Algebra 2
Unit 0 Lesson 3 - Solving Systems by Graphing.

- Determine if an ordered pair is a solution to a system.

- Determine the solution to a system of equations by looking at a graph.

- Use a calculator to find the solution to a system of linear equations.

<u>System of Equations</u>: A collection of two or more equations with the same set of variables.

What is a Solution to a system?

Any ordered pair that makes ALL equations TRUE when you plug the (x,y) into x and y is a solution.

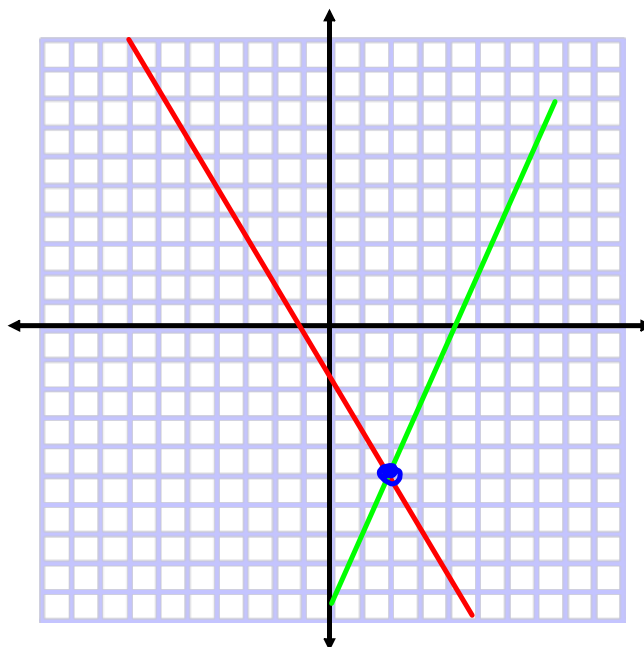Ex: Is the ordered pair a solution to the system? (6, -1)

$$3x - 4y = 22$$

$$2x + 5y = 7$$

$3(6) - 4(-1)$ $\overset{x \quad y}{}$

$18 + 4 = 22\checkmark$

$2(6) + 5(-1)$

$12 - 5 = 7\checkmark$ <u>Yes</u>

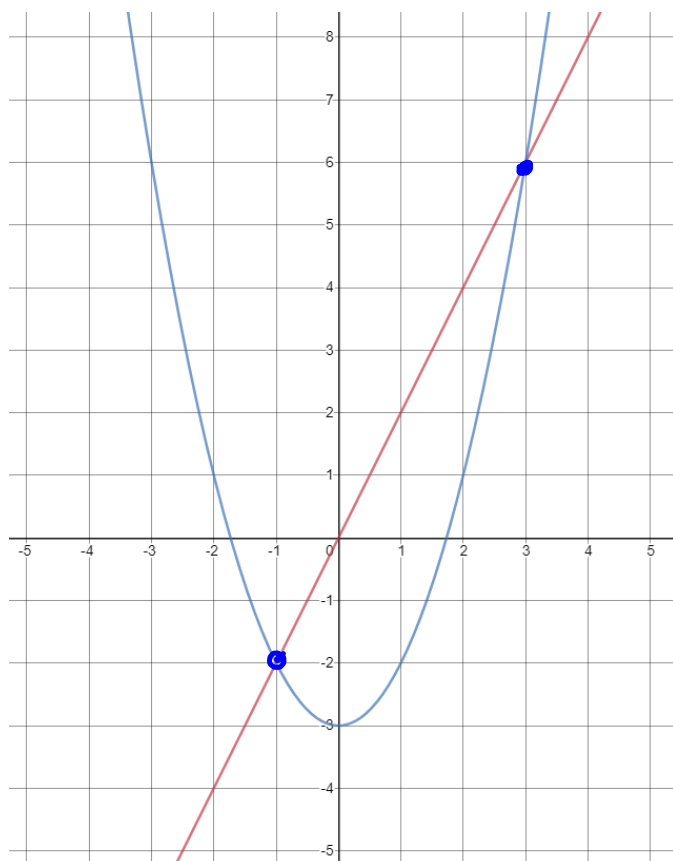Solutions in terms of Graphing: A solution is the point of Intersection of the two lines.

(x, y)

What is the solution to the graphed system below?

$(2, -5)$

Example: Determine the solution(s) the the system of equations graphed below.

$(-1, -2)$

$(3, 6)$

You aren't always given the graphs. Usually you will be given equations and you will have to graph them yourself to figure out where they intersect. This can be done on a calculator.

Ex: Solve the following system of equations using Graphing.

We will do this on our calculators. If you don't have a calculator then pay attention as we do this. Everyone will be sent a google classroom announcement with the instructions we will be using to solve this.

$$\begin{cases} y = -2x + 1 \quad Y_1 \\ y = \dfrac{1}{3}x + 8 \quad Y_2 \end{cases}$$

$(-3, 7)$

$\boxed{X, T, \theta, n}$

Solving Graphically (Calculator):

1. Solve each equation for y.

2. Press the "y=" button at the top left.

3. Enter each equation in a separate line.

4. Press the Graph button (top right).

5. Press 2nd -> Trace (top right)

6. Go to the Intersect option.

7. Move the cursor (using the arrow keys) to ensure it is on the First line. Press Enter.

8. Move the cursor to ensure it is on the 2nd line. Press Enter.

9. Press Enter again.

10. Look at the bottom of the screen for your answer.

Over the next few days we will learn more ways to solve systems of equations. You should use THIS method (Graphing) when the equations are either...
1. Already solved for y on both equations
2. Easy to solve for y on both equations

Example: Find the solution(s) to the system.

$$y = (x-1)^2 - 3$$
$$y = 2x - 2$$

$$x^2$$

$(0, -2)$

$(4, 6)$

Ex: Solve the System of Equations.
(Remember to solve equations for y before putting them into your calculator)

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

$$y - 6 = -x$$

$$\begin{array}{cc} +6 & +6 \end{array}$$

$$y = -x + 6$$

$$(2, 4)$$

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4. Press the Graph button (top right).

5. Press 2nd -> Trace (top right)

6. Go to the Intersect option.

7. Move the cursor (using the arrow keys) to ensure it is on the First line. Press Enter.

8. Move the cursor to ensure it is on the 2nd line. Press Enter.

9. When it says "Guess", move the cursor near the intersection point you want to find the ordered pair for.

10. Look at the bottom of the screen for your answer.

11. You will need to do this for each intersection. Follow steps 5-10 for each intersection point you want to find.

Homework:

Solving Systems of Equations by Graphing and Substitution worksheet.