

Quadratics and Area

Part I

A farmer has 300 feet of fencing with which to build a rectangular livestock pen and wants to enclose the maximum area.

- Draw a picture to represent the situation.
- Use variable(s) to label the length and width of the rectangle. Be sure to define your variable(s) explicitly.
- Find a variable expression to represent the area of the pen.
- If you haven't already, rewrite your variable expression for the area in terms of only one other variable.
- Use your graphing calculator to show the different possibilities for the area of the pen. Print this graph out and include it as part of your assignment. Be sure that your axes are labeled.
- Use your calculator to find the dimensions of the pen that will have the maximum area. What is this area?

Part II

Suppose that the farmer needs to have a pen that is separated into two rectangular parts, so that different animals could be kept in the different sections of the pen. Follow the same instructions for Part I, assuming this change.

Part III

What if the farmer made a circle out of the 300 ft. of fencing? What would the area of the pen be in this situation? Give a complete explanation of your answer.