Warmup 12/ (The number of games the Blackhawks won in the 2017 playoffs + 1)

- 1. Create your own system of equations that would have a solution of **(8, -3)**.
- 2. We are going to do a check for understanding to test how well you are doing with graphing and substitution. Get ready!

CFU

- Just checking in to see where you're at.
- No asking questions. Just do your best!

p.247 (1 - 10, 15) 11 shirts, 4 pairs of pants 1. (1,6) (P + H = 49)2. (-30, -18) 10. H = P + 113. (-2, -12) Horatio has 30 games, 4. (15, 30) Preston has 19 games 5. (7, 11) 15. The third one doesn't 6. (4, 1) belong. Its solution is (-2, 7. $\left(\frac{1}{2}, 12\frac{1}{2}\right)$ 1). The solution of the $\left(\frac{1}{4}, 5\frac{1}{2}\right)$ other three is (1, -2). 8. S + P = 159. S = P + 7

Story Problem

- Jesse and Anders have 75 squirrels all together. Anders has 17 more squirrels than Jesse.
- Write and solve a system of equations to represent this situation.

Story Problem

- Jesse and Anders have 100 squirrels all together. Anders has 4 times as many squirrels as Jesse.
- Write and solve a system of equations to represent this situation.

What would you do here???

2x + 2y = 18
3x - 2y = 12

Table of Contents	20
p. 1 Consecutive Sums Project p. 2 Converting Fractions and Decimals (1.1)	Solve Systems with Elimination
p. 3 Roots (1.8 & 1.9)	
p. 4 Solving x ² and x ³ Equations (1.8)	
p. 6 What is a function?	Objective:
p. 7 Function Notation: f(x)	 Use a new strategy (elimination) to solve
p. 8 Worksheet: Graphing Functions	systems of equations
p. 10 Slope	systems of equations
p. 11 Graphing Linear Functions – Looking for Patterns	 Most useful when BOTH equations have x and y
p. 12 Slope-Intercept Form	on the same side
p. 13 Slope-Intercept Story Problems p. 14 1 and 2 Step Equations	
p. 15 Equations w/ Variables on Both Sides	
p. 16 Equations with Distributive Property	
p. 17 Equations with no solution or Infinite Solutions	
p. 18 Solving Systems by Graphing	
p. 19 Solving Systems by Substitution	
p. 20 Solving Systems by Elimination	



 Today, we are going to learn a strategy to solve systems where both equations are in STANDARD FORM, such as:

$$2x + y = 18$$

 $3x - y = -3$





Together, with me:

5x - 2y = 17x + 2y = 13

MAIN IDEA:

- You **can't** completely solve an equation that still has 2 variables in it. There are unlimited solutions.
- You can solve an equation that has only 1 variable.
- Elimination Strategy:
 - 1. Make sure you have opposite coefficients on a variable
 - 2. Add the 2 equations together so that one of the variables gets "eliminated."
 - 3. Solve for the first variable, then plug the answer back in to find the second

Try these: -3x + y = 6 3x + 2y = 30	
10x - y = 5 -6x + y = -9	When you show me a correct answer + work for one of the problems, you may volunteer to put it on the board.
4x - 2y = 30 - $4x + 6y = -38$	



























$$\underbrace{\text{Example: Multiplying One Equation}}_{\mathbf{-2x + 4y = 8} \longrightarrow \mathbf{-2x + 4y = 8}}_{4(3x - y = 3)} \longrightarrow \underbrace{\mathbf{12x - 4y = 12}}_{\mathbf{10x} = \mathbf{20}}_{x = 2}$$
$$\underbrace{\mathbf{x = 2}}_{\text{Findy: -2x + 4y = 8}}_{\mathbf{-2(2) + 4y = 8}}_{\mathbf{-4 + 4y = 8}}_{\mathbf{-4 + 4y = 8}}_{\mathbf{4y = 12}}_{\mathbf{y = 3}}$$

$$\frac{\text{Try it!}}{x + 4y = 5}$$

x + 2y = 1

Example: Multiplying BOTH Equations $3(-5x + 3y = 2) \rightarrow -15x + 9y = 6$ $5(3x - 2y = -2) \rightarrow \underline{15x - 10y = -10}$ -1y = -4 y = 4Find x: 3x - 2y = -2 3x - 2(4) = -2 3x - 8 = -2 3x = 6x = 2



