There are 3 different ways to solve a system of linear equations: graphing, substitution, and linear combinations.

Systems of Linear Equations

Today, we will talk about graphing SOLVE SYSTEMS BY GRAPHING

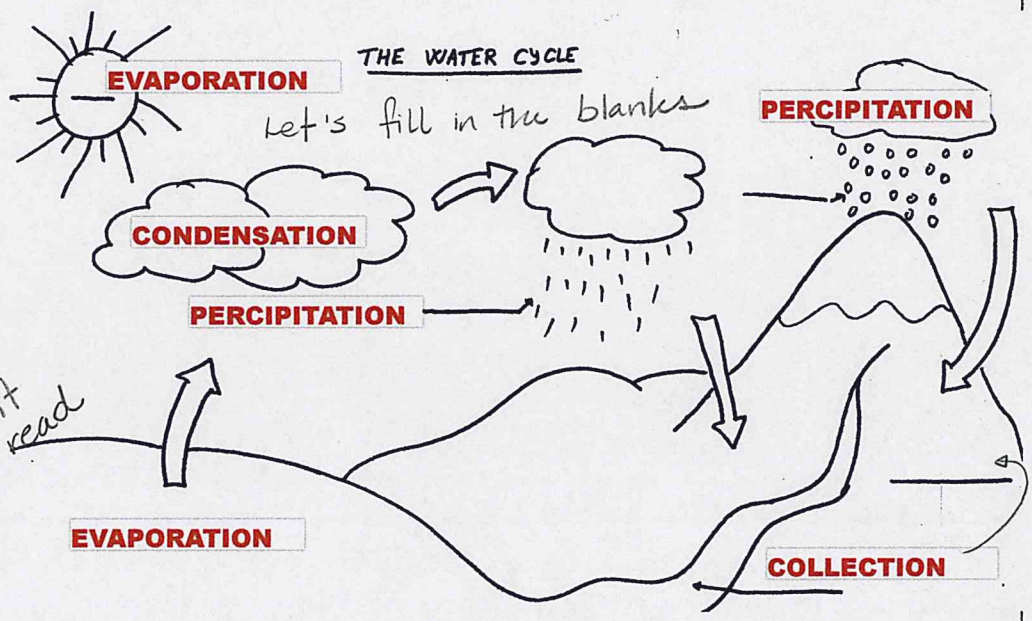
*Ask a student to read.

Objectives:

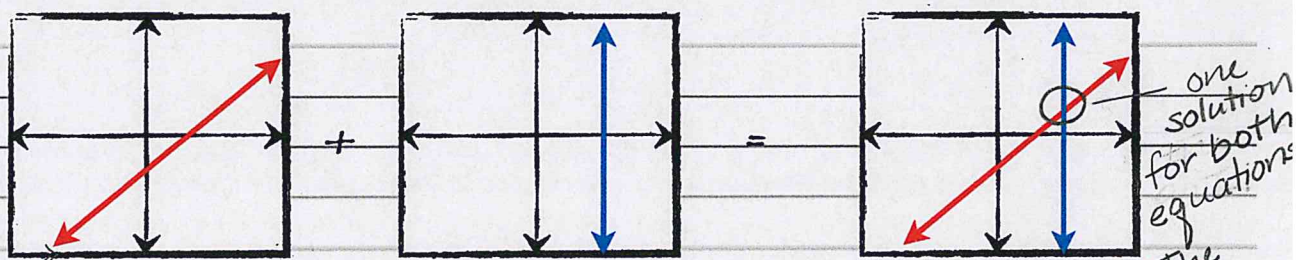
1. After this lesson I will be able to solve a system of equation by graphing.
2. After this lesson I will be able to identify the number of solutions a system of equation has, by graphing.

So what is a system and why is it messing with our linear equations?

A system is when many things work together. We see examples of systems ALL THE TIME in science class! The WATER CYCLE is a system because * Ask a student to read everything has to work together!



A system of linear equations is when two lines "work together" or touch when graphed on the same coordinate plane.



If they do "touch", the point[s] at which they touch are the solution[s]: The POI

All the points on this line are a solution for the equation.

