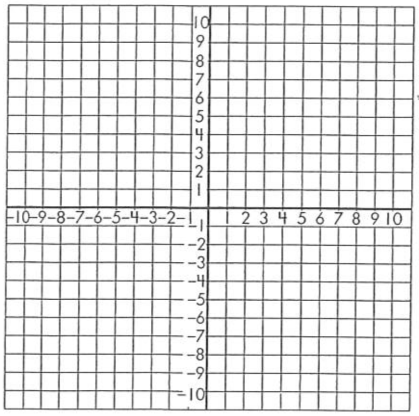
NAME ______________________________

Lesson 4.9 Graphing Functions

Sketch each linear function shown.

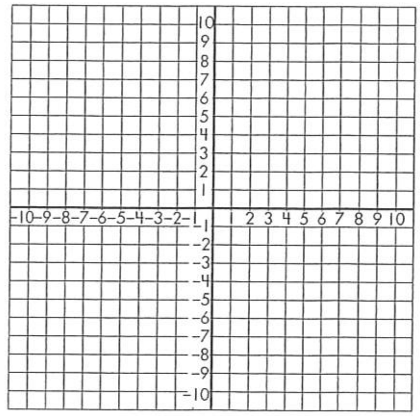
a

1. $y = 2x - 1$

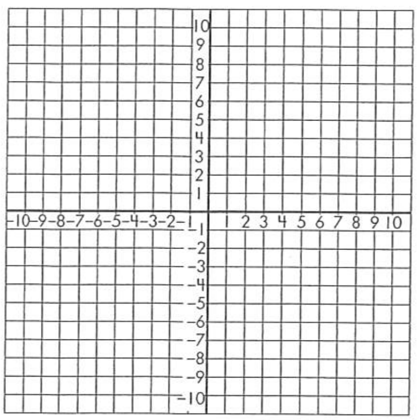


b

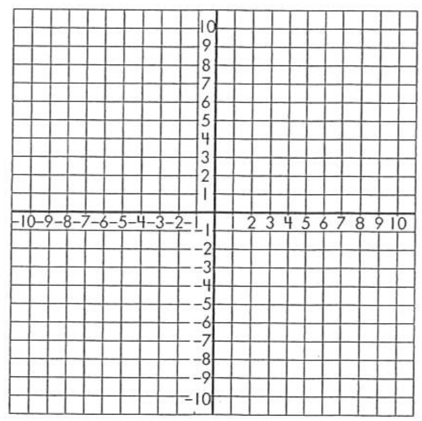
$y = -\frac{1}{2}x - 3$



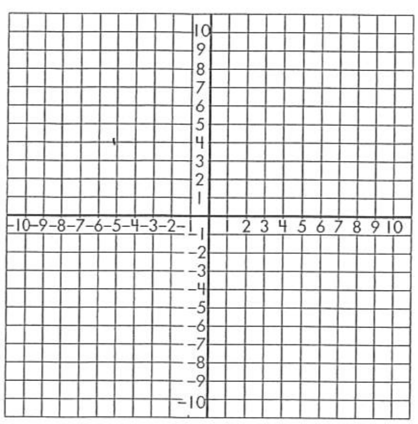
2. $y = 3x - 6$



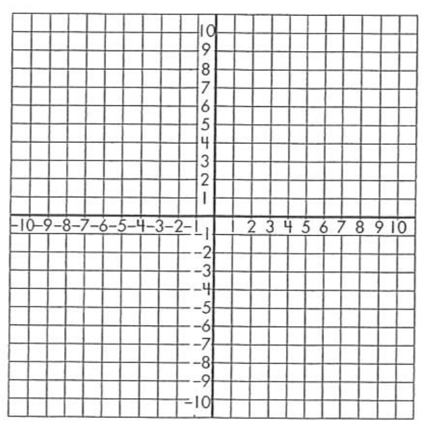
$y = -\frac{2}{3}x + 4$



3. $y = 4x + 3$



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

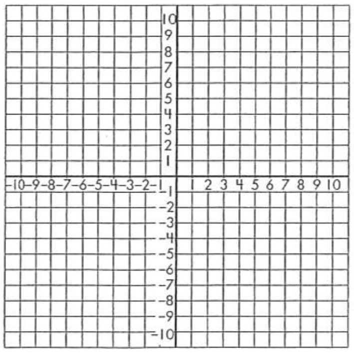


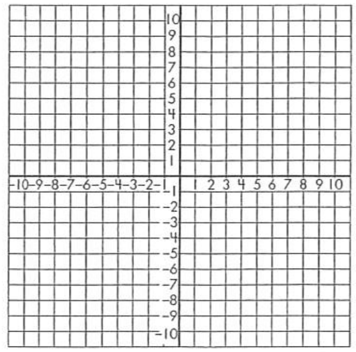
NAME ______________________________

Lesson 4.9 Graphing Functions

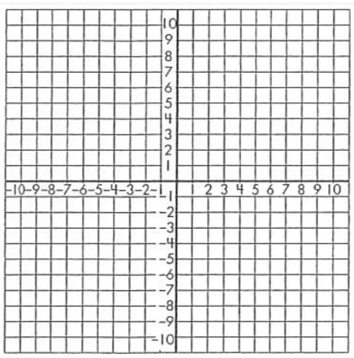
Sketch each linear function shown.

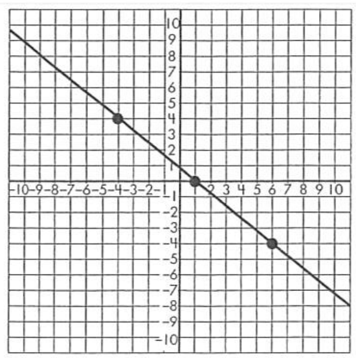
	a	b
1.	$y = 3x + 9$	$y = 2x - 5$



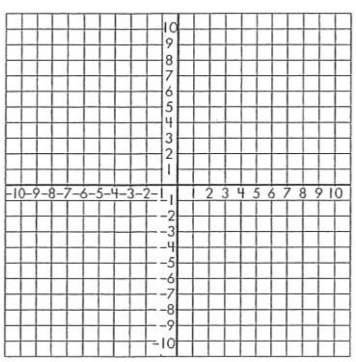


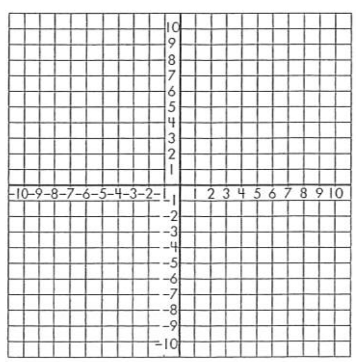
	a	b
2.	$y = -3x + 4$	$y = 5$





	a	b
3.	$y = \frac{1}{2}x + 4$	$y = -\frac{4}{5}x + 1$





Name: ______________________ **Class:** __________________

AU4: Notes #1 – Graphing Systems of Equations

Date: __________________

Vocabulary:

A system of linear equations is ____

____

A solution of a system of linear equations is ____________________________________

____

Points of Intersection (POI) are the same thing as the solutions of a system.

No solution means ____

____

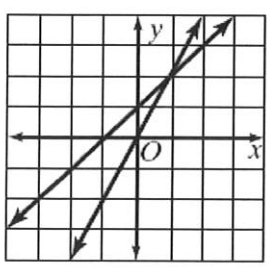
A system of equations has infinitely many solutions when __________________________

____

Vocabulary and Key Concepts

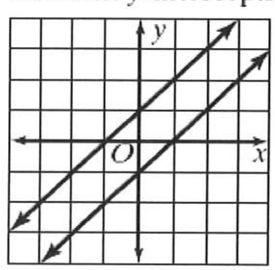
Numbers of Solutions of Systems of Linear Equations

different slopes



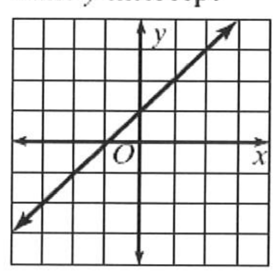
The lines ________ so there is ________ solution.

same slope
different *y*-intercepts



The lines ________ so there are ________ solutions.

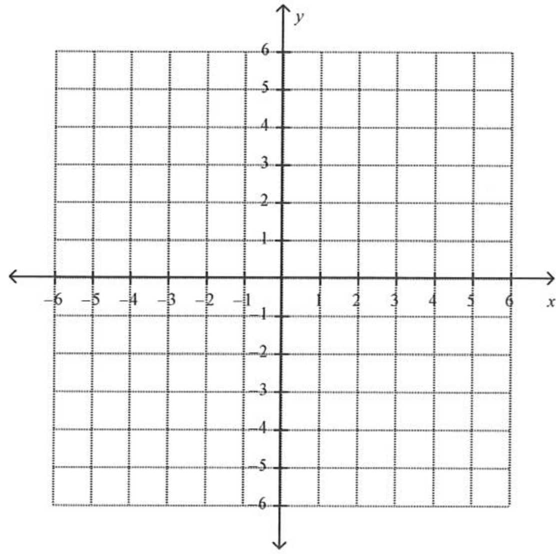
same slope
same *y*-intercept



The lines are ________ so there are ________ solutions.

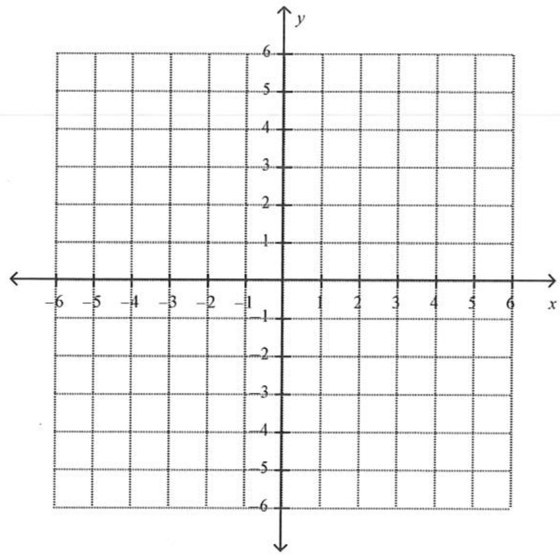
Solve by graphing:
Systems with No solutions

1.): $\begin{cases} y = 3x + 2 \\ y = 3x - 2 \end{cases}$

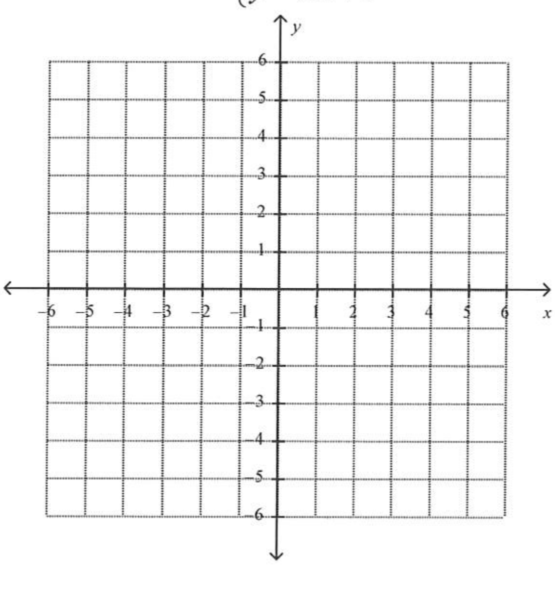


Systems with Infinitely Many solutions

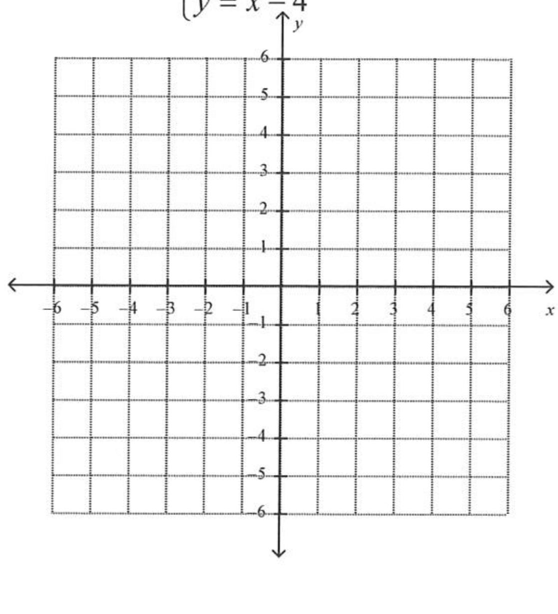
2.) $\begin{cases} y = -\dfrac{3}{4}x + 3 \\ y = -\dfrac{3}{4}x + 3 \end{cases}$



