

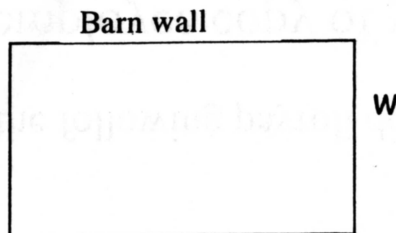
Joe

Answer all components of the following questions. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. A correct numerical answer for each component with NO WORK SHOWN will receive only 1 credit.

A rancher is building a rectangular corral and is using one wall of his barn as one of the sides. Because the barn wall is quite long, he needs fencing only along the other three sides. He has 500 feet of fencing.

1. The rancher wants the area of the corral to be as large as possible. What should he choose as the dimensions of the corral? (Don't assume that the "obvious" answer is correct). Construct a table that can be used to help find the largest area. Use the table to find the correct dimensions. (5 credits)

2. Use w to represent the width (in feet) of the side of the corral. Find a formula that expresses the area of the corral in terms of w . (2 credits)



3. Justify your answer to Question #1 by using your formula found in Question #2 and a *graphing calculator*. Sketch the graph. Clearly indicate the steps or procedures you used. (3 credits)

4. The city of Euclid is building a public swimming pool. The architect of the pool builds the pool in the shape of a rectangle. The walls of the pool will be vertical and the pool will be 4 feet deep everywhere. The length of the pool is 24 feet and the width is 15 feet.

After the pool is built, the city will have to paint the inside of the pool (which means the walls as well as the bottom). Find the total surface area (in square feet) of the inside of the pool. (4 credits)

5. Once the pool is painted, the city will, of course, fill it with water. Find the volume of water (in cubic feet) needed to fill the pool. (1 credit)