

1-7

NAME _____ DATE _____

The Distributive Property (Pages 45–50)

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.

Distributive Property

For any numbers a , b , and c ,
 $a(b + c) = ab + ac$ and $(b + c)a = ba + ca$;
 $a(b - c) = ab - ac$ and $(b - c)a = ba - ca$.

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.

$$\begin{aligned} 3x^2 + 2x + 6x + x^2 &= 3x^2 + x^2 + 2x + 6x \\ &= (3 + 1)x^2 + (2 + 6)x \quad \text{Remember, } x^2 = 1x^2. \\ &= 4x^2 + 8x \end{aligned}$$

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 $4m + 4h + 4a$

Answers: 1. $3a + 12$ 2. $2x + 6$ 3. $6h - 30$ 4. $-3b - 3f - 30$ 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