Warm Up **Week 1!**

$$3/(1 + 2 + 3 + 4 + 5 + 6 + 7)$$

1. What is the solution to x + 9 = 11 ?
2. What are three solutions to y = -x – 5 ?
3. What is the solution to the following
System of Equations? (You may use any tool you want)

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

$$y = x + 2 \qquad (2, 4)$$

Objective

Graph Systems of Equations and Inequalities

Schedule

- We will be doing systems of equations and inequalities this whole week and next week
- You will have a quiz next Friday

System of Linear Equations

- two or more linear equations

Solution of a System of Equations

- any **ordered pair** that satisfies all of the equations in the system

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Solving Equations

$$y = x + 3$$

What are the solutions to this equation?

Which (x, y) works for BOTH?

$$x + y = 9$$
$$x - y = 1$$

(5, 4)

(5, 4) is the solution to this system of equations

Which (x, y) works for BOTH?

$$x - y = 7$$
$$xy = 30$$

(10, 3)

(10, 3) is the solution to this system of equations

Which (x, y) works for BOTH?

$$y = 2x$$
$$x + y = 15$$

(5, 10)

(5, 10) is the solution to this system of equations

Which (x, y) works for BOTH?

$$x + y = 13$$
$$x - y = -3$$

(5, 8)

(5, 8) is the solution to this system of equations

Which (x, y) works for BOTH?

$$x + y = 10$$
$$2x + y = 12$$

(2, 8)

(2, 8) is the solution to this system of equations

Example

- is (0,0) a solution of this system?

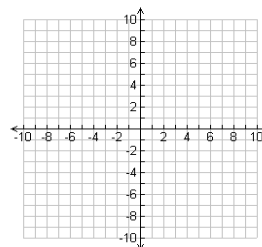 - $x + 6y = 10$
  - $7x = 7y$

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Graphing Systems

- How can we figure out the solution to a system of equations by graphing?

- *Graph the two equations and look for the point of intersection*

Solve by Graphing:
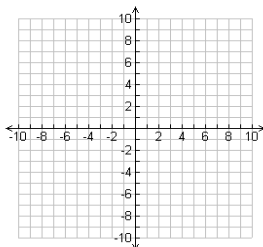
$-x + y = 7$

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

(-1, 6)

Solve by Graphing:

$y - 1 = 3/5(x - 5)$

$y + 2 = 2x$

(0, -2)

Essential question

- When will a system of two linear equations have no solution?

When they are parallel lines

Essential question

- When will a system of two linear equations have infinitely many solutions?

When they are the same line

Essential Question

- Why is the solution of a system of two equations represented by the point where the two graphs intersect?

System of Linear Inequalities

- two or more linear inequalities

Solution of System of Linear inequalities

- **ALL** of the ordered pairs that make all the inequalities in the system true.

Tell whether the ordered pair is a solution of the given system (must make both true)

$$(2, -2); \begin{cases} y < x - 3 \\ y > -x + 1 \end{cases}$$

Tell whether the ordered pair is a solution of the given system (must make both true)

$$(2, 5); \begin{cases} y > 2x \\ y \geq x + 2 \end{cases}$$

Tell whether the ordered pair is a solution of the given system (must make both true)

$$(1, 3); \begin{cases} y \leq x + 2 \\ y > 4x - 1 \end{cases}$$

Remember!

- With linear inequalities solve for y first then graph the inequality!

Use a dashed line for < or >
Use a solid line for <orequal to or > or equal to
SWITCH THE INEQUALITY when multiplying or dividing by a negative number!

Graph the system

$$\begin{cases} y \le x + 4 \\ y \ge -2x \end{cases}$$

- Give two ordered pair solutions of the system
- Give two that are not solutions of the system

Graph the system

$$\begin{cases} -6x + 3y \le 12 \\ y > \frac{1}{2}x - 3 \end{cases}$$
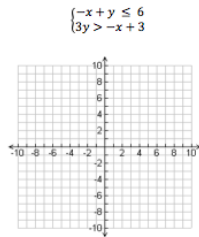
- Give two ordered pair solutions of the system
- Give two that are not solutions of the system

Graph the system

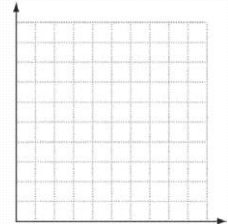$$\begin{cases} -x + y \le 6 \\ 3y > -x + 3 \end{cases}$$
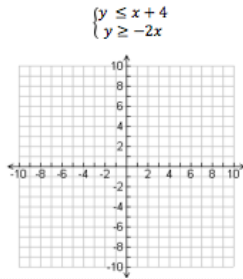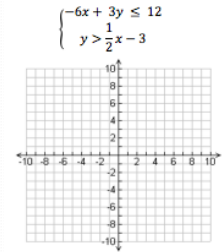
- Give two ordered pair solutions of the system
- Give two that are not solutions of the system

Word Problem

Charlene makes $10 per hour babysitting and $5 per hour gardening. She wants to make at least $80 a week,
but can work no more than 12 hours a week.
a.   Write a system of linear inequalities to describe this situation.

b. Graph the solutions of the system.
c.   List two possible combinations of hours that Charlene could work at each job.

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Homework

- None