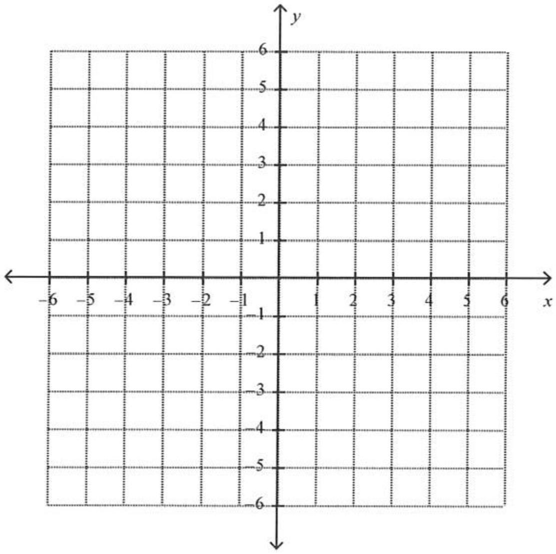
Ex. 1) $\begin{cases} y = x + 2 \\ y = 2x + 1 \end{cases}$



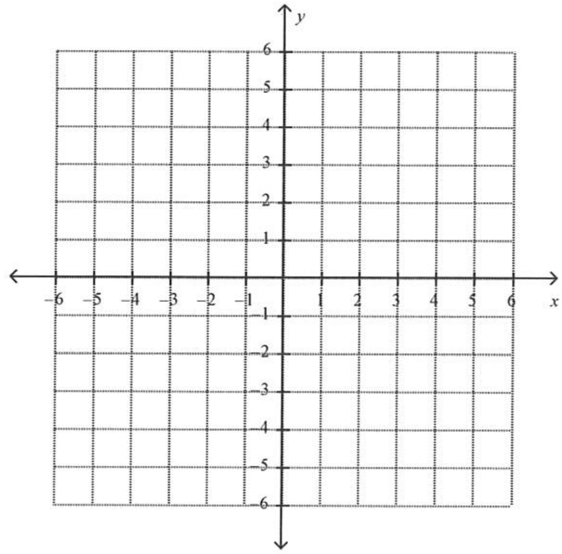
Try-It) $\begin{cases} y = -\dfrac{1}{2}x - 1 \\ y = x - 4 \end{cases}$



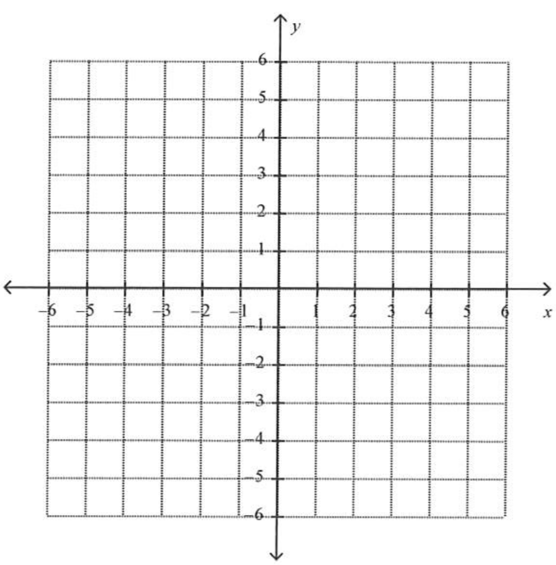
Ex. 2) $\begin{cases} x = 2 \\ y = -6 \end{cases}$



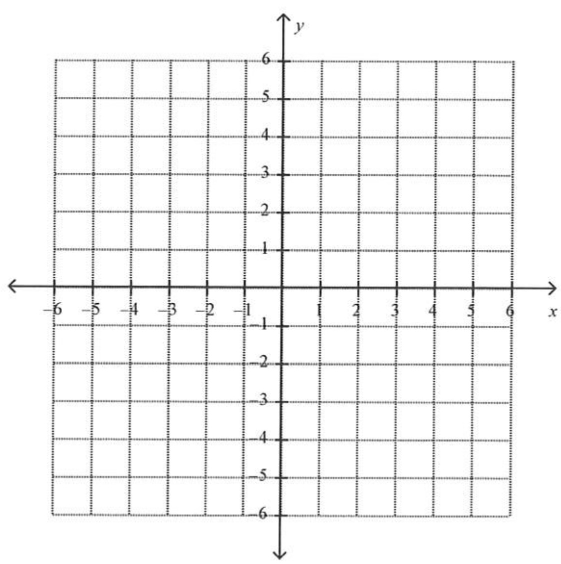
Try-It) $\begin{cases} y = 3 \\ x = -4 \end{cases}$



Ex. 3) $\begin{cases} 2x - 6 = y \\ 3 - x = y \end{cases}$



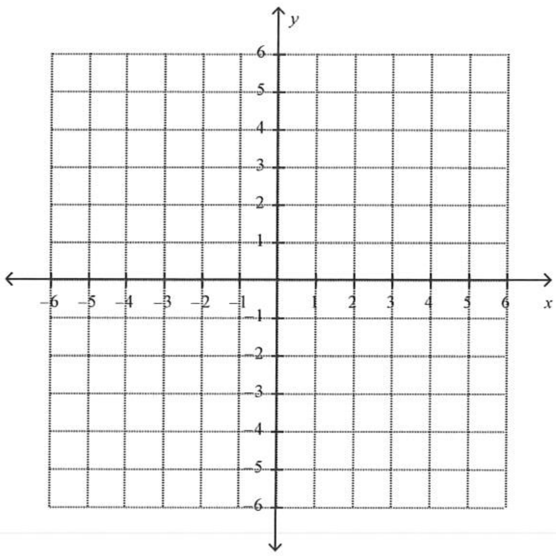
Try-It) $\begin{cases} -\dfrac{3}{2}x + 2 = y \\ -2 + \dfrac{1}{2}x = y \end{cases}$

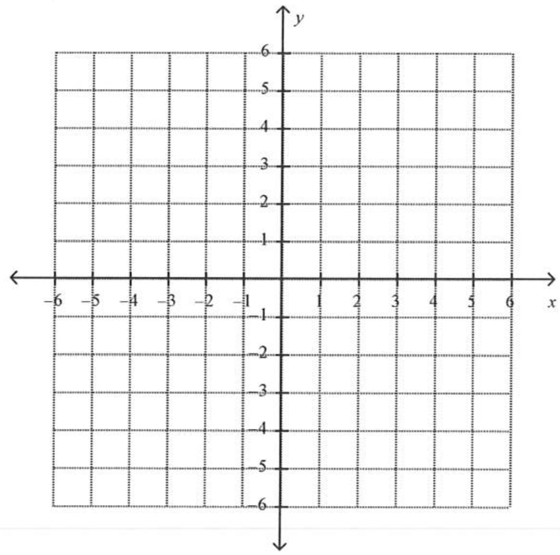


Graphing Standard Form Systems:

Ex. 4) $\begin{cases} x - y = 6 \\ 2x + y = 0 \end{cases}$

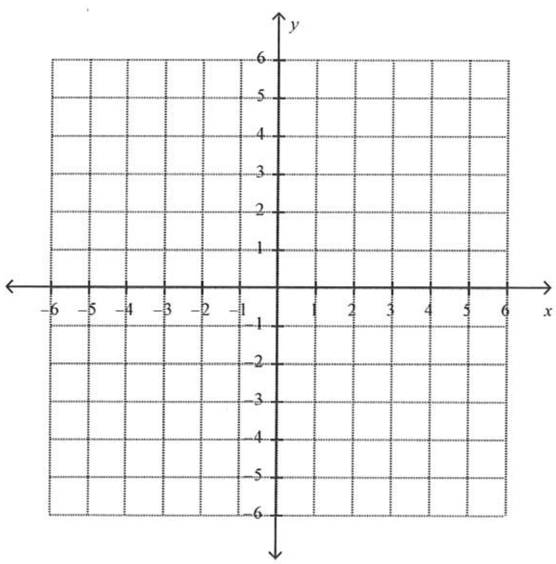
Try-It) $\begin{cases} 2x - y = 1 \\ 3x + y = -6 \end{cases}$

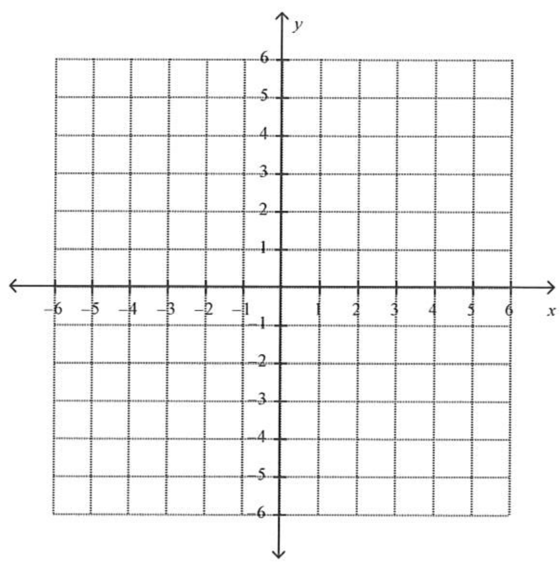




Try-It) $\begin{cases} 2x - y = 5 \\ x - y = 1 \end{cases}$

Try-It) $\begin{cases} -2x + y = -5 \\ \frac{1}{3}x + y = 2 \end{cases}$



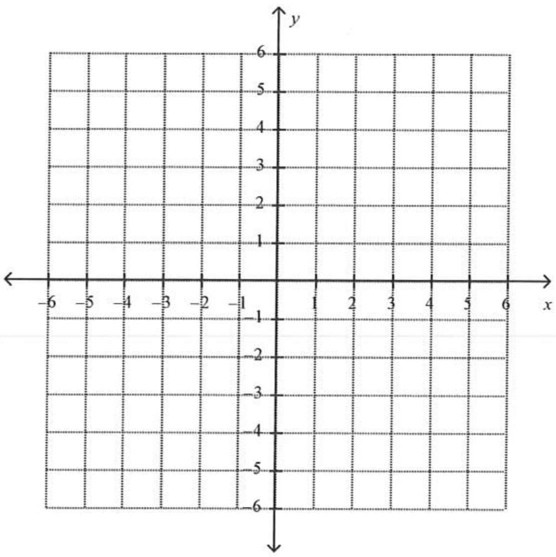


Name: ______________________ **Class:** __________________

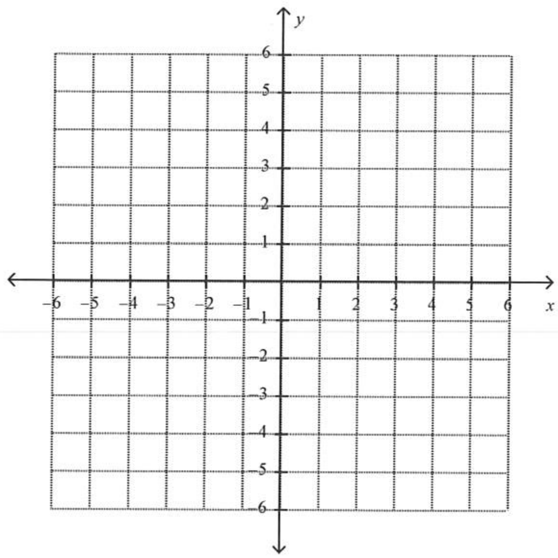
M8-U5: HW #1 – Graphing Systems of Equations **Date:** __________________

What is the **solution** to the following system of linear equations?
If there is *no solution* or *infinitely many*, explain why.

