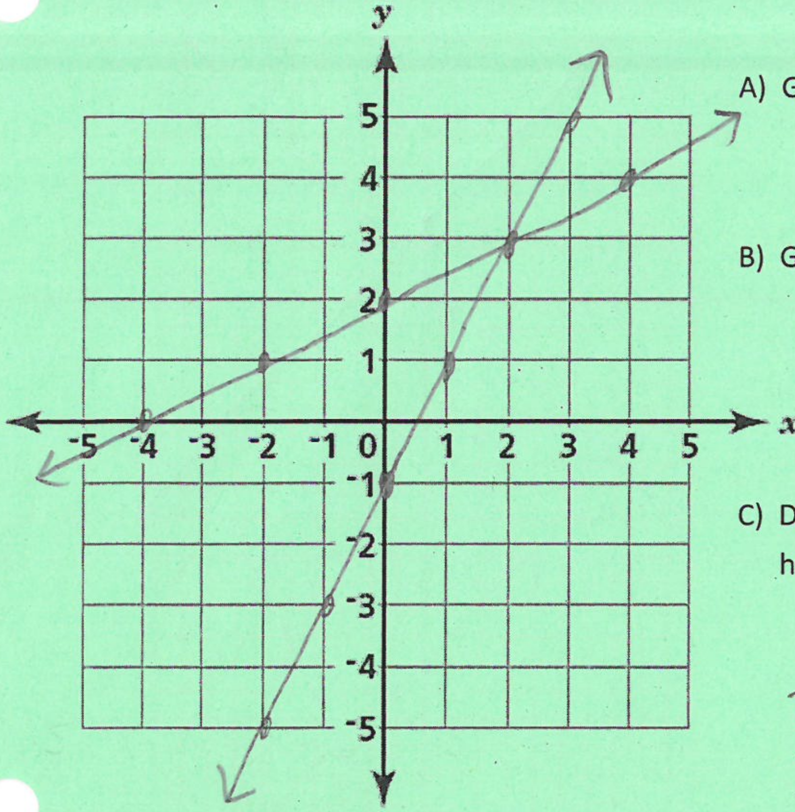
Unit 2 2.2 Name: Key

Systems of Equations: Solve by Graphing



A) Graph the equation $y = 2x - 1$ on the grid.

B) Graph the equation $y = \frac{1}{2}x + 2$ on the same grid.

C) Do the equations $y = 2x - 1$ and $y = \frac{1}{2}x + 2$ have any solutions in common? How do you know?

yes, the point (2,3)

$3 = 2(2) - 1$ & $3 = \frac{1}{2}(2) + 2$

$3 = 3$ $3 = 3$

A set of two or more equations is called a **system of equations**. A solution of a system is an **ordered pair** that satisfies both equations.

Examples:

1. Which ordered pair(s) is/are a solution(s) to $-8x + 6y = 12$?
   a. $(6, -10)$ b. $(0,2)$ c. $(-9, -10)$ d. $(14,9)$

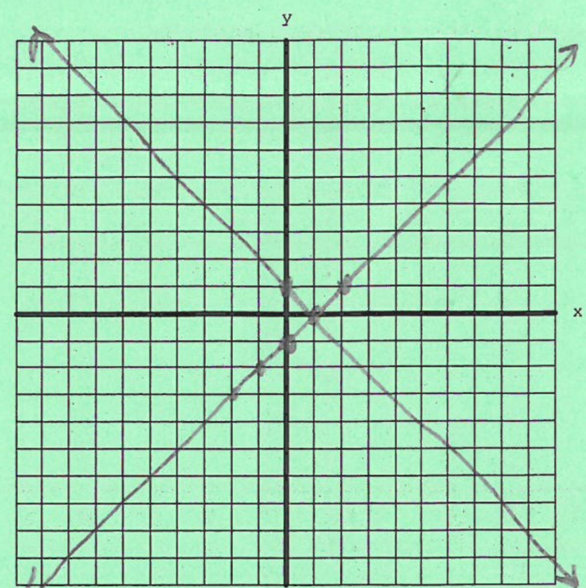
2. Which ordered pair(s) is/are a solution(s) to $4x - 5y = 30$?
   a. $(20,10)$ b. $(10, -14)$ c. $(2,2)$ d. $(-6,0)$

3. Which ordered pair(s) is/are a solution(s) to $4x - y = 9$?
   a. $(-10,9)$ b. $(2, -1)$ c. $(-5, -2)$ d. $(7,22)$

Problem Set 1: Use the graph to determine the solution to the system of equations

