Name:_____ Date:_____

Notes
Algebra Section 7.1
Pages 427-433

Goal: "You will graph and solve systems of linear equations"

Remember:

A solution to a linear equation is any ordered pair that when substituted in makes the equation true.

Vocabulary:

System of Equations – two (or more) linear equations with the same variables.

Solution to a system of equations – any ordered pair that is a solution to **BOTH** equations.

The solution to a linear equation is where the two lines intersect.

Decide if the given point is a solution to the system of equations:

Ex: $x + y = -2$
$x + 5y = 2$
$(-3, 1)$

$-3 + 1 = -2$ $-3 + 5(1) = 2$
$-2 = -2$ $-3 + 5 = 2$
$2 = 2$
Since it works for both, then yes it is a solution to the system.

Ex: $2x - 3y = 4$
$2x + 8y = 11$
$(5, 2)$

No, it doesn't work for both

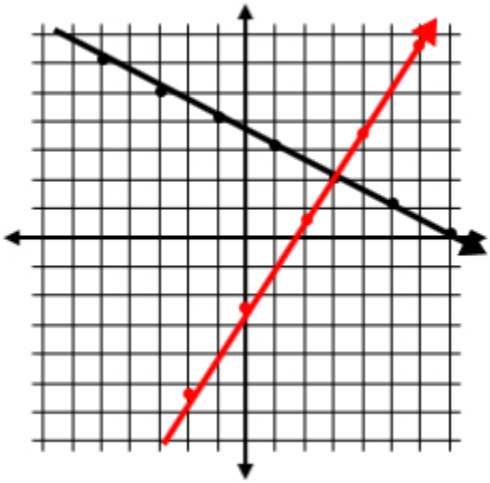
Ex: $6x + 5y = -7$
$x - 2y = 0$
$(-2, 1)$

No, it doesn't work for both

Solve by graphing:

Ex: Graph the following lines in the same coordinate plane. Identify the solution to the system:

$x + 2y = 7$ and $3x - 2y = 5$



*remember that in order to graph the lines you can use a table, intercepts or slope – intercept. Choose the most appropriate method when graphing.
The first line has an x-intercept of 7 so you can graph that first, then use the slope of –½ to find other points.

The second line it makes the most sense to use $y = mx + b$

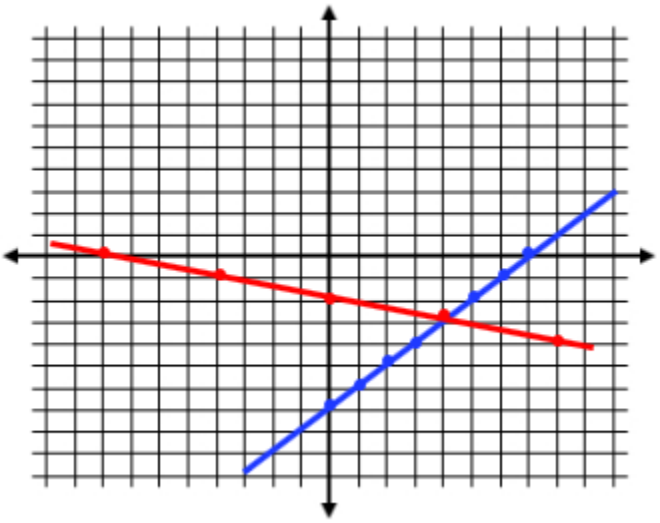
*Hint: Often times if you graph multiple (more than two points) you will be able to see the solution more easily.

What is the solution to the system? How do you know?

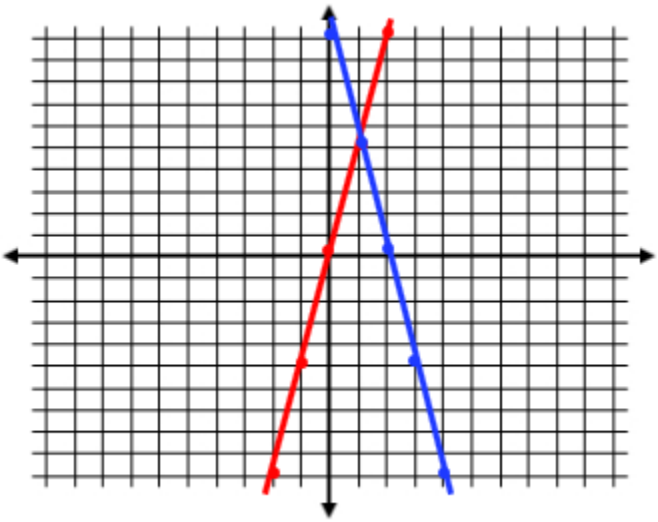
The solution is (3, 2). This is where they intersect. And you can check it's accurate by plugging the point into both equations. When you do, it works.