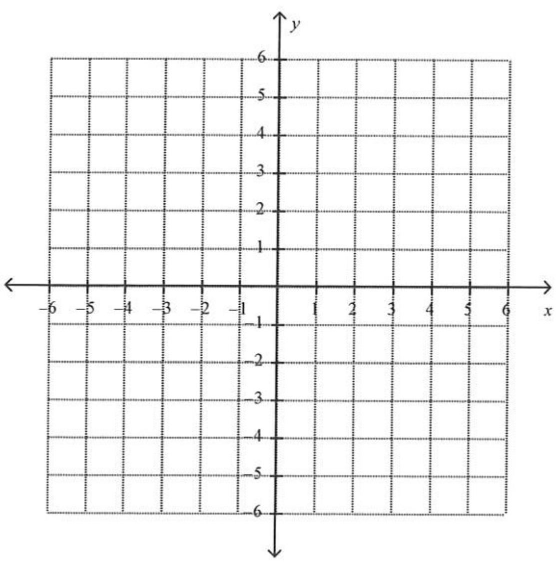
1) $\begin{cases} y = x + 3 \\ y = -2x + 3 \end{cases}$



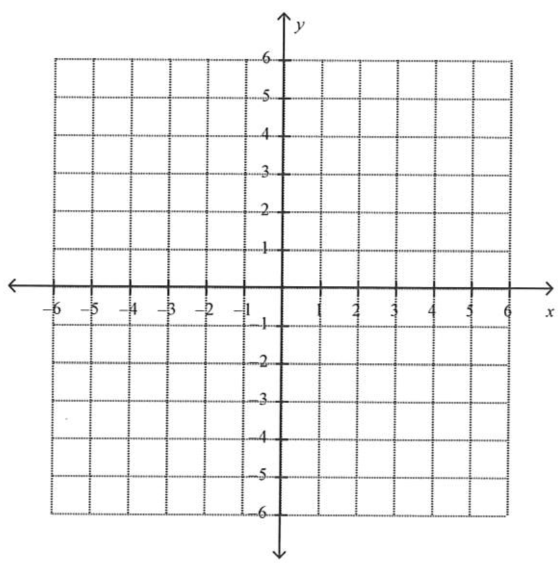
2) $\begin{cases} y = x + 2 \\ y = 4x - 1 \end{cases}$



3) $\begin{cases} y = 2x + 3 \\ y = \dfrac{1}{2}x \end{cases}$

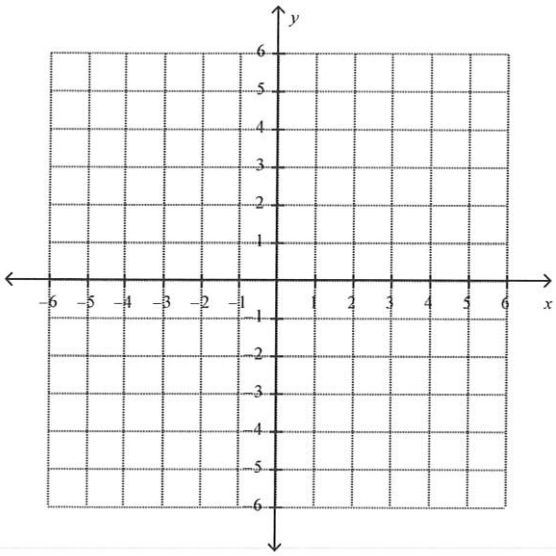


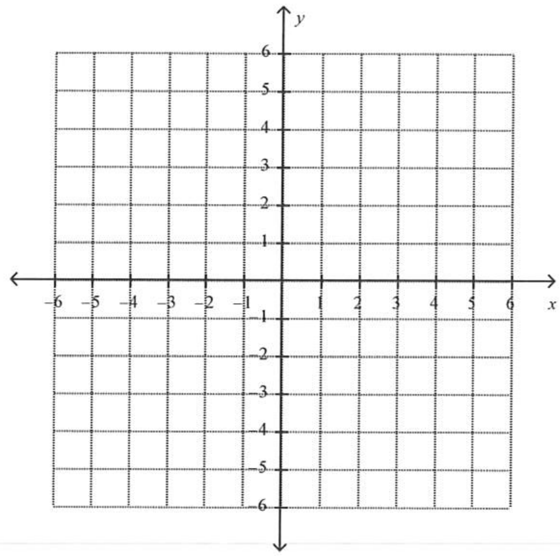
4) $\begin{cases} y = -\dfrac{3}{2}x + 2 \\ y = \dfrac{1}{2}x - 2 \end{cases}$



5) $\begin{cases} x = 5 \\ y = 2 \end{cases}$

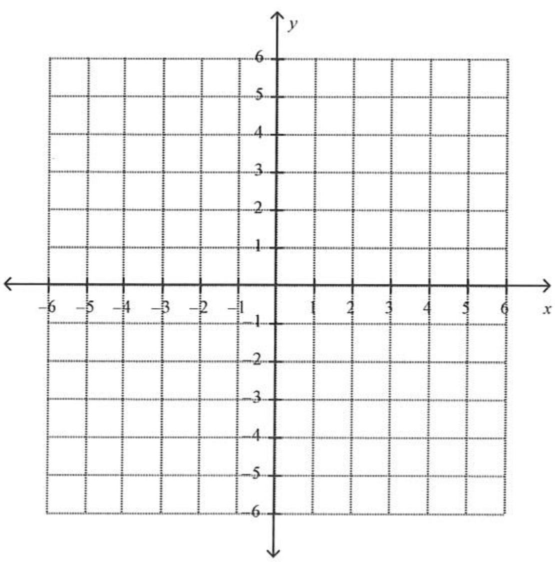
6) $\begin{cases} 2x - 5 = y \\ -1 + x = y \end{cases}$

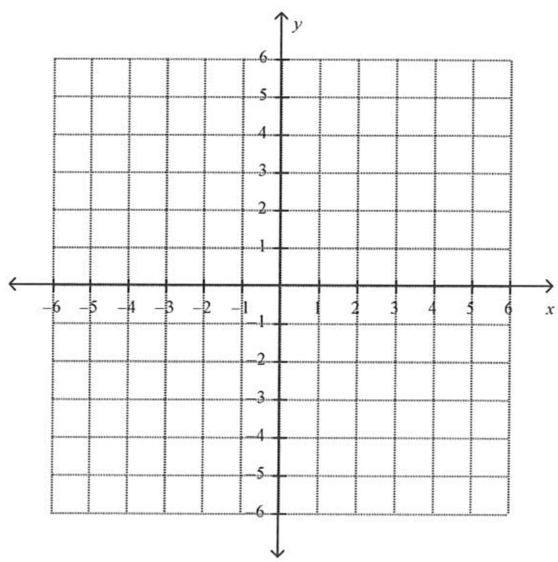




7) $\begin{cases} y = 2x + 4 \\ y = 2x + 4 \end{cases}$

8) $\begin{cases} y = 2x - 2 \\ y = 2x + 5 \end{cases}$





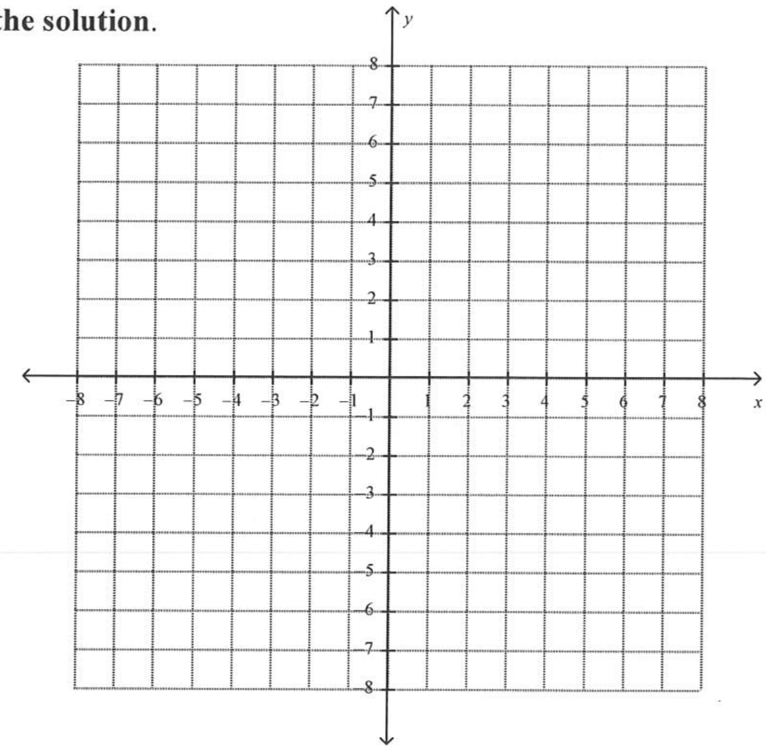
Name: ______________________ **Class:** ________________

M8-U5: Notes #2 – Graphing Systems (Day2) **Date:** ________________

Warm-Up:

Graph the two linear equations and **find the solution**.

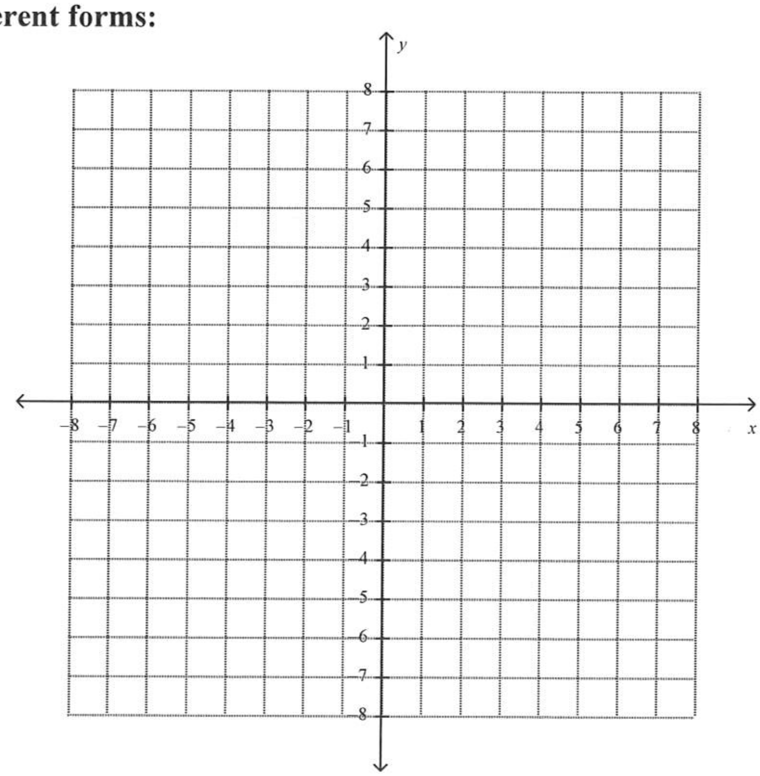
$$\begin{cases} y = -3x + 6 \\ y = -\dfrac{1}{2}x + 1 \end{cases}$$



Graphing a system of equations in different forms:

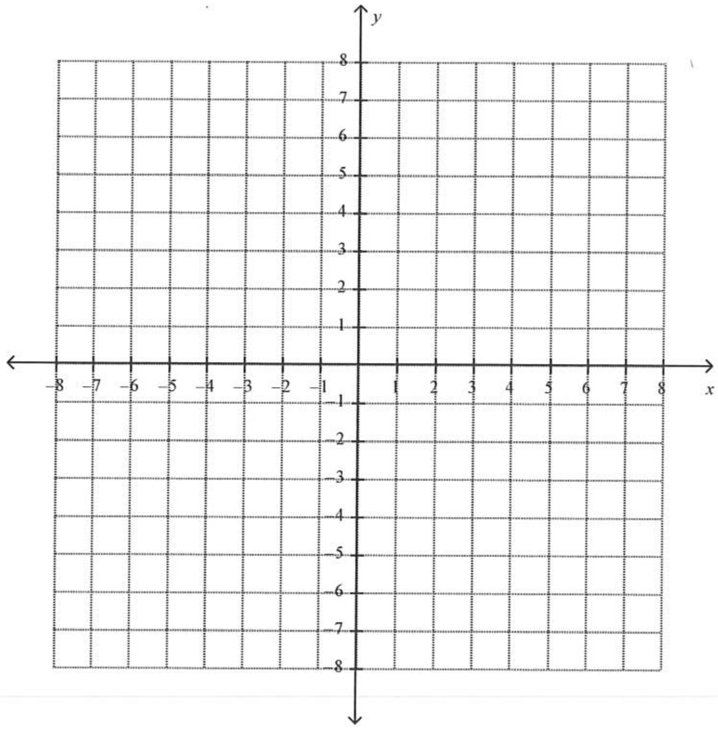
1. Find the solution to the system.

$$\begin{cases} y = 2x - 3 \\ 2x + y = 5 \end{cases}$$



2. **Find the solution to the system.**

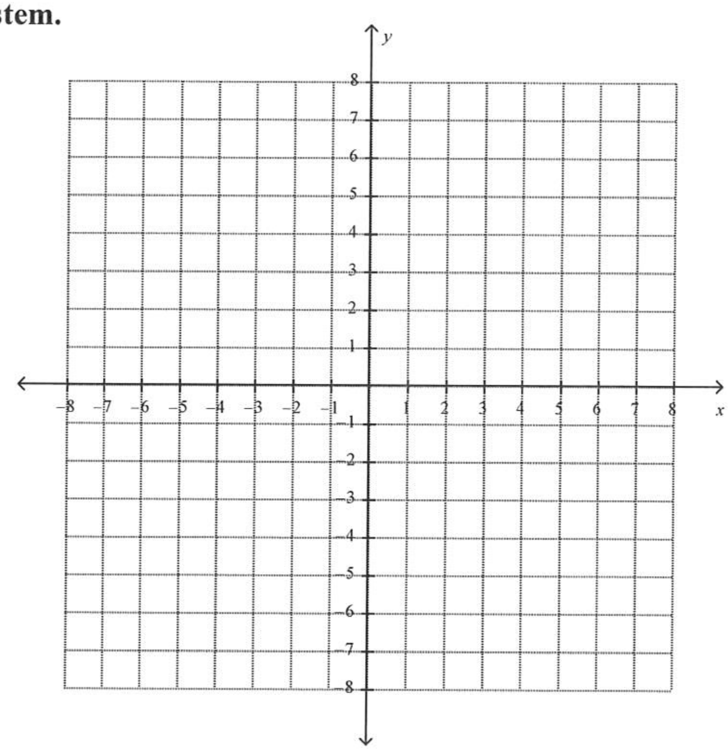
$$\begin{cases} y = -x \\ y + 3 = 2x \end{cases}$$



Try It!