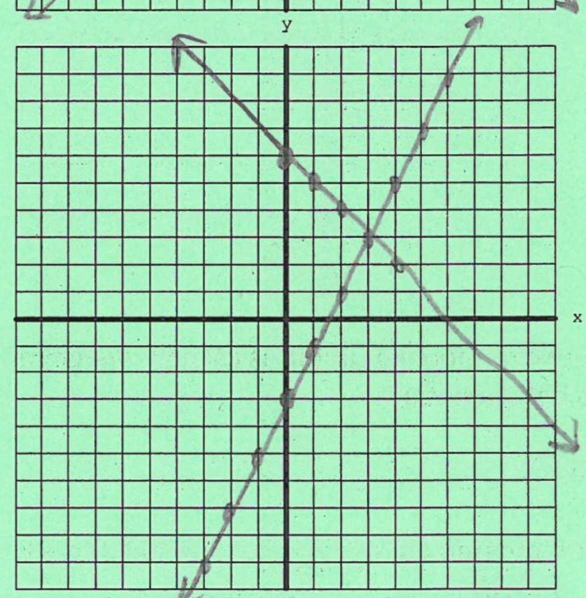
A. $\begin{cases} y = x - 1 \\ y = -x + 1 \end{cases}$

(1,0)



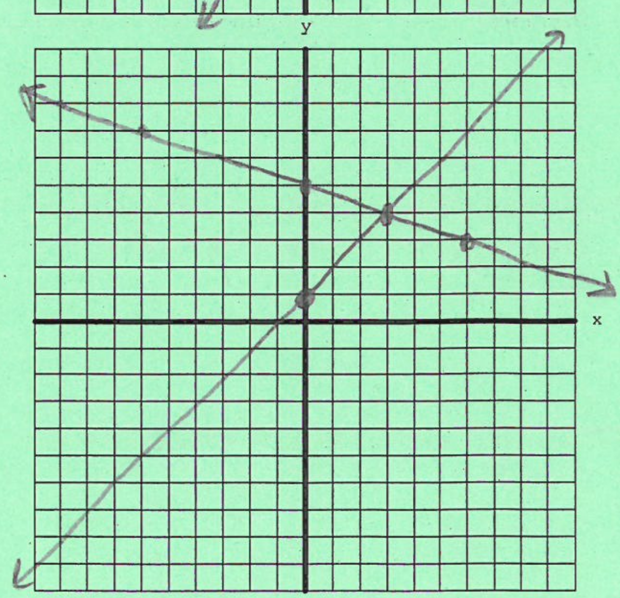
B. $\begin{cases} y = 2x - 3 \\ y = -x + 6 \end{cases}$

(3,3)



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

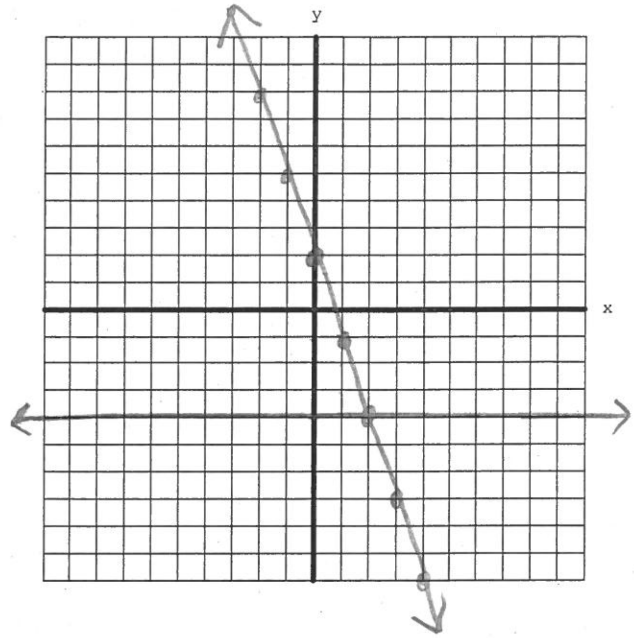
(3,4)



Problem Set 2: Graph each system of equations to determine the solution.

