Name:_____ Date:_____

Notes
Algebra Section 7.5
Pages 459-465

Goal: "Solve and identify when a system of equations has one solution, no solution or an infinite number of solutions"

Remember:

What is a **solution** to a linear system?

1) An _____ _____ that when _____ in works for _____ equations.

2) The _____ of _____.

· Then what would you say is the solution if you graphed two lines and they happened to be parallel?
When are two lines parallel?

· What would you say if you graphed two lines and they were the exact same line?
When are two lines **exactly the same**?

· If two lines are **not** parallel, then what must be true about them?
When are lines **not** parallel?

****RECALL****

Solve each equation or inequality.

Ex: $3(x + 4) = 3x + 16$

Ex: $4(2x + 6) = 8(x + 3)$

Ex: $2x - 3x + 6 \leq -(x - 10)$

Ex: $3(6x - 1) > 2(9x - 1)$

***Regardless of if you are solving an <u>equation</u> or an <u>inequality</u> what is the general rule that applies to both types of problems?**

If you get a _____ statement then the solution is "infinite solutions"

If you get a _____ statement then the solution is "no solution"

Solve each system using the method of your choice:

Ex: $3x + 2y = 10$
$3x + 2y = 2$

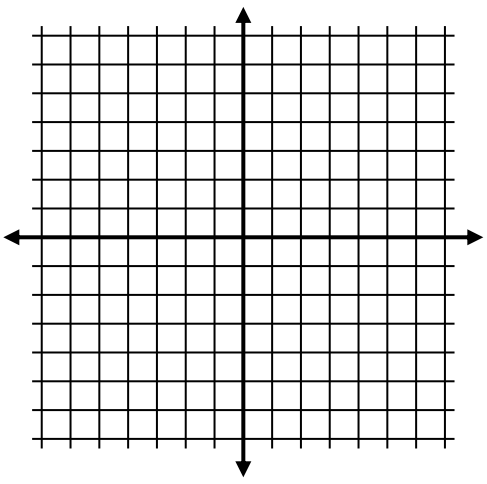
Ex: $x - 2y = -4$
$y = \frac{1}{2}x + 2$

Ex: $5x + 3y = 6$
$-5x - 3y = 3$

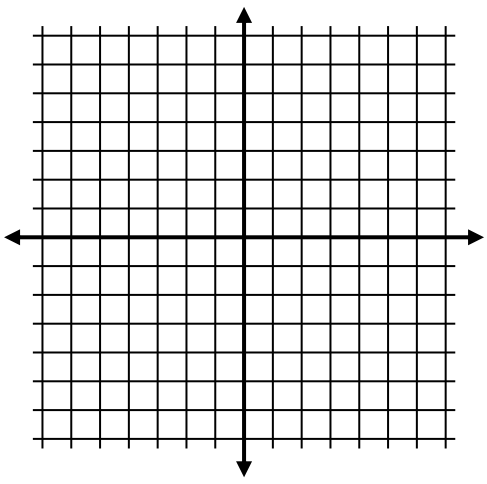
Ex: $y = 2x - 4$
$-6x + 3y = -12$

Solve each system by graphing.

Ex: $2x - 3y = 6$
$2x - 3y = -4$



Ex: $4x - 2y = 8$
$y = 2x - 4$



Identify the number of solutions of a linear system:

· A system of equations will have _____ _____ when the two lines are _____.

They are _____ when they have the same _____ but different _____

· A system of equations will have an _____ _____ _____ _____ when the two lines are exactly the _____.

They are the _____ _____ when they have the same _____ and _____.

· A system of equations will have exactly _____ _____ when the two lines are not _____.

They are not _____when their _____ are _____.

The _____ is _____.

Number of Solutions	**Slopes and *y*-intercepts**

If you can quickly identify the slope and y-intercept of each line, then you can state how many solutions the system has **without solving.**

- What do you need to do to be able to quickly identify the slope and y-intercept of a line?

  The line needs to be in _____ _____ form first.

Without solving the system, tell whether there is one solution, no solution or infinitely many solutions.

Ex: $5x + y = -2$
$-10x - 2y = 4$

Ex: $6x + 2y = 3$
$6x + 2y = -5$

Ex: $-3x + 5y = 6$
$6x - 10y = -12$

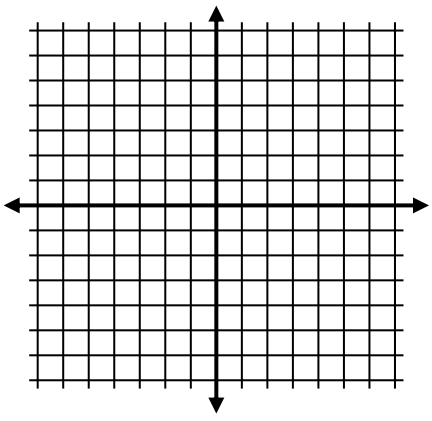
Ex: $9x - 5y = 12$
$9x - 5y = 8$

Ex: $x - 3y = -15$
$2x - 3y = -18$

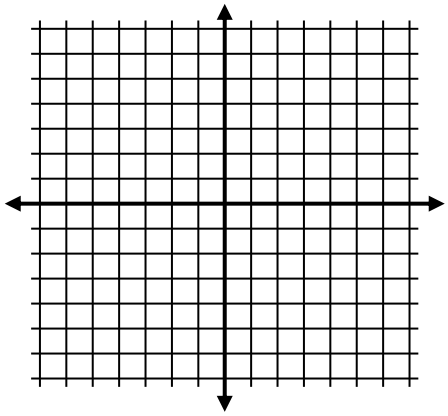
Ex: $3x - 4y = 6$
$4y - 3x = 12$

Use the graphs below to show a system of equations with:

a. No solution



b. One solution



c. Infinitely many solutions