SECTION 4.7 APPLIED OPTIMIZATION (DAY 1)

1. A Framework for Approaching Optimization

   (a) Read the problem two or three times. Draw pictures. Label them. Pick specific numerical examples, to make the problem concrete. Be creative. Try more than just one approach.

   (b) Identify the quantity to be minimized or maximized (and which one... min or max).

   (c) Chose notation and explain what it means.

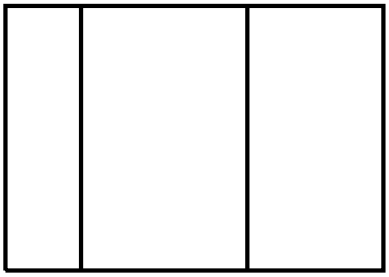
   (d) Write the thing you want to maximize or minimize **as a function of one variable**, including a reasonable **domain**.

   (e) Use calculus to answer the question and justify that your answer is correct.

2. Why does *justification* matter?

3. Find two positive numbers whose sum is 110 and whose product is a maximum.

4. A rancher has 800 feet of fencing with which to enclose three adjacent rectangular corrals. See figure below. What dimensions should be used so that the enclosed area will be a maximum?



5. Which points on the graph of $y = 4 - x^2$ are closest to the point $(0, 2)$? (Get started on this problem and once you have a function – that is, you have made it through part (d) of the Framework – look at the hint at the bottom of the page.)

HINT: Whenever you are asked to maximize or minimize distance, it is nearly ALWAYS easier to maximize or minimize the *square* of the distance. Why?