Find the solution the following system.

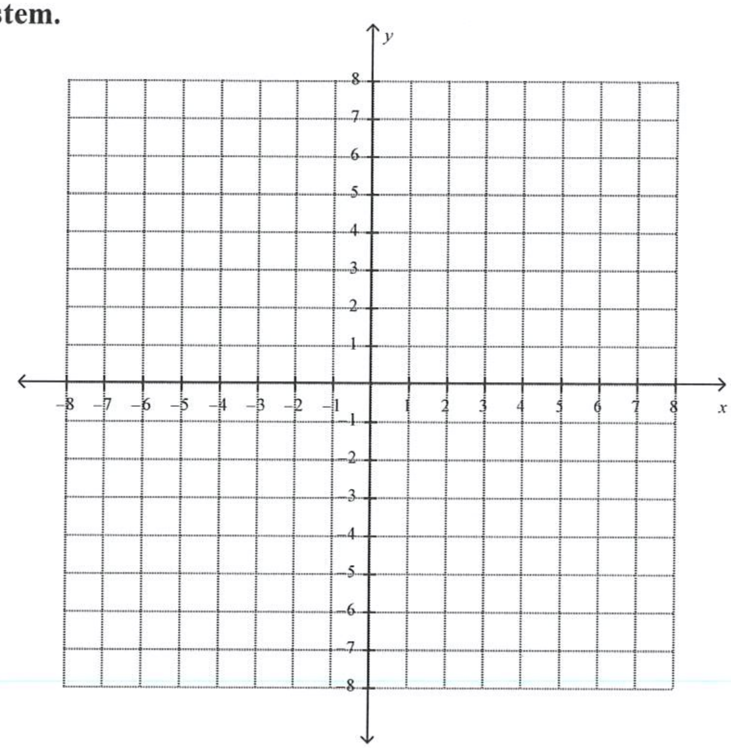
$$\begin{cases} 2x + y = -4 \\ y = 2x + 4 \end{cases}$$



Try It!

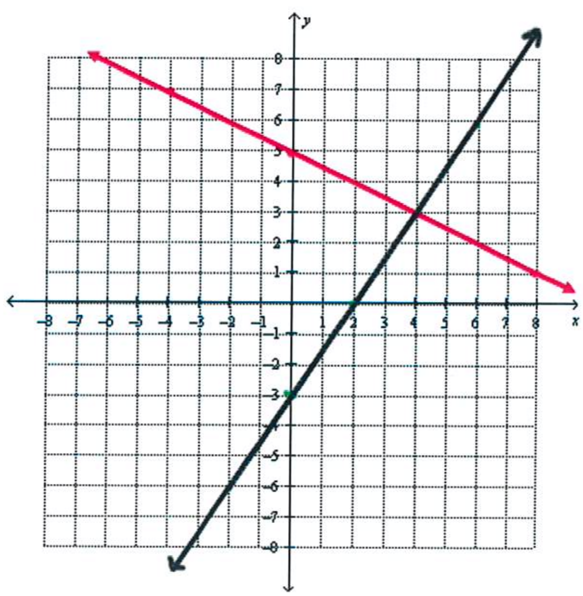
Find the solution the following system.

$$\begin{cases} -4x + y = 1 \\ y = -\dfrac{1}{2}x + 1 \end{cases}$$

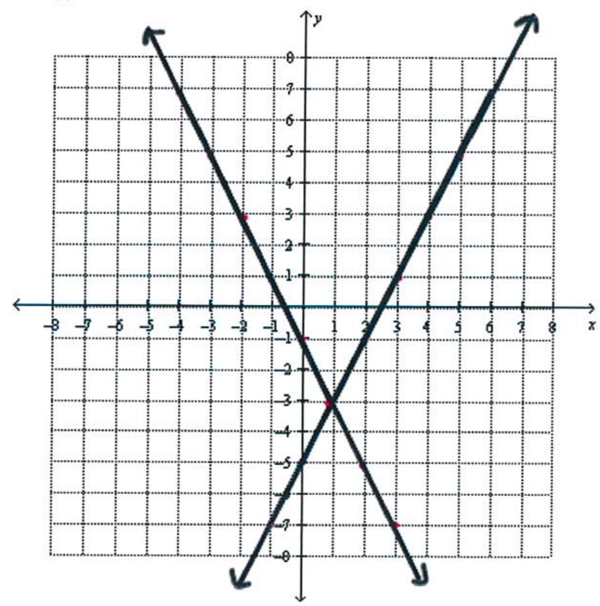


Find the solution to the given systems.

3.

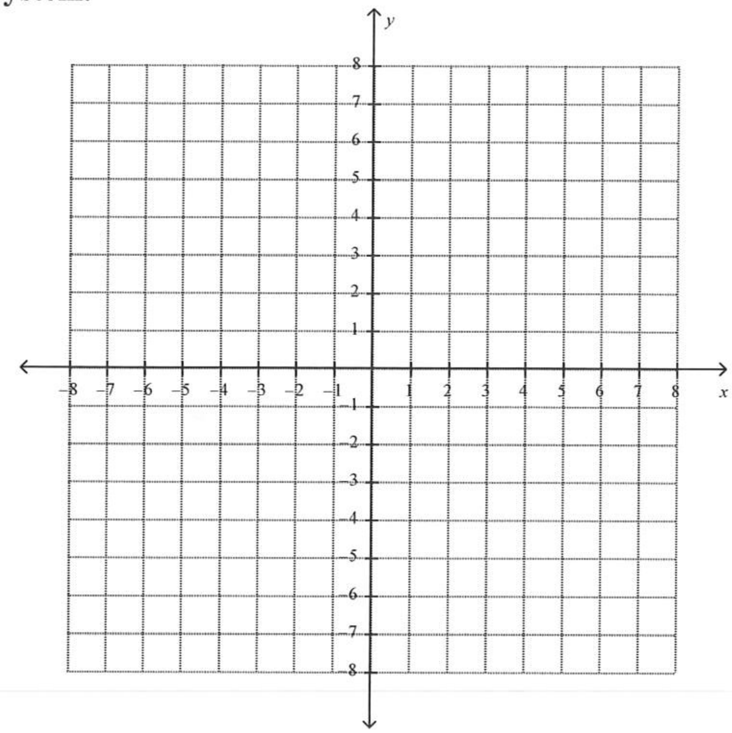


4.



5. **Find the solution the following system.**

$$\begin{cases} 3x + 4y = 12 \\ y = -\dfrac{3}{4}x + 3 \end{cases}$$



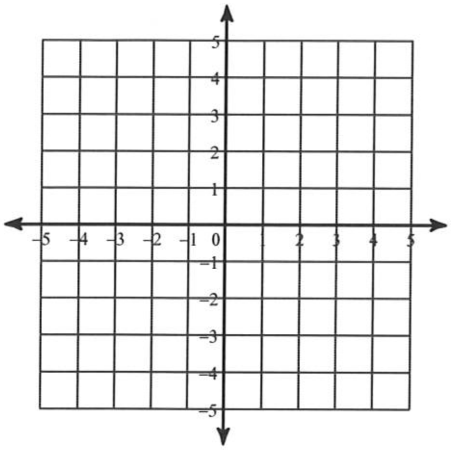
Worksheet Name________________________________

Solving Systems of Equations by Graphing

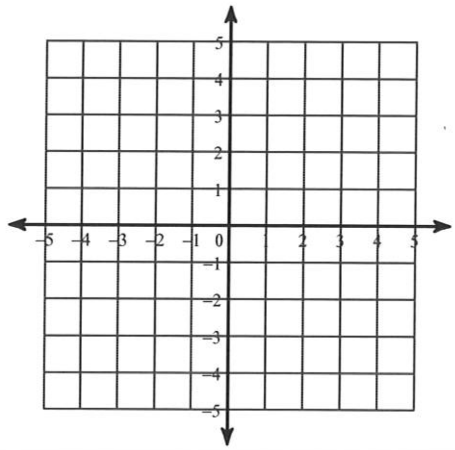
Date________________

Solve each system by graphing (find the point of intersection of the two lines) .

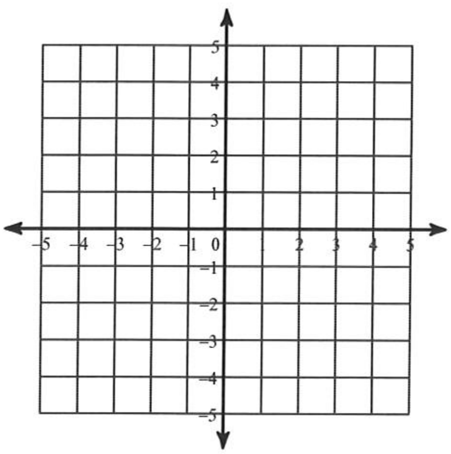
1) $y = 2x - 3$
$y = -3x + 2$



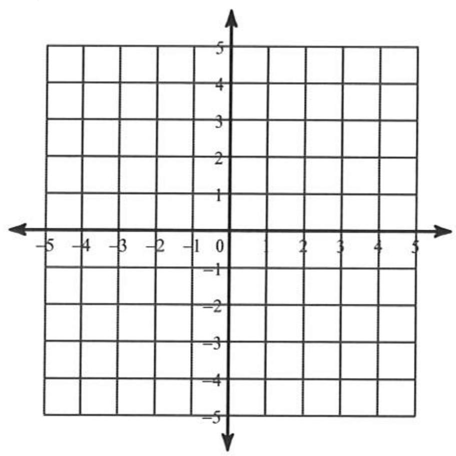
2) $y = -\frac{5}{3}x + 1$
$y = -\frac{1}{3}x - 3$



