

FIXED PERIMETER, MAXIMUM AREA

Lydia has 100 feet of fencing with which to make a rectangular pen for her new puppy. She would like the pen to have whole number dimensions and the maximum possible area. Find the dimensions of the rectangle with the maximum area. What is the maximum area?

Complete the following table:

Possible Widths Area	Corresponding Lengths
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1	
2	
3	
4	
5	
10	
15	
25	

QUESTIONS

1. Make a scatter plot of the width and length data. Using **LinReg**, find the equation of the line of best fit.
2. Using this equation, discuss the relationship of the width and length.
3. Make a scatter plot of the width and area data. Using **QuadReg**, find the equation of the quadratic function which fits the data.
4. What is the maximum area that can be generated with 100 feet of fencing?
5. What shape must the dog pen be to have the maximum area?
6. What is the largest area that Lydia could enclose with 80 feet of fencing?

7. Suppose Lydia was going to build the pen on the side of her house. If she had 100 feet of fencing, what is the total area she could enclose using the fencing for three sides?

8. What are the dimensions of the pen discussed in #7. Explain your answer.