

12-6-18

Aim: SWBAT solve and check one-step equations.

HW: Finish the little packet (Solve and check)

Do Now: Put your name on the new packet

How to Play the Equations Game

#1 Eliminating numbers on the same side as the variable

- Constants eliminate with opposite sign
- Coefficients eliminate with division of the coefficient
- Denominators eliminate with multiplication of the denominator
- Fractional Coefficients eliminate with multiplication of the reciprocal

#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
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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

Solving One-Step Equations Review

Solving equations means to isolate or get the variable by itself.

Solving using addition and subtraction:

Example 1:

$$\begin{array}{r}
 r + 16 = -7 \\
 -16 \quad -16 \\
 \hline
 r = -23 \quad \text{Answer.} \\
 r = 23
 \end{array}$$

Get the variable by itself. Right now 16 is being added to it.
 Undo the addition by subtracting 16 from both sides.

Check

$$\begin{array}{l}
 r + 16 = -7 \\
 -23 + 16 = -7 \\
 -7 = -7
 \end{array}$$

Remember...whatever you do to one side, you MUST do to the other side!

Example 2:

When solving equations, it is always best to eliminate any double signs.
 → As a general rule, replace "+ (-)" with "-" and "- (-)" with "+".

$$\begin{array}{r}
 y + (-3) = 8 \\
 y - 3 = 8 \\
 +3 \quad +3 \\
 \hline
 y = 11
 \end{array}$$

$$\begin{array}{l}
 y + (-3) = 8 \\
 11 + (-3) \stackrel{?}{=} 8 \\
 8 = 8
 \end{array}$$

$$\begin{array}{l}
 r + 16 = -7 \\
 23 + 16 \stackrel{?}{=} -7 \\
 39 \neq -7
 \end{array}$$

Solving using multiplication and division:

Example 1:

$$\begin{array}{r}
 -5t = 60 \\
 \frac{-5t}{-5} = \frac{60}{-5} \\
 t = -12 \quad \text{Answer.}
 \end{array}$$

Get the variable by itself. Right now -5 is being multiplied to it.
 Undo the multiplication by dividing both sides by -5.

$$\begin{array}{l}
 -5t = 60 \\
 (-5)(-12) \stackrel{?}{=} 60 \\
 60 = 60
 \end{array}$$

Example 2:

$$\begin{array}{r}
 \frac{x}{4} = -12 \\
 \frac{x}{4} = -12(4) \\
 \frac{4x}{4} = -48 \\
 x = -48
 \end{array}$$

Since 4 is dividing x, multiply both sides by 4 to clear the fraction.
 The fours will cancel each other out. $\frac{4x}{4}$ simplifies to 1x

$$\begin{array}{l}
 \frac{x}{4} = -12 \\
 \frac{-48}{4} \stackrel{?}{=} -12 \\
 -12 = -12
 \end{array}$$

Example 3:

$\frac{2}{3}x = 18$ To get rid of multiplying a fraction, multiply by the reciprocal.
 $\left(\frac{3}{2}\right)\frac{2}{3}x = 18\left(\frac{3}{2}\right)$ Multiply straight across.
 $x = \frac{18 \cdot 3}{2}$
 $x = 27$

multiplicative inverse

Solve each equation. Be sure to show ALL steps.

1. $x + 2 = 10$

2. $3x = -15$

* 3. $\boxed{-4} + x = 12$

$$\begin{array}{r} \boxed{-4} + x = 12 \\ +4 \quad +4 \\ \hline x = 16 \end{array}$$

4. $\frac{x}{-3} = -6$

* 5. $15 = t - \boxed{2}$

$$\begin{array}{r} 15 = t - \boxed{2} \\ +2 \quad +2 \\ \hline 17 = t \end{array}$$

6. $\frac{1}{2}x = 3$

7. $x - (-4) = 3$

* 8. $3 = -x$

$$\begin{array}{r} 3 = -x \\ -1 \quad -1 \\ \hline -3 = x \end{array}$$

$$\begin{array}{l} 3 = -x \\ 3 = -(-3) \\ 3 = 3 \end{array}$$

9. $w + 14 = -8$

10. $y + (-10) = 6$

11. $-11 = a + 8$

12. $5h = 35$

13. $-2.3 = x + (-1.1)$

14. $-7 = -16 - k$

15. $-13m = 39$

16. $z + (-13) = -27$

17. $p - (-27) = 13$

18. $41 = 32 - r$

19. $\frac{2}{3}X = -16$

20. $-\frac{1}{2}X = \frac{2}{3}$

$$\frac{\cancel{8}}{\cancel{8}}x = \frac{9}{8}$$

$$x = \frac{9}{8}$$

$$8x = 9$$

$$\frac{8}{\cancel{8}} \cdot \frac{9}{\cancel{8}} = 9$$

$$9 = 9$$