Systems of Equations – Quick Reference

Two linear equations form a system of equations. You can solve a system of equations using one of three methods:

- 1. Graphing
- 2. Substitution Method
- 3. Linear Combinations Method



If two lines lay **one on top of another** then there are **infinite solutions**. Every point on the line is a solution.

	Solve the following syste	lve the following system of equations: x = 2x = -10	
x - 2y = -10 v= 3x		3x	
	x - 2y = -10	Since we know $y = 3x$,	
	x - 2(3x) = -10	the first equation.	
	x - 6x = -10	Simplify: Multiply $2(3x) = 6x$.	
	-5x = -10	Simplify: $x - 6x = -5x$	
	$\frac{-5x}{-5} = \frac{-10}{-5}$	Solve for x by dividing both sides by -5.	
	x= 2	The x coordinate is 2.	
	y = 3x y = 3(2) y = 6	Since we know that $x = 2$, we can substitute 2 for x into $y = 3x$.	
	Solution: (2, 6)	The solution!	

Substitution Mothod

Linear Combinations (Addition Method)

Solve the following system of equations:

3x+2y = 10 2x +5y = 3

$\frac{-2(3x + 2y = 10)}{3(2x + 5y = 3)}$	Create opposite terms. I'm creating opposite x terms.
-6x - 4y = -20 $\frac{6x + 15 y = 9}{11y = -11}$	Multiply to create opposite terms. Then add the like terms.
$\frac{11y}{11} = \frac{-11}{11}$	Solve for y by dividing both sides by 11.
y = -1	The y coordinate is -1
2x + 5y = 3 2x + 5(-1) = 3	Substitute -1 for y into one of the equations.
2x - 5 = 3 2x - 5 + 5 = 3 + 5 $\frac{2x}{2} = \frac{8}{2}$	Solve for x!
x = 4	The solution (4, -1)