Algebra 1
Unit 3

Notes & Assignments

Mrs. Cisneros, Rm 715

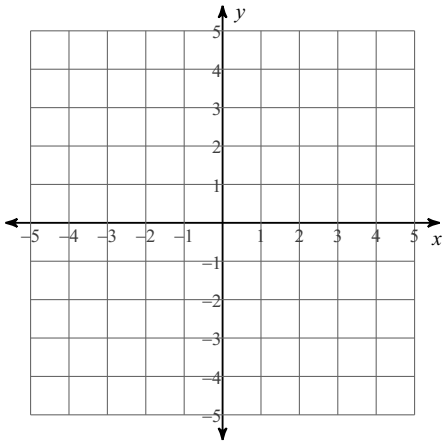
Name_____Per___

Unit 3 Prerequisite Graphing Lines CW/HW

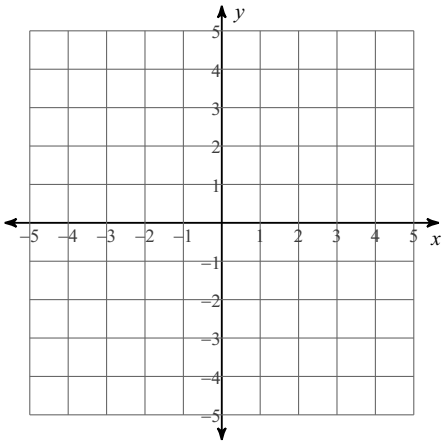
USE A STRAIGHTEDGE!!!!

Graph **BOTH** lines on the same graph. Do they intersect? If so, where???

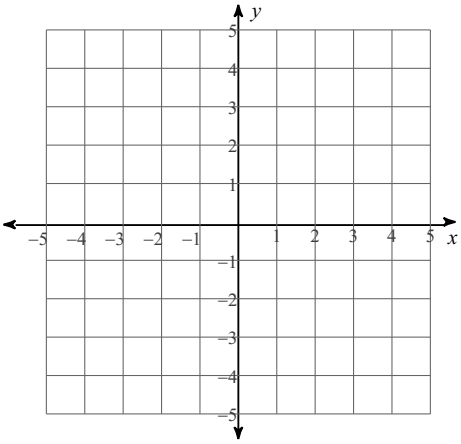
1) $y = x - 3$
$y = 5x + 1$



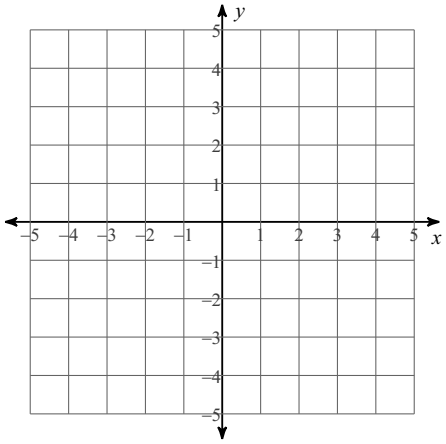
2) $y = x - 4$
$y = -x - 2$



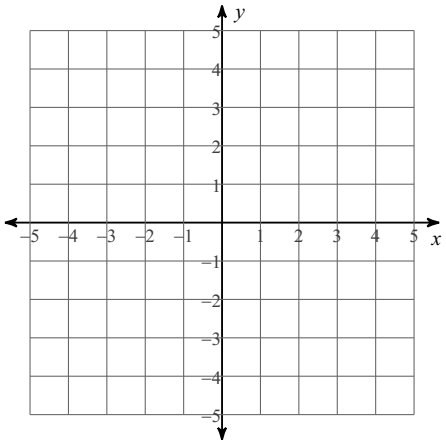
3) $y = x - 4$
$y = -\frac{4}{3}x + 3$



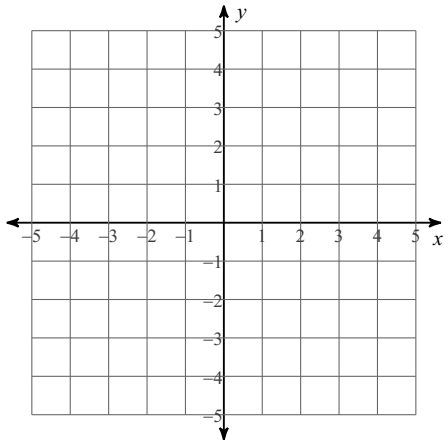
4) $y = -x - 1$
$y = 2x - 4$



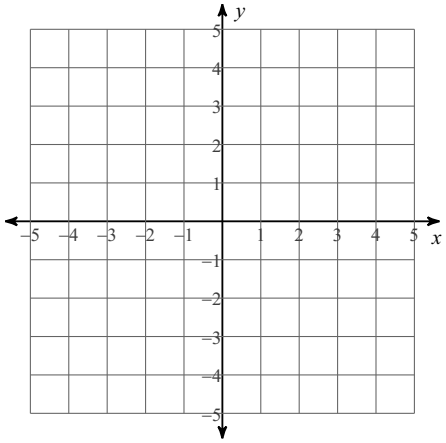
5) $y = -2x + 2$
$y = x - 4$



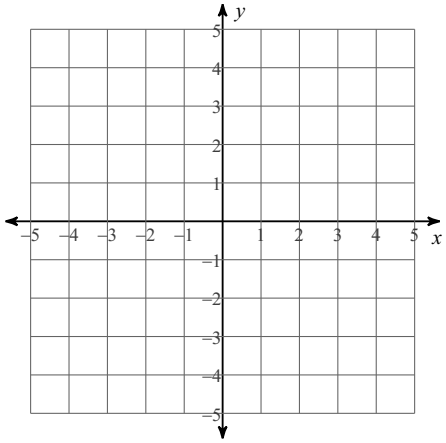
6) $y = \frac{1}{3}x - 3$ $y = -\frac{4}{3}x + 2$



