

Lesson 3.3- 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 substitution. $2x - 3y = -1$
 $y = x - 1$
 (check: $2(4) - 3(3) = -1$ ✓)
 $2x - 3(x-1) = -1$
 $2x - 3x + 3 = -1$
 $-x + 3 = -1$
 $-x = -4$
 $x = 4$
 $y = (4) - 1 = 3$
 $x = 4$
 $y = 3$
 2) Find $f(g(2))$ when $f(x) = 2x - 1$ and $g(x) = x^2 + 3x + 4$.
 $g(2) = (2)^2 + 3(2) + 4 = 14$
 $f(14) = 2(14) - 1 = 27$

Elimination Method (Addition) for Solving a System of Equations:
 -To use the addition method there must be two coefficients of the same variable that are additive inverses (opposites)
 -Adding the equations together will result in one equation with one variable!
 1) Solve and check the system of equations by elimination: $3x + 2y = 10$
 $5x - 2y = 6$
 $3x + 2y = 10$
 $3(2) + 2y = 10$
 $6 + 2y = 10$
 $-6 \quad \downarrow \quad -6$
 $2y = 4$
 $\frac{2y}{2} = \frac{4}{2} \quad y = 2$
 $8x = 16$
 $\frac{8x}{8} = \frac{16}{8}$
 $x = 2$

2) Solve and check the system of equations by elimination: $-4x - 2y = -12$
 $4x + 8y = -24$
 $6y = 36$
 $\frac{6y}{6} = \frac{36}{6}$
 $y = 6$
 ck: $-4x - 2y = -12$
 $-4(6) - 2(6) = -12$
 $-24 - 12 = -36$ ✓
 $ck: 4x + 8y = -24$
 $4(6) + 8(6) = -24$
 $24 + 48 = 72$ ✓
 $4x + 8y = -24$
 $4x + 8(-6) = -24$
 $4x - 48 = -24$
 $+48 \quad +48$
 $4x = 24$
 $\frac{4x}{4} = \frac{24}{4} \quad x = 6$

But, what happens when there are no additive inverses? You must use the Multiplication Property of Equations to rewrite one or both equations so there are opposite coefficients!
 To Do This:
 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!

3) Solve and check the system of equations by elimination: $2x + 5y = 9$
 $4x - 7y = -16$
 $8x + 20y = 36$
 $+ -8x + 14y = 32$
 $34y = 68$
 $\frac{34y}{34} = \frac{68}{34}$
 $y = 2$
 $2x + 5y = 9$
 $2x + 5(2) = 9$
 $2x + 10 = 9$
 $-10 \quad -10$
 $2x = -1$
 $\frac{2x}{2} = \frac{-1}{2}$
 $x = -\frac{1}{2}$

4) Solve and check the system of equations by elimination: $3x + 4y = 25$
 $2x + y = 10$
 $6x + 8y = 50$
 $+ -6x - 3y = -30$
 $5y = 20$
 $\frac{5y}{5} = \frac{20}{5}$
 $y = 4$
 $2x + y = 10$
 $2x + 4 = 10$
 $-4 \quad -4$
 $2x = 6$
 $\frac{2x}{2} = \frac{6}{2}$
 $x = 3$
 Check
 $3x + 4y = 25$
 $3(3) + 4(4) = 25$
 $25 = 25$
 $2x + y = 10$
 $2(3) + 4 = 10$
 $10 = 10$

5) Solve and check the system of equations by elimination. $3x + 4y = 2$
 $2x + 5y = -1$