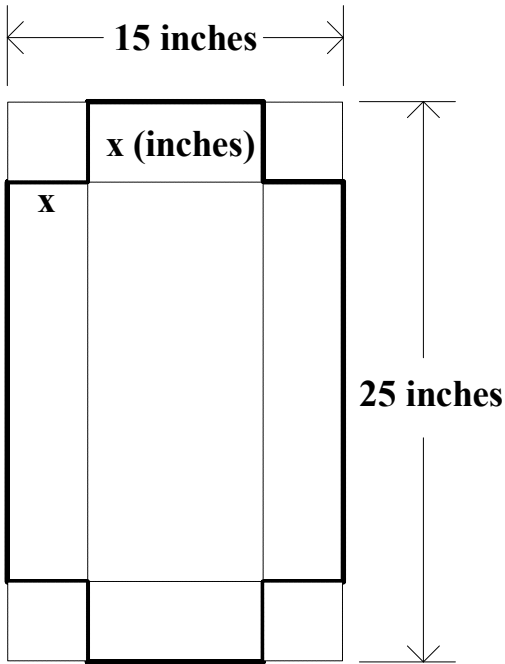


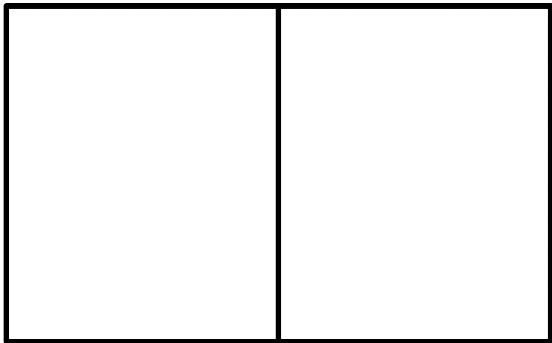
Calculus Worksheet #7 Unit 1 page 1 _____

Use calculus to solve the following problems. Show your work and your solutions neatly organized.

1. A piece of metal that is 25 inches long and 15 inches wide is to be made into a box without a top by cutting equal squares out of the corners, as shown in the diagram, and bending up the edges. If x represents the length of each side of the square cut-outs, then what value of x will result in a box with maximum volume?



2. A farmer wishes to fence in a rectangular plot of land and to divide it into two equal areas using a piece of fencing that connects the midpoint of two opposite sides. Please see the diagram. If the total enclosed area must be 2400 square feet, then what dimensions will use the least amount of fencing?



Calculus Worksheet #7 Unit 1 page 2

Use calculus to solve the following problems. Show your work and your solutions neatly organized.

3. A rectangle has two sides on the coordinate axes and one vertex in the first quadrant on the line $2x + 5y = 30$. What is the maximum area of the rectangle?

4. The sum of the length and the girth of a package mailed second-class must not exceed 100 inches, the girth being defined as the shortest distance around the package. A package is a rectangular box with a square base whose height is less than the length of its base. (See the diagram below.) What is the maximum volume of the package?