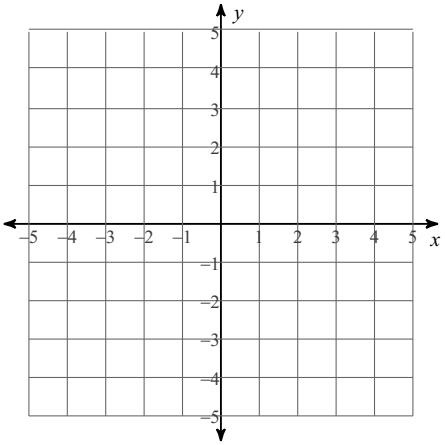
7) $y = \frac{1}{2}x - 3$
$y = 3x + 2$



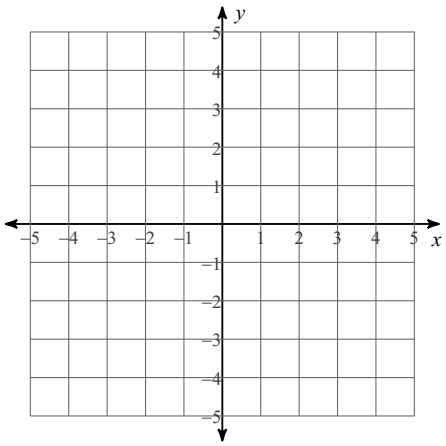
8) $y = \frac{1}{2}x + 2$
$x = 4$



9) $y = -x + 4$
$y = 6x - 3$

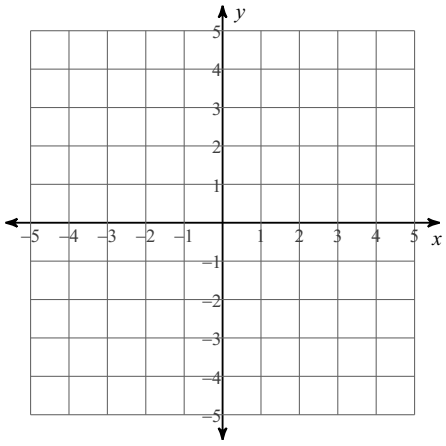


10) $y = \frac{2}{3}x + 3$
$y = -\frac{2}{3}x - 1$

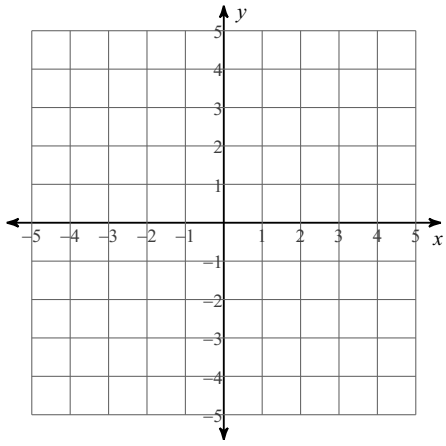


Solve each equation for y first, then graph both lines on the same xy-coordinate plane.

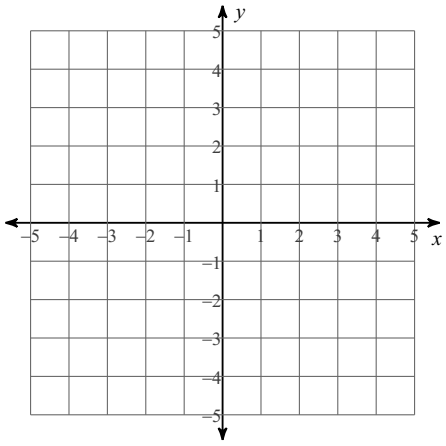
11) $x + y = -3$
$5x - y = -3$



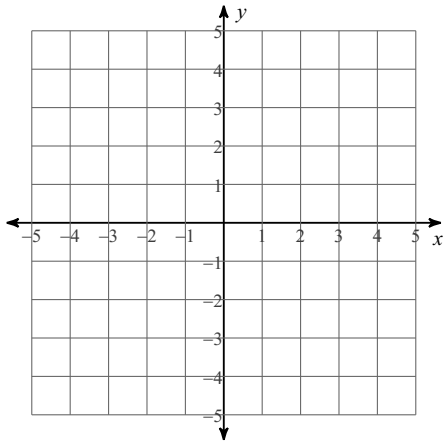
12) $x + 4y = -16$
$x - y = -1$



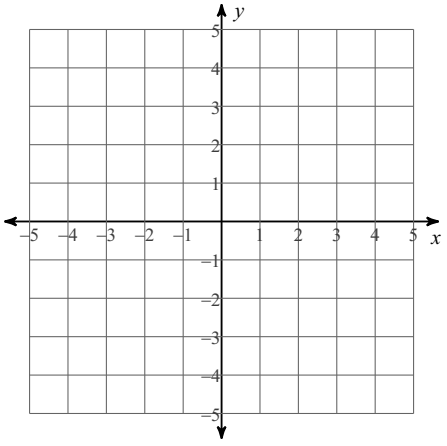
13) $2x - 3y = -9$
$2x + 3y = -3$



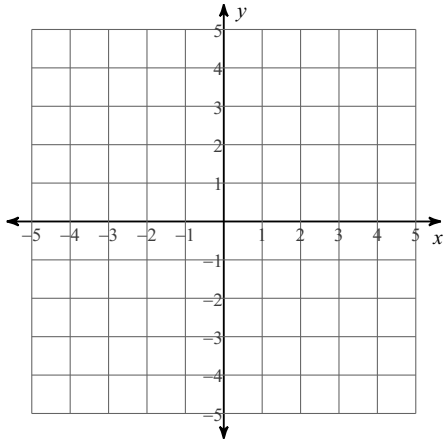
14) $x + 3y = -3$
$5x + 3y = 9$



15) $7x + 3y = 12$
$2x + 3y = -3$

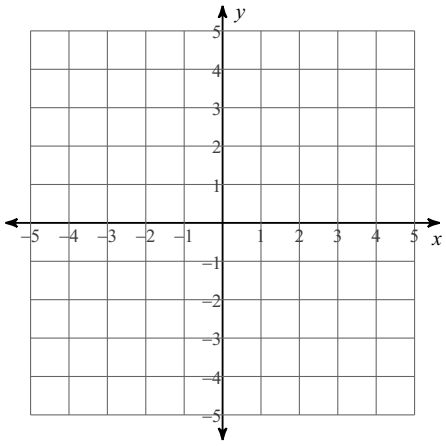


16) $x - y = 4$
$x - y = -4$

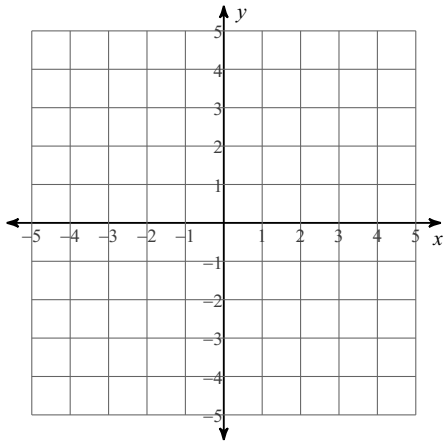


Solve each equation for y first, then graph both lines on the same xy-coordinate plane.