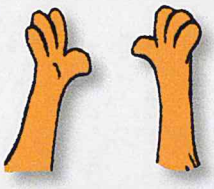
(x , y)

Graph each line on the same coordinate plane.

Systems of Linear Equations

Keep in mind, **SYSTEMS OF LINEAR EQUATIONS** allow for us to evaluate two linear equations at the same time!!!

Remember how we found out how many solutions a system had by using our arms?



inconsistent solutions

parallel lines never touch so no solution

NONE

consistent

lines intersect once so they have one solution.

ONE

lines are the same infinite pts of intersection

INFINITE

means infinite solutions

PRACTICE: Use the graph to the right to determine whether the system of linear equations has NONE, ONE, or INFINITE solutions.

I Do

① $y = -x - 3$

$y = x - 1$

ANSWER: **ONE**

(-1, -2)

We Do

② $2x + 2y = -6$

$y = -x - 3$

the same line

ANSWER: **INFINITE**

We Do

③ $y = -x - 3$

$2x + 2y = 4$

ANSWER: **NONE**

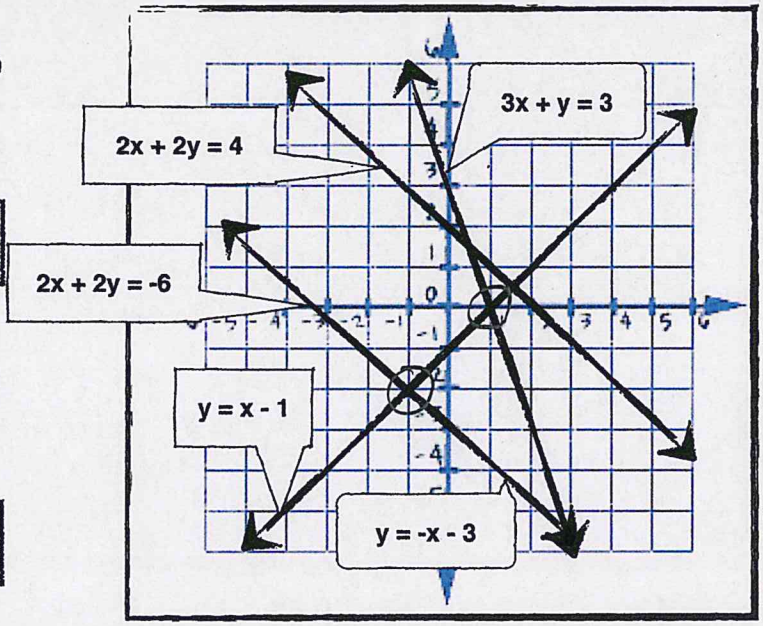
Parallel lines

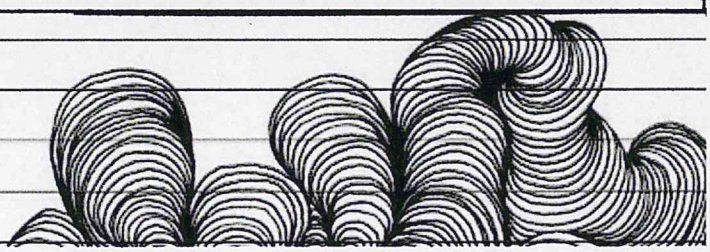
You Do

④ $2x + 2y = -6$

$3x + y = 3$

ANSWER: **ONE**





Sometimes they will make us graph our own linear equations to discover how many solutions the system has.