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

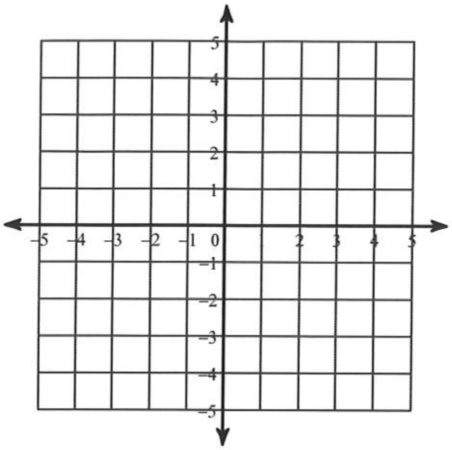


4) $y = 4x + 1$
$y = x - 2$



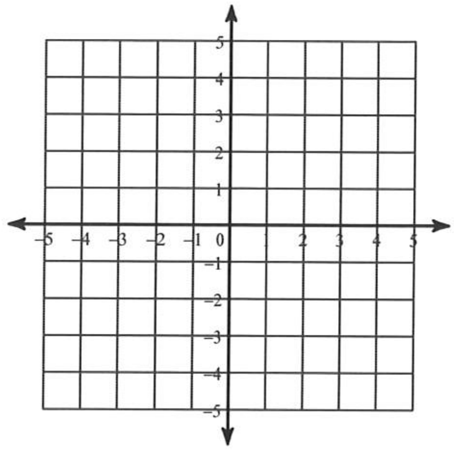
5) $y = -\frac{1}{3}x + 2$

$y = -2x - 3$



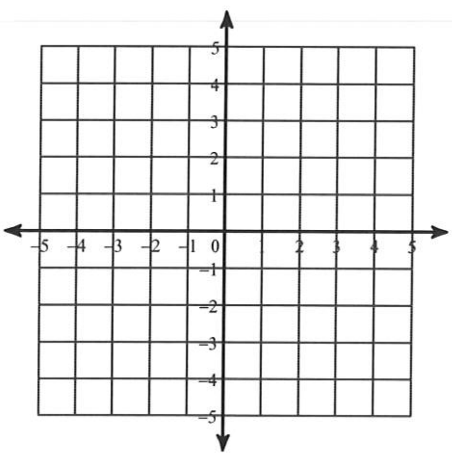
6) $y = -\frac{1}{4}x + 3$

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



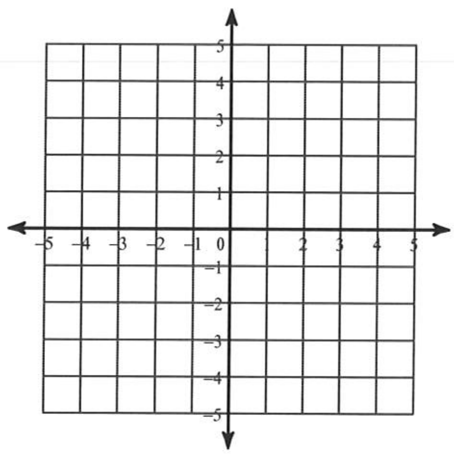
7) $y = \frac{4}{3}x - 3$

$y = 1$



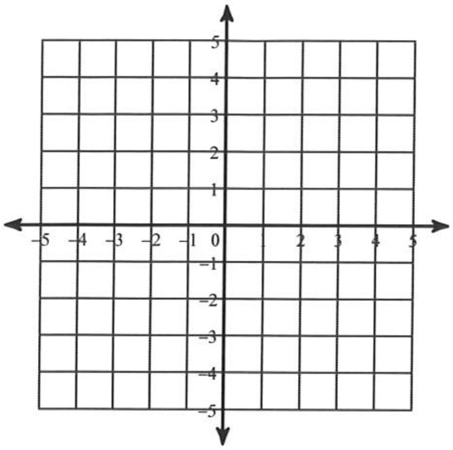
8) $y = -2x - 4$

$y = 4x + 2$



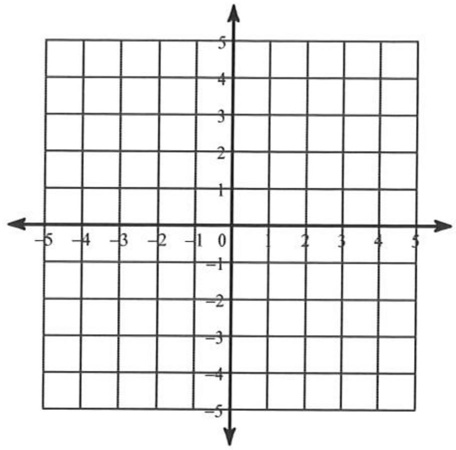
9) $y = -\frac{3}{2}x + 4$

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



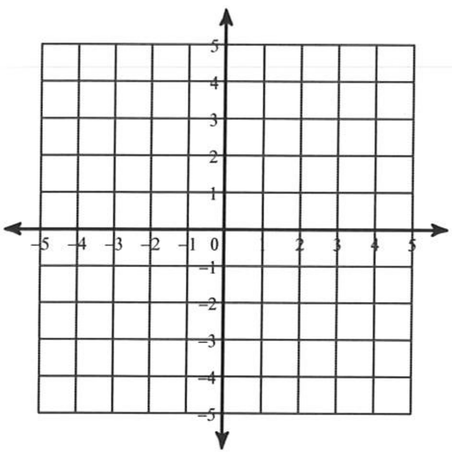
10) $y = 2x - 4$

$y = \frac{1}{4}x + 3$



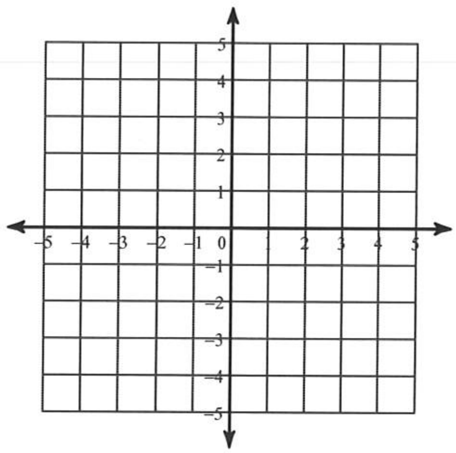
11) $5x + y = 4$

$x - y = 2$



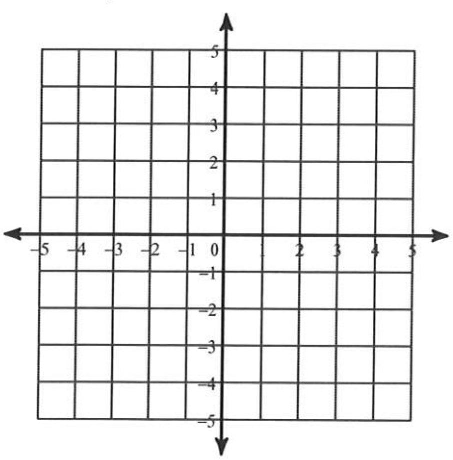
12) $x - 4y = -4$

$5x - 4y = 12$



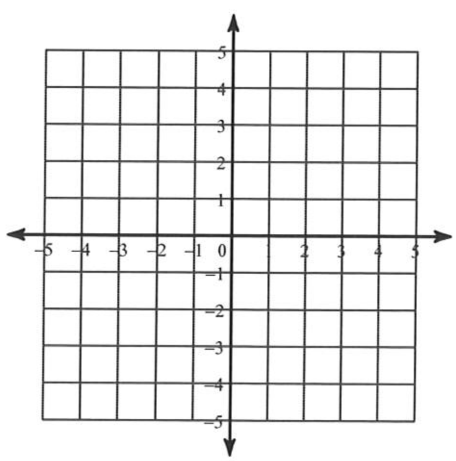
13) $x + y = 3$

$8x + y = -4$

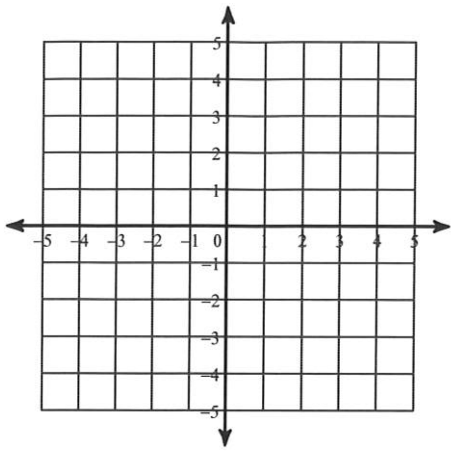


14) $x - y = 2$

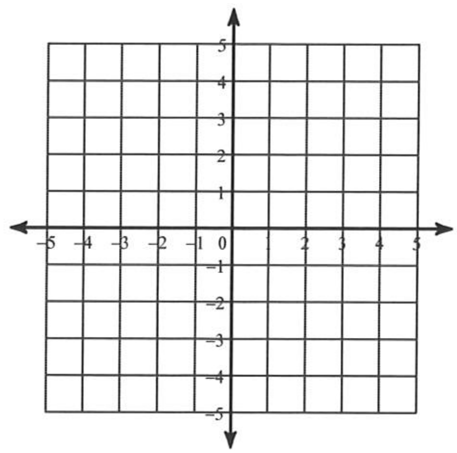
$x = -2$



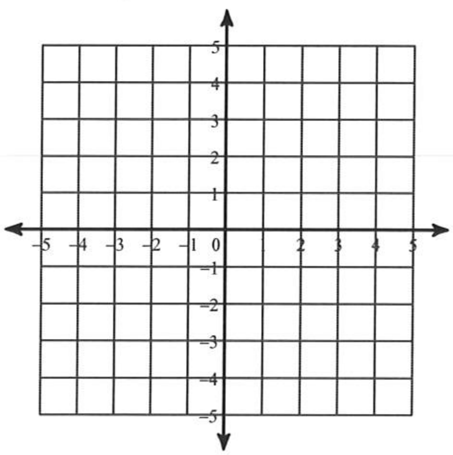
15) $2x + y = 1$
$2x - y = 3$



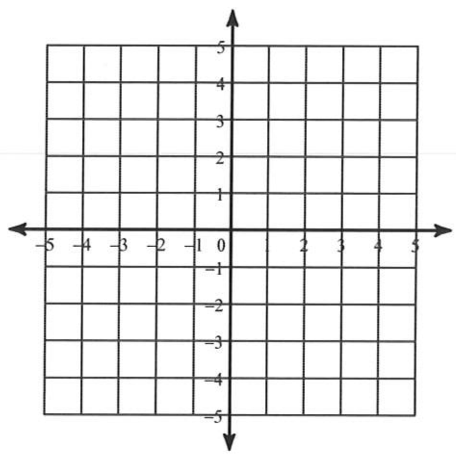
16) $x - 3y = -6$
$2x - y = 3$



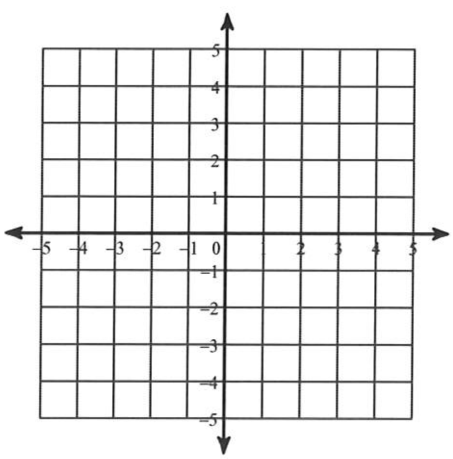
17) $x + 3y = -12$
$5x - 3y = -6$



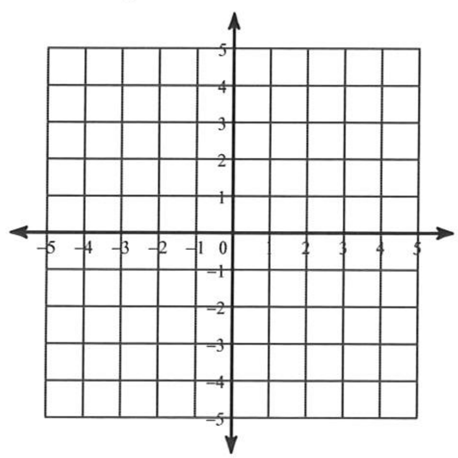
18) $2x + y = -4$
$x + 4y = 12$



19) $x + 2y = 8$
$x - 2y = -4$

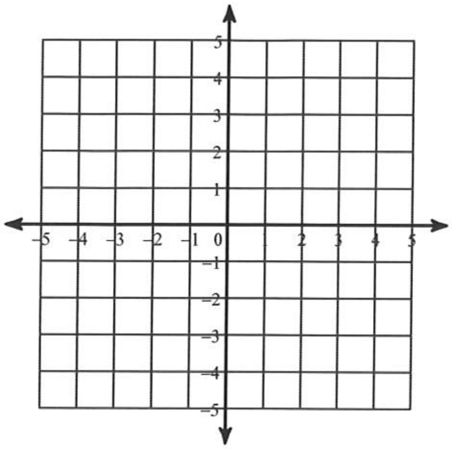


20) $2x + 3y = -12$
$5x - 3y = -9$

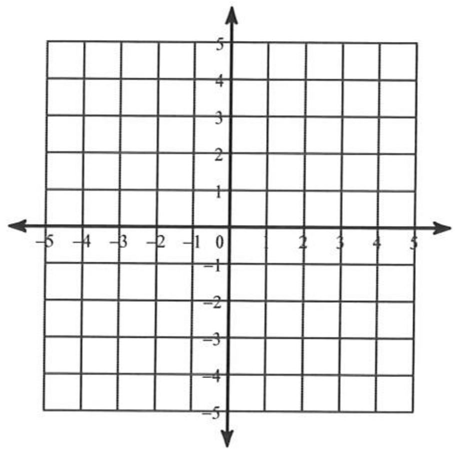


Solve each system by graphing (find the point of intersection of the two lines).

