

12-8-17

Aim: SWBAT solve and check multistep equations.

HW: Pg. 131 - 132 # 18 - 21, 25 - 27, 31 - 34 (Solve and Check)
Quiz Monday (2-step equations)

Do Now: Solve and check

$$6 = -2x + 5$$

Do Now: Solve and check.

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

$$\begin{array}{l} 6 = -2x + 5 \\ 6 \stackrel{?}{=} -2\left(\frac{1}{-2}\right) + 5 \\ 6 \stackrel{?}{=} 1 + 5 \\ 6 = 6 \end{array}$$

Pg. 131 # 3-17

$$\begin{array}{r} \textcircled{3} \quad 2x+1=7 \\ -1 \quad -1 \\ \hline 2x = 6 \\ \frac{2x}{2} = \frac{6}{2} \\ x = 3 \end{array}$$

ck/

$$\begin{array}{l} 2x+1=7 \\ 2 \cdot 3+1 \stackrel{?}{=} 7 \\ 6+1 \stackrel{?}{=} 7 \\ 7 = 7 \end{array}$$

$$\begin{array}{r} \textcircled{4} \quad 3y-4=2 \\ +4 \quad +4 \\ \hline 3y = 6 \\ \frac{3y}{3} = \frac{6}{3} \\ y = 2 \end{array}$$

ck/

$$\begin{array}{l} 3y-4 \stackrel{?}{=} 2 \\ 3 \cdot 2 - 4 \stackrel{?}{=} 2 \\ 6 - 4 \stackrel{?}{=} 2 \\ 2 = 2 \end{array}$$

$$\begin{array}{r} \textcircled{5} \quad 10-7z=3 \\ -10 \quad -10 \\ \hline -7z = -7 \\ \frac{-7z}{-7} = \frac{-7}{-7} \\ z = 1 \end{array}$$

ck/

$$\begin{array}{l} 10-7z=3 \\ 10-7 \cdot 1 \stackrel{?}{=} 3 \\ 10-7 \stackrel{?}{=} 3 \\ 3 = 3 \end{array}$$

$$\begin{array}{r} \textcircled{6} \quad 15 = -4p+7 \\ -7 \quad -7 \\ \hline 8 = -4p \\ \frac{8}{-4} = \frac{-4p}{-4} \\ -2 = p \end{array}$$

ck/

$$\begin{array}{l} 15 = -4p+7 \\ 15 \stackrel{?}{=} -4(-2)+7 \\ 15 \stackrel{?}{=} 8+7 \\ 15 = 15 \end{array}$$

$$\begin{array}{r} \textcircled{7} \quad 9-2k=25 \\ -9 \quad -9 \\ \hline -2k = 16 \\ \frac{-2k}{-2} = \frac{16}{-2} \\ k = -8 \end{array}$$

ck/

$$\begin{array}{l} 9-2k=25 \\ 9-2(-8) \stackrel{?}{=} 25 \\ 9-(-16) \stackrel{?}{=} 25 \\ 25 = 25 \end{array}$$

$$\begin{array}{r} \textcircled{8} \quad 11 = \frac{h}{6} + 8 \\ -8 \quad -8 \\ \hline \frac{h}{6} = 3 \\ \frac{6 \cdot 3}{1} = \frac{h \cdot 1}{6 \cdot 1} \\ 18 = h \end{array}$$

ck/

$$\begin{array}{l} 11 = \frac{h}{6} + 8 \\ 11 \stackrel{?}{=} \frac{18}{6} + 8 \\ 11 \stackrel{?}{=} 3 + 8 \\ 11 = 11 \end{array}$$

$$\begin{array}{r} \textcircled{9} \quad \frac{x}{9} - 4 = 5 \\ +4 \quad +4 \\ \hline \frac{x}{9} = 9 \\ \frac{9 \cdot x}{1} = \frac{9 \cdot 9}{1} \\ x = 81 \end{array}$$

ck/

$$\begin{array}{l} \frac{x}{9} - 4 = 5 \\ \frac{81}{9} - 4 \stackrel{?}{=} 5 \\ 9 - 4 \stackrel{?}{=} 5 \\ 5 = 5 \end{array}$$

$$\begin{array}{r} \textcircled{10} \quad 6+2c=15 \\ -6 \quad -6 \\ \hline 2c = 9 \\ \frac{2c}{2} = \frac{9}{2} \\ c = \frac{9}{2} \end{array}$$

ck/

$$\begin{array}{l} 6+2c=15 \\ 6 + 2 \cdot \frac{9}{2} \stackrel{?}{=} 15 \\ 6 + 9 \stackrel{?}{=} 15 \\ 15 = 15 \end{array}$$

