Name _____

Pd _____   Date _____

Gardening with Malama

Malama wants to fence in a rectangular area for a garden. Her mom, Mrs. Aina, provided her with 100 feet of fencing for this purpose.

$A=L \bullet W$
$A=49 \bullet 1$
$A=49$ sq ft

49'
1'

There are many (infinitely many, actually) dimensions for the rectangular garden. Assume she uses all 100 ft of fencing. Here are diagrams for just a few of these possibilities.

40'
10'

$A=10 \bullet 40$
$A=400$ sq ft

Although each of these rectangles use 100ft of fencing, the areas vary greatly. The rectangle illustrated at the top-right, for example, has an area of 49 sq ft ($A = LW$). The bottom rectangle at the right has an area of 600 sq ft.

30'
20'

$A=20 \bullet 30$
$A=600$ sq ft
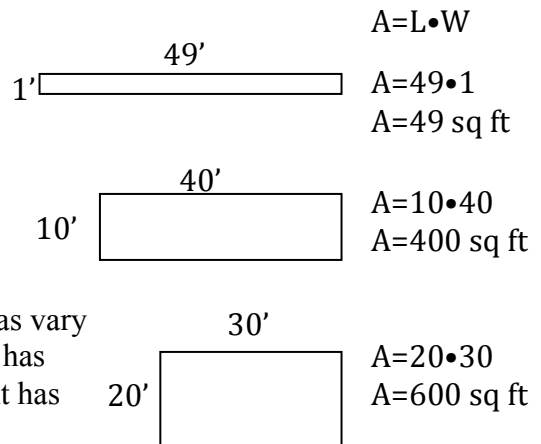
1. Complete the table below relating the area A to the length L of the rectangle. Although the width (base) is not included in this table, this measure must be known in order to determine the area. The process for completing each row of this table is included for the first few rows.

L	A
1	
5	225
10	
24	624
25	
27	
30	600
35	
40	
48	

Recall from last night's homework: "**the sum of L and W will equal one-half of the Perimeter**."
- Therefore, if the perimeter of Malama's garden must be 100 feet, then the sum of L and W must be _____.

So, if the length of Malama's garden is 5 ft, to find the width I need to think, 5 + ___ = 50, so W = 45. Now I can determine the area: A = LW, so A = 5(45), therefore, A = 225 sq. ft.

If L = 30, I need to think, "30 + ___ = 50" so, the width has to be 20. Now I can determine the area: A = LW, so A = 30(20), therefore, A = 600 sq. ft.
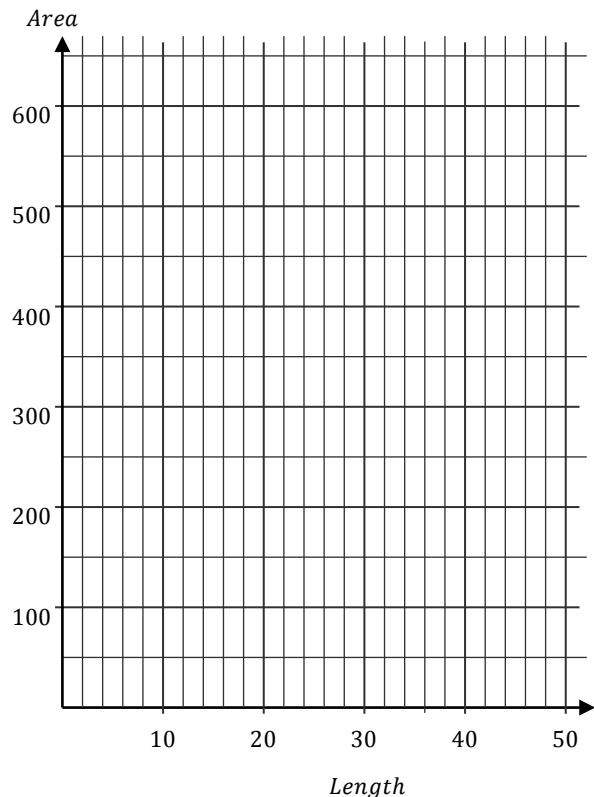
2. Use the values in your table above to sketch a graph for the area A as a function of the length L. Connect your points with a smooth curve.

