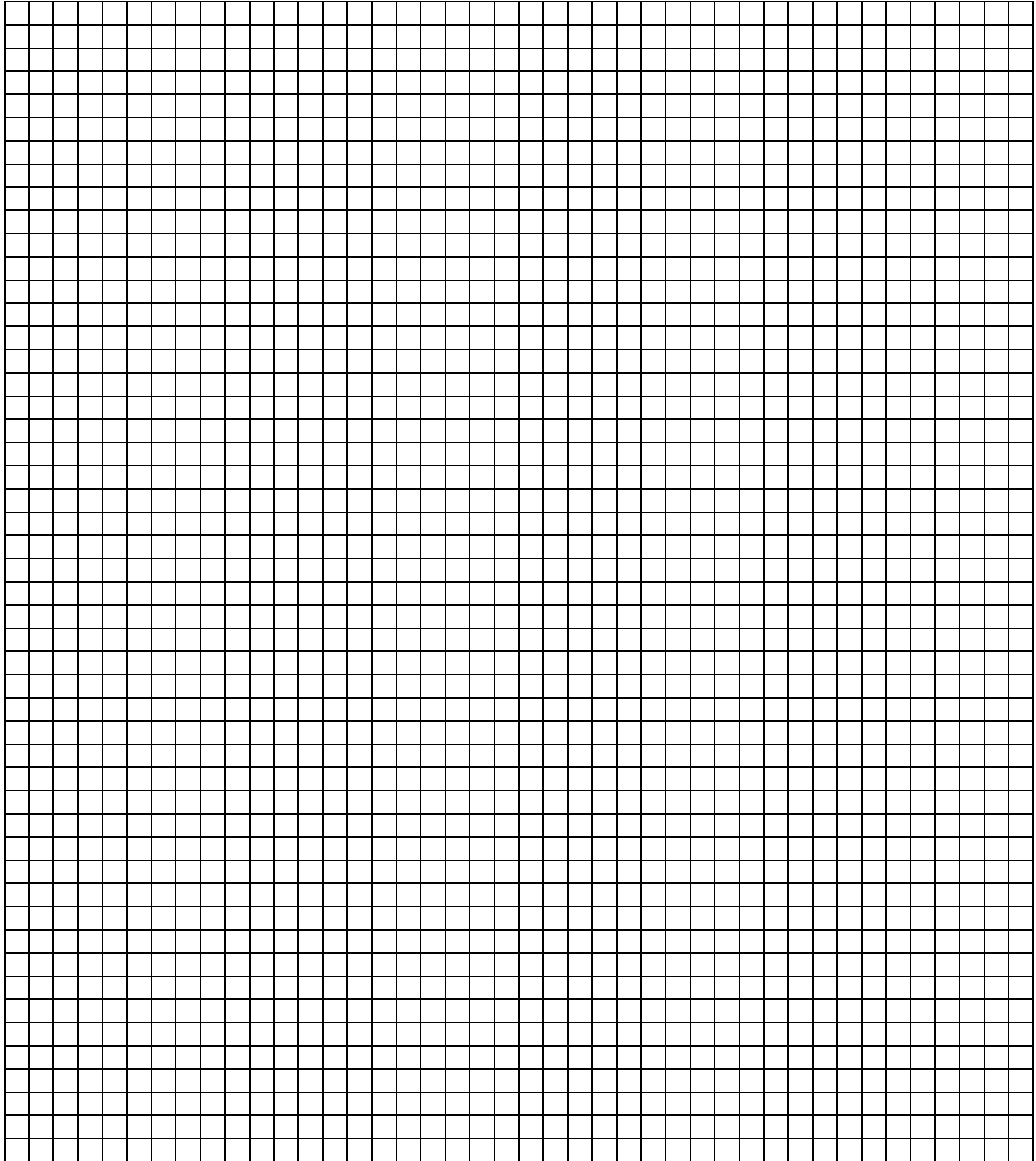


The Greatest Area Activity

Name: _____

1. Draw in a systematic way all of the different rectangles using integer lengths with a fixed perimeter of 40 units.



2. Record your dimensions here.

Perimeter	Length	Width	Area ($l \times w$)

Perimeter	Length (L1)	Width (L2)	Area (L3)

3. On a TI-84 Plus graphing calculator, press STAT and choose 1: Edit and then enter the data from the Length and Width columns into L1 and L2. To get the Area into L3, press STAT and choose 1: Edit. Arrow right to L3 and arrow up so the name of L3 is highlighted. You can have the calculator calculate the area for you and enter it automatically into L3 by entering the following expression $L1 * L2$ and hit ENTER. (See the screen shot to the right.)

L1	L2	L3
1	19	-----
2	18	
3	17	
4	16	
5	15	
6	14	
7	13	

$L3 = L1 * L2$

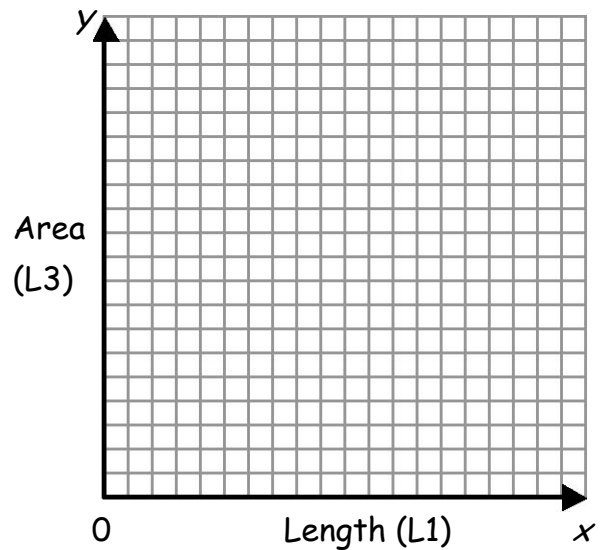
4. Plot the data using STATPLOT by pressing 2ND and then Y=. Choose 1: and turn ON the plot, select the first type for a scatterplot, set the Xlist: to L1 and the Ylist: to L3, and choose the first mark. (See the screen shot to the right.)

Plot1	Plot2	Plot3
On	Off	
Type:		
Xlist: L1		
Ylist: L3		
Mark:		

5. Adjust the window by pressing ZOOM, choose 9: ZoomStat.

Sketch the plot on the grid below.

Describe what the graph looks like.



6. Use a quadratic regression to create an equation to model this problem where x is the Length (L1) and y is the Area (L3). Here's how...

Press STAT and arrow right to CALC, then choose 5: QuadReg for a quadratic regression. You will be back at the home screen and see QuadReg. The TI-84 Plus is waiting for you to tell it what lists to use, so enter L1 followed by a comma and then L3. Press ENTER.

The home screen will now show you the standard form of a quadratic equation with the values of a , b , and c that will best fit the data in the scatterplot.

Write the equation, using the values of a , b , and c the calculator gave you.

Your Equation: $y =$ _____

Enter your equation into Y= and press graph. Does your parabola match your data?

7. View a table of points from the parabola by using the Table Setup feature. Press 2ND and WINDOW to access TBLSET. Start the table at 0 and change the table values by 1.



To see the table, press 2ND and GRAPH to access TABLE and scroll down through the table to find the maximum area for a figure with the perimeter of 40. What is the maximum area? _____