

Distributive Property (Pages 19–23)

A **term** is a number, variable, product, or quotient of numbers and variables. Some examples of terms are 7 and $3y$. The expression $3a + 5$ has two terms. **Like terms** are terms that contain the same variables, such as $2x$ and $7x$ or $3ab$ and $5ab$. The expressions $8g + 4g$ and $12g$ are **equivalent expressions** because their values are the same for any value of g . 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.

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| Distributive Property | For any numbers a , b , and c , $a(b + c) = ab + ac$ and $a(b - c) = ab - ac$. |
|------------------------------|---|

EXAMPLES

Simplify each expression.

A $7(2x + 3)$

$$\begin{aligned} 7(2x + 3) &= (7 \cdot 2x) + (7 \cdot 3) && \text{Distributive Property} \\ &= 14x + 21 && \text{Substitution Property} \end{aligned}$$

B $3x + 2y + 6x + y$

Group and combine like terms using the Distributive Property.

$$\begin{aligned} 3x + 2y + 6x + y & \\ &= (3x + 6x) + (2y + y) \\ &= (3 + 6)x + (2 + 1)y \\ &= 9x + 3y \end{aligned}$$

PRACTICE

Simplify each expression.

- | | | |
|------------------|------------------------|-----------------------|
| 1. $3(a + 4)$ | 2. $4x + 2x$ | 3. $12xy + 4xy$ |
| 4. $11k - k$ | 5. $8(3h - 2)$ | 6. $a(b + c)$ |
| 7. $4(2m + 8m)$ | 8. $6a + 4 - 5a$ | 9. $x(2 + y)$ |
| 10. $3(3st - 5)$ | 11. $5n + 2p - 2n + p$ | 12. $7(2 - r)$ |
| 13. $(h - 5)6$ | 14. $(x - 3y)2 + 9y$ | 15. $8g - 4 - 2g + 5$ |

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 simplify the expression $2(m + 4h + 2a)$.

- A** $2m + 4h + 2a$ **B** $2m + 8h + 4a$ **C** $m + 4h^2 + 4a$ **D** $4m + 4h + 4a$

Answers: 1. $3a + 12$ 2. $6x$ 3. $16xy$ 4. $10k$ 5. $24h - 16$ 6. $ab + ac$ 7. $40m$ 8. $a + 4$ 9. $2x + xy$ 10. $9st - 15$ 11. $3n + 3p$ 12. $14 - 7r$ 13. $6h - 30$ 14. $2x + 3y$ 15. $6g + 1$ 16. $6(100 + 4) = 600 + 24 = 624$ 17. B