$\begin{array}{c} \text{Warmup 11/}(10+10+10) \end{array}$

Solve the system of equations by elimination. $\begin{cases}
8x - 4y = 32 \\
7x + 4y = 13
\end{cases}$

 Create a problem that equals 1. (For the date tomorrow) My favorite problem will earn 10 LiveSchool Points. (Call me over and show me your problem when you have it)

Today's Objective

- Master yesterday's topic Elimination
- Solve STORY PROBLEMS using elimination

Example: Multiplying One Equation

$$-2x + 4y = 8 \rightarrow -2x + 4y = 8$$

 $4(3x - y = 3) \rightarrow \frac{12x - 4y = 12}{10x = 20}$
 $x = 2$
Findy: $-2x + 4y = 8$
 $-2(2) + 4y = 8$
 $-4 + 4y = 8$
 $4y = 12$
 $y = 3$

$$\frac{\text{Try it!}}{x + 4y = 5}$$

x + 2y = 1

What do you do when you CAN'T Eliminate right away???

• You need opposite coefficients, such as:

-5x and 5x
3y and -3y
-x and x
Etc...

What do you do when you CAN'T Eliminate right away???

How could you make it so that you have opposite coefficients?

$$\begin{cases} 5x - 2y = 1\\ 4x + 4y = 12 \end{cases}$$

What do you do when you CAN'T Eliminate right away???

How could you make it so that you have opposite coefficients?

$$\begin{cases} 2(5x - 2y = 1) \\ 4x + 4y = 12 \end{cases} \rightarrow \frac{10x - 4y = 2}{4x + 4y = 12}$$

What do you do when you CAN'T Eliminate right away???

How could you make it so that you have opposite coefficients?

$$\begin{cases} 3x + 11y = -35 \\ -x + 3y = 5 \end{cases}$$

What do you do when you CAN'T Eliminate right away???

 How could you make it so that you have opposite coefficients?

$$\begin{cases} 3x + 11y = -35 \\ 3(-x + 3y = 5) \end{cases} \xrightarrow{3x + 11y = -35 \\ -3x + 9y = 15 \end{cases}$$

What do you do when you CAN'T Eliminate right away???

 How could you make it so that you have opposite coefficients?

$$\begin{cases} -4x + 2y = 18\\ 12x - 2y = -34 \end{cases}$$

What do you do when you CAN'T Eliminate right away???

How could you make it so that you have opposite coefficients?

$$\begin{cases} 3x + y = 2\\ 3x - 2y = 32 \end{cases}$$

What do you do when you CAN'T Eliminate right away???

How could you make it so that you have opposite coefficients?

$$\begin{cases} 2(3x + y = 2) \\ 3x - 2y = 32 \end{cases} \xrightarrow{6x + 2y = 4}{3x - 2y = 32}$$

What do you do when you CAN'T Eliminate right away???

How could you make it so that you have opposite coefficients?

$$\begin{cases} 3x + y = 2 \\ -1(3x - 2y = 32) \end{cases} \xrightarrow{3x + y = 2} \\ -3x + 2y = -32 \end{cases}$$

What do you do when you CAN'T Eliminate right away???

How could you make it so that you have opposite coefficients?

$$\begin{cases} x+4y=20\\ x-6y=15 \end{cases}$$

What do you do when you CAN'T Eliminate right away???

