Name _____ Date _____

LESSON 5.2

Study Guide

For use with pages 252–255

CA Standards
AF 1.3
AF 1.4

GOAL **Simplify algebraic expressions.**

VOCABULARY

The parts of an expression that are added together are called **terms**.

In a term with a variable, the number multiplied by the variable is the **coefficient** of the variable.

Like terms have identical variable parts with corresponding variables raised to the same power.

A term that has no variable is a **constant term**.

EXAMPLE 1 Identifying Parts of an Expression

Identify the terms, coefficients, like terms, and constant terms of the expression $10 - 8x + 4x - 1 + 3x$.

Solution

Write the expression as a sum: $10 + (-8x) + 4x + (-1) + 3x$.

Terms: $10, -8x, 4x, -1, 3x$ **Like terms:** $-8x$, $4x$, and $3x$; 10 and -1

Coefficients: $-8, 4, 3$ **Constant terms:** $10, -1$

Exercises for Example 1

Identify the terms, coefficients, like terms, and constant terms of the expression.

1. $x + 5 + 9x$

2. $6m - 8 + 11 + 7m$

3. $4q + 5p - 2p + 1 - 3q$

4. $-12y - 7z - 2 + 10y + 2z$

EXAMPLE 2 Combining Like Terms

a. $7x + 5x = (7 + 5)x$ Distributive property

$= 12x$ And inside grouping symbols.

b. $-6y + 8y + 9 = (-6 + 8)y + 9$ Distributive property

$= 2y + 9$ Add inside grouping symbols.

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EXAMPLE 3 Simplifying Expressions

$3(7 - x) + 4x = 21 - 3x + 4x$		Distributive property
$= 21 + (-3x) + 4x$		Change subtraction to addition.
$= 21 + (-3 + 4)x$		Distributive property
$= 21 + x$		Add inside grouping symbols.

Exercises for Examples 2 and 3

Simplify the expression by combining like terms.

5. $r + 3r - 8r$

6. $16w - 5w - 7w + 12w$

7. $-2x + 5x + 3y - 9y$

8. $r + 10r - (-4r) - r$

EXAMPLE 4 Simplifying an Expression in Real Life

You are on vacation and buy souvenir key chains and beach towels for x number of friends. Key chains cost \$2.75 each and beach towels cost \$7.50 each.

a. Write and simplify an expression for the total amount you spend on souvenirs.

b. Find the total amount you spend if you buy souvenirs for 4 friends.

Solution

a. Write a verbal model.

Cost of • key chain	Number of friends	+	Cost of • beach towel	Number of friends

$2.75 \cdot x + 7.50 \cdot x$	Substitute.
$= 10.25x$	Combine like terms.

Answer: An expression for the total amount you spend is $10.25x$.

b. Substitute 4 for x to find the total amount you spend on souvenirs.

$10.25(4) = 41$ Substitute 4 for x and simplify.

Answer: You spend \$41 on souvenirs.

Exercise for Example 4

9. You are on vacation and buy souvenir hats and T-shirts for x number of friends. Hats cost \$5.50 each and T-shirts cost \$6.75 each. Write and simplify an expression for the total amount you spend on souvenirs. Then find the total amount you spend if you buy souvenirs for 3 friends.

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