

12-6-17

Aim: SWBAT solve and check one-step equations and solve literal equations.

HW: Packet Page 3

Do Now: Put your name on the new packet

AIM: SWBAT solve 1-step equations and literal equations algebraically and check using a 3-Step Check.

REMEMBER: When Solving Equations the Goal is to Get the Variable by Itself.

I) Simplify each side of the equation. Remember = separates it into 2 sides.

(Same side use same operation)

II) Get variable terms on one side and constant terms on the other side.

(Opposite side use opposite (inverse) operations.)

III) Solve for the variable

3-Step Check:

- 1) **Rewrite** the equation
- 2) **Replace** the variable
- 3) **PROVE** (Do the math!)

EXAMPLES:

<p style="text-align: center;">$V + C = C$</p> <p>1) $x + 12 = -14$ $\quad -12 = -12$ <hr style="width: 50%; margin-left: 0;"/> $x = -26$ $x = 26$</p>	<p style="text-align: center;">CHECK:</p> <p>1) $x + 12 = -14$ $26 + 12 = -14$ $38 \neq -14$</p>
<p style="text-align: center;">$V - C = C$</p> <p>2) $x - 12 = -14$ $\quad +12 = +12$ <hr style="width: 50%; margin-left: 0;"/> $x = -2$</p>	<p style="text-align: center;">CHECK:</p> <p>1) $x - 12 = -14$ $-2 - 12 = -14$ $-14 = -14 \checkmark$</p>

Remember: NO DOUBLE SIGNS!

Example.

1) $x - 9 = 31$ Get rid of double signs FIRST!

$$\begin{array}{r} x + 9 = 31 \\ -9 \quad -9 \\ \hline x = 22 \end{array}$$

When multiplying or dividing with SAME SIGNS you get a positive answer.

When multiplying or dividing with DIFFERENT SIGNS you get a negative answer.

Whenever you solve a **multiplication equation** you use the **division property of equality**.

Whatever you **divide** one side of the equation with you must **divide** the other side with.

Example.

1) $3y = -36$	$\frac{3y}{3} = \frac{-36}{3}$	2) $\frac{-65}{-13} = \frac{-13m}{-13}$
	$y = -12$	$5 = m$

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How to Play the Equations Game

#1 Eliminating numbers on the same side as the variable

- Constants eliminate with opposite sign *(need to make 0)*
- Coefficients eliminate with division of the coefficient
- Denominators eliminate with multiplication of the denominator
- Fractional Coefficients eliminate with multiplication of the reciprocal

*need to
make 1
sign stays
the same*

#2 Variable terms eliminate with opposite sign

#3 Two-Step Equations

- i. Eliminate the constant
- ii. Eliminate the coefficient or denominator

#4 Entire side as a fraction

- i. Eliminate the denominator

#5 Distributive Property and Combining Like Terms Equations

- i. Simplify before you solve
 - Eliminate parentheses
 - Combine Like Terms

#6 Variables on Both Sides Equations

- i. Eliminate a variable term

Checking an Equation

- i. Rewrite the original equation
- ii. Substitute the answer for the variable
- iii. Evaluate until sides match using the Order of Operations

Step iii repeats as long as it takes.

Whenever you solve a **division equation** you use the multiplication property of equality. Whatever you multiply one side of the equation with you must multiply the other side with.

Example.

$\frac{x}{9} = -7$ $(9) \frac{x}{9} = -7(9)$ (remember we need to get "x" by itself, so multiply by 9)
 $x = -63$

$\frac{x}{9} = \frac{1}{9}x$

2) $-13 = \frac{k}{-5}$ $(-5) -13 = \frac{k}{-5} \cdot \frac{-5}{1}$
 $65 = k$

You Try! Solve for the variable. (Check #3 & #4 ONLY)

1) $x + 5 = 12$ 2) $x - 17 = -23$ 3) $8.5 + y = 10.2$ CHECK:
 $\frac{x}{9} = \frac{1}{9}x$

$\frac{x}{9} = \frac{1}{9}x$

$x = 17$ $x = -40$ $y = 1.7$ $8.5 + y = 10.2$
 $8.5 + 1.7 = 10.2$
 $10.2 = 10.2$

4) $-3y = 39$ CHECK: 5) $\frac{m}{13} = -9$
 $-3y = 39$
 $(-3)(-13) = 39$
 $39 = 39$

$m = -117$

Literal equation - an equation in which known quantities are expressed with letters.

Formula - A type of literal equation that shows a relationship between quantities.

- When you use a literal equation you may be asked to solve it for one variable in terms of another variable.
- To do this - pretend that all the other variables except for the one you are solving for are numbers and proceed by following the steps for solving equations.

Solve for y: $x + y = 12$

$\frac{x}{9} = \frac{1}{9}x$

$y = -x + 12$

Homework - Solving one step equations and one step literal equations

Solve each equation algebraically and check using a 3-step check

1) $x - 13 = -48$

2) $x + 26 = -13$

3) $\frac{x}{-8} = -24$

4) $-7x = 56$

Solve each of the following for the indicated variable.

5) Solve for w : $w + r = 5 - 3r$

6) Solve for w : $V = \ell w h$

7) Solve for t : $I = prt$

8) Solve for x : $x + c = 2b$

9) Solve for x : $3a = 2c + x$

10) Solve for x : $4c + x = a$

11) Solve for x : $bx = 2cd$