How could you make it so that you have opposite coefficients?

$$\begin{cases} x+4y=20\\ -1(x-6y=15) \end{cases} \stackrel{x+4y=20}{\begin{pmatrix} -x+6y=-15 \end{cases}}$$

What do you do when you CAN'T Eliminate right away???

 How could you make it so that you have opposite coefficients?

$$\begin{cases} 2x+4y=8\\ -3x-3y=-9 \end{cases}$$

What do you do when you CAN'T Eliminate right away???

How could you make it so that you have opposite coefficients?

$$\begin{cases} 5x + 2y = 8\\ 4x - 5y = 13 \end{cases}$$

What do you do when you CAN'T Eliminate right away???

How could you make it so that you have opposite coefficients?

$$\begin{cases} 3(2x+4y=8) \\ 2(-3x-3y=-9) \end{cases} \xrightarrow{6x+12y=24} -6x-6y=-18 \end{cases}$$

Example: Multiplying BOTH Equations

$$3(-5x + 3y = 2) \rightarrow -15x + 9y = 6$$

 $5(3x - 2y = -2) \rightarrow 15x - 10y = -10$
 $-1y = -4$
 $y = 4$
Find x: $3x - 2y = -2$
 $3x - 2(4) = -2$
 $3x - 8 = -2$
 $3x = 6$
 $x = 2$

Try these.		
$\begin{cases} No Multiplying \\ x + y = 8 \\ -x + 5y = -20 \end{cases}$	$ Multiplying One \begin{cases} 3x + y = 3 \\ -4x - 4y = 12 \end{cases} $	$ Multiplying Both \begin{cases} -5x + 3y = 7 \\ 4x - 4y = -12 \end{cases} $
(10, -2)	(3, -6)	(1, 4)

Story Problem!

- The sum of Nate & Anne's ages is 59. The difference of their ages is 5. Nate is older.
- a) Write a system of equations that represents this situation.
- b) Solve the system and say what the solution represents.

$$\begin{cases} N+A = 59\\ N-A = 5 \end{cases}$$

N = 32, A = 27Nate is 32 years old, Anne is 27 years old

Story problem

 Henry gets paid for doing chores. Last week, he did 2 loads of laundry and 3 loads of dishes, and his parents paid him \$12. The week before, he did 7 loads of laundry and 6 loads of dishes, and his parents paid him \$33. How much does Henry earn for doing each type of chore? -4L - 6D = -247L + 6D = 337L + 6D = 333*L* = 9 2(3) + 3D = 12L = 36 + 3D = 123D = 6Doing the laundry is \$3, doing the dishes is \$2. D = 2

Story problem

 There are 14 total people at the Easter gathering – adults and children. Each child found 4 Easter eggs and each adult found 3 Easter eggs. All together, 48 eggs were found. How many adults and children were at the gathering?

$$\begin{cases} A + C = 14 \\ 3A + 4C = 48 \end{cases} \begin{cases} -3A - 3C = -42 \\ 3A + 4C = 48 \\ C = 6 \\ A = 8 \end{cases}$$

There were 6 children and 8 adults.

27	Wh	at is the solution to this system of linear equations?
		2x - 2y = 10
		x + 4y = 30
	Α	(10, 5)
	В	(50, -5)
	С	(0, 5)
	D	(10, -5)



37 If 2x - 6y = 32 and 3x + 5y = 6, then which ordered pair represents the solution for x and y?

- **A** (-3, 3)
- **B** (7, −3)
- C (25, 3) D (-3, -7)

32 What is the solution to this system of linear equations? 3y + 2x = 4 y - 4x = 20F (4, -4) G (4, 4) H (-4, -4) J (-4, 4)



ļ	10	Wł	nat is the value of y in the solution to this system of linear equations?
			8x - 4y = 28 $-3x + 6y = 12$
		F	2
		G	3
		н	5
		J	6

F G H	2a - 4b = 4 $3a + 3b = -21$
F G H	-9
G = H -	
H =	-6
	-4
J -	-3