Area

600

500

400

300

200

100

10   20   30   40   50

Length

Algebra 1 -- Module 1: Functions
F – 4.3: Which Representation is Better?

Name _____

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Below is a review of the table and graph you created from problems 1 and 2 on the previous page.

Along with the graph and table, a function representing the area of Malama's rectangular garden is also provided. The function, $A(L) = L(50 - L)$, will gives us the Area of any rectangle (with a perimeter of 100) if we know it's length. In other words, "Area as a function of the length."
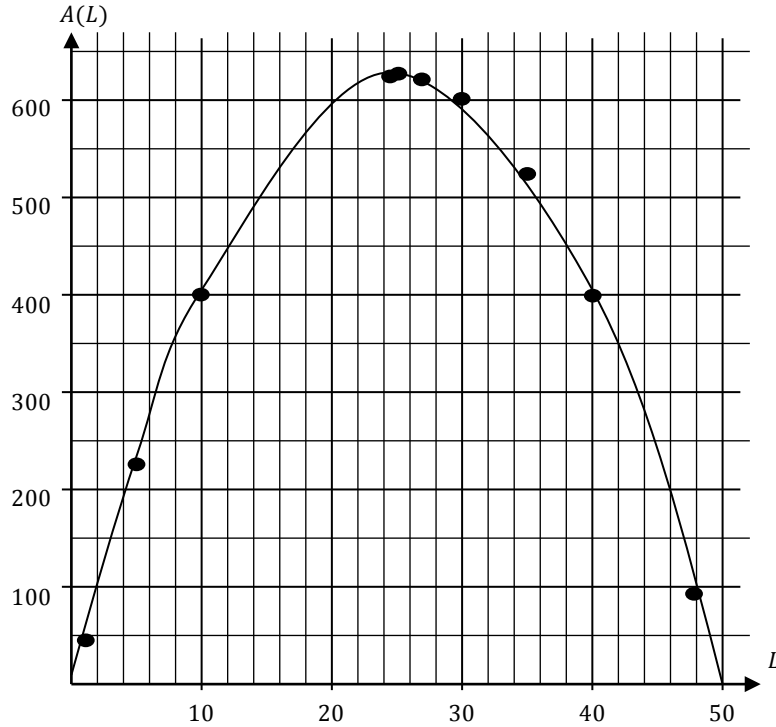
$$A(L) = L(50 - L)$$

L	A
1	49
5	225
10	400
24	624
25	625
27	621
30	600
35	525
40	400
48	96

The next page asks 5 questions about different scenarios regarding Malama's rectangular garden.

- Use the table of values, the symbolic representation (i.e., the function), or the graph to answer the questions.

- Then, indicate which representation(s) you used to answer the question, and provide a brief explanation/reason why you chose that representation to help you answer the question.

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3. Answer the questions below about different scenarios regarding Malama's rectangular garden.

- Use the <u>table of values</u>, the **symbolic representation** (i.e., the function), or the *graph* on the previous page to help you answer each question.

- Then, indicate which representation(s) you used to answer the question, and provide a brief explanation/reason why you chose that representation to help you answer the question.

A. Malama's garden would have an area of 500 sq ft if the length was about 14 ft long. At about what other length would give Malama this same area of 500 sq ft?	☐ symbolic representation ☐ table of values ☐ graph Reason why you used that representation:
B. Your response to question 3A (above) was most likely an estimate. How close was your estimated length to the desired area of 500 sq ft?	☐ symbolic representation ☐ table of values ☐ graph Reason why you used that representation:
C. What is the area of Malama's garden if her rectangle is also a square (the length and width are the same)?	☐ symbolic representation ☐ table of values ☐ graph Reason why you used that representation:
D. A garden length of 48 ft gave Malama a garden area of 96 sq ft. What other length would give her the same area (96 sq ft)?	☐ symbolic representation ☐ table of values ☐ graph Reason why you used that representation:
E. What length(s) would give Malama an area of 600 sq ft?	☐ symbolic representation ☐ table of values ☐ graph Reason why you used that representation: