

# Simplifying Algebraic Expressions

Parts of an algebraic expression are called *terms*. **Like terms** are terms that have the same variables raised to the same exponents. Constant terms are also like terms.

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 1** Simplify  $8y + 7y$ .

$$\begin{aligned} 8y + 7y &= (8 + 7)y \\ &= 15y \end{aligned}$$

Distributive Property

Add coefficients.

**Example 2** Simplify  $2(x + 5) - 3(x - 2)$ .

$$\begin{aligned} 2(x + 5) - 3(x - 2) &= 2(x) + 2(5) - 3(x) - 3(-2) \\ &= 2x + 10 - 3x + 6 \\ &= 2x - 3x + 10 + 6 \\ &= -x + 16 \end{aligned}$$

Distributive Property

Multiply.

Group like terms.

Combine like terms.

**Example 3** Simplify  $xy + 3y - 2x + 5y - 3xy$ .

$$\begin{aligned} xy + 3y - 2x + 5y - 3xy &= xy - 3xy + 3y + 5y - 2x \\ &= -2xy + 8y - 2x \end{aligned}$$

Group like terms.

Combine like terms.

## Practice

Check your answers at [BigIdeasMath.com](http://BigIdeasMath.com).

Simplify the expression.

1.  $7x + 15x$

2.  $8y - 14y$

3.  $7d + 9 - 5d$

4.  $3w + 2(2 - 3w) + 2$

5.  $(x + 3) + (3x - 7)$

6.  $(5k + 6) + (4k - 8)$

7.  $(-7n + 6) + (5n + 15)$

8.  $(9z + 12) - (6z + 8)$

9.  $(8b + 1) - (-10b - 5)$

10.  $s(8 - 2t) + 3t(4 - 2s) + 5t$

11.  $qr + 2q^2 - 3qr - r^2 - 6q^2$

12.  $g^3(h - 4g) - h(3 - 2g^3)$

13. **EARNINGS** The original price of a model car is  $d$  dollars. You use a coupon and buy the kit for  $(d - 10)$  dollars. You assemble the model car and sell it for  $(2d - 20)$  dollars. Write an expression that represents your earnings. Interpret the expression.