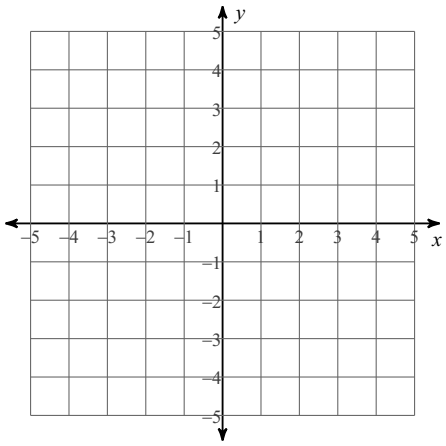
17) $2x + 3y = 9$
$4x - 3y = 9$



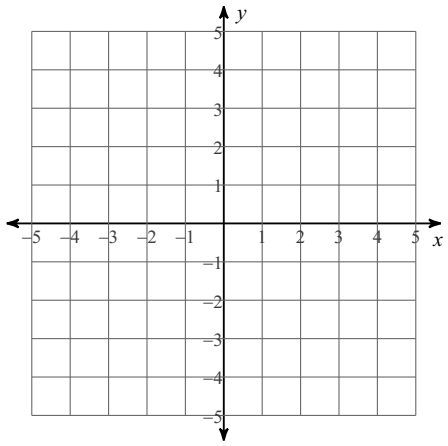
18) $3x - 2y = 8$
$x + 4y = 12$



19) $x + 2y = 4$
$3x - 2y = 4$



20) $x - 3y = -9$
$8x - 3y = 12$



The hardest part about graphing for me is _____

_____

_____

_____

Why? _____

_____

_____

I can improve my graphing skills by _____

_____

_____

_____

NOTES Differentiated Point on a Line

Choose one of the three problems below. Show ALL work, and be prepared to defend/ explain your answer.

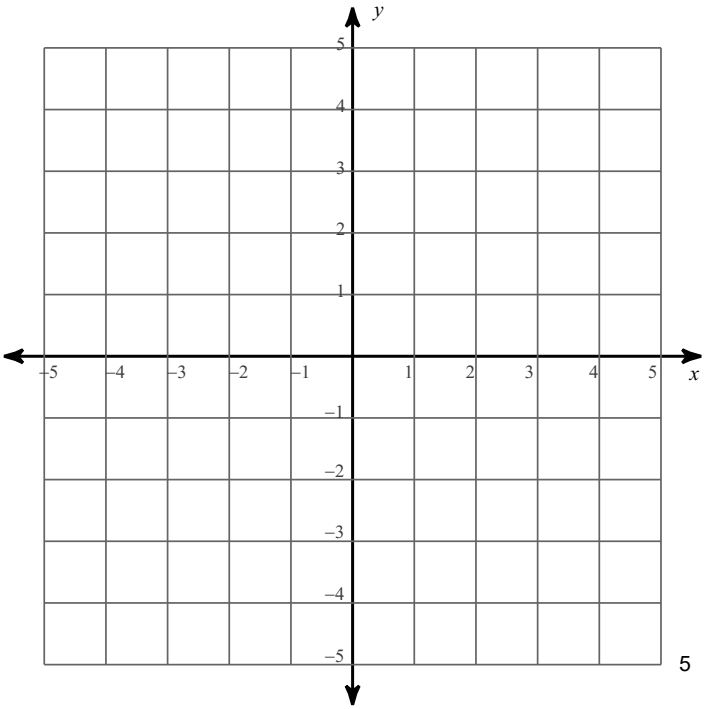
For each equation, use the given point on the line to solve for *b*.

1. 2x + 3y = 4
   (-2, b)

2. 2x + 3y = 4
   (2b, -2)

3. 2x + 3y = 4
   (-2, b-5)

This graph is optional for use for #'s 1-3.



Solutions to Systems of Linear Equations NOTES

A solution to a system of linear equations is the point of intersection of the corresponding lines.

Match the point of intersection (solution) to the correct system of linear equations. Show proof.

System of Linear Equations

1. $3x - 7y = -4$
   $-2x + 4y = 2$

2. $x + 2y = 5$
   $-x - y = -3$

3. $x + y = 6$
   $2x - 3y = -8$

4. $-2y + x = -7$
   $2x + 3y = 14$

Solutions

a. $(1,1)$

b. $(-1,3)$

c. $(2,4)$

d. $(1,4)$

CW/HW

"What do you call a donkey with a defect?"

Determine which of the points of intersection provided solve each system of linear equations.

The answer to each problem will match a letter that will allow you to figure out the joke ☺

1. $\begin{aligned} x+2y&=5 \\ y&=3x-1 \end{aligned}$

2. $\begin{aligned} 3x-3y&=7 \\ 2x+3y&=3 \end{aligned}$

3. $\begin{aligned} 2x+4y&=10 \\ x-y&=-7 \end{aligned}$

4. $\begin{aligned} 3x+5y&=-10 \\ 2x-3y&=6 \end{aligned}$

5. $\begin{aligned} 7x-y&=6 \\ 2x+9y&=11 \end{aligned}$

6. $\begin{aligned} x&=\frac{4}{3}y \\ \frac{1}{2}x+\frac{1}{3}y&=3 \end{aligned}$

7. $\begin{aligned} \frac{5x+y}{3}&=\frac{7}{2} \\ \frac{5}{2}x-\frac{y}{3}&=4 \end{aligned}$

$(1,1)$ S	$(2,0)$ I	$(1,2)$ T	$(0,-2)$ A	$(-4,-3)$ E
$\left(\frac{9}{5},\frac{3}{2}\right)$ A	$\left(\frac{1}{2},5\right)$ U	$\left(2,-\frac{1}{3}\right)$ L	$(4,3)$ P	$(-3,4)$ H

____ ____ ____ ____ ____ ____ ____

7 5 6 3 4 2 1

NOTES

Substitution Intro & Solving Equations

Set the right sides of the equations equal to each other. Then solve.

1) $y = 8x + 6$
$y = -3x + 6$

Step 1: $-3x + 6 = 8x + 6$
then solve for x

Step 2: $0 = 11x$
$x = 0$

Step 3: substitute the value of x into one equation to find y

$y = 8(0) + 6$
$y = 6$

So, (0, 6) is the solution to both equations.

2) $y = -4x - 3$
$y = -7x$

3) $y = -6x + 3$
$y = -4x + 3$

4) $y = 5x - 7$
$y = 8x - 16$

5) $y = -2x + 10$
$y = 5x - 18$

CW/HW **Set the right sides of the equations equal to each other. Then solve.**

1) $5x + 3y = 3$
$y = -7x + 17$

2) $3x - 6y = -9$
$y = 8x - 21$

3) $y = 7x + 2$
$-8x - 2y = 18$

4) $-5x + 3y = -8$
$y = -6x - 18$

5) $4x + 3y = -2$
$y = -6x + 18$

NOTES

Solving Systems - Substitution Method (day 1)

Find the point of intersection using Substitution.

1) $4x - 3y = -8$
$y = 4x + 24$

2) $y = -5x$
$4x + 2y = -6$

3) $-7x + 6y = -8$
$y = 3x - 5$

4) $y = 7x - 6$
$-4x + 4y = -24$

5) $y = -4x + 1$
$6x - y = 9$

Solve one of the given equations for *x* or *y*. Then solve the system by substitution.

1) $3x + 4y = 11$
$x + 5y = 11$

2) $2x - 4y = 12$
$-4x + y = -3$

3) $4x + y = 6$
$12x + 3y = -3$

4) $x + 4y = -18$
$2x + 8y = -36$

CW/HW **Solve each system by substitution.**

1) $-2x - 5y = 2$
$2x + y = 6$

2) $x + 3y = -3$
$-3x + 7y = -7$

3) $-x - 4y = 13$
$x + 4y = -13$

4) $8x - 5y = 12$
$4x + y = -8$

5) $-x - 5y = -24$
$4x + y = -18$

6) $3x - 9y = -3$
$x - 3y = -6$

NOTES

Elimination Method (day 1)

Add the equations together, piece by piece. Then solve for the point of intersection.