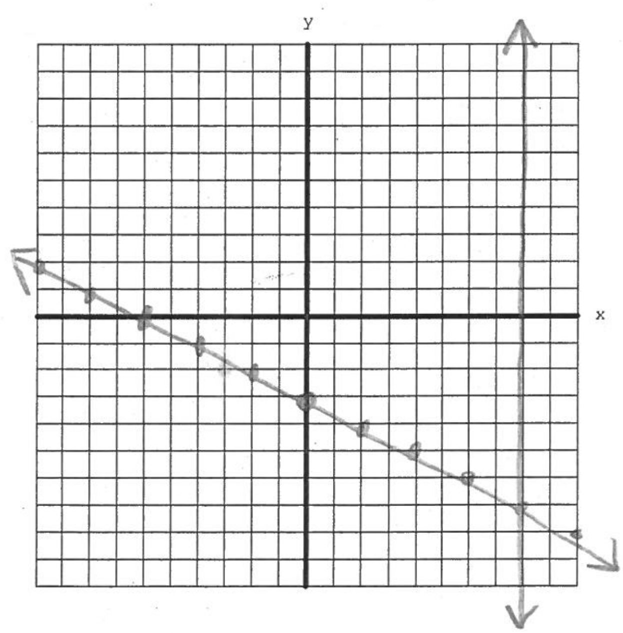
A. $\begin{cases} y = \cancel{2x} - 4 \\ y = -3x + \cancel{1}\ 2 \end{cases}$

(2, -4)



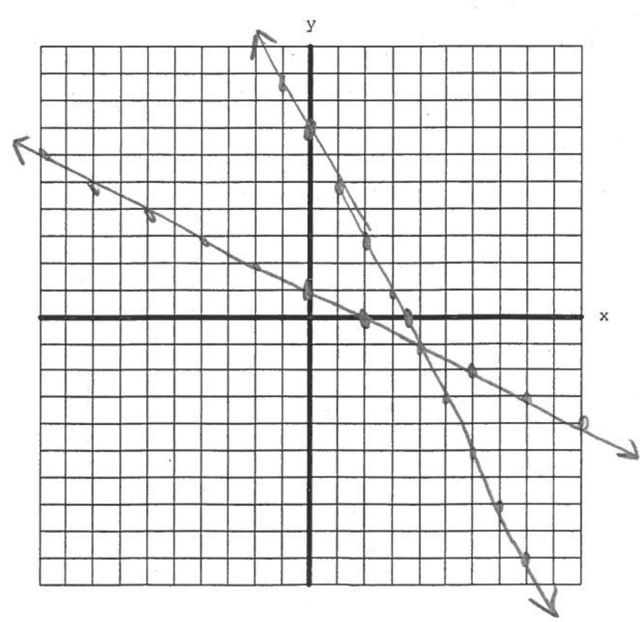
B. $\begin{cases} \cancel{y = \frac{1}{2}x + 1} & x = 8 \\ 2x + 4y = -12 \end{cases}$

(8, -7)



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

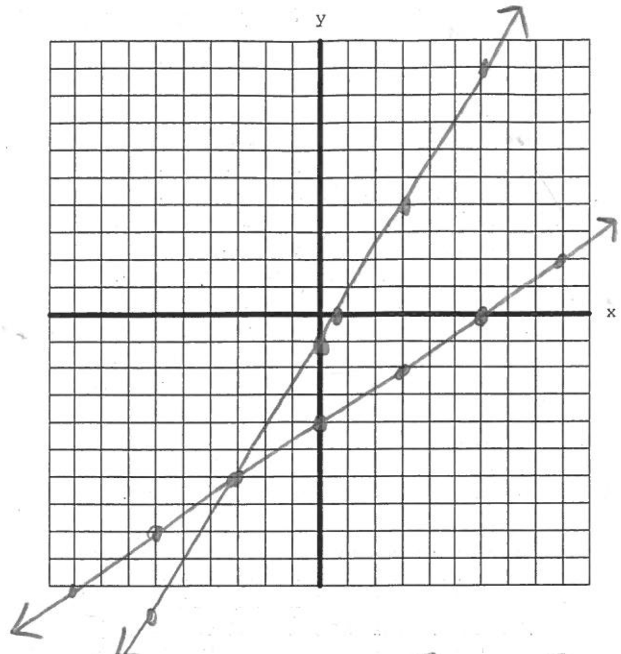
(4, -1)



Problem Set 3: Graph each system of equations to determine the solution.

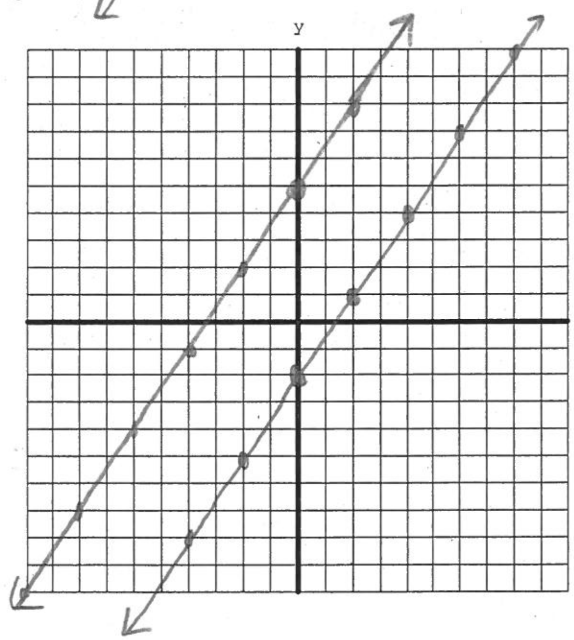
A. $\begin{cases} 2x - 3y = 12 \\ 10x - 6y = 6 \end{cases}$