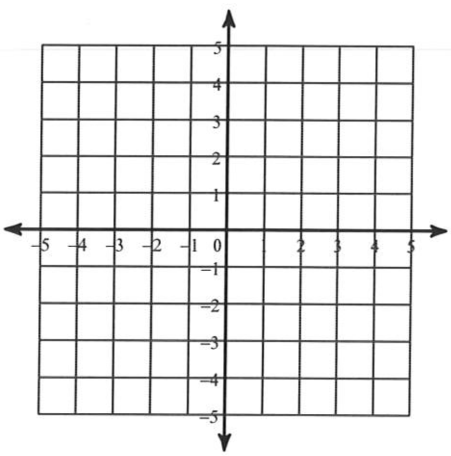
21) $-6x + y = 4$
$-y - 2x = 4$



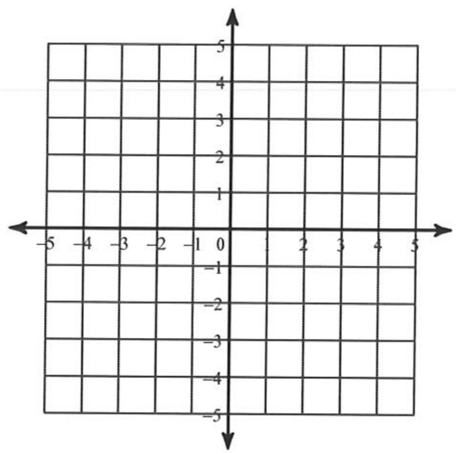
22) $-y - 3 + 4x = 0$
$-4 = -3x - y$



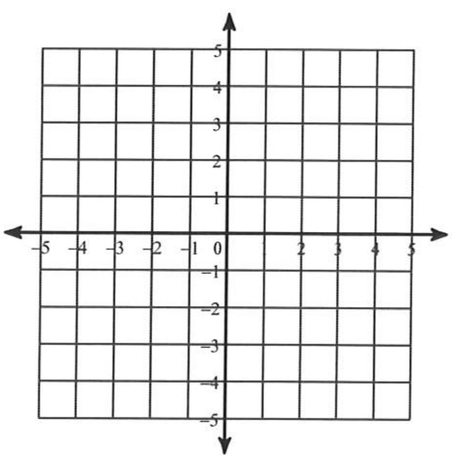
23) $0 = -3x - 4 - 2y$
$2 - \frac{1}{2}x = y$



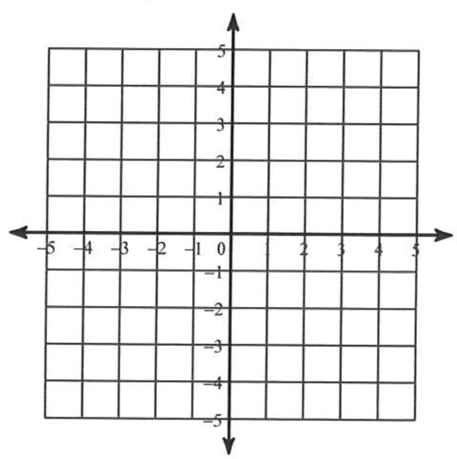
24) $-2x - y = 1$
$-6x = 3y + 3$



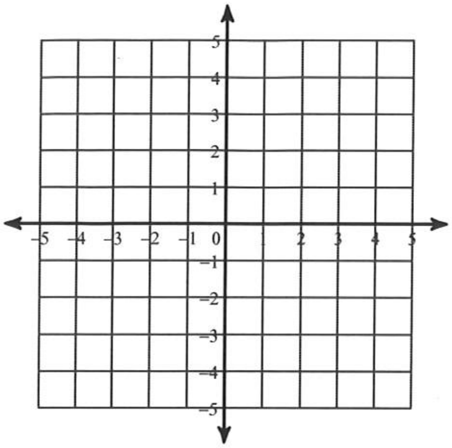
25) $x - 2y + 8 = 0$
$-6 - 2y = -x$



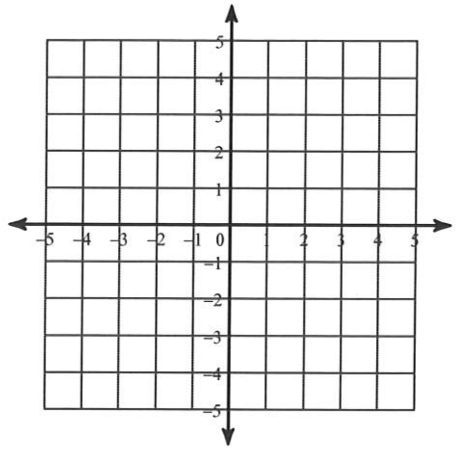
26) $-2y - 5x = 2$
$-5x = 2y - 4$



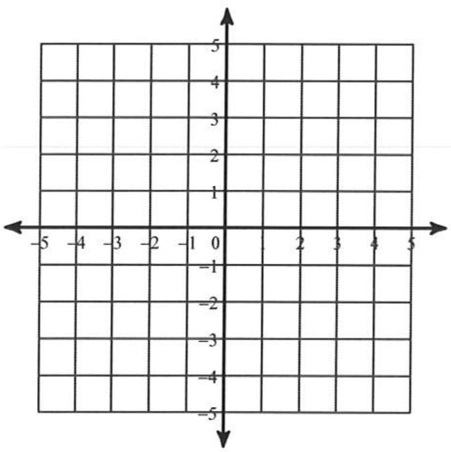
27) $2y + x - 4 = 0$
$2y = -x + 4$



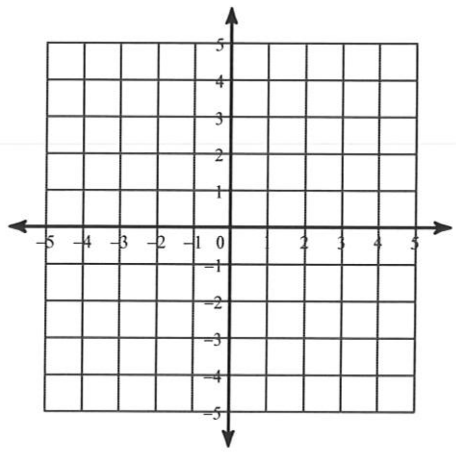
28) $-4 = -2y$
$4 + 6x = -y$



29) $-2x = -8 - 2y$
$-2y - 8 = -2x$



30) $2y + 4 + 3x = 0$
$-2y = 8 + 3x$



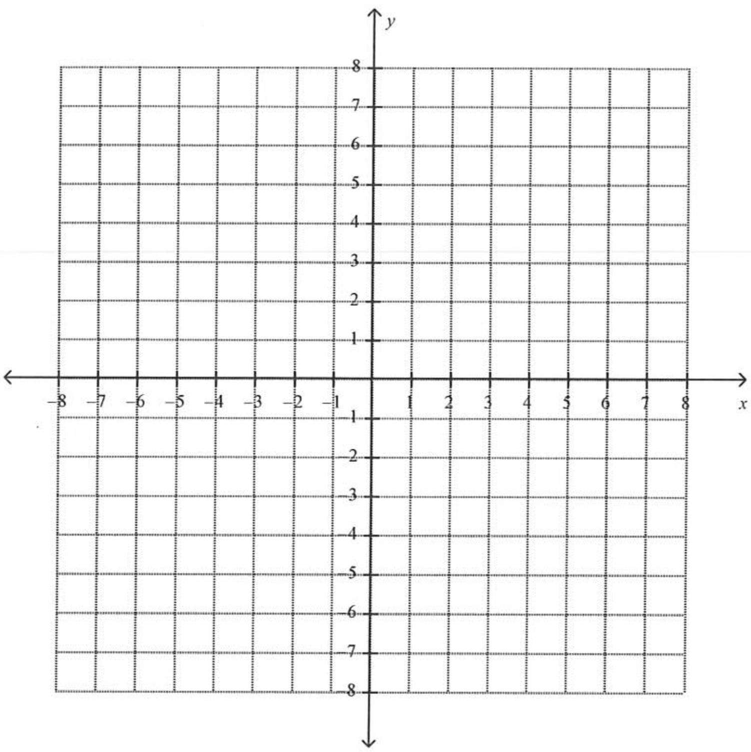
Name: ______________________ **Class:** ____________________

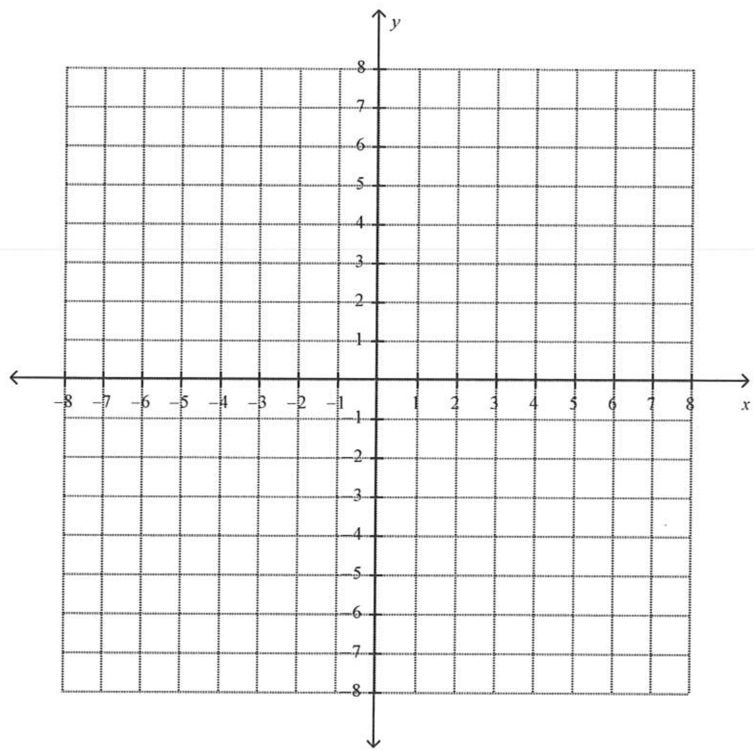
M8-U5: HW #2 – Graphing Systems (Day2) **Date:** ____________________

Graph the two linear equations and find the solution.

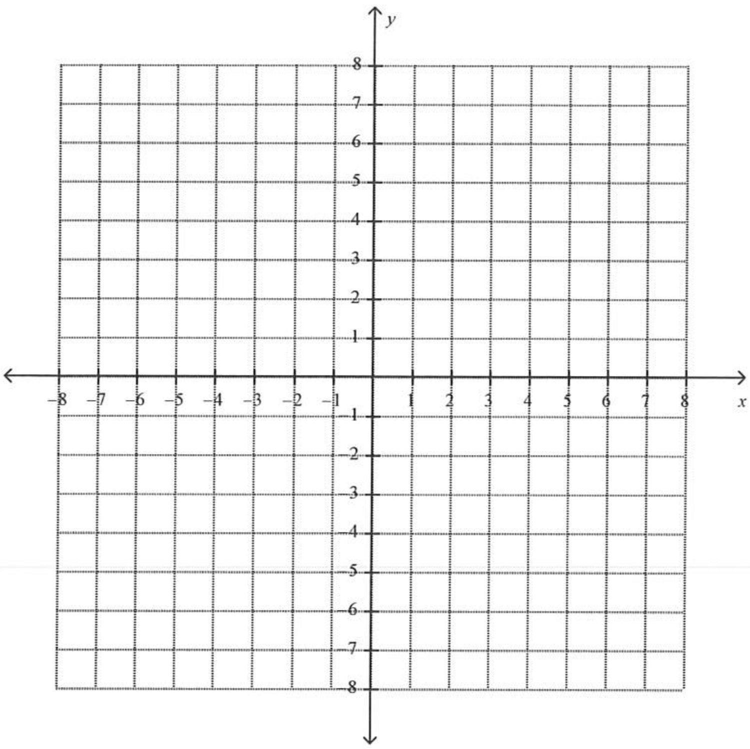
1. $\begin{cases} y = -x + 2 \\ -x + y = -2 \end{cases}$