1) $-x - 4y = 12$
$x + 2y = -2$

2) $-4x + y = 25$
$-3x - y = 10$

3) $2x + 2y = 4$
$-6x - 2y = -4$

4) $-3x - 3y = -21$
$2x - 3y = -21$

5) $-8x - 9y = 26$
$-8x - 6y = -4$

CW/HW #1 **Solve each system by elimination.**

1) $6x - y = 24$
$x + y = 11$

2) $4x - 2y = -24$
$-4x - 2y = -16$

3) $-8x + 2y = -26$
$8x + y = -1$

4) $-2x - 2y = 14$
$2x + 3y = -23$

5) $-x - 2y = -1$
$x + 5y = 4$

6) $8x + 6y = -16$
$8x + 2y = 16$

7) $-4x + 5y = 17$
$-6x + 5y = 13$

8) $-x + 4y = 14$
$-7x + 4y = 2$

9) $-3x - 5y = -25$
$-7x - 5y = -5$

10) $-4x - 3y = -7$
$-x - 3y = -22$

NOTES

Elimination Method (day 2)

Multiply one equation so that you can add the equations together, piece by piece, eliminating one variable. Then solve for the point of intersection.

1) $-7x - 4y = -26$
$-6x - 2y = -8$

2) $-6x - 10y = -6$
$2x + 20y = 2$

3) $6x - 6y = 0$
$-3x - y = 0$

4) $-3x - 3y = 15$
$x + y = -5$

5) $-18x - 14y = 25$
$9x + 7y = -10$

CW/HW #2 **Solve each system by elimination.**

1) $-6x + 3y = 6$
$12x - 9y = 12$

2) $-3x - 8y = -30$
$12x + 2y = 30$

3) $2x + 10y = -24$
$-3x + 2y = 19$

4) $2x + 3y = 3$
$3x + 12y = -3$

5) $10x + 2y = 6$
$-5x - 3y = 1$

6) $10x - 5y = -30$
$-20x - 8y = 24$

7) $10x + 7y = 14$
$-2x - 8y = -16$

8) $4x + 9y = -6$
$-6x - 3y = 30$

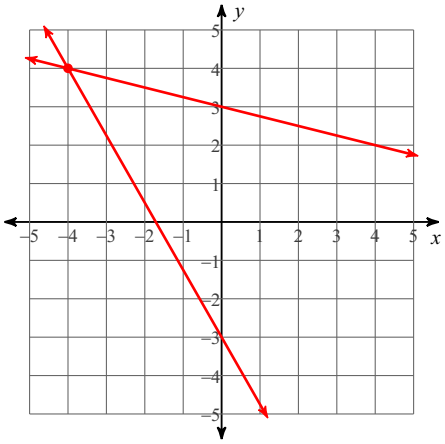
9) $-3x - 5y = 3$
$-8x - y = 8$

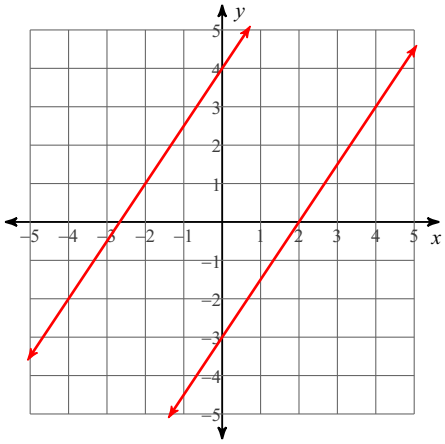
10) $3x + 6y = -12$
$-2x + 12y = 24$

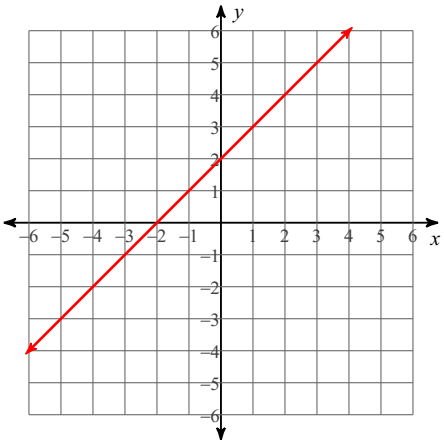
NOTES

Number & Types of Solutions to Linear Systems

Determine the number of solutions for the given system of linear equations.







_____ _____ _____

A system of linear equations has _____ solution if the graph shows a _____ __ _____

A system of linear equations has _____ solution if the lines are _____.

A system of linear equations has _____ _____ solutions if the lines are the _____.

Solve by substitution.

1) $-5x + y = 8$
$-15x + 3y = 7$

2) $2x - 12y = 44$
$x - 6y = 22$

Solve by elimination.

3) $-12x - 9y = -9$
$16x + 12y = 12$

4) $36x + 36y = -28$
$8x + 8y = -8$

NOTES

Linear Systems with Word Problems (day 1)

Translate each scenario to a system of equations and solve.

Example 1 Four times a certain number is three more than twice another number. The sum of the first number and twice the second number is 5. Find the numbers.

Example 2 The sum of two numbers is 56. The sum of one third of the first number and one fourth of the second number is 16. Find the numbers.

Example 3 Two angles are complementary. One angle is 42º more than one half the other. Find the angles.

CW/HW Set up each set of linear equations and check them with Cisneros before you solve. Then solve the system.

1. The sum of two numbers is 115. The difference is 21. Find the numbers.

2. The sum of two numbers is 26.4. One is five times the other. Find the numbers.

3. The sum of the length and width of a rectangle is 20 in. The length is one less than twice the width. Find the length and width of the rectangle.

4. The perimeter of a rectangle is 46 m. The width of the rectangle is 2 more than half the length. Find the length and width.

5. Two angles are complementary. Their difference is 34º. Find the angles. (Complementary angles are angles whose sum is 90º.)

CW/HW

Linear Systems Word Problems Practice (day 2)

Write a system of equations for each scenario and check it with Cisneros before solving. Then solve on separate paper.

1) There are 22 students in a class made up of boys and girls. There are 4 more boys than girls. How many boys and girls are in the class?

2) The total number of members in the Great Oak and Vista Murrieta bands are a combined 334 people. Vista Murrieta has 66 more members than Great Oak. How many members are in each band?

3) The sum of two numbers is 80. One number is 20 less than the other number. Find the numbers.

4) There were 80 shoes on the shoe rack made up of tennis shoes and sandals. There were 10 more sandals than tennis. How many of each are there?

5) In my pocket I have 15 coins made up of quarters and dimes that totals $3.00. How many of each do I have?

6) Daniel saw 140 red and green ghosts. He noticed that there were two more red ghosts than green ones. How many of each were there?