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$$\begin{array}{r} \textcircled{11} \quad 29 = -5a + 4 \\ -4 \quad \quad -4 \\ \hline \frac{25}{-5} = \frac{-5a}{-5} \\ -5 = a \end{array}$$

ck/ $29 = -5a + 4$
 $29 \stackrel{?}{=} (-5)(-5) + 4$
 $29 \stackrel{?}{=} 25 + 4$
 $29 = 29$

$$\begin{array}{r} \textcircled{12} \quad 7 + 5b = -23 \\ -7 \quad \quad -7 \\ \hline \frac{5b}{5} = \frac{-30}{5} \\ b = -6 \end{array}$$

ck/ $7 + 5b = -23$
 $7 + 5(-6) \stackrel{?}{=} -23$
 $7 + (-30) \stackrel{?}{=} -23$
 $-23 = -23$

* $\textcircled{13}$

$$\begin{array}{r} 100 - 7c = 44 \\ -100 \quad \quad -100 \\ \hline -7c = -56 \\ \frac{-7c}{-7} = \frac{-56}{-7} \\ c = 8 \end{array}$$

ck/ $100 - 7c = 44$
 $100 - 7 \cdot 8 \stackrel{?}{=} 44$
 $100 - 56 \stackrel{?}{=} 44$
 $44 = 44$

$$\begin{array}{r} \textcircled{14} \quad 20 - 6w = 14 \\ -20 \quad \quad -20 \\ \hline -6w = -6 \\ \frac{-6w}{-6} = \frac{-6}{-6} \\ w = 1 \end{array}$$

ck/ $20 - 6w = 14$
 $20 - 6 \cdot 1 \stackrel{?}{=} 14$
 $20 - 6 \stackrel{?}{=} 14$
 $14 = 14$

$$\begin{array}{r} \textcircled{15} \quad -32 = -17 - \frac{d}{2} \\ +17 \quad \quad +17 \\ \hline -\frac{2}{1} \cdot \frac{-15}{1} = \frac{d}{-2} \cdot \frac{-2}{1} \\ 30 = d \end{array}$$

ck/ $-32 = -17 - \frac{d}{2}$
 $-32 \stackrel{?}{=} -17 - \frac{30}{2}$
 $-32 \stackrel{?}{=} -17 - 15$
 $-32 = -32$

$$\begin{array}{r} \textcircled{16} \quad \frac{c}{3} - 7 = 5.3 \\ +7 \quad \quad +7 \\ \hline \frac{3}{1} \cdot \frac{c}{3} = 12.3 \cdot \frac{3}{1} \\ c = 36.9 \end{array}$$

ck/ $\frac{c}{3} - 7 = 5.3$
 $\frac{36.9}{3} - 7 \stackrel{?}{=} 5.3$
 $12.3 - 7 \stackrel{?}{=} 5.3$
 $5.3 = 5.3$

* $\textcircled{17}$

$$\begin{array}{r} -7 + \frac{z}{4} = 5.2 \\ +7 \quad \quad +7 \\ \hline \frac{4}{1} \cdot \frac{z}{4} = 12.2 \cdot \frac{4}{1} \\ z = 48.8 \end{array}$$

ck/ $-7 + \frac{z}{4} = 5.2$
 $-7 + \frac{48.8}{4} \stackrel{?}{=} 5.2$
 $-7 + 12.2 \stackrel{?}{=} 5.2$
 $5.2 = 5.2$

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.

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

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

$$x = 6$$

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

$$\begin{array}{r} \frac{2x}{-3} - 10 = -4 \\ +10 \quad +10 \\ \hline \frac{2x}{-3} = 6 \cdot \frac{-3}{1} \\ \frac{2x}{2} = \frac{-18}{2} \\ x = -9 \end{array}$$

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

$$x = 6$$

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

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

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

$$-4 = -4$$

or

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

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

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

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

$$-4 = -4$$

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.

$$\begin{array}{r|l} -3(x-9) = 39 & \\ -3x + 27 = 39 & \\ -27 & -27 \\ \hline -3x = 12 & \\ -3 & -3 \\ \hline x = -4 & \end{array}$$

$$\begin{array}{l} \text{ck/ } -3(x-9) = 39 \\ -3(-4-9) \stackrel{?}{=} 39 \\ \quad \quad \quad \checkmark \\ -3(-13) \stackrel{?}{=} 39 \\ \quad \quad \quad 39 = 39 \end{array}$$

Order of Operations

$$\begin{array}{r|l} \frac{1}{3}(x-9) = 5 & \\ \frac{1}{3}x - 3 = 5 & \\ +3 & +3 \\ \hline \frac{1}{3}x = 8 & \\ \frac{3}{1} \cdot \frac{1}{3}x = \frac{3}{1} \cdot 8 & \\ x = 24 & \end{array}$$

$$\begin{array}{l} \text{ck/ } \frac{1}{3}(x-9) = 5 \\ \frac{1}{3}(24-9) \stackrel{?}{=} 5 \\ \quad \quad \quad \checkmark \\ \frac{1}{3}(15) \stackrel{?}{=} 5 \\ \quad \quad \quad 5 = 5 \end{array}$$