2. $\begin{cases} y = -\dfrac{1}{4}x - 1 \\ y - 2 = \dfrac{1}{2}x \end{cases}$

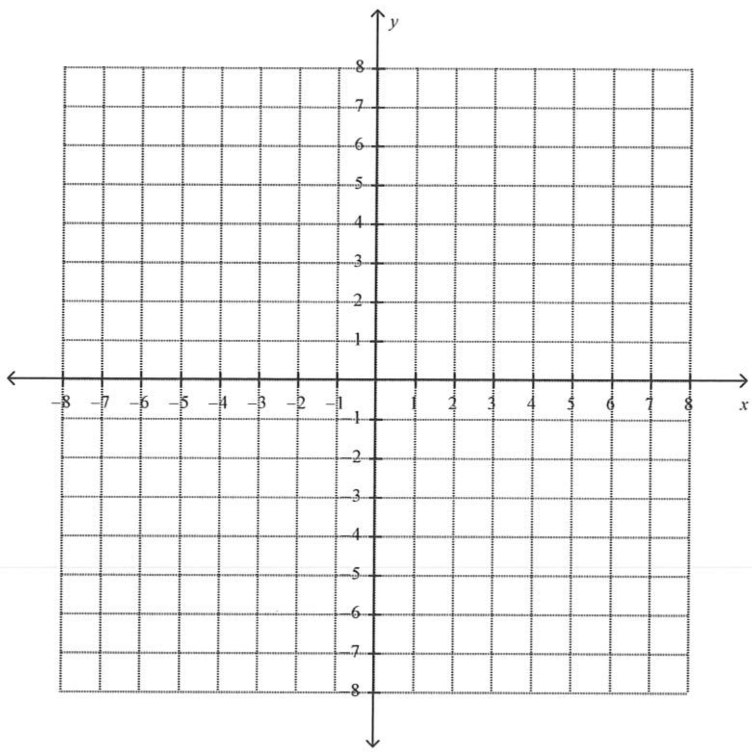




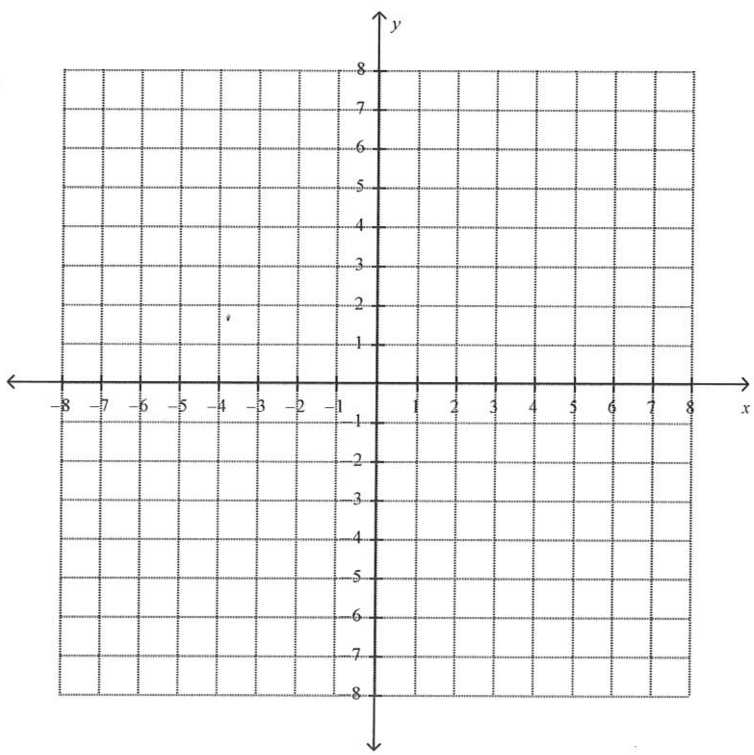
3. $\begin{cases} y = 2x + 6 \\ -2x + y = 6 \end{cases}$



4. $\begin{cases} y - 4 = 2x \\ y - 2x = 4 \end{cases}$

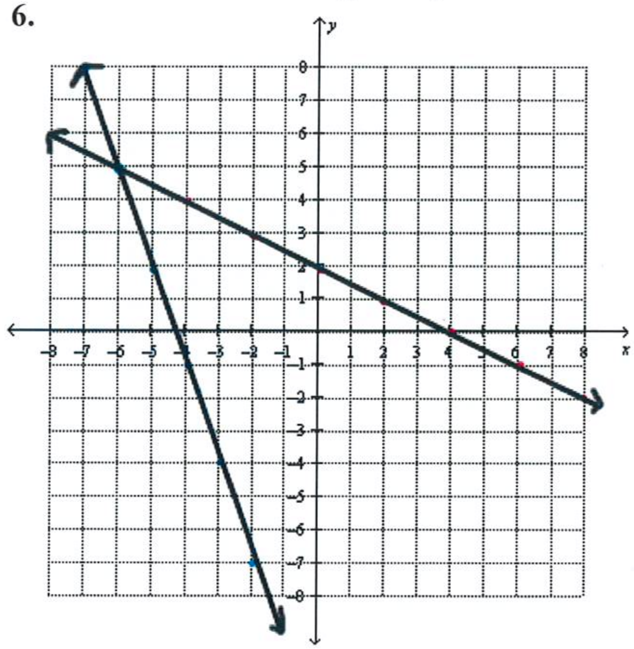


5. $\begin{cases} 2 + y = 2x \\ y - 2x = 5 \end{cases}$

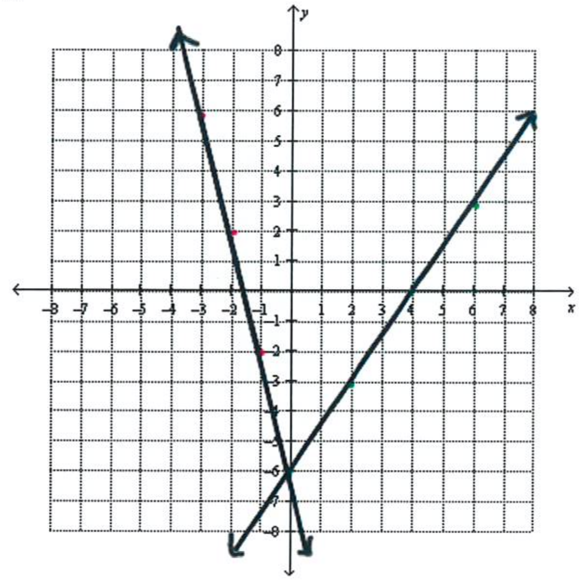


Find the solution to the given systems.

6.



7.



Spiral – Show all work:

Solve the following equations:

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

9. $6(f + 5) = 2(f - 3)$

Name________________ Class____________ Date________

3-3

Solving Systems Graphically

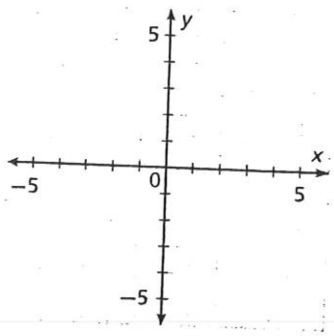
Essential question: *How can you solve a system of equations by graphing?*

COMMON CORE

CC.8.EE.8a
CC.8.EE.8c

1 EXPLORE Investigating Systems of Equations

A Graph the system of linear functions: $\begin{cases} y = 3x - 2 \\ y = -2x + 3 \end{cases}$.



B Explain how to tell whether the ordered pair (2, −1) is a solution of the equation $y = 3x - 2$ without using the graph.

____

____

C Explain how to tell whether the ordered pair (2, −1) is a solution of the equation $y = -2x + 3$ without using the graph.

____

____

D Explain how to use the graph to tell whether the ordered pair (2, −1) is a solution of either equation.

____

____

E Find an ordered pair that is a solution of both equations. Test the coordinates in each equation to verify your hypothesis.

The point ____________ is a solution of both equations.

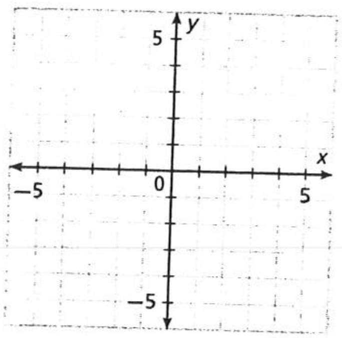
An ordered pair (x, y) is a solution of an equation in two variables if substituting the x- and y-values into the equation results in a true statement. A **system of equations** is a set of equations that have the same variables. An ordered pair is a solution of a system of equations if it is a solution of every equation in the system.

Since the graph of a function represents all ordered pairs that are solutions of the related equation, if a point lies on the graphs of two functions, the point is a solution of both related equations.

2 EXAMPLE Solving Systems Graphically

Solve each system by graphing.

A $\begin{cases} y = -x + 4 \\ y = 3x \end{cases}$



Start by graphing each function.

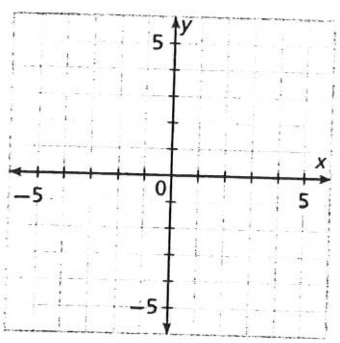
Identify if there are any ordered pairs that are solutions of both equations.

The solution of the system appears to be

______________________________.

To check your answer, you can substitute the values for x and y into each equation and make sure the equations are true statements.

B $\begin{cases} y = 2x - 2 \\ y = 2x + 4 \end{cases}$



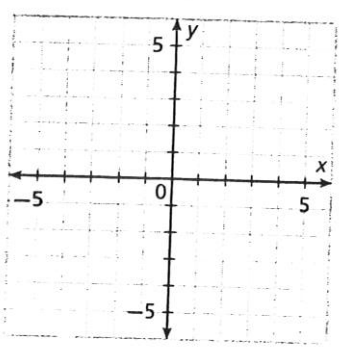
Start by graphing each function.

Identify if there are any ordered pairs that are solutions of both equations.

The graphs are parallel, so there is no ordered pair that is a solution of both equations. The system has

______________________________.

C $\begin{cases} y = 3x - 3 \\ y = 3(x - 1) \end{cases}$



Start by graphing each function.

Identify if there are any ordered pairs that are solutions of both equations.

The graphs overlap, so every ordered pair that is a solution of one equation is also a solution of the other equation. The system has

______________________________.

3 EXAMPLE Solving a Real-World Problem by Graphing

Keisha and her friends visit the concession stand at a football game. The stand charges $2 for a hot dog and $1 for a drink. The friends buy a total of 8 items for $11. Tell how many hot dogs and how many drinks they bought.

A Let x represent the number of hot dogs they bought and y represent the number of drinks they bought.

Write an equation representing the **number of items they purchased.**

Number of hot dogs	+	Number of drinks	=	Total items
	+		=	

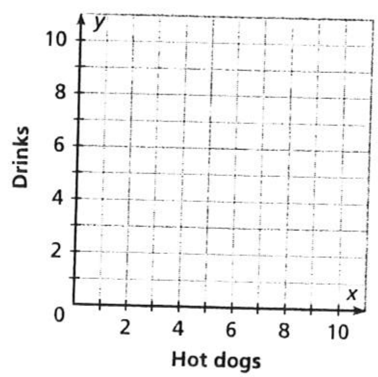
Write an equation representing the **money spent on the items.**

Cost of 1 hot dog times number of hot dogs	+	Cost of 1 drink times number of drinks	=	Total cost
	+		=	

B Write your equations in slope-intercept form.

___

C Graph the solutions of both equations.



D Use the graph to identify the solution of the system of equations. Check your answer by substituting the ordered pair into both equations.

The point ________ is a solution of both equations.

E Interpret the solution in the original context.

Keisha and her friends bought ________ hot dog(s) and ________ drink(s).

REFLECT

3. Conjecture Why do you think the graph is limited to the first quadrant?

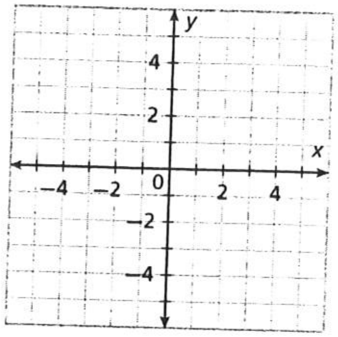
___

___

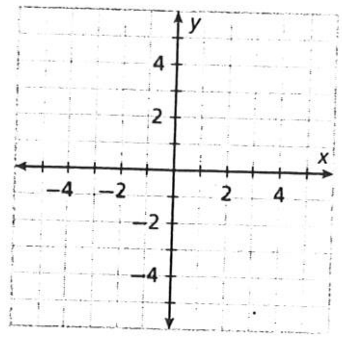
PRACTICE

Solve each system by graphing.

1. $\begin{cases} 2x - 4y = 10 \\ x + y = 2 \end{cases}$ ____________________

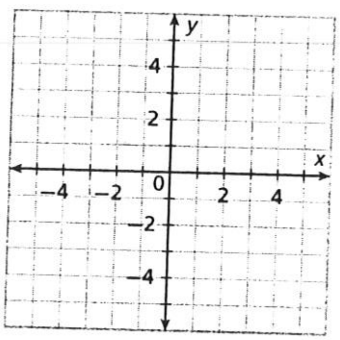


2. $\begin{cases} 2x - y = 0 \\ x + y = -6 \end{cases}$ ____________________



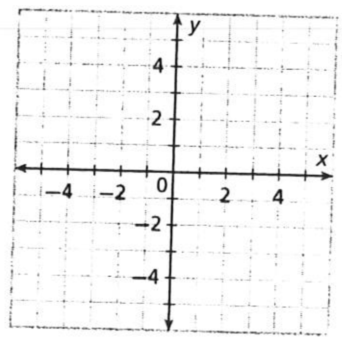
Graph each system and tell how many solutions the system has.

