

# 1-5 The Distributive Property (Pages 26–31)

A **term** is a number, a variable, or a product or quotient of numbers and variables. Some examples of terms are  $x^2$  and  $3y$ . The expression  $3a + 5$  has two terms. **Like terms** are terms that contain the same variable, with corresponding variables having the same power. For example,  $2x^2$  and  $7x^2$  are like terms, but  $4b^2$  and  $2b$  are not. The expressions  $8g + 4g$  and  $12g$  are **equivalent expressions** because they denote the same number. An expression is in **simplest form** when it is replaced by an equivalent expression having no like terms and no parentheses. The **coefficient** of a term is the numerical factor. For example, in  $8g$ , 8 is the coefficient. You can use these facts plus the **Distributive Property** to simplify expressions.

<b>Distributive Property</b>	For any numbers $a$ , $b$ , and $c$ , $a(b + c) = ab + ac$ and $(b + c)a = ba + ca$ ; $a(b - c) = ab - ac$ and $(b - c)a = ba - ca$ .
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### Examples

**a. Rewrite  $7(2x + 3)$  without parentheses.**

Use the Distributive Property.

$$7(2x + 3) = 14x + 21$$

The expression  $14x + 21$  is in simplest form because it has no parentheses and no like terms.

**b. Simplify the expression  $3x^2 + 2x + 6x + x^2$ .**

Group and combine like terms using the Distributive Property.

$$3x^2 + 2x + 6x + x^2$$

$$= 3x^2 + x^2 + 2x + 6x$$

$$= (3 + 1)x^2 + (2 + 6)x$$

$$= 4x^2 + 8x$$

Rearrange the terms.

Remember,  $x^2 = 1x^2$ .

Simplify.

### Practice

Use the distributive property to rewrite each expression without parentheses.

1.  $3(a + 4)$

2.  $2(x + 3)$

3.  $(h - 5)6$

4.  $-3(b + f)$

5.  $x(2 + y)$

6.  $a(b + c)$

Simplify each expression, if possible. If not possible, write *in simplest form*.

7.  $4x + 2x$

8.  $6a + 3b$

9.  $12xy + 4xy$

10.  $11m + 7m^2 + 5m^2$

11.  $10b + 6b^2 + 4b^3$

12.  $27x^2 - 18x^2$

13.  $15b^3 + 10b + 20b^3$

14.  $2x^2 + 2x^2$

15.  $3y^4 - 9y^5 + 15y^4 + 3y^6$

**16. Mental Math** How would you use the Distributive Property to find the product of 6 and 104 mentally? Show your steps.

**17. Standardized Test Practice** Use the Distributive Property to rewrite the expression  $2(m + 4h + 2a)$  without using parentheses.

**A**  $2m + 4h + 2a$

**B**  $2m + 8h + 4a$

**C**  $m + 4h^2 + 4a$

**D**  $4m + 4h + 4a$

<b>Answers:</b> 1. $3a + 12$ 2. $2x + 6$ 3. $6h - 30$ 4. $-3b - 3f$ 5. $2x + xy$ 6. $ab + ac$ 7. $6x$ 8. in simplest form 9. $16xy$ 10. $11m + 12m^2$ 11. in simplest form 12. $9x^2$ 13. $35b^3 + 10b$ 14. $4x^2$ 15. $18y^4 - 9y^5 + 3y^6$ 16. $6(100 + 4) = 600 + 24 = 624$ 17. B
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