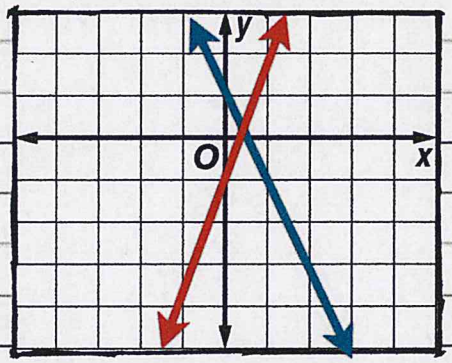
PRACTICE

I DO

⑤ $y = -2x + 1$

$y = 3x - 1$

let each square = 1 unit

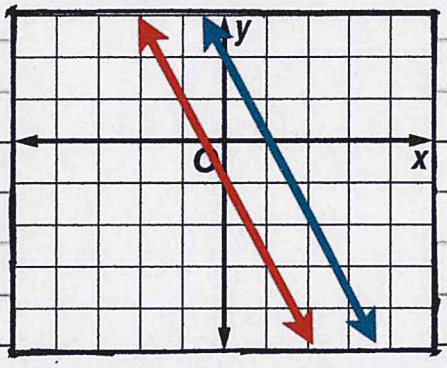


ANSWER: **ONE**

We DO

⑥ $y = -2x - 1$

$y = -2x + 2$

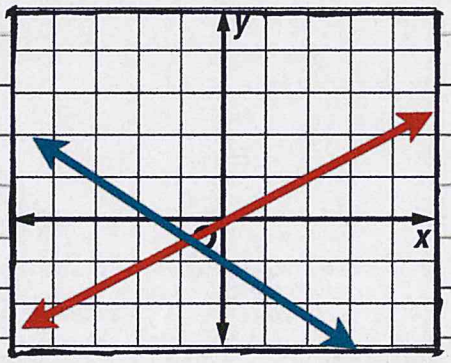


ANSWER: **NONE**

You DO

⑦ $y = \frac{1}{2}x + 0$

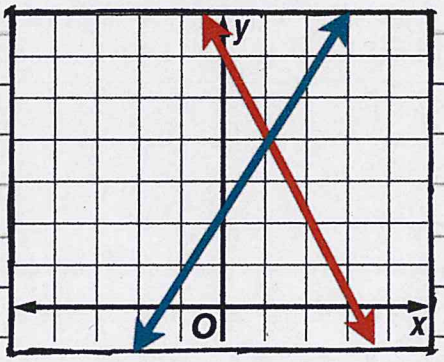
$y = -\frac{2}{3}x - 1$



ANSWER: **ONE**

⑧ $y = -2x + 6$

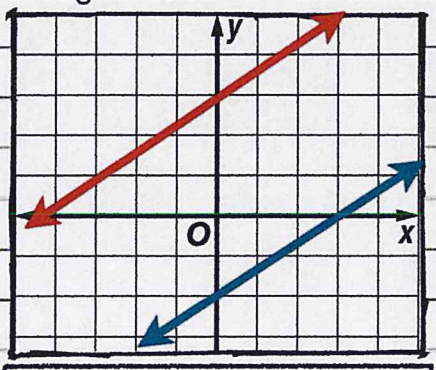
$y = 2x + 2$



ANSWER: **ONE**

⑨ $y = \frac{2}{3}x + 3$

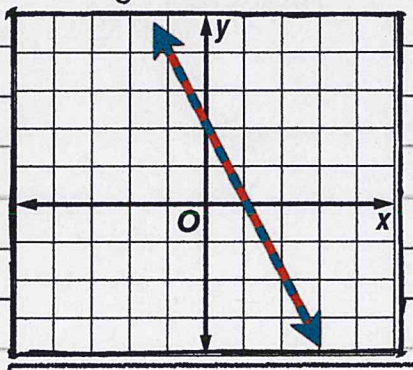
$y = \frac{2}{3}x - 2$



ANSWER: **NONE**

⑩ $y = -2x + 2$

$y = -2x + 2$



ANSWER: **INFINITE**

* Homework

Practice on your own:
Graphing Systems of Linear Equations

NAME:

Use the graph below to determine whether the system of linear equations has NONE, ONE, or INFINITE solutions.

