Name _____

Homework 15
Section 4.2

Answers need to be found algebraically. Simply using a calculator will not be sufficient for receiving credit. Answers should include units when appropriate.

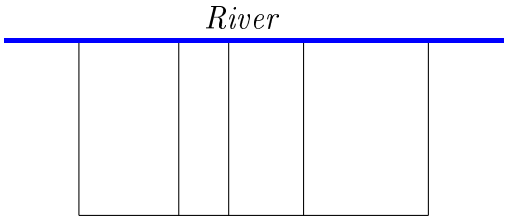
1. (4) Dennis the mad scientist determines that his profit, in hundreds of dollars, from raising and selling x emus is given by the function

$$P(x) = -0.1x^2 + 17.2x - 108.$$

What is Dennis's maximum profit from emu sales?

2. (6) Suppose the price of an item, p, and the quantity q of the item sold are related by the function $p = 60 - \frac{1}{4}q$. The cost of producing the item is \$8 per item, plus a fixed cost of \$50. How many items should be produced in order to maximize profit? What is the maximum profit that can be attained from producing and selling this item?

3. (5) A farmer plans to construct 4 adjacent pens with one edge along a river, as shown below. If the farmer has 1800 yards of fencing, what is the maximum total area that he can enclose? *No fencing is needed along the river.*



4. (6) Through market research, Walter White's Widget Warehouse has determined that if they price their widgets at \$80 each, they can sell 630 widgets. They have also determined that raising the price of each widget by 50 cents will decrease the number of sales by 3. What price should they charge for each widget in order to maximize their revenue from widget sales? What is the maximum revenue?