7) There are 20 students in Mr. Morton's class. There are two more guys than girls. How many of each are in the class?

8) Mr. Morton threw 50 pitches. The number of strikes was 5 more than twice the number of balls. Find out how many strikes and balls were thrown.

9) There are 25 coins in my pocket made up of nickels and quarters. I have a total of $3.25. How many of each do I have?

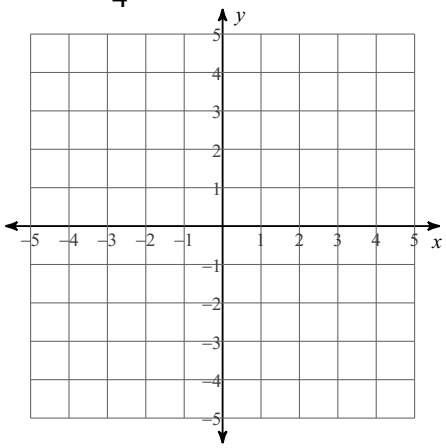
10) For a soccer game, there were 120 tickets sold for students and adults for a total of $195. If student tickets sold for $1 and adults for $2, how many of each were sold?

Review of Graphing & Solving Linear Systems

Solve each system by graphing. SHOW that the point of intersection solves both equations.

1) $y = -x - 2$

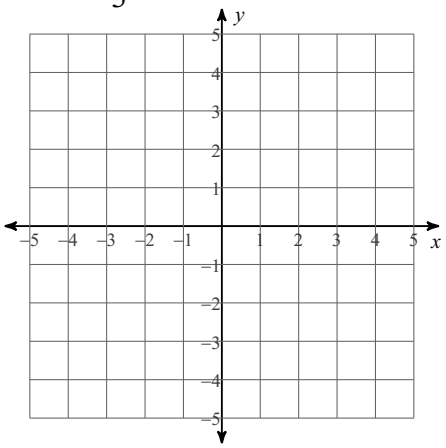
$y = -\frac{1}{4}x + 1$



Check: (,)

2) $y = x + 2$

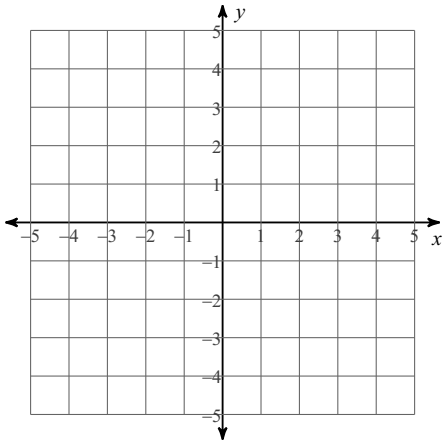
$y = -\frac{2}{3}x - 3$



Check: (,)

3) $y = -\frac{5}{4}x + 4$

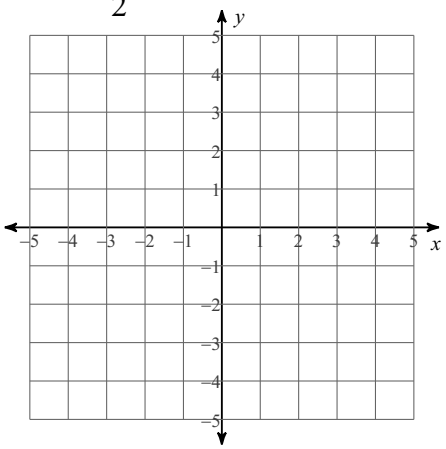
$y = -1$



Check: (,)

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

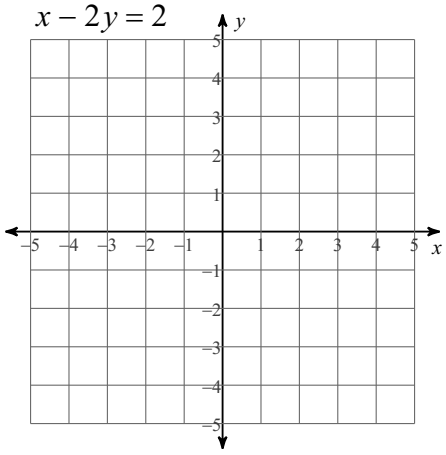
$y = -\frac{1}{2}x + 3$



Check: (,)

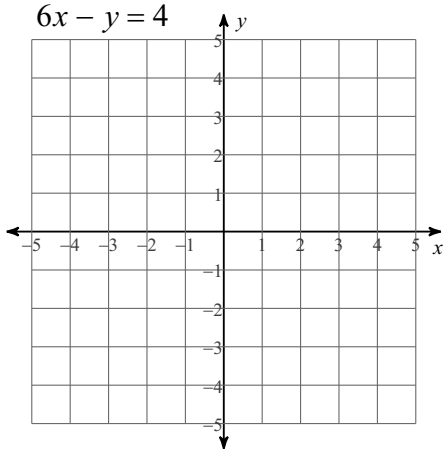
Graph each system and then solve. SHOW that the point of intersection solves both equations.

5) $x + 2y = -6$
$x - 2y = 2$



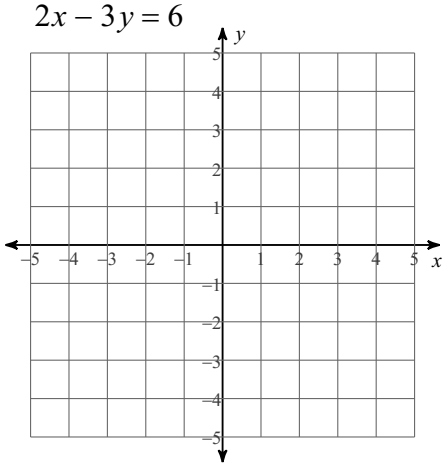
Check: (,)

6) $x + y = 3$
$6x - y = 4$



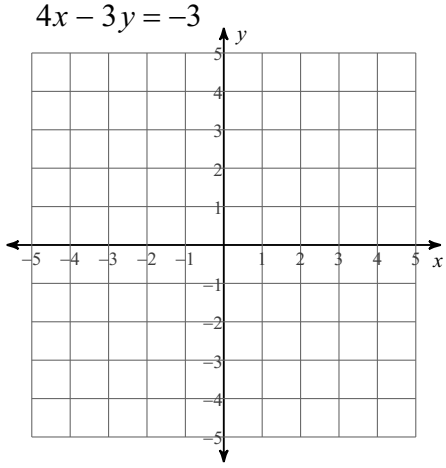
Check: (,)

7) $8x - 3y = -12$
$2x - 3y = 6$



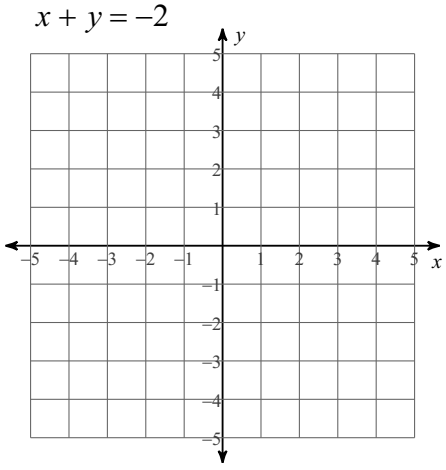
Check: (,)

