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Mathematics 9th-10th: 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 **y₁**.
 2. Enter the second equation in **y₂**.
 3. Hit **GRAPH**.
 4. Use the **INTERSECT** to find where the two graphs intersect. (the answer)
2nd 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.