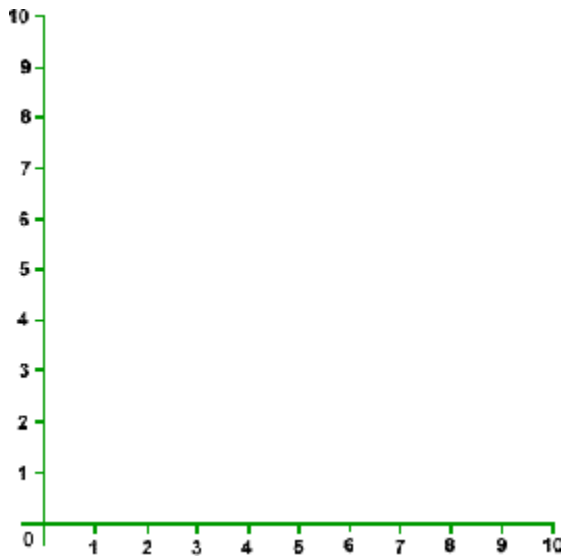


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Curve stitching, also known as string art, is a combination of geometry, linear algebra and art. Designs are created by using a number of straight lines drawn together on a set of axes. The finished product creates the appearance of a curve.

You are going to use your knowledge of writing linear equations to create and graph a curve stitching pattern. Let's get started!

1. Using the set of axes below and a ruler, connect the coordinate  $(0,10)$  to  $(1,0)$ .



What is the slope of the line you just drew? \_\_\_\_\_ y-intercept? \_\_\_\_\_

Write the equation for that line in slope-intercept form here: \_\_\_\_\_

2. Now connect the coordinate  $(0,9)$  to  $(2,0)$ . Write the equation of that line in slope intercept form below.

3. Continue the process of drawing the lines and writing each equation. Fill in the chart below.

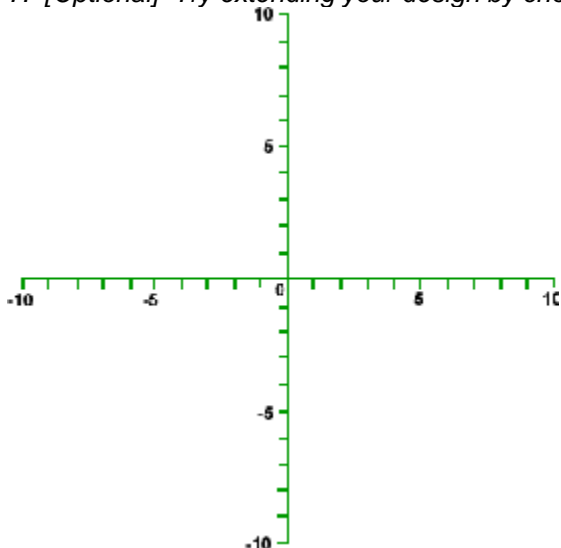
<b>Coordinates connected</b>	<b>Linear Equation</b>
$(0,10)$ to $(1,0)$	
$(0,9)$ to $(2,0)$	
$(0,8)$ to $(3,0)$	
$(0,7)$ to $(4,0)$	
$(0,1)$ to $(10,0)$	

4. Does your design look as if it has a curve? \_\_\_\_\_

5. Using the linear equations you wrote in the table, graph each one on your TI-Nspire calculator. Change the "Window" setting the "Quadrant 1."

6. Does your design on the calculator look like the same one you created on paper? \_\_\_\_\_

7. [Optional] Try extending your design by choosing to add lines in one other quadrant. (see below)



**ACTIVITY EXTENSION**

7. Now let's talk about the curve that's created. What kind of function does it seem to be? Why?

8. Using your calculator, find the intersection points of each pair of lines that create the curve. Record the points below, rounding to the nearest hundredth.

[This is done by using the following: Menu – 6:Points and Lines – 3:Intersection Points; followed by selecting two of the intersecting lines at a time]

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

After you have found all of the intersection points, use Menu – 1:Tools – 2:Hide/Show to hide each individual line so that you can only see the intersection points. Doing this will allow you to better see the curve that is created by the design.

9. Enter the coordinates of each intersection point into the spreadsheet.

10. On the next page, make sure the axis are label with "x" and "y." Check out the points that were plotted. Your task is to find the regression line that best fits the points.

To choose a regression line, use Menu – 3: Actions – 5: Regression. Choose 5 different types of regressions and fill in the chart below. Put a star next to the regression line that is the best fit for the points.

Type of Regression	Regression Equation	Good Fit?