8) $x - 3y = 6$
$4x - 3y = -3$



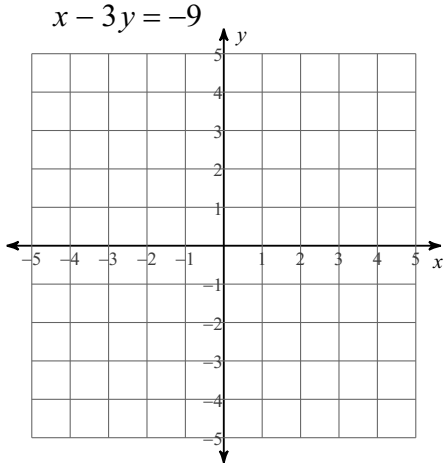
Check: (,)

9) $4x + y = 4$
$x + y = -2$



Check: (,)

10) $x - 3y = -6$
$x - 3y = -9$



Check: (,)

Review of Graphing Linear Inequalities & Testing Solutions

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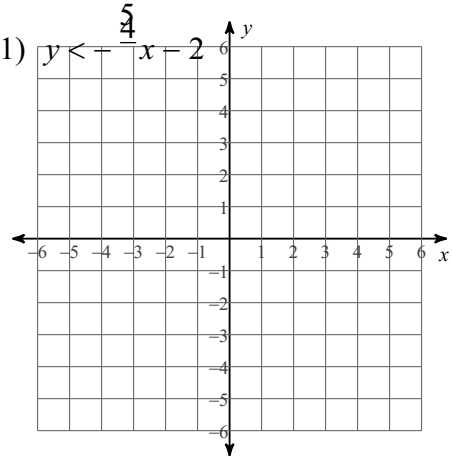
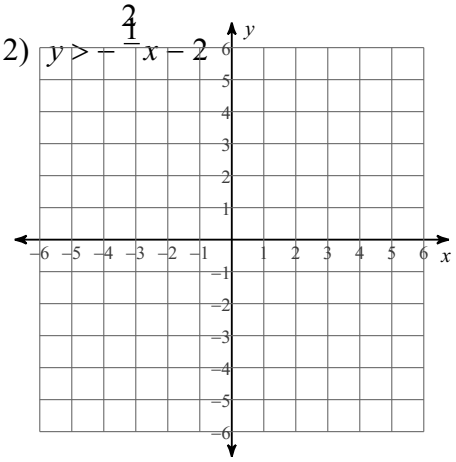
Graph each linear inequality and use a Test Point to verify the Solution Region.

1) $y < -\frac{5}{4}x - 2$



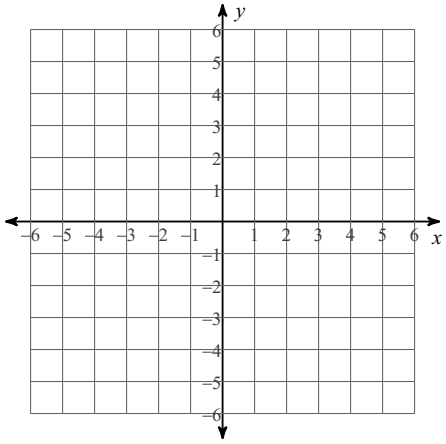
Test Point: (,)

2) $y > -\frac{2}{1}x - 2$



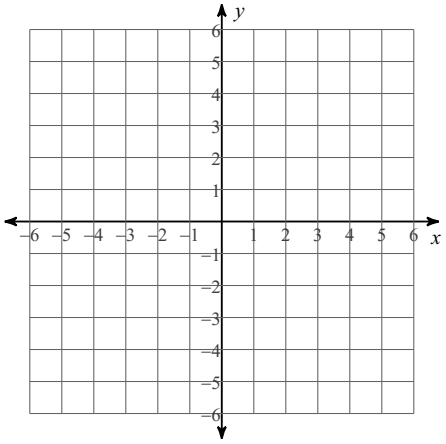
Test Point: (,)

3) $2x - 5y \leq -10$



Test Point: (,)

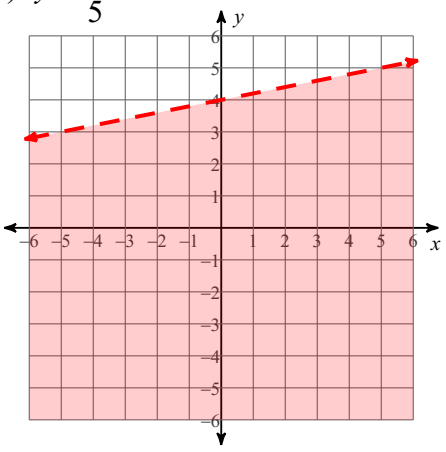
4) $5x - y > -2$



Test Point: (,)

Determine which points are solutions to the inequality.

5) $y < \frac{1}{5}x + 4$



(-4, 3) **(-1, -1)** **(0, 0)** **(1, 5)** **(5, 5)** **(2, -3)**

NOTES *Systems of Inequalities*

The solutions to systems of inequalities are shown by <u>graphing</u> and <u>shading</u> the regions that make <u>BOTH</u> inequalities true.

Rearrange both inequalities into slope-intercept form to graph easily.

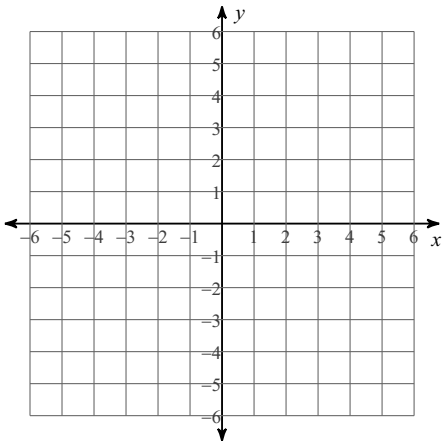
Remember to shade the regions where the solutions are located!

Shade the overlapping region a little darker and label it the "Solution Region".

<u>Example 1:</u> Graph the system.

