

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.

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

1.  $2(x + 14) = 2x + 28$       2.  $-5(3c + 6) = -15c + -30$

3.  $3v + -5v + 7 = -2v + 7$       4.  $-1(-5e + 4) = 5e + -4$

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

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

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

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.  $5(x + 4) = 40$   
 $5x + 20 = 40$   
 $-20 \quad -20$   


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 $5x = 20$   
 $\frac{5}{5} \quad \frac{5}{5}$   
 $x = 4$

9.  $-2(3y + 7) = 56$   
 $-6y + 14 = 56$   
 $-14 \quad -14$   


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 $-6y = 42$   
 $\frac{-6}{-6} \quad \frac{-6}{-6}$   
 $y = -7$

10.  $15 + -1(4m + 5) = 32$   
 $15 + -4m + 5 = 32$   
 $-4m + 20 = 32$   
 $-20 \quad -20$   


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 $-4m = 12$   
 $\frac{-4}{-4} \quad \frac{-4}{-4}$   
 $m = -3$

11.  $-5y + 5(-6 + 2y) = 0$   
 $-5y + 30 + 10y = 0$   
 $5y + 30 = 0$   
 $-30 \quad -30$   


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 $5y = -30$   
 $\frac{5}{5} \quad \frac{5}{5}$   
 $y = -6$

12.  $5(4 + 2x) + 1(8x + 12) = 68$   
 $20 + 10x + 8x + 12 = 68$   
 $2x + 32 = 68$   
 $-32 \quad -32$   


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 $2x = 36$   
 $\frac{2}{2} \quad \frac{2}{2}$   
 $x = 18$