

**LEARNING OBJECTIVE:** We will generate equivalent expressions by combining like terms. (G8M4L3b)

**CONCEPT DEVELOPMENT:**

NOT SOLVING! SIMPLIFYING

**Any Grouping, Any Order with ADDITION:** When we are evaluating expressions involving only addition, we often use the associative and commutative properties of addition at the same time. We want get the terms that look alike to be closer to each other.

Example:  $2x + 1 + 5x$  LONGER

$$\begin{array}{l} 2x + 5x + 1 \\ \boxed{7x + 1} \end{array} \quad \text{SIMPLIFIED}$$

(Non-Example):  $-3a + 2 + 5a - 3$  CHANGE TO ADDITION

$$\begin{array}{l} -3a + 2 + 5a + (-3) \\ -3a + 5a + 2 + (-3) \\ \boxed{2a + (-1)} \quad \text{or} \\ \boxed{2a - 1} \end{array}$$

When combining expressions with parentheses,

**Remember the opposite of a sum is the sum of its opposites!!**

Examples:

$$40 + 9 - (30 + 2)$$

$$\begin{array}{l} \rightarrow 3x + 2 - (8 + 2x) \quad \text{CHANGE SIGNS IN PARENTHESES!} \\ 3x + 2 - 8 - 2x \quad \text{CHANGE TO ADDITION} \\ \boxed{3x + 2 + (-8) + (-2x)} \\ \boxed{3x + (-2x) + 2 + (-8)} \\ \boxed{1x + (-6)} \quad \text{or} \\ \boxed{x - 6} \end{array}$$

**GUIDED PRACTICE:****Steps for Writing Equivalent Expression by Combining Like Terms**

1. (If necessary) Rewrite any subtraction by adding the inverse.
2. (If necessary) Evaluate any multiplication before combining like terms.
3. Rearrange (using associative and distributive properties) the terms to place similar variable terms closer together.
4. Add the similar variable terms to generate an equivalent expression.

$\underline{2x} + \underline{3} + \underline{5x} + \underline{6}$ $\underline{2x+5x} + \underline{3+6}$ $\checkmark \boxed{7x+9}$	$\underline{12} + \underline{3y} + \underline{4} + \underline{11y}$ $\underline{3y+11y} + \underline{4+12}$ $\boxed{14y+16}$
$3c + 2 + 4c - 1d - 12 + 7d$ $\underline{3c+2} + \underline{4c} + \underline{(-1d)} + \underline{(-12)} + \underline{7d}$ $\underline{3c+4c} + \underline{(-1d)} + \underline{7d} + \underline{2+(-12)}$ $7c + 6d + (-10)$ $\boxed{7c+6d-10}$	$\underline{4m} - \underline{3n} + \underline{5} + \underline{12n} - \underline{17} + \underline{2m}$ $\underline{4m} + \underline{(-3n)} + \underline{5} + \underline{12n} + \underline{(-17)} + \underline{2m}$ $\underline{4m+2m} + \underline{(-3n)} + \underline{12n} + \underline{5+(-17)}$ $6m + 9n + (-12)$
<p>Distribute negative</p> $2x - 4 - (5x + 2)$ $2x - 4 - 5x - 2$ $\underline{2x+(-4)} + \underline{(-5x)} + \underline{(-2)}$ $\underline{2x+(-5x)} + \underline{(-4)} + \underline{(-2)}$ $-3x + (-6)$ $\boxed{-3x-6}$	$3x + 17 - (7x + 3)$ $3x + 17 - 7x - 3$

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**TEACHER NOTES:**

This will help us solve multistep equations later on in the module...need to mention this.