3.4 The Distributive Property

1

ESSENTIAL QUESTION

How do you use the Distributive Property to simplify expressions?

2

COMMON CORE STATE STANDARDS

6.NS.4 . . . Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor.

6.EE.2b Identify parts of a expression.

6.EE.3 Apply the properties of operations to generate equivalent expressions.

6.EE.4 Identify when two expressions are equivalent.

3

Simplify the expression

$4(x + 9)$

HOUSE

TRICK OR TREATERS

WE USED THE **DISTRIBUTIVE PROPERTY** TO SIMPLIFY THIS EXPRESSION.

4

The Distributive Property

Multiply each term in the sum or difference by the term outside the parenthesis. Then evaluate.

$3(w + 7)$
$3 \cdot w + 3 \cdot 7$
$3w + 21$

Algebra
$a(b + c) = ab + ac$

$3(w - 7)$
$3 \cdot w - 3 \cdot 7$
$3w - 21$

Algebra
$a(b - c) = ab - ac$

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EXAMPLE 3 Simplifying Algebraic Expressions

Use the Distributive Property to simplify the expression.

$4(n + 5)$

$4 \cdot n + 4 \cdot 5$

$4n + 20$

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EXAMPLE 3 Simplifying Algebraic Expressions

Use the Distributive Property to simplify the expression.

$12(2y - 3)$

$12 \cdot 2y - 12 \cdot 3$

$24y - 36$

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EXAMPLE 3 Simplifying Algebraic Expressions

Use the Distributive Property to simplify the expression.

$9(6 + x + 2)$

$9 \cdot 6 + 9 \cdot x + 9 \cdot 2$

$54 + 9x + 18$

$72 + 9x$

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On Your Own

Use the distributive Property to simplify the expression.

$7(d + 2)$

$7 \cdot d + 7 \cdot 2$

$7d + 14$

9

On Your Own

Use the distributive Property to simplify the expression.

$3(d - 11)$

$3 \cdot d - 3 \cdot 11$

$3d - 33$

10

On Your Own

Use the distributive Property to simplify the expression.

$7(2 + 6 - 4d)$

$7 \cdot 2 + 7 \cdot 6 - 7 \cdot 4d$

$14 + 42 - 28d$

$56 - 28d$

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EXAMPLE 4 Real-Life Application

Jose is x years old. His brother, Felipe, is 2 years older than Jose. Their aunt, Maria, is three times old as Felipe. Write and Simplify an expression that represents Maria's age in years.

Jose → x years old

Felipe → 2 years older than Jose

$x + 2$

12 Maria → 3 times as old as Felipe

$3(x+2)$

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

Alexis is x years old. Her sister, Gloria, is 7 years older than Alexis. Their grandfather if five times as old as Gloria. Write and simplify an expression that represents their grandfather's age in years.

Alexis → x

Gloria → $x+7$

Grandfather → $5(x+7)$

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$5(x+7) = 5x+35$

LIKE TERMS-> Terms that have the same variables raised to the same exponents. Constant terms are also like terms.

12 *and* 7 → *Like Terms*

$7r$ *and* r → *Like Terms*

$5x$ *and* $5w$ → *Not Like Terms*

$9x^2$ *and* $2x$ → *Not Like Terms*

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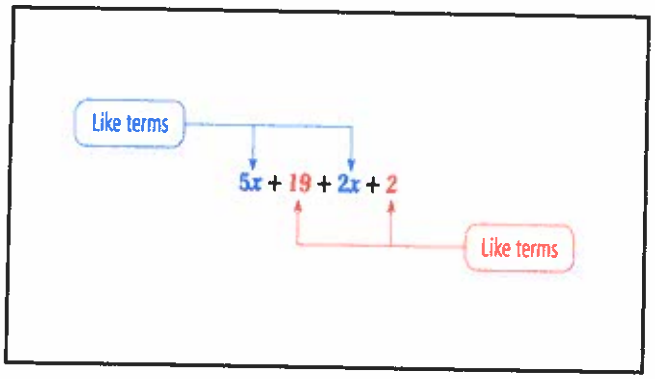

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EXAMPLE 5 Combining Like Terms

Simplify each expression.

$3x + 9 + 2x - 5$

$5x + 4$

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EXAMPLE 5 Combining Like Terms

Simplify each expression.

$y + y + y$

$3y$

17

EXAMPLE 5 Combining Like Terms

Simplify each expression.

$7z + 2(z - 5y)$

$7z+2z-10y$

$9z-10y$

18

Simplify the expression.

$8 + 3z - z$

$8 + 2z$

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Simplify the expression.

$3(b + 5) + b + 2$

$3b + 15 + b + 2$

$4b + 17$

20

Simplify the expression.

$10 + 7(3 + x)$

$10 + 21 + 7x$

$22 + 7x$

21

Simplify the expression.

$5(2w + 8) - 3w$

$10w + 40 - 3w$

$7w + 40$

22

Simplify the expression.

$5(4 + 8k) + 12$

$20 + 40k + 12$

$32 + 40k$

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Simplify the expression.

$8(x + y) - 5x$

$8x + 8y - 5x$

$3x + 8y$

24

Simplify the expression.

$2c + 3(f + 5c)$

$2c + 3f + 15c$

$17c + 3f$

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Simplify the expression.

$3(x + 5) + 4(2 + x)$

$3x + 15 + 8 + 4x$

$7x + 23$

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