

UNIT 2: EQUATIONS & INEQUALITIES

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Objective: I can solve multi-step equations with the distributive property and combining like terms.

Solving Multi-Step Equations

Sometimes one side of an equation will need to be simplified before you can solve. You may have to **combine like terms** or use the distributive property.

or BOTH

Practice using the **distributive property** and **combining like terms** with these expressions:

$$1. 2(x + 14) = 2x + 28$$

(2x) + 2(14)

$$2. -5(3c + 6) = -15c + (-30)$$

-5(3c) + (-5)(6)

$$3. 3v + -5v + 7 = -2v + 7$$

$$4. -1(-5e + 4) = 5e + (-4)$$

(-1)(-5e) + (-1)(4)

$$5. 2(9f + 4) - 5f = 18f + (-8) + (-5f) = 13f + (-8)$$

(2)(9f) + 2(4)

$$6. 9 + 4x + 8 = 9 + (-4x) + (-8) = -4x + 1$$

(-1)(4x) + (-1)(8)

$$7. 2(5n + 6) + 5(-4n + 3) = 10n + (-12) + (-20n) + 15 = -10n + 3$$

2(5n) + 2(6) + 5(-4n) + 5(3)

First... Distribute if possible
 Second... Combine like terms if possible
 Third... Isolate the variable by UNDOING the order of operations.

Now we'll simplify one side of the equation before we solve.

$$8. 5(x + 4) = 40$$

$$\begin{array}{r} 5x + 20 = 40 \\ -20 \quad -20 \\ \hline 5x = 20 \\ \frac{5x}{5} = \frac{20}{5} \\ x = 4 \end{array}$$

$$9. -2(3y + 7) = 56$$

$$\begin{array}{r} -6y + 14 = 56 \\ -14 \quad -14 \\ \hline -6y = 42 \\ \frac{-6y}{-6} = \frac{42}{-6} \\ y = -7 \end{array}$$

$$10. 15 + 1(4m + 5) = 32$$

$$15 + (-4m) + 5 = 32$$

$$\begin{array}{r} -4m + 20 = 32 \\ -20 \quad -20 \\ \hline -4m = 12 \\ \frac{-4m}{-4} = \frac{12}{-4} \\ m = -3 \end{array}$$

$$11. -5y + 5(-6 + 2y) = 0$$

$$-5y + 30 + 10y = 0$$

$$\begin{array}{r} 5y + 30 = 0 \\ -30 \quad -30 \\ \hline 5y = -30 \\ \frac{5y}{5} = \frac{-30}{5} \\ y = -6 \end{array}$$

$$12. 5(4 + 2x) + 1(8x + 12) = 68$$

$$20 + 10x + (-8x) + 12 = 68$$

$$\begin{array}{r} 2x + 32 = 68 \\ -32 \quad -32 \\ \hline 2x = 36 \\ \frac{2x}{2} = \frac{36}{2} \\ x = 18 \end{array}$$