Lesson 8-1

Example 1 Write Expressions with Addition
Use the Distributive Property to rewrite $3(x + 2)$.

$3(x + 2) = 3(x) + 3(2)$
$= 3x + 6$ Simplify.

Example 2 Write Expressions with Addition
Use the Distributive Property to rewrite $(y + 6)4$.

$(y + 6)4 = y \cdot 4 + 6 \cdot 4$
$= 4y + 24$ Simplify.

Example 3 Write Expressions with Subtraction
Use the Distributive Property to rewrite $5(z – 3)$.

$5(z – 3) = 5[z + (–3)]$ Rewrite $z – 3$ as $z + (–3)$.
$= 5(z) + 5(–3)$ Distributive Property
$= 5z + (–15)$ Simplify.
$= 5z – 15$ Definition of subtraction

Example 4 Write Expressions with Subtraction
Use the Distributive Property to rewrite $–4(x – 5)$.

$–4(x – 5) = –4[x + (–5)]$ Rewrite $x – 5$ as $x + (–5)$.
$= –4(x) + (–4)(–5)$ Distributive Property
$= –4x + 20$ Simplify.

Example 5 Identify Parts of an Expression
Identify the terms, like terms, coefficients, and constants in the expression $3m – 2m + 5 + m$.

$3m – 2m + 5 + m = 3m + (–2m) + 5 + m$ Definition of subtraction
$= 3m + (–2m) + 5 + 1m$ Identity Property; $m = 1m$

The terms are $3m$, $–2m$, 5, and m. The like terms are $3m$, $–2m$, and m. The coefficients are 3, –2, and 1. The constant is 5.

Example 6 Simplify Algebraic Expressions
Simplify the expression $5x + x$.

$5x$ and x are like terms.

$5x + x = 5x + 1x$	Identity Property; $x = 1x$
$= (5 + 1)x$	Distributive Property
$= 6x$	Simplify.

Example 7 Simplify Algebraic Expressions
Simplify the expression $6w + 5 + –6w$.

$6w$ and $–6w$ are like terms.

$6w + 5 + –6w = 6w + –6w + 5$	Commutative Property
$= (6 + –6)w + 5$	Distributive Property
$= 0w + 5$	$6 + –6 = 0$
$= 0 + 5$ or 5	$0w = 0 \cdot w$ or 0

Example 8 Real-World Example
FOOD At the pool, you buy some boxes of popcorn that cost $1.50 each and the same number of slices of pizza that cost $2.50 each. Write an expression in simplest form that represents the total amount of money spent on popcorn and pizza.

Words $1.50 each for some number of boxes of popcorn and $2.50 each for the same number of slices of pizza

Variable Let x represent the number of boxes of popcorn or slices of pizza.

Expression $1.50 \cdot x + 2.50 \cdot x$

Simplify the expression.

$1.50x + 2.50x = (1.50 + 2.50)x$	Distributive Property
$= 4x$	Simplify.

The expression $\$4x$ represents the total amount of money spent on popcorn and pizza.