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Algebra 1 or pre-algebra
Technology Lesson Plan
Introduction to Graphing Linear Equations on the TI83

A. Objectives:

This is an introduction to graphing calculators. These students have not used a calculator to graph before.

Students will be introduced to a graphing calculator. Students will use a graphing calculator to graph linear equations. They have already been graphing using slope intercept form, as I expect them to have that down before they use calculators.

Will review and reinforce PASS **2.2D** (equation of a line), **2.2cII** (use slopes to differentiate between parallel and perpendicular), **1.1b** (solve multivariable equations for one variable in terms of the other), **2.4** (system of equations by graphing)

B. Instruction: Part 1 (suitable for 8th grade or Algebra 1)

Put an example on the board of a linear equation in slope intercept form

$$y = \frac{1}{2}x + 3 \quad \text{briefly review what is the slope and what is the y intercept}$$

Pass out graphing calculators. Have the students set the windows for -10, 10, with scales of 1. Explain to them how to do this and what it means.

Write the following sets of equations on the board

$$y = \frac{1}{4}x + 2$$
$$y = \frac{1}{4}x - 1$$

$$y = -2x + 3$$
$$y = \frac{1}{2}x + 1$$

$$y = -x + 4$$
$$y = x + 4$$

$$y = \frac{2}{3}x - 3$$
$$y = -\frac{3}{2}x + 4$$

$$y = -\frac{3}{5}x - \frac{1}{2}$$
$$y = \frac{3}{5}x + \frac{1}{2}$$

Instruct the students to put the first 2 equations into the calculator in the y = window.
Graph.

On a piece of paper or out loud as a class, have them answer/discuss the following questions. Are the equations parallel, perpendicular, neither? Consistent, inconsistent, dependant? Continue in this fashion through all 5 sets of equations.

Part 2: (suitable for Algebra 1)

Solve systems of equations by graphing, using the calculator

Students should already be familiar with using substitution or elimination to solve systems of equations.

Review: When we have a system of equations, we can graph both equations. Where they cross is the solution to the equation. The (x,y) coordinates of the point at which they cross is the same (x,y) coordinates we would get by graphing.

Solve for y to put $3y - 2x = 9$ in slope intercept form. You can now enter this into the y= window in the calculator.

To solve a system of equations in the calculator:

- 1) Solve each for y.
- 2) Enter the equations into the y = window
- 3) Graph
- 4) To find the intersection of the graphs, go to the calculate window. Number 5 says intersect. Then follow the on screen instructions. The window will come up with the prompt First Curve? and the cursor on one line. Click enter. The cursor will jump to the second line and the prompt will ask you Second Curve? Click enter again. It will then ask you Guess? Move the cursor to where it looks like they cross. Click enter, and it will tell you (x,y) coordinates.

Solve the following system together

$$3x + 2y = 12$$
$$8x - 2y = 10$$

C. Assessment

Name _____

Use your graphing calculator to solve the following systems of equations. You may need to adjust the settings on your window to do some of these problems.

1. $y = x - 4$
 $y = -x + 2$

2. $y = 2x$
 $y = -x + 6$

3. $4x - 3y = -3$
 $2x + 4y = -18$

4. $2x - 3y = 5$
 $3x + y = 35$

5. $x - 3y = -6$
 $2x + 5y = 21$

D. Reflection: This lesson went well. The students had not used the graphing calculator before to solve systems of equations, and they enjoyed it. With this particular bunch of students, the lesson did not need any modification.