Math 118 Calculus Ia **Problems 7 – Optimizing (part B)**

You'll need correct solutions to the modeling phase before you can solve these! You may work with a partner, and I encourage it! If you work with a partner, you may submit one write-up with both your names on it.

Due by 4:00 Tuesday December 13th. You'll have time to work on it and ask questions in class on Tuesday, and you may turn it in then, or turn it in to the drop box outside my office.

1. A sheep farmer wishes to construct a rectangular pen enclosing 500 square feet and subdivide it into two pens using a fence parallel to one of the sides. The fencing for the four outer sides of the pen must be heavy-duty (to keep out predators) and costs \$2 per foot. The interior (subdividing) fence costs \$1 per foot. How should the farmer construct the pen in order to minimize its cost? What will the minimum cost be?

For full credit:

Answer the questions, in terms that a sheep farmer who doesn't understand calculus can understand.
Include a sketch of the optimal pen with all the relevant measurements labeled.
Show a solution that supports your answers.

2. A rectangular page is to contain 36 square inches of print. The margins on the left and right sides are to be 1 inch each, and the margins at the top and bottom are to be $1\frac{1}{2}$ inches each. What dimensions for the page will ensure that the least amount of paper is used?

For full credit:

Answer the question in terms that a graphic designer can understand.
Give both exact answers for the measurements, in terms of square roots.
Also give decimal approximations which would be useful for the designer.
Include a sketch of the optimal page with all the relevant measurements labeled.
Show a solution that supports your answers.