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Algebra, Geometry, Prepare for Math A Exam

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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 = slope and b = 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 \( y_1 \).
   2. Enter the second equation in \( y_2 \).
   3. Hit GRAPH.
   4. Use the INTERSECT to find where the two graphs intersect. (the answer)
      \( 2^\text{nd} \) 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 \( x + 3y = 9 \)

\[ y = \frac{1}{2}x - 7 \]
\[ y = -\frac{1}{3}x + 3 \]

1. Enter the first equation into \( y_1 \).
2. Enter the second equation into \( y_2 \).
3. Hit \text{GRAPH}. The two graphs appear to intersect off the window. We need more \( x \)-values to see the point of intersection. Go to \text{WINDOW} to increase the size of \( X_{\text{max}} \). Hit \text{GRAPH}.
4. Use the \text{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 access the students learning by checking their work.