

12-11-17

Aim: SWBAT solve and check multistep equations.

HW: WS

Quiz tomorrow (1-step and 2-step equations)

Do Now: Solve and check

$$\begin{array}{r}
 6 = -2x + 5 \\
 \hline
 \frac{1}{-2} = \frac{-2x}{-2} \\
 \hline
 -\frac{1}{2} = x
 \end{array}$$

$$\begin{array}{l}
 6 = -2x + 5 \\
 6 = -\frac{2}{1} \cdot \frac{-1}{2} + 5 \\
 6 = 1 + 5 \\
 6 = 6
 \end{array}$$

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.

Solve and check.

$$\frac{-3}{1} \cdot \frac{2x}{-3} = -4 \cdot \frac{-3}{1}$$

$$\frac{2x}{\cancel{2}} = \frac{12}{2}$$

$$x = 6$$

OR

$$\frac{-3}{2} \cdot \frac{2x}{-3} = -4 \cdot \frac{-3}{2}$$

$$x = 6$$

$$\frac{2x}{-3} = -4$$

$$\frac{2(6)}{-3} \stackrel{?}{=} -4$$

$$\frac{12}{-3} \stackrel{?}{=} -4$$

$$-4 = -4$$

$$\frac{2x}{3} = \frac{2}{3}x$$

$$\frac{2x}{-3} - 10 = -4$$

$$+10 \quad +10$$

$$\frac{-3}{2} \cdot \frac{2x}{-3} = 6 \cdot \frac{-3}{2}$$

$$x = -9$$

$$\frac{2x}{-3} - 10 = -4$$

$$\frac{2(-9)}{-3} - 10 \stackrel{?}{=} -4$$

$$\frac{-18}{-3} - 10 \stackrel{?}{=} -4$$

$$6 - 10 \stackrel{?}{=} -4$$

$$-4 = -4$$

Solve and check.

$$\begin{array}{l} \cancel{\frac{3}{1}} \cdot \frac{2x+1}{\cancel{3}} = 4 \cdot \frac{\cancel{3}}{1} \\ 2x+1 = 12 \\ \hline 2x = 11 \\ \cancel{2} = \frac{11}{\cancel{2}} \\ x = \frac{11}{2} \end{array}$$

$$\frac{2x+1}{3} = 4$$

$$\begin{array}{l} \frac{\cancel{2} \cdot \frac{11}{\cancel{2}} + 1}{3} \stackrel{?}{=} 4 \\ \frac{11+1}{3} \stackrel{?}{=} 4 \\ \frac{12}{3} \stackrel{?}{=} 4 \\ 4 = 4 \end{array}$$

$$\begin{array}{l} \cancel{\frac{3}{1}} \cdot \frac{-11x-1}{\cancel{3}} = -4 \cdot \frac{\cancel{3}}{1} \\ -11x-1 = -12 \\ \hline -11x = -11 \\ \cancel{-11} = \frac{-11}{\cancel{-11}} \\ x = 1 \end{array}$$

$$\checkmark \frac{-11x-1}{3} = -4$$

$$\begin{array}{l} \frac{-11(1)-1}{3} \stackrel{?}{=} -4 \\ \frac{-11-1}{3} \stackrel{?}{=} -4 \\ \frac{-12}{3} \stackrel{?}{=} -4 \\ -4 = -4 \end{array}$$

Solve and check. Simplify before you solve.

$$-3(x - 9) = 39$$

$$\begin{array}{r} -3 \times \boxed{+27} = 39 \\ \quad \quad \quad -27 \quad -27 \\ \hline -3x = 12 \\ \quad \quad \quad -3 \quad -3 \\ \hline x = -4 \end{array}$$

$$\frac{1}{3}(x - 9) = 5$$

$$\begin{array}{r} \frac{1}{3} \times \boxed{-3} = 5 \\ \quad \quad \quad +3 \quad +3 \\ \hline \frac{1}{3}x = 8 \\ \quad \quad \quad \cdot 3 \quad \cdot 3 \\ \hline x = 24 \end{array}$$

OR

$$\begin{array}{r} \cancel{-3}(x - 9) = 39 \\ \quad \quad \quad -3 \quad -3 \\ \hline x - 9 = -13 \\ \quad \quad \quad +9 \quad +9 \\ \hline x = -4 \end{array}$$

$$\text{OK} / \frac{1}{3}(x - 9) = 5$$

$$\begin{array}{r} \frac{1}{3}(24 - 9) \stackrel{?}{=} 5 \\ \quad \quad \quad \checkmark \quad ? \\ \frac{1}{3}(15) \stackrel{?}{=} 5 \\ 5 = 5 \end{array}$$

$$\begin{array}{l} * -3(x - 9) = 39 \\ -3(-4 - 9) \stackrel{?}{=} 39 \\ -3(-13) \stackrel{?}{=} 39 \\ 39 = 39 \end{array}$$

Order of Operations

Solve and check.

$$\textcircled{18} \frac{3x}{5} = 12$$

$$\textcircled{19} \frac{2x}{3} = -8$$

$$\textcircled{20} -\frac{5m}{2} = 35$$

$$\textcircled{25} 3(r+1) = 9$$

$$\textcircled{26} 4 = -1(z+11)$$

$$\textcircled{27} 6\left(\frac{1}{3}+h\right) = 20$$

$$\textcircled{31} \quad \frac{4h-6}{8} = -3$$

$$\textcircled{32} \quad \frac{3a+4}{5} = 11$$

$$\textcircled{33} \quad \frac{2w-3}{9} = 5$$

$$\textcircled{35} \quad \frac{2(4t-7)}{3} = -22$$