UNIT 3 LESSON 3 - SYSTEM OF EQUATIONS

GRAPHING, SUBSTITUTION, ELIMINATION

So now that you have some practice with systems of equations, let's add some more techniques.

MULTIPLY BY -1 TO ELIMINATE

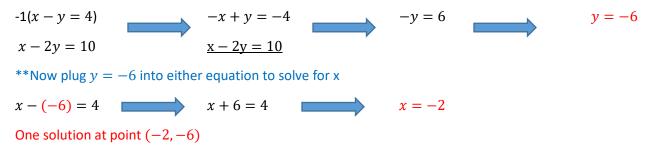
Sometimes multiplying one equation by -1 will allow elimination of one variable.

Example 1) Solve: x - y = 4

x - 2y = 10

**Look for variables that have the same coefficient

Since the x variable has the same coefficient = 1, one equation needs to be multiplied by -1 to make them opposites



MULTIPLY BY LEAST COMMON FACTOR (LCF) TO ELIMINATE

Sometimes multiplying one equation by a least common factor will allow elimination of one variable.

Example 2) Solve: 2x + 3y = 9

x + 5y = 8

**Eliminate one of the variables by multiplying one of the equations by a least common factor. 2x + 3y = 9

-2(x + 5y = 8) *multiply equation by -2 so elimination can happen

2x + 3y = 9

-2x - 10y = -16 *new equation after multiplication by -2

-7y = -7

y = -1 * Now plug y = -1 into either equation to solve for x

x + 5(-1) = 8 x - 5 = 8x = 13 One solution at point (-1,13)

SYSTEM OF EQUATIONS WORD PROBLEMS

Now we will write a system of equations based on a word problem. Remember a system of equations will produce two equations with two variables.

Example 3) In a talent show of singing and comedy acts, singing acts are 5 minutes long and comedy acts are 3 minutes long. The show has 12 acts and lasts a total of 50 minutes. How many singing acts and comedy acts are in the show? Write and solve a system of equations.

Step 1) Identify your variables S = singing acts C = comedy acts	Step 2) Write a system of equations S + C = 12 5S + 3C = 50
Step 3) Solve the system -3(S + C = 12) 5S + 3C = 50 -3S - 3C = -36 5S + 3C = 50	Step 4) Interpret your answer There are 7 singing acts and 5 comedy acts.
2S = 14 S = 7 **Plug S = 7 into either equation to solve for C	
7 + C = 12 C = 5	