

### 3.2 Adding and Subtracting Linear Expressions

E.Q.: How do we use what we know about DISTRIBUTIVE Property and COMBINING LIKE TERMS to add and subtract LINEAR EXPRESSIONS?

**LINEAR EXPRESSION:** an expression in which the exponent of the variable is 1.

**HIDDEN 1:** When a parenthesis has a subtraction/negative sign in front of it, the subtraction/negative sign is actually a -1.

EX:  $3 - (8+6)$  is REALLY:  $3 - 1(8+6)$

#### ADDING AND SUBTRACTING LINEAR EXPRESSIONS:

**Step 1:** Rewrite the sum so all terms are out of parenthesis using DISTRIBUTIVE PROPERTY if needed.

**Step 2:** CIRCLE, BOX, or HIGHLIGHT like terms.

**Step 3:** Group like terms together.

**Step 4:** Combine like terms.

#### EXAMPLE 1:

$$(-4y + 3) + (11y - 5)$$

$$(-4y + 3) + (11y - 5) = -4y + 3 + 11y - 5 \quad \text{STEP 1}$$

$$= \boxed{-4y + 3} + \boxed{11y - 5} \quad \text{STEP 2}$$

$$= \boxed{(-4y + 11y)} + \boxed{(3 - 5)} \quad \text{STEP 3}$$

$$\boxed{11y - 4y} = 7y \quad \boxed{3 + (-5)} = -2 \quad \text{STEP 4}$$

$$7y - 2 \quad \text{FINAL ANSWER}$$

#### EXAMPLE 2:

Find  $2(-7.5z + 3) - (5z - 2)$

$$2(-7.5z + 3) - 1(5z - 2) = -15z + 6 - 5z + 2 \quad \text{STEP 1-use distributive property}$$

$$= \boxed{-15z + 6} - \boxed{5z} + \boxed{2} \quad \text{STEP 2}$$

$$= \boxed{-15z - 5z} + \boxed{6 + 2} \quad \text{STEP 3}$$

$$-15z - 5z = -20z \quad 6 + 2 = 8 \quad \text{STEP 4}$$

$$\boxed{-20z + 8} \quad \text{FINAL ANSWER}$$

$$(x + 3) + (2x - 1)$$

$$\boxed{x + 3} + \boxed{2x - 1}$$

$$2x + x + 3 - 1$$

$$\boxed{3x + 2}$$

$$(-8z + 4) + (8z - 7)$$

$$\boxed{-8z + 4} + \boxed{8z - 7}$$

$$-8z + 8z + 4 - 7$$

$$\boxed{-3}$$

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

$$\boxed{4 - n} + \boxed{-10n} + \boxed{6}$$

$$-n + (-10n) + 4 + 6$$

$$\boxed{-11n + 10}$$

$$\frac{1}{2}(w - 6) + \frac{1}{4}(w + 12)$$

$$\frac{1}{2}w - 3 + \frac{1}{4}w + 3$$

$$\frac{1}{2}w + \frac{1}{4}w + 3 - 3$$

$$\frac{3}{4}w + 0$$

$$\boxed{\frac{3}{4}w}$$