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

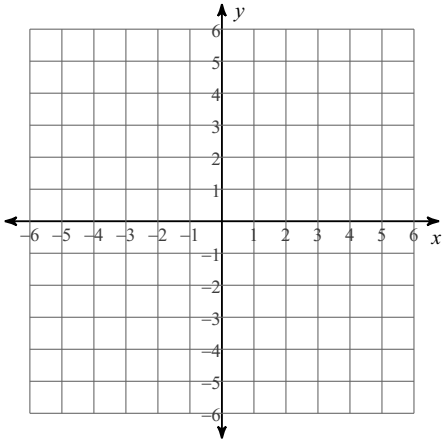
$$y \leq 3x - 3$$



<u>Example 2:</u> Graph the system.

$$x - 2y \geq 8$$

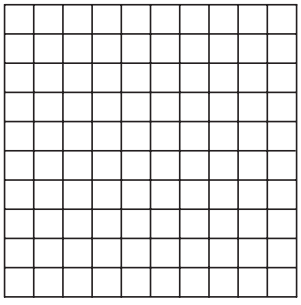
$$3x + y < 6$$



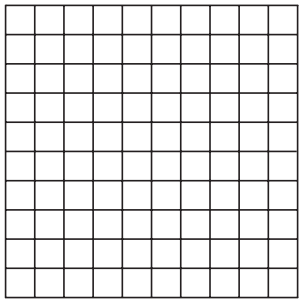
CW/HW Systems of Linear Inequalities

Solve each system of inequalities by graphing. Show your work.

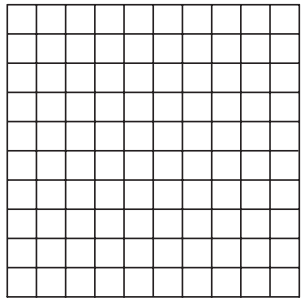
1. $y < 4$
$y > 2$



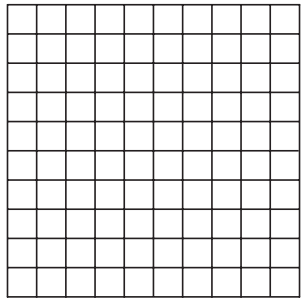
2. $x < 4$
$y > 2$



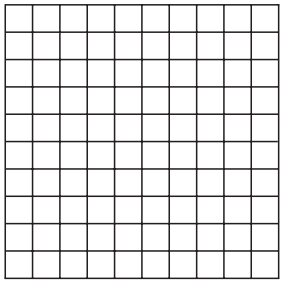
3. $x + y > -3$
$-x + y < -2$



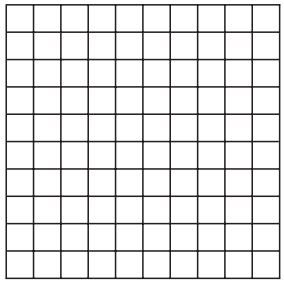
4. $x + y < 2$
$x + y > 5$



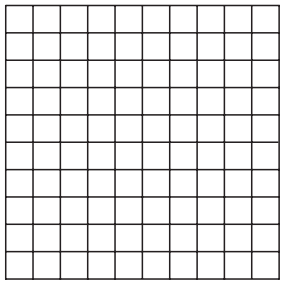
5. $y < 2x - 3$
$-2x + y > 5$



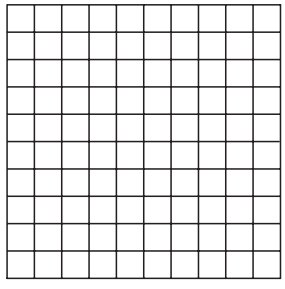
6. $-x + y < -5$
$y \geq -x + 1$



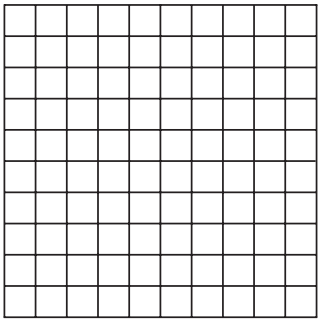
7. $y \geq \frac{1}{4}x + 1$
$y \geq \frac{3}{4}x - 1$



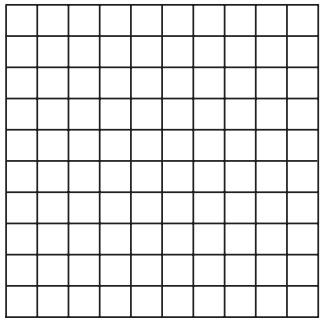
8. $2x - y < 5$
$-\frac{1}{2}x + y > 5$



9. $-4x + 2y < -2$
$-2x + y > 3$



10. $x < 1$
$x > 4$

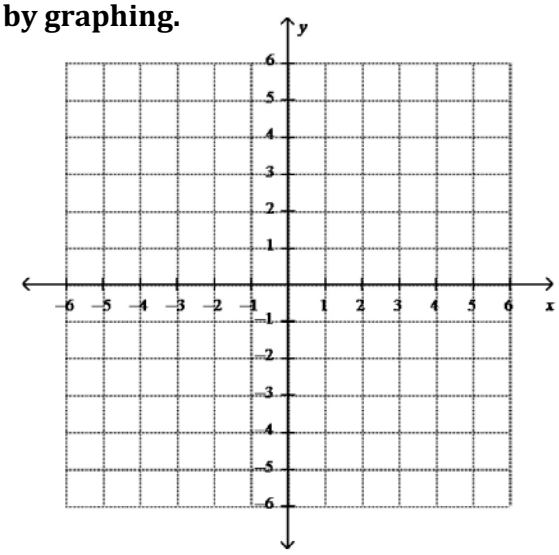


Name_____
Per____

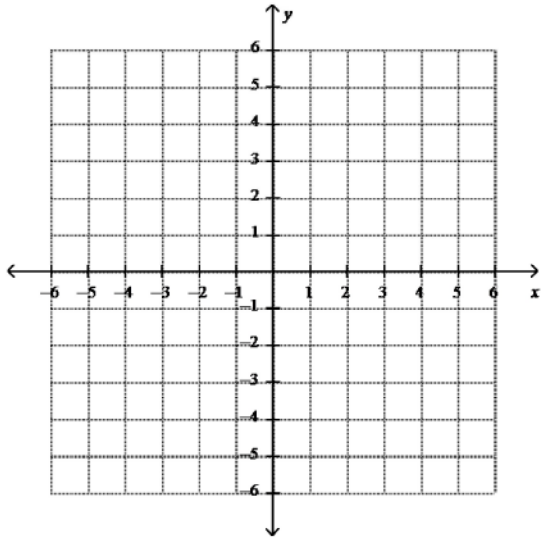
Algebra 1 Unit 3 Review

Find the solution of the system of equations by graphing.

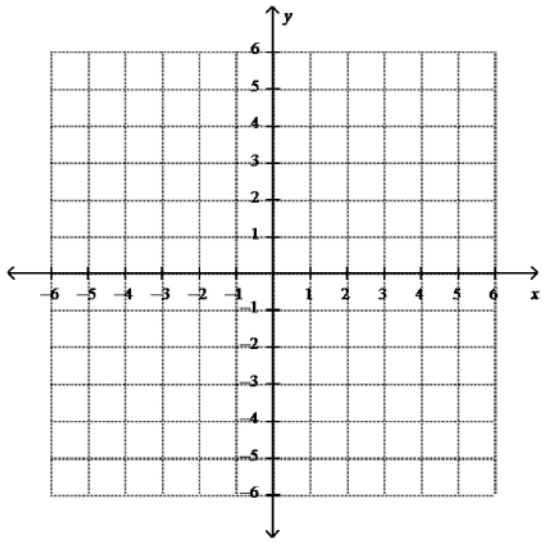
1. $y = -\frac{3}{2}x + 2$
$y = \frac{1}{2}x - 2$



2. $y = 2x + 4$
$6x - 3y = 12$



3. $y = 2x - 2$
$y = 2x + 5$



Solve by substitution. Tell whether the system has *no solution, one solution* or *infinitely many solutions*.