(-3, -6)



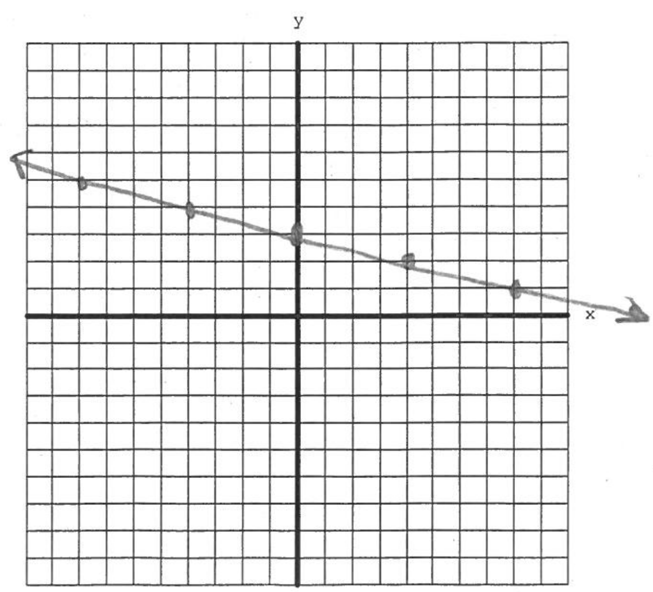
B. $\begin{cases} y = \frac{3}{2}x + 5 \\ y = \frac{3}{2}x - 2 \end{cases}$

no solution



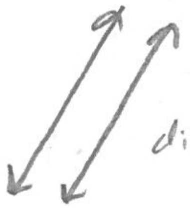
C. $\begin{cases} x + 4y = 12 \\ y = -\frac{1}{4}x + 3 \end{cases}$ > same line

infinite solutions



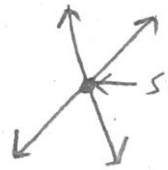
A system of two linear equations can have no, one, or an infinite number of solutions:

No Solution: parallel lines



same slope
different y-int

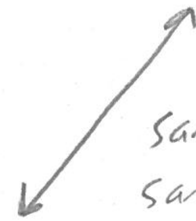
One Solution: intersecting lines



solution
(x,y)

different slopes

Infinite Solutions: same lines



same slope
same y-int

Consider the equation y = 5x – 3 . Write a second equation that would create a system with...

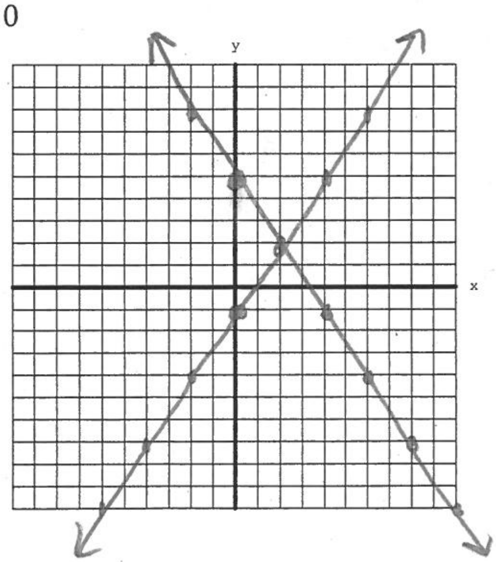
A) zero solutions $y = 5x + 2$ $m = 5$ $b \neq -3$