Solve each of the following systems by graphing. Be sure to state the solution.

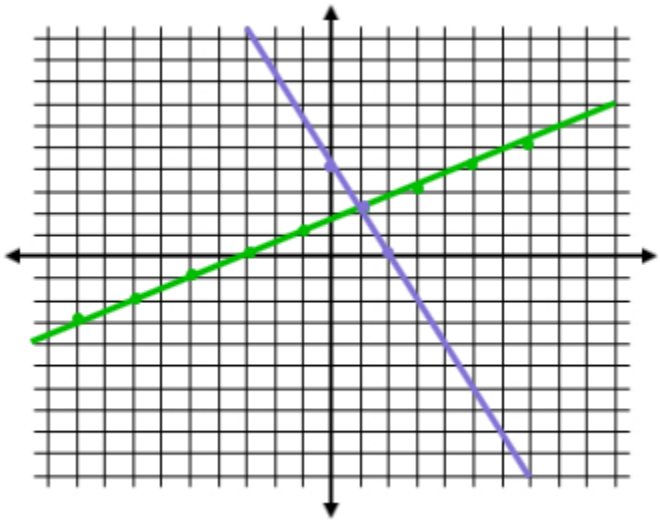
Ex: $-x + y = -7$
$x + 4y = -8$ (4, –3)



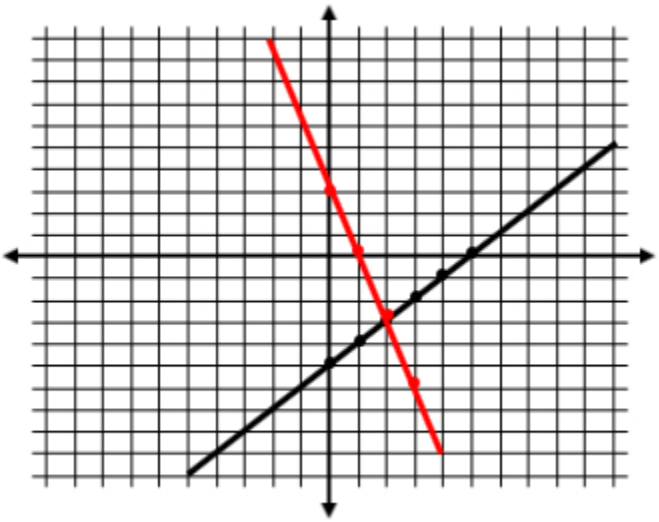
Ex: $-5x + y = 0$
$5x + y = 10$ (1, 5)



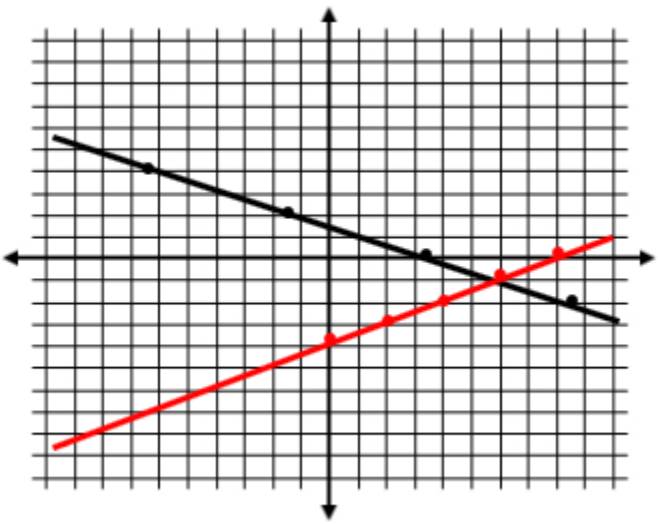
Ex: $-x + 2y = 3$
$2x + y = 4$ (1, 2)



