MATHEMATICS · GRADES 7-9

Distributive property

Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you work out a total by breaking it into parts. Buying the same lunch for everyone at your table is one price times the number of people, and you can work it out by splitting the price into dollars and cents first. The same trick works for a bulk order, a group ticket, or any total that is one amount repeated. Breaking a hard multiplication into easy pieces is faster than guessing and more reliable than a calculator you do not have.



Rule

Distributive property: $a \times (b + c) = a \times b + a \times c$.

Multiply the number outside the brackets by each term inside the brackets. It works for any numbers, including negatives.

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Worked examples

EXAMPLE 1

Q Expand $3(x + 8)$.

SOLUTION

This is the distributive property: the number outside the brackets multiplies every term inside.

$3 \times x = 3x$, and $3 \times 8 = 24$

So $3(x + 8) = 3x + 24$

EXAMPLE 2

Q Expand $-7(x - 2)$.

SOLUTION

The outside number is negative, so watch the signs: a negative times a negative is a positive.

$-7 \times x = -7x$, and $-7 \times (-2) = +14$

So $-7(x - 2) = -7x + 14$

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Practice questions

1 Expand $4(x + 5)$.

- **A** $4x + 5$
- **B** $x + 20$
- **C** $4x + 20$
- **D** $4x - 20$

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2 Expand $5(2x - 3)$.

- **A** $10x - 15$
- **B** $10x + 15$
- **C** $10x - 3$
- **D** $2x - 15$

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3 Expand $-3(2 + 2x)$.

- **A** $-6 + 6x$
- **B** $6 + 6x$
- **C** $-6 - 6x$
- **D** $-6 - 2x$

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4 Expand $-(4x - 5)$.

- **A** $-4x - 5$
- **B** $4x - 5$
- **C** $-4x + 5$
- **D** $4x + 5$

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5 Simplify $2(3x - 1) + 5$

- **A** $6x - 2$
- **B** $6x + 3$
- **C** $6x + 7$
- **D** $3x + 3$

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6 Simplify $3(x + 2) + 4(x - 1)$.

- **A** $7x + 2$
- **B** $7x + 10$
- **C** $7x - 2$
- **D** $3x + 2$

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7 Factor $6x + 12$ using the distributive property in reverse.

- **A** $6(x + 2)$
- **B** $6(x + 12)$
- **C** $3(x + 2)$
- **D** $6x(x + 2)$

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8 Use the distributive property for mental math: 7×98.

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9 Expand $x(x + 4)$.

- **A** $x^2 + 4$
- **B** $2x + 4$
- **C** $x^2 + 4x$
- **D** $x^2 - 4x$

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10 A rectangle is $(x + 3)$ cm long and 4 cm wide. Write its area as a sum.

- **A** $4x + 3$
- **B** $4x + 12$
- **C** $x + 12$
- **D** $4x - 12$

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ANSWER KEY

1. $4x + 20$

2. $10x - 15$

3. $-6 - 6x$

4. $-4x + 5$

5. $6x + 3$

6. $7x + 2$

7. $6(x + 2)$

8. 686

9. $x^2 + 4x$

10. $4x + 12$

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