

Lesson 3.4- SWBAT solve systems of equations by elimination.  
 Kick off- Take out your homework and answer the following questions.

1) Solve the system of equations by elimination.

$$\begin{aligned} -4x - 2y &= -12 \\ Ax + 8y &= -24 \end{aligned}$$

$$\begin{aligned} \frac{6y}{6} &= \frac{-36}{6} \\ y &= -6 \end{aligned}$$

$$\begin{aligned} 4x + 8y &= -24 \\ 4x + 48 &= -24 \\ \cancel{4x} + 48 &= -24 \\ 48 &= -24 - 4x \\ 4x &= -24 - 48 \\ 4x &= -72 \\ x &= -18 \end{aligned}$$

2) Find  $f(g(x))$  when  $f(x) = 2x - 1$  and  $g(x) = x^2 + 3x + 4$

$$2(x^2 + 3x + 4) - 1$$

$$2x^2 + 6x + 8 - 1$$

$$2x^2 + 6x + 7$$

**Elimination Method (Addition) for Solving a System of Equations:**

- 1) Choose which variable to eliminate.
- 2) Multiply the equation(s) by a constant (number) that will make coefficients that are additive inverses.
- 3) Add the two new equations!
- 4) Solve for the variable.
- 5) Substitute in the value of that variable and solve to find the other variable.
- 6) Check BOTH equations with the order pair that you found!

1) Solve and check the system of equations by elimination:

$$\begin{cases} -2x - 9y = -25 \\ -4x - 9y = -23 \end{cases}$$

$$\begin{aligned} 8x + 36y &= 100 \\ -8x - 18y &= -46 \\ \hline 18y &= 54 \\ y &= 3 \end{aligned}$$

$$\begin{aligned} -2x - 9y &= -25 \\ -2x - 9(3) &= -25 \\ -2x - 27 &= -25 \\ \downarrow +27 \quad +27 \\ -2x &= 2 \\ x &= -1 \end{aligned}$$

2) Solve and check the system of equations by elimination:

$$\begin{cases} -6x + 5y = 1 \\ 6x + 4y = -10 \end{cases}$$

$$\begin{aligned} 6x + 4y &= -10 \\ 6x + 4(-1) &= -10 \\ 6x - 4 &= -10 \\ \cancel{6x} - 4 &= -10 \\ -4 &= -10 + 4 \\ 0 &= -6 \\ x &= -1 \end{aligned}$$

$$\begin{aligned} -6x + 5y &= 1 \\ 9y &= -9 \\ y &= -1 \end{aligned}$$

3) Solve and check the system of equations.

$$\begin{cases} y = -3x + 5 \\ 5x - 4y = -3 \end{cases}$$

$$5x - 4(-3x + 5) = -3$$

$$5x + 12x - 20 = -3$$

$$17x - 20 = -3$$

$$\frac{17x}{17} = \frac{17}{17}$$

$$x = 1$$

$$y = -3(1) + 5 = 2$$

4) Solve and check the system of equations.

$$\begin{cases} 8x + y = -16 \\ -3x + y = -5 \end{cases}$$

$$-8(-3x + y) = -8(-5)$$

5) Solve and check the system of equations.  $5x + 4y = -14$   
 $3x + 6y = 6$

6) Solve and check the system of equations.  $-3x - 3y = 3$   
 $y = -5x - 17$