3. $\begin{cases} x - 3y = 2 \\ -3x + 9y = -6 \end{cases}$



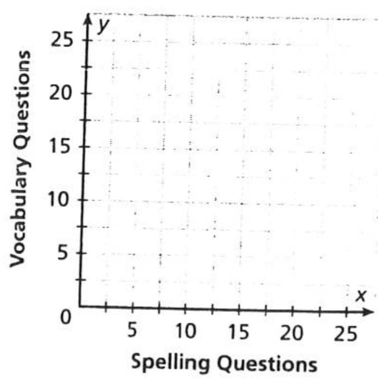
____________________ solutions

4. $\begin{cases} 2x - y = 5 \\ 2x - y = -1 \end{cases}$



____________________ solutions

Mrs. Morales wrote a test with 15 questions covering spelling and vocabulary. Spelling questions (*x*) are worth 5 points and vocabulary questions (*y*) are worth 10 points. The maximum number of points possible on the test is 100.



5. Write an equation in slope-intercept form to represent the number of questions on the test.

____

6. Write an equation in slope-intercept form to represent the total points on the test.

____

7. Graph the solutions of both equations.

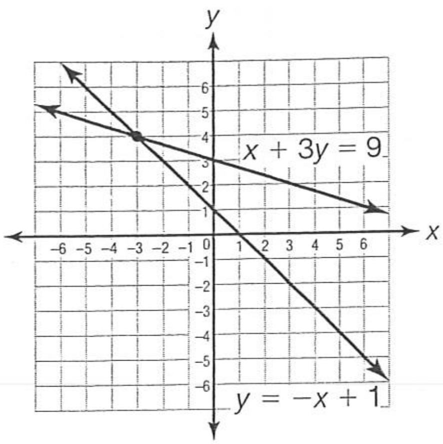
8. Use your graph to tell how many of each question type are on the test.

__________ spelling questions; __________ vocabulary questions

Lesson Practice

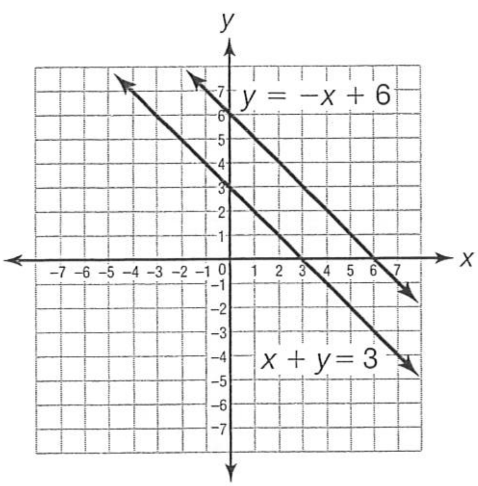
Choose the correct answer.

1. Which is the solution for the system of linear equations graphed below?



A. (−4, 3)
B. (0, 1)
C. (0, 3)
D. (−3, 4)

2. Which best describes the solution for the system of linear equations graphed below?

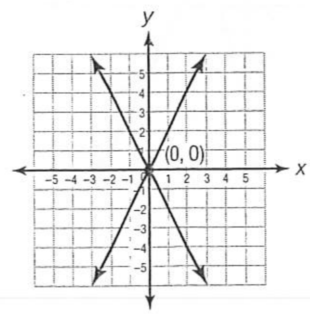


A. (3, 0) only
B. (6, 0) only
C. no solution
D. infinitely many solutions

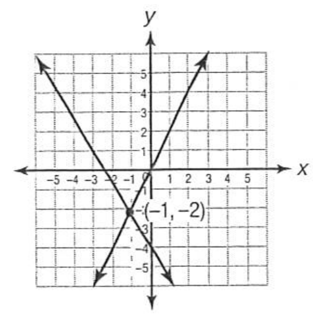
3. Which shows the solution for the following system of equations?

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

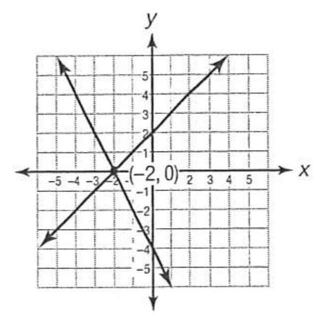
A.



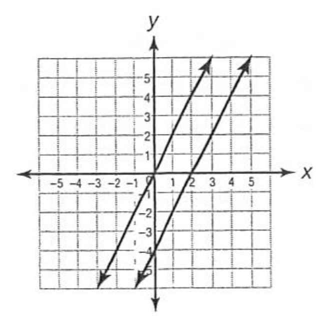
B.



C.



D.

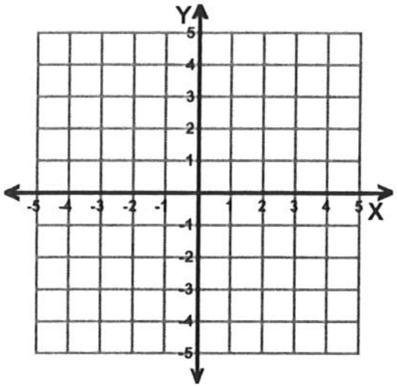


Name : ______________________ Score : __________

Teacher : ______________________ Date : __________

Solve each system by graphing. Quiz

1)

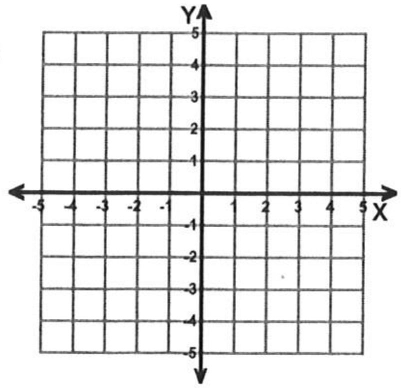


$y = -2x + 2$

$y = \frac{1}{3}x - 5$

____

2)

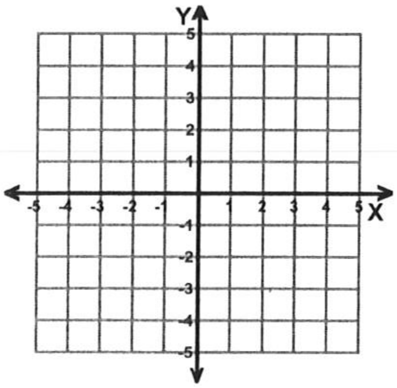


$-x + 3y = -6$

$-5x + 3y = 6$

____

3)

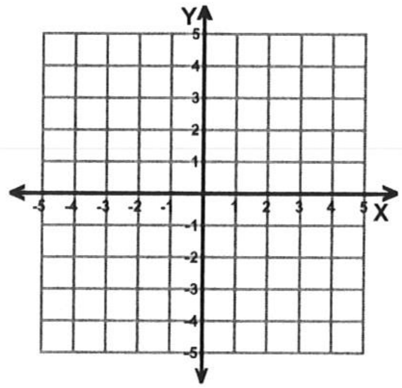


$-x + 3y = 6$

$4x + 3y = -9$

____

4)

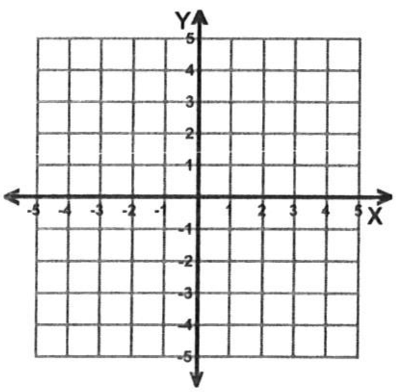


$5x + 3y = 12$

$-x + 3y = -6$

____

5)

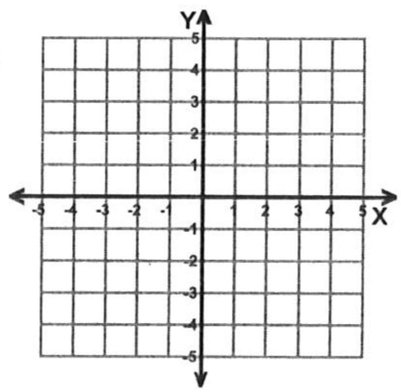


$y = \frac{5}{2}x - 4$

$y = -x + 3$

____

6)

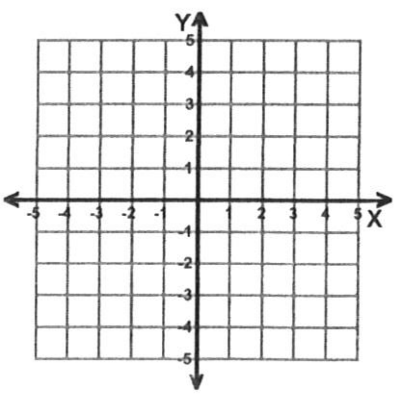


$-5x + 2y = 6$

$-x + 2y = -2$

____

7)

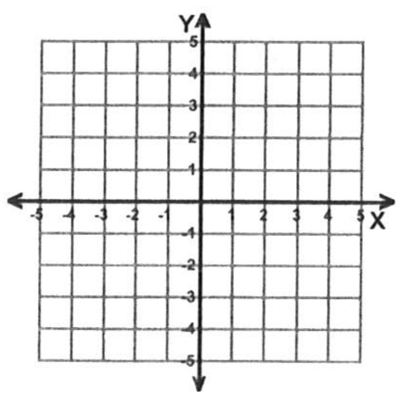


$y = \frac{1}{3}x + 2$

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

____

8)



$y = -\frac{4}{9}x - 3$

$y = -\frac{7}{5}x - 3$

____

Name: ______________________________ **Class:** ______________

M8-U5: Notes #4 - Solving by Substitution **Date:** ______________

Warm-Up:
Solve this system of equations algebraically.

a. $\begin{cases} y = -2x - 7 \\ y = 2x + 17 \end{cases}$

b. $\begin{cases} x = -4y + 1 \\ x = y - 4 \end{cases}$

Substitution Method:
The substitution method is another method for solving systems of equations.

1. $\begin{cases} y = x - 2 \\ 2x + 2y = 4 \end{cases}$

2. $\begin{cases} x = -4y - 4 \\ 3x + 5y = 2 \end{cases}$

Try It!

a. $\begin{cases} y = -2x - 1 \\ x - 2y = 12 \end{cases}$

b. $\begin{cases} -3x - 7y = 1 \\ y = -2x + 3 \end{cases}$

Special Cases

3. $\begin{cases} y = -3x + 4 \\ 6x + 2y = 7 \end{cases}$

4. $\begin{cases} y = 3x - 6 \\ -3x + y = -6 \end{cases}$

Try It!

Solve the following system:

$$\begin{cases} y = 2x - 5 \\ -2x + y = 7 \end{cases}$$

Practice: Solve the following systems.

1. $\begin{cases} 3x - y = 30 \\ y = -x + 14 \end{cases}$

2. $\begin{cases} x = -6y + 15 \\ -x + 4y = 5 \end{cases}$

3. $\begin{cases} y = \frac{1}{2}x + 2 \\ x - 2y = -4 \end{cases}$

Name: ______________________________ Core: ________________

Solving Systems of Equations through Substitution

Directions: Solve each system using substitution. Write no solution or infinitely many solutions where applicable. Show all your work to receive credit.

1. $y = x-9$

   $2x+5y = 4$

2. $4x+2y = 0$

   $y = 1/2x-5$

3. $y = 2x-4$

   $7x-2y = 5$

4. $-4x+y = 3$

   $5x-2y = -9$

5. $y = 4x-2$

   $y = 4x+1$

6. $y = x+3$

   $y = 5x-5$

Name: ______________________ **Class:** __________________

M8-U5: HW #4 – Solving Systems Using Substitution **Date:** __________________

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

1. $\begin{cases} y = x + 4 \\ y = 3x \end{cases}$

2. $\begin{cases} x = -2y + 1 \\ x = y - 5 \end{cases}$

3. $\begin{cases} y = 5x + 5 \\ y = 15x - 1 \end{cases}$

4. $\begin{cases} y = x - 7 \\ 2x + y = 8 \end{cases}$

5. $\begin{cases} y = 3x - 6 \\ -3x + y = -6 \end{cases}$

6. $\begin{cases} x + 2y = 200 \\ x = y + 50 \end{cases}$

7. $\begin{cases} 2x + y = 3 \\ y = 2x + 1 \end{cases}$

8. $\begin{cases} y = \dfrac{3}{2}x \\ 6x - 4y = 1 \end{cases}$