Lesson 3.1- SWBAT solve systems of equations by substitution

Kick off- Take out your homework and answer the following questions.

1) If $f(x) = x^2 + 3x$ find, $f(-2)$

2) Solve and graph: $|9 + b| < 10$

$(-2)^2+3(-2)=-2$

$|9+b|<10$ $-(9+b)$

$-9 \quad -9$

$-9-b<10$

$b<1$ $+9 \quad +9$

$|9+b|<10$

$|9+(-20)|<10$

$|11|<10$

$11<10$

$|9+0|<10$

$9<10$

$|9+2|<10$

$11<10$

$-b<19$

$-1 \quad -1$

$b>-19$

-20 -19 0 1 2

A system of equation is two equations considered together. The solution of a system of equations is an ordered pair (x, y). Always check solution(s) algebraically.

Example:

Is (3,-2) a solution of the system of equations?

x y

$2x - 3y = 12$

$5x + 2y = 11$

$X=3$

$Y=-2$

Check solution in BOTH equations:

$2(3)-3(-2)=12$ $5(3)+2(-2)=11$

$12=12$ $11=11$

Yes!

* NO means one of the two equations don't check

Examples:

1) Is (-3, -6) a solution of the system of equations: $-4x + y = 6$ $-5x - y = 21$

x y

$X=-3$

$Y=-6$

$-4x+y=6$

$-4(-3)+(-6)=6$

$6=6$ ✓

yes!

$-5x-y=21$

$-5(-3)-(-6)=21$

$21=21$ ✓

2) Is (1, -2) a solutions of the system of equations: $-5x + y = -2$ $-3x + 6y = -12$

$X=1$

$Y=-2$

$-5x+y=-2$

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

$-7=-2$

No!

Substitution Method for Solving a System of Equations

1) Solve one of the equations of the system in terms of x or in terms of y.
2) Substitute that into the other equation for the variable.
3) Solve the equation.
4) Substitute that value into one of the equations to find the other variable
5) Check the solution (point) in BOTH equations.

x= y= (x, y)

1) Solve by the substitution method: (3,-4)

$5x + 4y = -1$

$y = 2 - 2x$

$5x+4(2-2x)=-1$

$5x+8-8x=-1$

$-3x+8=-1$

$-8 \quad -8$

$\frac{-3x=-9}{-3 \quad -3}$

$X=3$

$Y=2-2x$

$Y=2-2(3)$

$Y=-4$

(3,-4)

Check

$5x+4y=-1$

$5(3)+4(-4)=-1$

$-1=-1$ ✓

$Y=2-2x$

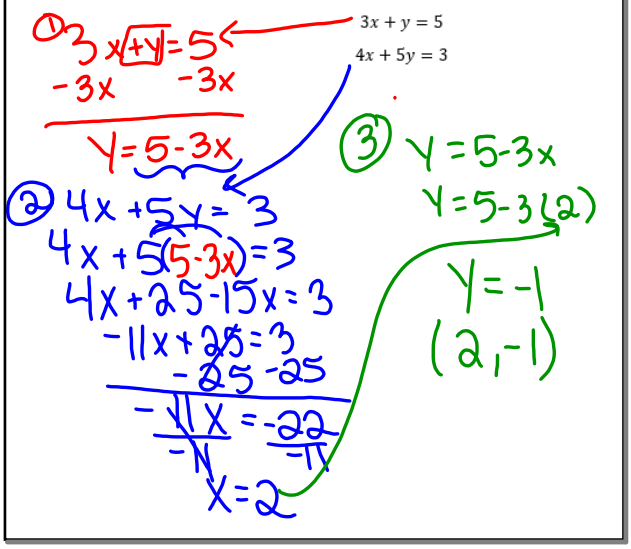
$(-4)=2-2(3)$

$-4=-4$ ✓

2) Solve by the substitution method:

$3x + y = 5$

$4x + 5y = 3$



3) Solve by the substitution method:

$3x - 2y = 4$

$x = 2$