Day 1: Systems

A-Day March 16, 2020

B-Day March 17, 2020

Standards	**A1.AREI.6*** Solve systems of linear equations algebraically and graphically focusing on pairs of linear equations in two variables. **A1.AREI.11*** Solve an equation of the form f(x)=g(x) graphically by identifying the x- coordinate(s) of the point(s) of intersection of the graphs of y=f(x) and y=g(x). (Limit to linear; quadratic; exponential)
Learning Targets/I Can Statements	I can determine the intersection point of two lines from a graph. I can understand that systems of equations have one, zero, or infinite solutions.
Essential Question(s)	How I determine the intersection point of two linear equations by graphing? How can I determine the number of solutions when given a system of equations?
Resources	https://www.khanacademy.org/math/algebra-basics/algbasics-systems-of-equations http://crctlessons.com/systems-of-equations-game.html https://www.desmos.com/calculator
Learning Activities or Experiences	1st: Recall questions (attached) 2nd: Watch the Khan Academy video (link above) system of linear equation basics and number of solutions to systems of equations Alternative: Notes on systems on linear equations (Solutions and graphing) 3rd: System of linear equations game 4th: Assignment

Recall Questions

1. How many solutions are there for the following equation $3x + 8 = 6x - 3$?

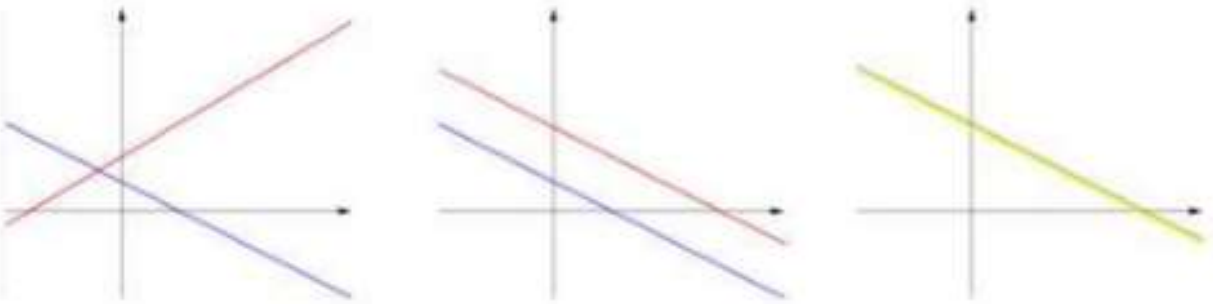
2. How many solutions are there for the following equation $2(x + 3) = 5X - 3X + 3$?

3. How many solutions are there for the following equation $\frac{4X-6}{2} = 2X - 3$?

4. What is the solution: $-3x + 7x + 4 = 4x - 10$

5. What is the solution: $\frac{2x-3}{4} = \frac{3x+1}{3}$

Systems of Linear Equations



System of Linear Equations: is a collection of two or more equations.

Number of solutions

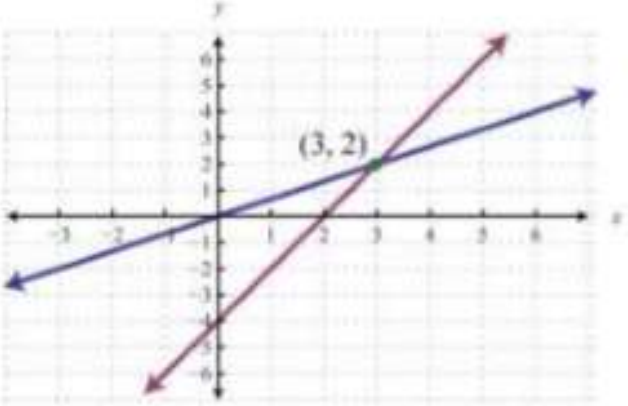
We will be looking at two ways to find the number of solutions to a system of linear equations.

1st : We will be looking at graphs of systems of linear equations.

2nd: We will be looking at linear equations:

One solution

There is one solution when the graphs intersect at a given point.

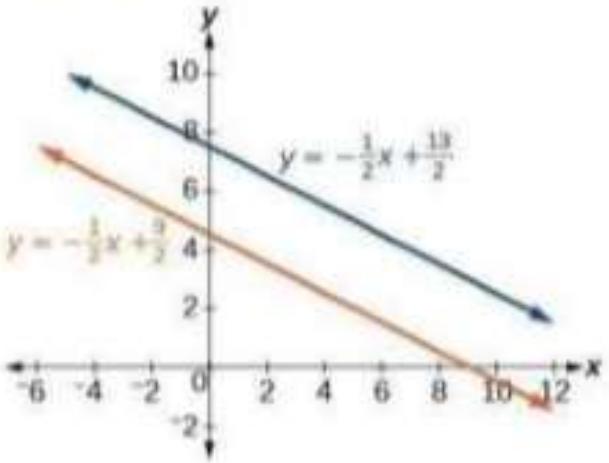


When equations are in slope intercept form, the linear equations will have different slopes.

Ex: $y = 2x + 3$ and $y = 3x - 4$

No solution

There is no solution when the lines are parallel.

