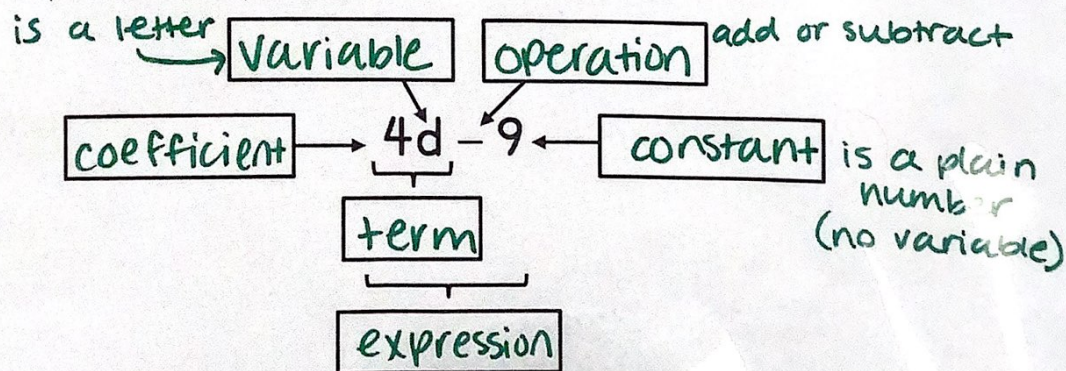


SIMPLIFYING EXPRESSIONS

<p>EXPRESSION</p>	<ul style="list-style-type: none"> A mathematical phrase that can contain <u>numbers</u>, <u>variables</u> and <u>operations</u> (like addition and subtraction). *An expression does <u>not</u> have an equal sign.*
<p>TERM</p>	<ul style="list-style-type: none"> A term is a <u>constant</u> or a <u>variable</u> in an expression. Separated by <u>+</u> and <u>-</u> signs. Ex: <u>6n, 14, 2x²</u>
<p>COEFFICIENT</p>	<ul style="list-style-type: none"> The number in front of a <u>variable</u>
<p>LIKE TERMS</p>	<ul style="list-style-type: none"> Must have both the same base (or <u>variable</u>) and the same exponent (or <u>power</u>).

Label the various parts of the expression below.



Use the definitions above to help you complete the following.

<p>1. Give an example of an expression with three terms.</p> <p><u>$5n + 3x - 7$</u></p>	<p>2. List all the terms in the expression below.</p> <p>$8c - 5 + 4c^2 + 2b$</p> <p><u>$8c, -5, 4c^2, 2b$</u></p>	<p>3. Circle the coefficients in the expression below.</p> <p><u>$5g + 7h - 4 - 2g$</u></p>
<p>4. Give an example of a like term for each of the following:</p> <p>a. -50 <u>32</u> b. $3b$ <u>$-5b$</u> c. $-5a$ <u>$100a$</u> d. x^2 <u>$4x^2$</u></p>		

3.1 Lesson

Key Vocabulary

like terms, p. 165
simplest form, p. 165

In an algebraic expression, **like terms** are terms that have the same variables raised to the same exponents. Constant terms are also like terms. To identify terms and like terms in an expression, first write the expression as a sum of its terms.

Example 1 Identifying Terms and Like Terms

Identify the terms and like terms in each expression.

a. $9x - 2 + 7 - x$

Rewrite as a sum of terms.

$$9x + (-2) + 7 + (-x)$$

Terms: $9x$, -2 , 7 , $-x$

Like terms: $9x$ and $-x$, -2 and 7

b. $z^2 + 5z - 3z^2 + z$

Rewrite as a sum of terms.

$$z^2 + 5z + (-3z^2) + z$$

Terms: z^2 , $5z$, $-3z^2$, z

Like terms: z^2 and $-3z^2$, $5z$ and z

Try It

Identify the terms and like terms in the expression.

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

terms: $y, 10, -\frac{3}{2}y$
like terms: y and $-\frac{3}{2}y$

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

3. $7 + 4p - 5 + p + 2q$

terms: $7, 4p, -5, p, 2q$
like terms: 7 and -5
 $4p$ and p

An algebraic expression is in **simplest form** when it has no like terms and no parentheses. To *combine* like terms that have variables, use the Distributive Property to add or subtract the coefficients.

Example 2 Simplifying Algebraic Expressions

Remember

The Distributive Property states

$$a(b + c) = ab + ac$$

and

$$a(b - c) = ab - ac.$$

a. Simplify $6n - 10n$.

$$6n - 10n = (6 - 10)n$$

$$= -4n$$

Distributive Property

Subtract.

b. Simplify $-8.5w + 5.2w + w$.

$$-8.5w + 5.2w + w = -8.5w + 5.2w + 1w$$

$$= (-8.5 + 5.2 + 1)w$$

$$= -2.3w$$

Multiplicative Identity Property of One

Distributive Property

Add.



Try It

Simplify the expression.

4. $-10y + 15y$

$-5y$

5. $\frac{3}{8}b - \frac{3}{4}b$

$-\frac{3}{8}b$

6. $2.4g - 2.4g - 9.8g$

$-9.8g$

Example 3 Simplifying Algebraic Expressions

a. Simplify $\frac{3}{4}y + 12 - \frac{1}{2}y - 6$.

$$\frac{3}{4}y + 12 - \frac{1}{2}y - 6 = \frac{3}{4}y + 12 + \left(-\frac{1}{2}y\right) + (-6)$$
 Rewrite as a sum.

$$= \frac{3}{4}y + \left(-\frac{1}{2}y\right) + 12 + (-6)$$
 Commutative Property of Addition

$$= \left[\frac{3}{4} + \left(-\frac{1}{2}\right)\right]y + 12 + (-6)$$
 Distributive Property

$$= \frac{1}{4}y + 6$$
 Combine like terms.

b. Simplify $-3y - 5y + 4z + 9z$

$-8y + 13z$

$$-3y - 5y + 4z + 9z = (-3 - 5)y + (4 + 9)z$$
 Distributive Property

$$= -8y + 13z$$
 Simplify.

Try It

Simplify the expression.

7. $14 - 3z + 8 + z$

$22 - 2z$

8. $2.5x + 4.3x - 5$

$6.8x - 5$

9. $2s - 9s + 8t - t$

$-7s + 7t$