B) one solution $y = 5/2\,x - 3$ $m \neq 5$

C) infinite solutions $2y = 10x - 6$ another version of the same line

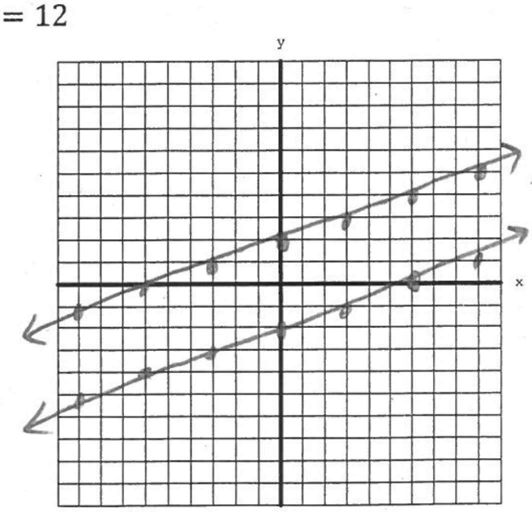
Extra Practice

1. $\begin{cases} y = \frac{3}{2}x - 1 \\ 3x + 2y = 10 \end{cases}$



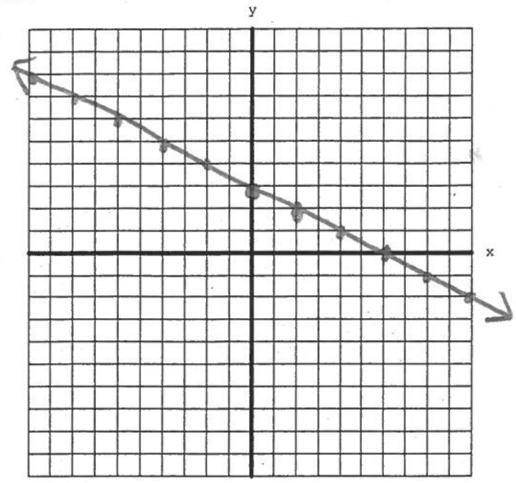
(2,2)

2. $\begin{cases} y = \frac{1}{3}x + 2 \\ 2x - 6y = 12 \end{cases}$



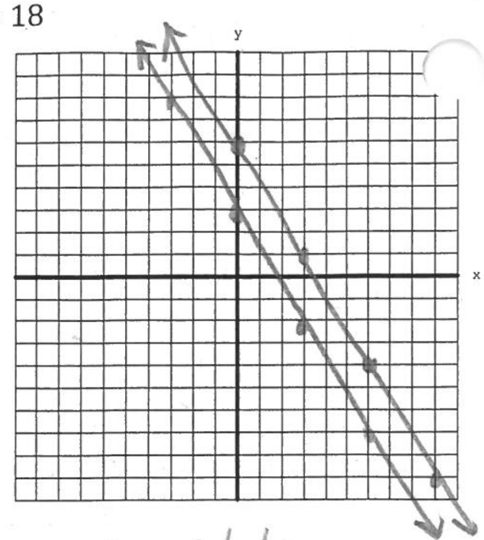
no solution

3. $\begin{cases} y = -\frac{1}{2}x + 3 \\ 2x + 4y = 12 \end{cases}$ > same line



Infinite Solutions

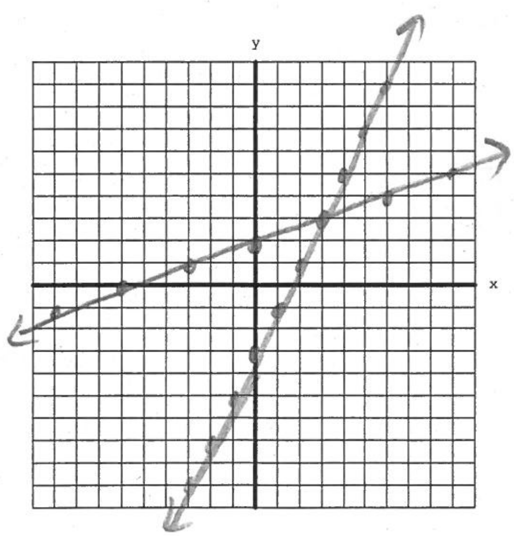
4. $\begin{cases} y = -\frac{5}{3}x + 6 \\ 10x + 6y = 18 \end{cases}$



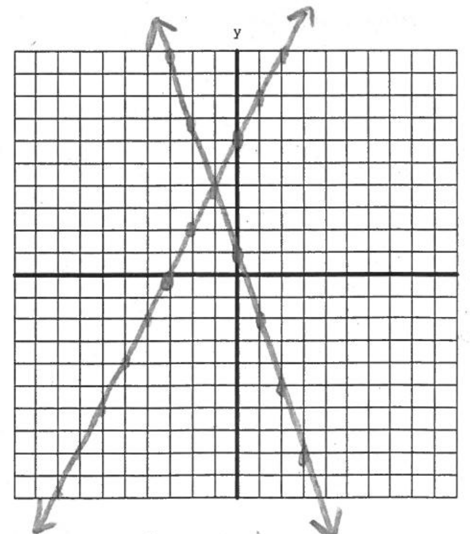
no solution

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

(3,3)



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



(-1,4)