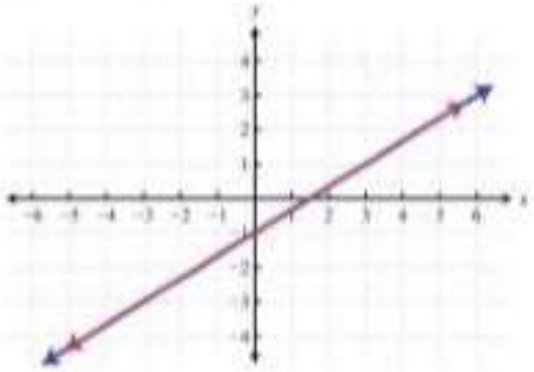


When equations are in slope intercept form, the linear equations will have the same slope but different y intercepts.

Ex: $y = -3x + 2$ and $y = -3x - 3$

Infinite solution

When only one line appears on a graph, there is infinite solutions (many). The lines will overlap each other



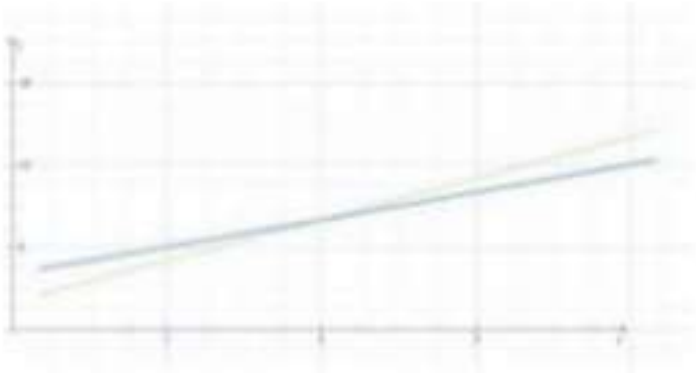
When equations are in slope intercept form, the linear equations have the same slopes and the same y intercepts.

Ex: $y = -5x + 4$ and $y = 4 - 5x$

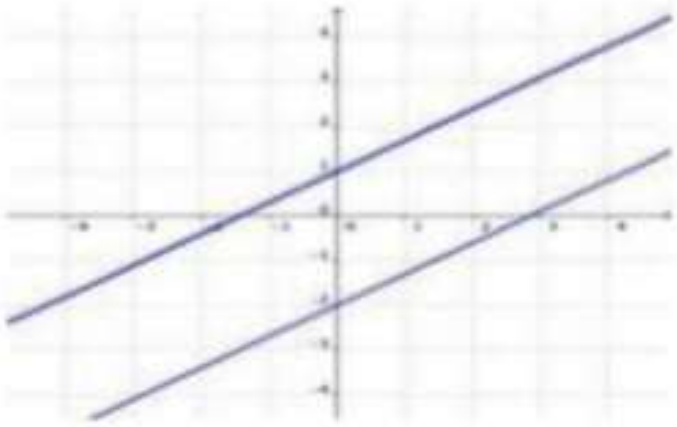
Your Turn: Tell how many solutions to the system of linear equations.

1. $Y = -3x + 5x$ and $3x + y = 10$
2. $Y = \frac{1}{2}x + 4$ and $x - 2y = -8$
3. $3x - 2y = 10$ and $y = 2/3x + 12$

4.

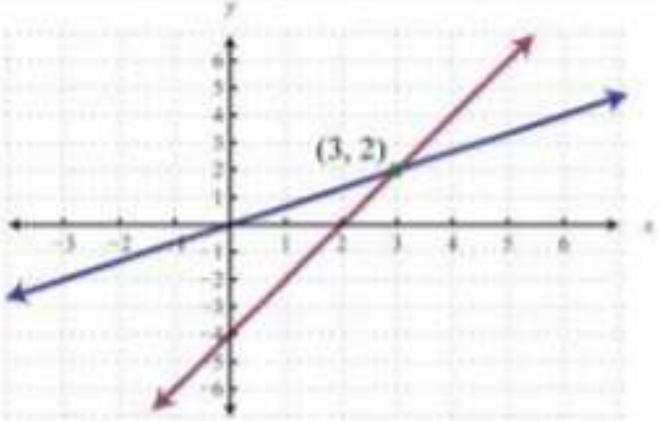


5.



Solutions of linear equations by graphing

The intersections of linear equations is the solution.



The solution to the above system of linear equations is (3,2).

System of Linear equations

Algebraically

The coordinate that satisfies both equations is the solution to the system of equations.

Ex: $3x + 3y = 9$ and $y = 2x - 3$ (2, 1)

$3(2) + 3(1) = 9$ $(1) = 2(2) - 3$

$6 + 3 = 9$ $1 = 4 - 3$

Ex: $-2x + 5y = 10$ and $4x + y = 12$ (0, 2)

$-2(0) + 5(2) = 10$ $4(0) + 2 = 12$

$0 + 10 = 10$ $0 + 2 = 12$

This is not a solution because it didn't satisfy both equations?

Your turn:

1. Is (-3,4) a solution to the system of equations?

   $y - x = -7$ and $2x - 2y = -14$

2. Is (2, 3) a solution to the system of equations?

   $Y = x + 1$ and $2y = 3x$