

3.1b Combining Like Terms

EQ: How do we use what we know about Terms, Constants, Variables and Coefficients to COMBINE LIKE TERMS?

COMBINING LIKE TERMS: a process used to SIMPLIFY an expression.

We can **ONLY** combine **TERMS** that have:

-the **SAME VARIABLES** and the **SAME EXPONENTS**

HOW TO:

1) IDENTIFY all TERMS with SHAPES or COLORS.

$$\textcircled{6} \quad \boxed{9x} \quad \heartsuit 3x^2 \quad \diamond 2y - 5 \quad + \quad \heartsuit 2x^2 \quad - \quad \boxed{5x} \quad + \quad \diamond y$$

2) MOVE all LIKE TERMS together. MOVE SIGNS with the term that follows it.

$$\underline{-3x^2 + 2x^2} \quad +9x - 5x \quad +2y + y \quad 6 - 5$$

3) Combine the COEFFICIENTS of the VARIABLES to simplify.

$$\begin{array}{cccc} -3x^2 + 2x^2 & +9x - 5x & +2y + y & 6 - 5 \\ \downarrow & \downarrow & \downarrow & \downarrow \\ -1x^2 & +4x & +3y & +1 \end{array}$$

4) Write final simplified expression.

$$\boxed{-x^2 + 4x + 3y + 1}$$

EXAMPLE 1:

Identify the TERMS & LIKE TERMS

$$\textcircled{2a} + \textcircled{3b} - \textcircled{4a}$$

TERMS:

$$2a, 3b, -4a$$

LIKE TERMS:

$$2a \quad \& \quad -4a$$

EXAMPLE 2:

Simplify the expression.

$$2a + 3b - 4a$$

$$2a - 4a + 3b$$

$$2a + (-4a) + 3b$$

$$\boxed{-2a + 3b}$$

Identify the TERMS & LIKE TERMS

$$y + 10 - \frac{2}{3}y$$

TERMS:

$$y, -\frac{2}{3}y, 10$$

LIKE TERMS:

$$y \text{ and } -\frac{2}{3}y$$

SIMPLIFY the expression

$$y + 10 - \frac{2}{3}y$$

$$1y + \left(-\frac{2}{3}y\right) + 10$$

$$\frac{1 \times 3}{1 \times 3}y + \left(-\frac{2}{3}y\right) + 10$$

$$\frac{3}{3}y + \left(-\frac{2}{3}y\right) + 10 = \frac{1}{3}y + 10$$

Identify the TERMS & LIKE TERMS

$$2r^2 + 7r - r^2 - 9$$

TERMS:

$$2r^2, +7r, -r^2, -9$$

LIKE TERMS:

$$2r^2 \text{ \& } -r^2$$

SIMPLIFY the expression

$$2r^2 + 7r - r^2 - 9$$

$$2r^2 - r^2 + 7r - 9$$

$$1r^2 + 7r - 9$$

Identify the TERMS & LIKE TERMS

$$14 - 3z + 8 + z$$

TERMS:

$$14, -3z, +8, +z$$

LIKE TERMS:

$$-3z \text{ \& } z, 14 \text{ \& } 8$$

SIMPLIFY the expression

$$14 - 3z + 8 + z$$

$$-3z + z + 14 + 8$$

$$-2z + 22$$

Identify the TERMS & LIKE TERMS

$$2.5x + 4.3x - 5$$

TERMS:

LIKE TERMS:

SIMPLIFY the expression

$$2.5x + 4.3x - 5$$

TERM

-a single number or variable, or numbers & variables multiplied together.
Terms are separated by + or - signs.

EX: x , v^2 , 8 , xy , $9z$, r^3

CONSTANT

-ONLY a NUMBER

EX: 1 , 45 , 6 , 3 , 45 , $\frac{1}{2}$

VARIABLE

-a letter with an unknown value, can also have an exponent

EX: a , x^2 , y , z , q , v^3

COEFFICIENT

-a number in front of (multiplied by) a variable(s)

EX: 3 xy , 2 q