4. $y = x + 3$
$y = -2x + 3$

5. $y = 3x - 6$
$-3x + y = -6$

6. $y = 3x - 6$
$-3x + y = -6$

Solve by elimination. Show your work.

8. $x + 2y = 7$
$3x - 2y = -3$

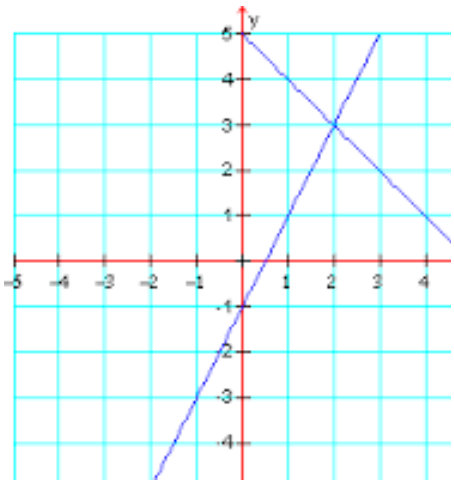
9. $3x + y = 20$
$x + y = 12$

10. $2x + 5y = -1$
$x + 2y = 0$

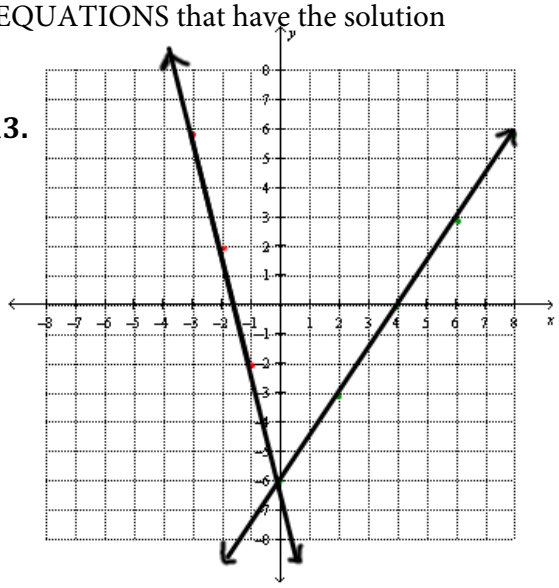
11. $3x + 5y = 10$
$x - 5y = -10$

Determine the SOLUTION of the systems and WRITE THE EQUATIONS that have the solution

12.

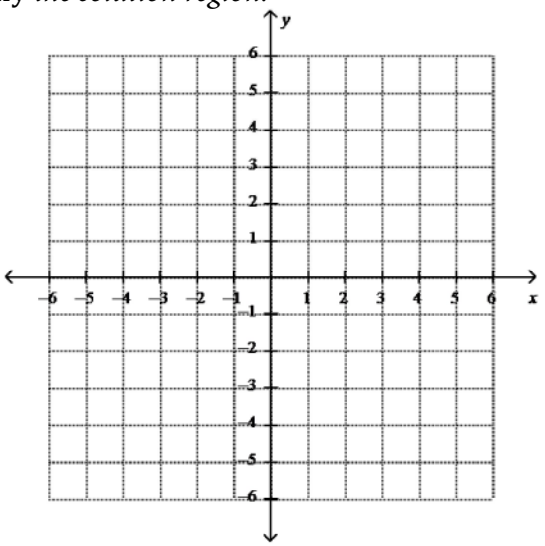


13.

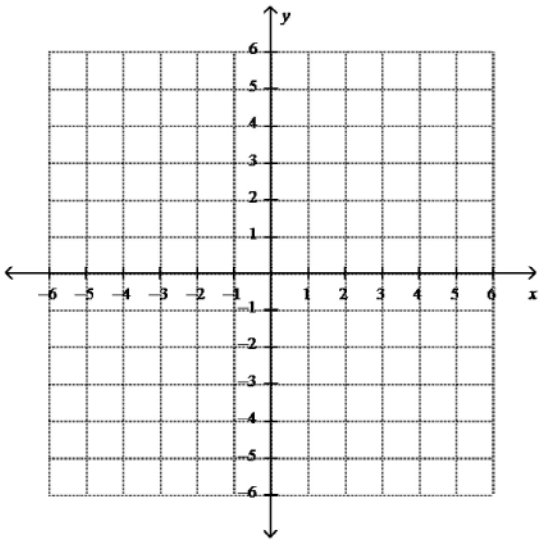


For #'s 14-16, Graph each system of inequalities AND identify *the solution region.*

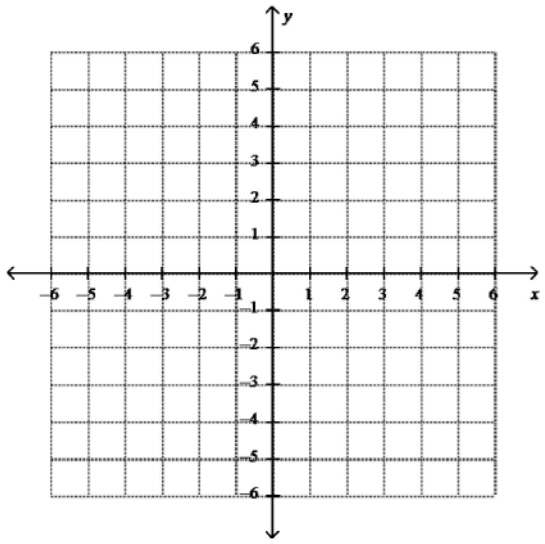
14. $x - y \le -2$
$x + y \ge 2$



15. $y \ge -\frac{2}{3}x - 1$
$y \ge \frac{3}{4}x + 1$



16. $-x+3y<12$
$y \geq -x+4$



17. Suppose a video store charges non-members $4 to rent each video. A store membership costs $21 and members pay only $2.50 to rent each video. *How many videos need to be rented for the cost to be the same for a non-member and a member?*

18. Suppose your club is selling candles to raise money. It costs $100 to rent a booth from which to sell the candles. If the candles cost your club $1 each and are sold for $5 each, how many candles must be sold to equal your expenses?

Spiral Review – Show all work:

Solve the following equations:

19. $7k-8+2(k+12)=52$

20. $\frac{1}{2}(4x-6)=17$

21. $\frac{3x+2}{4}=16$

22. $Find\ f(3)\ when\ f(x)=3x^2+2x-4$

23. $Find\ f(5) when\ f(x)=-2x-5$

24. Find the equation of line passing through (*4, 9*) with a slope of $\frac{1}{2}$.

25. Find the equation of a line passing through the points $(4, 5)$ ***and*** $(5, 10)$.