① $y = -x + 2$
$y = x + 1$

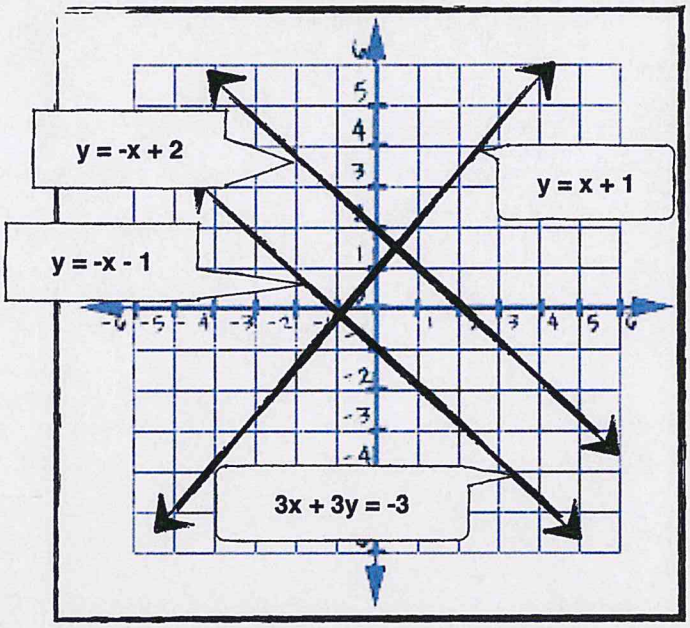
ANSWER: ONE

② $y = -x + 2$
$3x + 3y = -3$

ANSWER: NONE

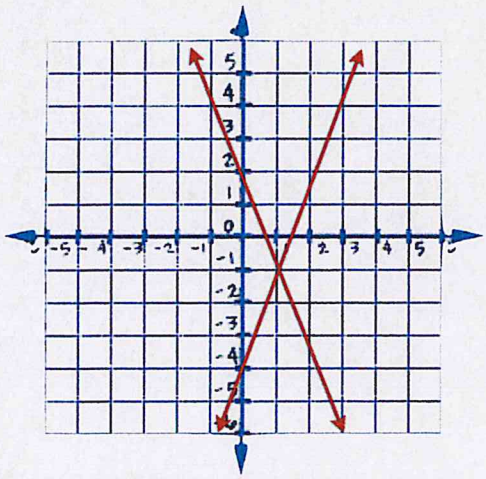
③ $3x + 3y = -3$
$y = -x - 1$

ANSWER: INFINITE



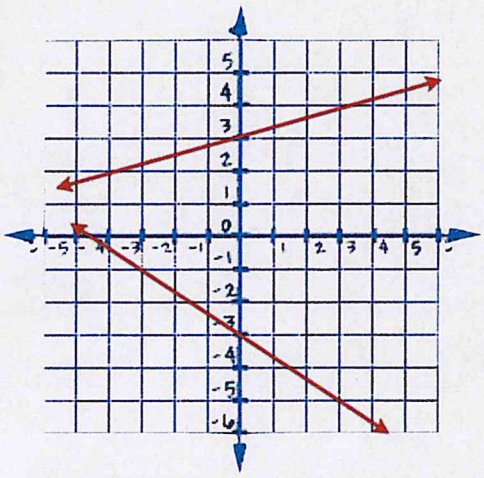
Graph the systems below, stating how many solutions the system has:

④ $y = 3x - 4$
$y = -3x + 2$



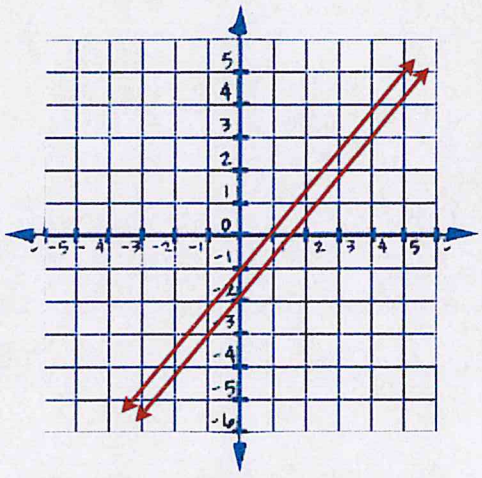
ANSWER: ONE

⑤ $y = 1/3x + 3$
$y = -2/3x - 3$



ANSWER: ONE

⑥ $y = 5/4x - 2$
$y = 5/4x - 1$



ANSWER: NONE