8th Grade Math
Lesson: April 7th
Learning Target:
Students will solve systems of equations through inspection and algebraically (substitution and elimination).

Lesson Includes:

1) Graphing
2) Substitution
3) Elimination

## Warm Up Activity

Solve the following equations:

$$
6=-3(x+2)
$$

$$
4 n-2 n=4
$$

## Graphing Systems Lesson - Part 1

Read through the steps of how to graph a system of equations, then watch the two videos.

> *Review Video for graphing linked here.* **Graphing Systems video linked here. ${ }^{* *}$

## Steps:

1) Graph each line in the system. Start with y-intercept and apply the slope.
2) Identify the solution.

One Solution: Lines intersect; written as an ordered pair; different slopes
No Solution: Lines are parallel; same slope, different y-intercept
Infinitely Many Solutions: Lines are the exact same; same slope, same y-intercept

## Graphing Systems Practice

## Read the types of solutions.

One Solution: Lines intersect; written as an ordered pair; different slopes
No Solution: Lines are parallel; same slope, different y-intercept Infinitely Many Solutions: Lines are the exact same; same slope, same y-intercept

Answer the question: What graph represents 'one solution'?




## Graphing Systems Practice

Go to this website:
Solutions to a system of equations by graphing

1. Select the equation to graph each line for the system of the equations.
2. Select the type of solution: one, no, or infinitely many.
3. Complete steps $1 \& 2$ for each questions. There are 10 questions per game.

Note: Green is correct. Yellow is incorrect.


## Systems by Substitution - Lesson Part 2

Read through the steps of how to solve a system of equations by substitution, then watch the video(s).

*Systems by Substitution video linked here.*<br>** Systems by Substitution video linked here. **

Steps:

1) Solve one of the equations for either $x=$ or $y=$.
2) Substitute the solution from step 1 into the other equation for either $x$ or $y$.
3) Solve the equation for the second variable (x or y).
4) State solution.

No Solution: variables cancel out, false statement (ex: 7 = 12)
One Solution: write as ordered pair : (x,y)
Infinitely Many Solutions: variables cancel out, true statement (ex: 2 = 2)
5) Check your answer.

## Systems by Substitution Practice

Review example one, then try the next example on your own.


$$
\text { 2) } \quad \begin{aligned}
& 2 x+2 y=4 \\
& x=y-4
\end{aligned}
$$

## Systems by Substitution Practice

Go to this website: Solve a system of equations using substitution

1. Solve each system using substitution.
2. Select the solution.
3. Complete steps $1 \& 2$ for each questions. There is 10 questions per game.

Note: Green is correct. Yellow is incorrect.

$$
\begin{array}{r}
2 x+y=6 \\
-1 x-3 y=2
\end{array}
$$

## Systems by Elimination - Lesson Part 3

## Read through the steps of how to solve a system of equations by elimination, then watch the video(s).

*Systems by Elimination video linked here.*<br>** Systems by Elimination video linked here. **

## Steps:

1) Line up the like variables in the equations.
2) Add or subtract the equations to eliminate one variable ( $x$ or $y$ ).

- Same numbers and values $\rightarrow$ subtract
- Same number, opposite values $\rightarrow$ add
- Not the same number? $\rightarrow$ multiply one or both of the equations so that one of the variables can be eliminated

3) Substitute your answer from step 2 into one of the original equations.
4) Solve the equation for the second variable ( $x$ or $y$ ).
5) State the solution: one, no, infinitely many solutions.
6) Check your answer.

## Systems by Elimination Practice

Review example $1 \& 3$, then try examples $2 \& 4$ on your own.

2) $4 x+5 y=22$
$2 x+5 y=6$
4)

$$
\begin{aligned}
& 4 x+2 y=14 \\
& 7 x-3 y=-8
\end{aligned}
$$

Systems by Elimination Practice
Go to this website: Solve a system of equations using elimination

1. Solve each system using elimination.
2. Type in or select the solution.
3. Complete steps $1 \& 2$ for each questions. There is 10 questions per game.

Note: Green is correct. Yellow is incorrect.


# Additional Practice All Methods (Graphing, Substitution, Elimination) 

Click on the links below to get additional practice and to check your understanding!

## Graphing

Substitution

Elimination