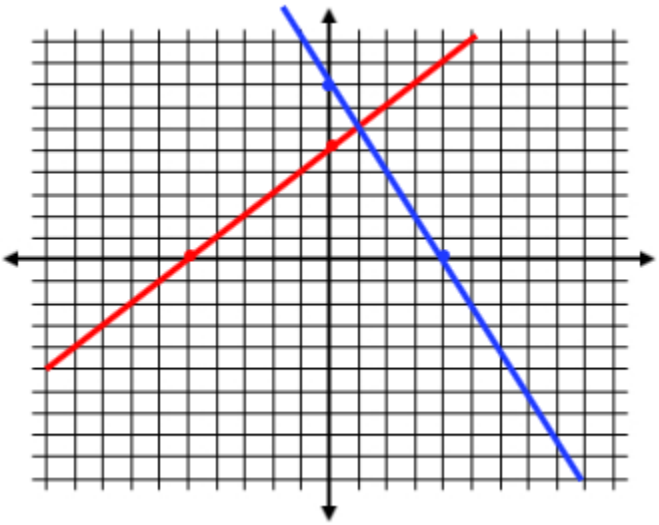
Ex: $x - y = 5$
$3x + y = 3$ (2, –3)



Ex: $2x + 5y = 7$
$-x + 2y = -8$ (6, –1)



Ex: $-x + y = 5$
$2x + y = 8$ (1, 6)



Ex: The parks and rec. department offers a seasons pass for $90. With a pass you pay $4 per session to use the tennis courts and without the pass you pay $13 per session.

a. Write a system of linear equations to describe the situation. (The total cost with and without a based on the number of times you use the tennis courts)

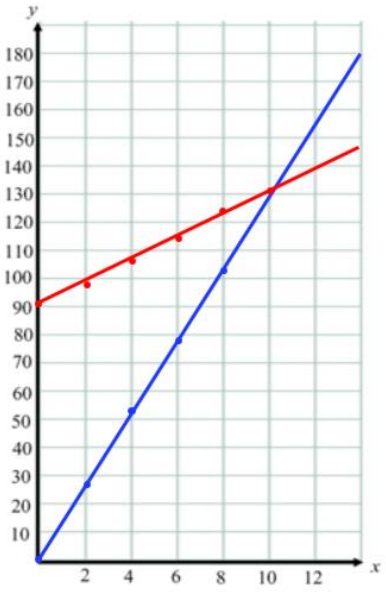
y = total cost, x = # of times you play tennis

$y = 13x$

$y = 90 + 4x$

b. Solve the system by graphing.

It would take 10 times playing tennis for the costs to be the same.

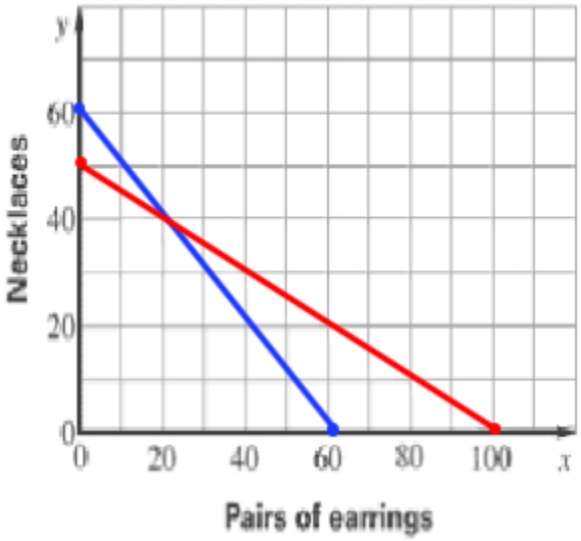


Ex: You sell earrings for $5 and necklaces for $10 and want to make $500. You also want to sell 60 items total. Write a system of equations to describe the total number of necklaces and earrings sold.

$5x + 10y = 500$

$x + y = 60$

20 pairs of earrings, 40 necklaces



Ex: A business rents inline skates for $15 per day and bicycles for $30 per day. During one day the business does a total of 25 rentals and makes $450. Write and solve a system of equations by graphing to find the number of in-line skates and bicycles rented.

Let x = the number of inline skates rented.
Let y = the number of bikes rented

$x + y = 25$
$15x + 30y = 450$

20 inline skates, 5 bikes