous test, can raise your grade on the max/min test problem up to a maximum of 13 points.

1. I want to fence a rectangular area with fencing that costs $1.50 per foot, and I want to also use the fence to subdivide my fenced area into three parts using fence that is parallel to one side of the rectangle. If I need to fence a total of 400 square feet, what dimensions will give me the cheapest fence.

2. I want to fence a rectangular space with a total area of 400 square feet, and I want to also use the fence to subdivide my fenced area into three parts using fence that is parallel to one side of the rectangle. If the fence I will use for the outer perimeter costs $2.00 per foot, and the fence I will use for the inner subdivisions costs $1.00 per foot, what is the minimum cost for my fence?

3. I want to make a box with a glass lid. The length of my box should be 1 1/2 times as long as the width of my box. I wish for my box to have a total volume of 0.2 cubic feet. The material for the base and sides of my box will cost $2.00 per square foot. The material for the glass lid will be $3.00 per square foot. My box will have hinges with a fixed cost of $1.50 ($1.50 for the pair of hinges). What is the minimum cost of the box?

4. I want to make a box with a lid. The box will have volume 1/2 cubic foot. The length should be three times the width. The material I am using to make the box has a weight of 2 oz per square foot. What dimensions will give me the lightest box?