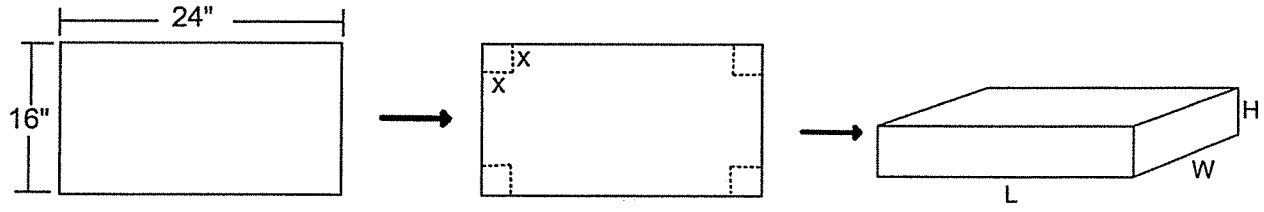
Algebra 2 Polynomial Application Problem Fall 2019

You have a 24" x 16" flat sheet of metal. You are going to cut squares of equal size from each corner of the sheet of metal then fold up the sides to create a box without a top. Your job is to find the dimensions of the squares to be removed from each corner that will create the maximum volume. See the diagrams below:



1. Write an expression for the Length of the box in terms of x: L=

2. Write an expression for the Width of the box in terms of x: W=

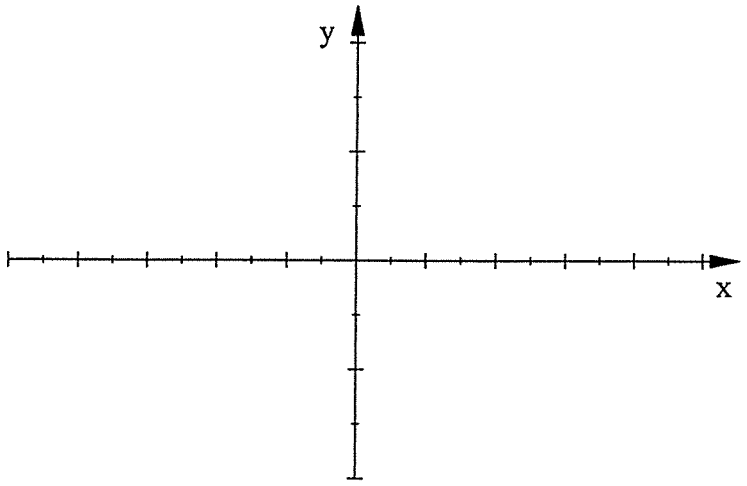
3. Write an expression for the Height of the box in terms of x: H =

4. Write an equation for the Volume of the box in terms of x. ($V = L \cdot W \cdot H$)

a) Write the Volume equation in Factored Form:

b) Write the Volume equation in Standard Form:

5. Find a good window on the graphing calculator to show all extremes. Sketch this graph below:



6. What part(s) of this graph make sense given what the equation represents?

7. a) If this volume equation didn't represent a real-life situation what would the domain be?

b) What is the domain of the volume equation using the real-life situation that it represents?

8. a) What is the maximum possible volume you can create? Round to the nearest hundredth.

b) What is the size of the square you'll remove from each corner in order to create this maximum volume? Round to the nearest hundredth.