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# Algebra, Geometry, Prepare for Math A Exam

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Patty Herrman

Mathematics 9<sup>th</sup>-10<sup>th</sup>: Algebra, Geometry, Prepare for Math A Exam

Objective: The student will be able to solve systems of linear and linear quadratic equations by graphing.

NY State Learning Standard #3 Mathematics

Key Idea: #7 Patterns and Functions\*\*\*\*\*

In my math class, I spend several weeks teaching systems of equations both algebraically and graphically. The lesson I will write below is presented after the students know how to graph a system. (linear, linear-quadratic) I teach the students to graph a line in “slope-intercept” form. ( $y = mx + b$ ,  $m = \text{slope}$  and  $b = \text{y-intercept}$ ) It is very important that the students know how to put their equation in  $y =$  form. They have to know this prior knowledge to graph on paper as well as with the TI.

I begin my lesson handing out a short warm-up at the door. This warm-up will consist of three problems that have to be put in “ $y =$  form”. While the students are working on the warm-up, I will be handing out the TI calculators. When all the calculators have been passed out, I will call on three students to put the warm-up answers on the board.

Next, I will hand-out the graphing calculator worksheet. On this worksheet, I will have step by step directions on how to graph a system on the TI. The directions will help the student who gets lost catch-up. I will graph three problems with the students using my calculator and overhead screen. Below is an example.

1. Solve the system:  $y = -2x + 9$  and  $y = 3x - 4$  ***NOTICE: Start easy***
  1. Enter the first equation in **y**<sub>1</sub>.
  2. Enter the second equation in **y**<sub>2</sub>.
  3. Hit **GRAPH**.
  4. Use the **INTERSECT** to find where the two graphs intersect. (the answer)  
**2<sup>nd</sup> TRACE (Calc) #5 intersect**  
Move the flashing spider close to the intersection.  
Hit **ENTER** 3 times.
  5. Answer:  $x = 2.6$  and  $y = 3.8$

2. Solve the System:  $x - 2y = 14$  and  $x + 3y = 9$

**NOTICE:** The TI will only accept entries that start with  $y =$ , so we need to solve these equations for  $y = ?$ .

$$y = \frac{1}{2}x - 7$$

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

1. Enter the first equation into  $y_1$ .
  2. Enter the second equation into  $y_2$ .
  3. Hit **GRAPH**. The two graphs appear to intersect off the window. We need more x-values to see the point of intersection. Go to **WINDOW** to increase the size of Xmax. Hit **GRAPH**.
  4. Use the **INTERSECT** to find where the two graphs intersect.
  5. Answer:  $x = 12$  and  $y = -1$ .
3. Solve the system:  $y = x^2 - 4x - 2$  and  $y = x - 2$ .

By now, the students should be able to follow along with me. If they can't they can look at the directions above.

After my classroom demonstration, I will give several systems for the students to solve on their own. I will assess the students learning by checking their work.