

Do Now

Solve and Check the following equations

1) $3x + 10 + 2x = 5$

$$\begin{aligned} 3x + 10 + 2x &= 5 \\ 5x + 10 &= 5 \\ -10 \quad -10 \\ \hline 5x - 5 &= -5 \\ \frac{5x}{5} - \frac{5}{5} &= \frac{-5}{5} \\ x &= -1 \end{aligned}$$

$$\begin{aligned} 3x + 10 + 2x &= 5 \\ 3(-1) + 10 + 2(-1) &= 5 \\ -3 + 10 + (-2) &= 5 \\ 5 &= 5 \end{aligned}$$

2) $3 - 2x + 4x + 6 = 9$

$$\begin{aligned} 3 - 2x + 4x + 6 &= 9 \\ 2x + 9 &= 9 \\ -9 \quad -9 \\ \hline 2x &= 0 \\ \frac{2x}{2} &= \frac{0}{2} \\ x &= 0 \end{aligned}$$

$$\begin{aligned} 3 - 2x + 4x + 6 &= 9 \\ 3 - 2(0) + 4(0) + 6 &= 9 \\ 3 + 6 &= 9 \\ 9 &= 9 \end{aligned}$$

Lesson #52 - Solving Equations with the Distributive Property

Warm Up: Simplify the following expressions

A) $6(2 + 4x)$

$$12 + 24x$$

B) $2(4x - 8) - 5(6 + 3x)$

$$\begin{aligned} 8x - 16 - 30 - 15x \\ \hline -7x - 46 \end{aligned}$$

Example 1) Solve and Check: $2(4x + 3) = 46$

Steps to solving an equation involving the distributive property:

<u>Steps</u>	<u>Example</u>
1) Use the distributive property where possible.	$8x + 6 = 46$
2) Combine like terms if necessary	No Like terms
3) Solve the resulting equation	$\begin{aligned} 8x + 6 &= 46 \\ -6 \quad -6 \\ \hline 8x &= 40 \\ \frac{8x}{8} &= \frac{40}{8} \\ x &= 5 \end{aligned}$
4) Check your solution.	

$$\begin{aligned} 2(4x + 3) &= 46 \\ 2(4 \cdot 5 + 3) &= 46 \\ 2(20 + 3) &= 46 \\ 2(23) &= 46 \\ 46 &= 46 \end{aligned}$$

Example 2) Solve and Check: $12(x+2) = 12$

$$\begin{array}{r}
 12x + 24 = 12 \\
 -24 \quad -24 \\
 \hline
 12x = -12 \\
 \frac{12x}{12} = \frac{-12}{12} \quad x = -1
 \end{array}$$

$$\begin{array}{l}
 12(x+2) = 12 \\
 12(-1+2) = 12 \\
 12(1) = 12 \\
 12 = 12 \checkmark
 \end{array}$$

Example 3) Solve and Check: $3(x+4) = 27$

$$\begin{array}{r}
 3x + 12 = 27 \\
 -12 \quad -12 \\
 \hline
 3x = 15 \\
 \frac{3x}{3} = \frac{15}{3} \quad x = 5
 \end{array}$$

Now, You Try!

Solve and Check the following equations.

<p>4) $3(x-2) = 12$</p> $ \begin{array}{r} 3x - 6 = 12 \\ +6 \quad +6 \\ \hline 3x = 18 \\ \div 3 \quad \div 3 \\ x = 6 \end{array} $	<p>5) $2(x+7) = 28$</p>
<p>6) $5(x+2) = -5$</p> $ \begin{array}{r} 5x + 10 = -5 \\ -10 \quad -10 \\ \hline 5x = -15 \\ \frac{5x}{5} = \frac{-15}{5} = x = -3 \end{array} $	<p>7) $10(x-4) = 50$</p> $ \begin{array}{r} 10x - 40 = 50 \\ +40 \quad +40 \\ \hline 10x = 90 \\ \frac{10x}{10} = \frac{90}{10} = x = 9 \end{array} $
<p>8) $\frac{1}{2}(6y+4) = 2$</p> $ \begin{array}{r} 3y + 2 = 2 \\ -2 \quad -2 \\ \hline 3y = 0 \\ \frac{3y}{3} = \frac{0}{3} \end{array} $	<p>9) $\frac{1}{4}(16n-12) = 26$</p> $ \begin{array}{r} .25(16n-12) = 26 \\ 4n - 3 = 26 \\ +3 \quad +3 \\ \hline 4n = 29 \\ \div 4 \quad \div 4 \\ n = 7.25 \end{array} $