

Do Now

Solve the following equations. Don't Check.

1) $x - 7 = -13$
 ~~$+7$~~ $+7$
 $x - 7 = -13$
 $-6 - 7 = -13$
 $-13 = -13 \checkmark$
 $x = -6$

2) $14x = -56$
 ~~14~~ 14
 $x = -4$

3) $\frac{x}{4} = (-10)4$
 $x = -40$

4) $-17x = -204$
 ~~-17~~ -17
 $x = 12$

Lesson #56 - Solving Two Step Equations with Distributive Property

Two Step Equations are equations that require two steps.

Example 1) Solve and check: $8x + 7 = 31$

Steps to solving a two step equation:

Steps	Example
1) Move all of the constant terms to one side of the equal sign by using either addition or subtraction.	$8x + 7 = 31$ $+7$ -7 $8x = 24$
2) Isolate the variable by using either multiplication or division.	$\frac{8x}{8} = \frac{24}{8}$ $x = 3$
3) Check your solution	$8x + 7 = 31$ $8(3) + 7 = 31$ $24 + 7 = 31$ $31 = 31 \checkmark$

Example 2) Solve and Check: $4 + \frac{x}{5} = 0$

~~$4 + \frac{x}{5} = 0$~~
 ~~$\left(\frac{x}{5}\right) + (-4) = 5$~~
 $x = -20$

Example 3) Ken said -20 is the solution to the equation $-4 = \frac{x}{20} - 5$.

Part A: Is Ken correct? _____

$-4 = \frac{-20}{20} - 5$
 $-4 = -1 - 5 \quad -4 \neq -6$

Part B: If Ken is incorrect, what is the actual solution to the above equation?

$-4 = \frac{x}{20} - 5$
 $+5 \quad +5$
 $20(1) = \left(\frac{x}{20}\right) 20$
 $x = 20$

Now, You Try!

Directions: Solve and check the following equations.

<p>4) $-15 = 4x + 5$ $-5 = 4x$ $-20 = 4x$ $\frac{-20}{4} = \frac{4x}{4}$ $-5 = x$ $x = -5$</p>	<p>5) $-6x + 10 = -104$ $-10 = -104$ $-6x = -114$ $\frac{-6x}{-6} = \frac{-114}{-6}$ $x = 19$</p>
<p>6) $\frac{x}{9} - 1 = -2$ $\frac{x}{9} - 1 = -2$ $\left(\frac{x}{9}\right) + (-1) = (-1) 9$ $x = -9$</p>	<p>7) $\frac{x}{-4} + 8 = 5$ $\frac{x}{-4} + 8 = 5$ $\left(\frac{x}{-4}\right) = (-3) - 4$ $x = 12$</p>

We can also use the DISTRIBUTIVE PROPERTY to turn longer equations into two step equations.

Example 8) Solve and check the following: $2(4x + 3) = 46$

$$\begin{array}{r} 8x + 6 = 46 \\ \underline{-6 \quad -6} \\ 8x = 40 \\ \underline{\div 8 \quad \div 8} \quad x = 5 \end{array}$$

<p>9) $3(x - 2) = 12$</p> $\begin{array}{r} 3x - 6 = 12 \\ \underline{+6 \quad +6} \\ 3x = 18 \\ \underline{\div 3 \quad \div 3} \quad x = 6 \end{array}$	<p>$10(x - 7) = 20$</p> $x = 2$
<p>11) $5(x + 2) = -5$</p> $\begin{array}{r} 5x + 10 = -5 \\ \underline{-10 \quad -10} \\ 5x = -15 \\ \underline{\div 5 \quad \div 5} \quad x = -3 \end{array}$	<p>12) $10(x - 4) = 50$</p> $\begin{array}{r} 10x - 40 = 50 \\ \underline{+40 \quad +40} \\ 10x = 90 \\ \underline{\div 10 \quad \div 10} \quad x = 9 \end{array}$

Challenge: Write and solve an equation for the following situation:

Ray buys bottles of water at \$2.10 each and a large pizza pie at \$12.99. The total cost was \$21.39. Write an equation that can be used to determine the number of water bottles he bought. Then solve the equation.

$$2.10x + 12.99 = 21.39$$

$$x = 4$$