

Curve Stitching

by – J. Marvel

Activity overview

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.

Concepts

Linear Relationships, Coordinate Geometry, Writing Linear Equations

Teacher preparation

Students should have a basic understanding of how to graph linear equations as well as how to write linear equations given two coordinate points.

Classroom management tips

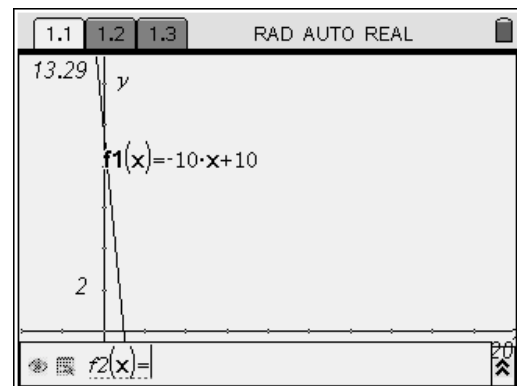
Students should use the provided worksheet to help them write the appropriate linear equations. Graph paper can be substituted if preferred.

TI-Nspire Applications

Curve Stitching Student.tns

Step-by-step directions

Following the worksheet, students should find that the equation for the first line is $y = -10x + 10$. Graph the equation.



Continuing on, students will find the following:

Eqn #2: $y = (-9/2)x + 9$

Students should continue to find the equation and graph each line. The rest of the equations follow (students may find the pattern):

Eqn #3: $y = (-8/3)x + 8$

Eqn #4: $y = (-7/4)x + 7$

Eqn #5: $y = (-6/5)x + 6$

Eqn #6: $y = (-5/6)x + 5$

Eqn #7: $y = (-4/7)x + 4$

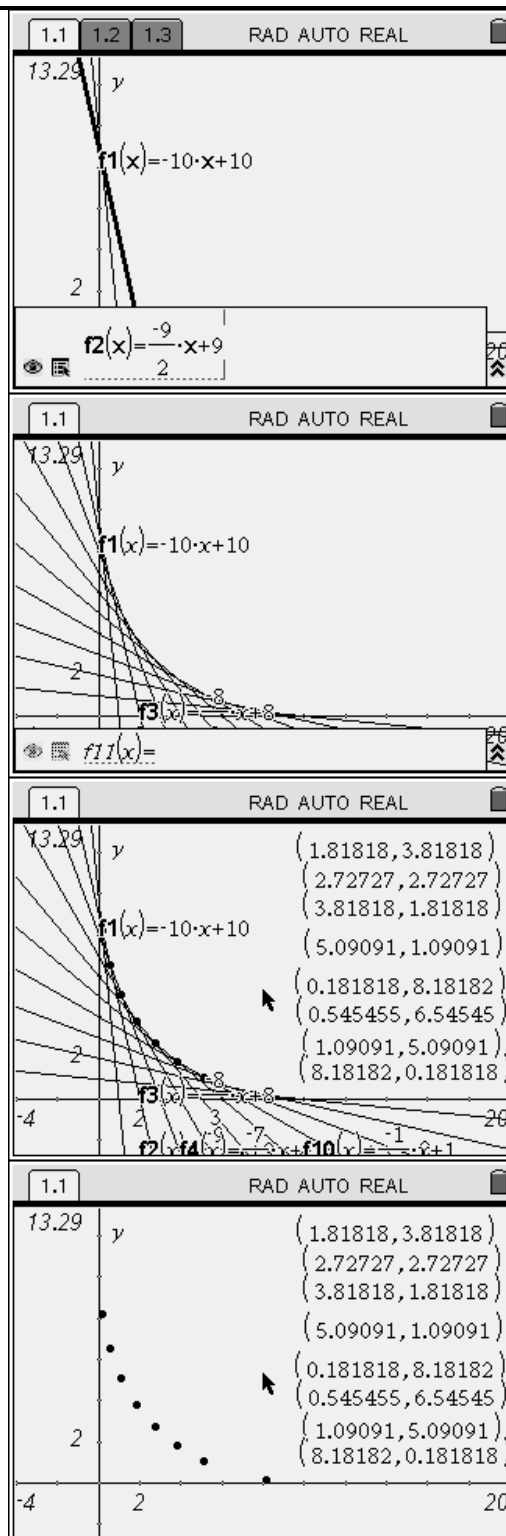
Eqn #8: $y = (-3/8)x + 3$ or $y = -\frac{1}{2}x + 3$

Eqn #9: $y = (-2/9)x + 2$

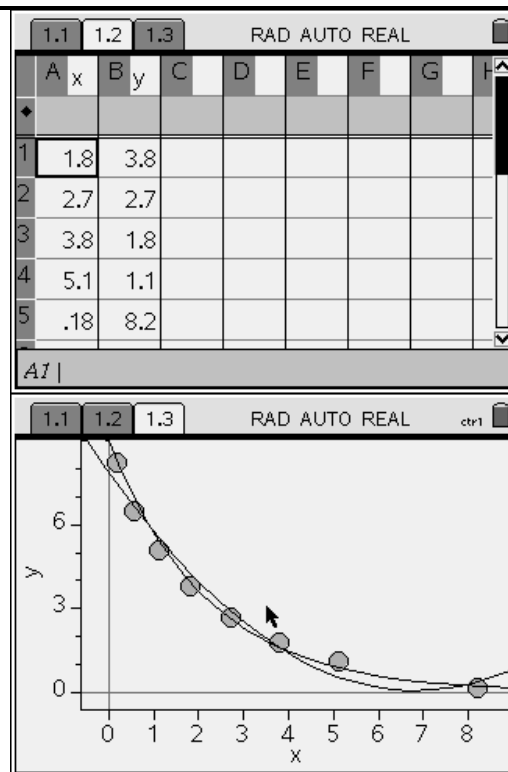
Eqn #10: $y = (-1/10)x + 1$

EXTENSION: Student should use the intersection application to find the intersection points that create the curve. They should record each point on their worksheet.

Students can hide each line to look at just the curve created by the intersection points.



Each coordinate point should be added to the provided spreadsheet.



Using the provided statistics plot, students should find the regression curve that is the best fit. The worksheet provides space for them to record and evaluate 5 separate attempts.

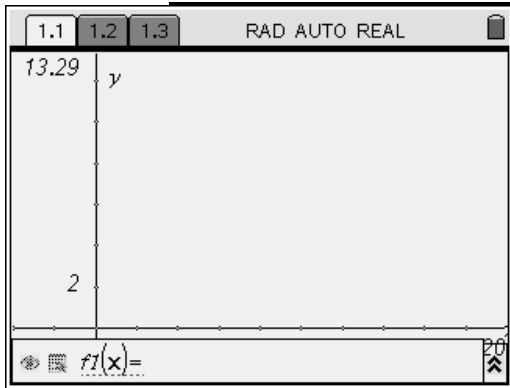
Assessment and evaluation

Evaluation of student work should be evident in the graphing stage of the activity. Students should show their graphs to a teacher before they proceed to finding the intersection points and regression line.

Activity extensions

- Students can attempt to create alternative line designs using the same technique, like the diamond.
- Students can investigate the geometry and angles involved in the design

Student TI-Nspire Document
Curve Stitching Student.tns



TI-84 Plus calculator screen showing a data table. The columns are labeled A through H, with A labeled 'x' and B labeled 'y'. The rows are numbered 1 through 5. The calculator mode is set to RAD, AUTO, and REAL. The cursor is in cell A1.

	A	B	C	D	E	F	G	H
1								
2								
3								
4								
5								

