Lesson 2.5- SWBAT solve literal equations.

Kickoff- Solve and check each of the following equations.

1) $-4(1 + a) = 2a - 8(5 + 3a)$

$-4 - 4a = 2a - 40 - 24a$

$-4 - 4a = -22a - 40$

$+4a \qquad +4a$

$-4 = -18a - 40$

$+40 \qquad +40$

$\dfrac{36}{-18} = \dfrac{-18a}{-18}$

$a = -2$

2) $-7(x - 2) = -4 - 6(x - 1)$

$-7x + 14 = -4 - 6x + 6$

$-7x + 14 = -6x + 7$

$-2 \qquad -2$

$-7x + 12 = -6x$

$+7x \qquad +7x$

$12 = x$

Equations with several variables are called **literal equations**. Your job will be to solve the equation for one of the variables, so that one variable you are solving for stands **alone**. The methods used to solve these equations are the same as the methods you use to solve all equations.

Example #1	Steps
Solve for x: $ax + b = c$ $\quad -b \quad -b$	1. Move b (the opposite of add is subtract)
$ax = c - b$ $\dfrac{ax}{a} = \dfrac{c - b}{a}$	2. Move a (the opposite of multiply is divide)
$x = \dfrac{c - b}{a}$	3. x is what we are solving for and it stands alone. Done.

Regular Equations	Literal Equations
1a) $x - 7 = 8$ $\quad +7 +7$ $x = 15$	1b) Solve for x. $x - b = a$ $\quad +b +b$ $x = a + b$
2a) $4x = -12$ $\dfrac{4x}{4} = \dfrac{-12}{4}$ $x = -3$	2b) Solve for k. $-3k = m$ $\dfrac{-3k}{-3} = \dfrac{m}{-3}$ $k = \dfrac{m}{-3}$

Regular Equations	Literal Equations
3a) $2x - 5 = 11$ $\quad +5 +5$ $\dfrac{2x}{2} = \dfrac{16}{2} \quad x = 8$	3b) Solve for b. $2b - 9 = d$ $\quad +9 +9$ $\dfrac{2b}{2} = \dfrac{d + 9}{2}$
4a) $\frac{1}{2}(4x) = -20$ $\dfrac{2x}{2} = \dfrac{-20}{2}$ $x = -10$	4b) Solve for g. $aeg = 10$ $\dfrac{aeg}{ae} = \dfrac{10}{ae} \quad b = \dfrac{d + 9}{2}$ $g = \dfrac{10}{ae}$

5a) $\dfrac{x}{-8} = 11$ $(-8) \qquad (-8)$ $x = -88$	5b) Solve for y. $\dfrac{y}{3} = h$ $(3) \qquad (3)$ $y = 3h$
6a) $14 = 2x + 26$	6b) Solve for v. $3d = 7v + 5$

7a) $-30 = 4 - 8x$	7b) Solve for h. $7a = 10 - 2h$
8a) $3(x - 4) = 12$	8b) Solve for p. $5(4x + p) = w$

9a) Which of the following is equivalent to:	9b) Which of the following is equivalent to:
$7a - 8b = 10x$	$4ab + k = 13$
A. $a = \frac{18b}{7}$	A. $k = \frac{13}{4ab}$
B. $a = \frac{(10x + 8b)}{7}$	B. $k = \frac{(13 - ab)}{4}$
C. $a = \frac{10x - 8b}{7}$	C. $k = 13 - 4ab$