MATHEMATICS · GRADES 7-9

Expanding brackets

Difficulty level: Intermediate

Mathematics: Grades 7-9

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Overview of the concept

This is how you multiply out a formula that is hiding inside brackets. The total cost of several identical gift baskets is one price times the number of baskets, and expanding the brackets shows you that total plainly. It turns a shortcut piece of writing into the full calculation. Once the brackets are gone, the rest is just arithmetic.



Rule

Distributive law: a number outside brackets multiplies every term inside the brackets.

So a(b + c) = ab + ac, and 5(2x + 3) = 10x + 15.

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Worked examples

EXAMPLE 1

Q Expand $5(2x + 3)$.

SOLUTION

This is a single bracket, so the number outside multiplies every term inside.

$5 \times 2x = 10x$, and $5 \times 3 = 15$

So $5(2x + 3) = 10x + 15$

EXAMPLE 2

Q Expand $-2(a - 4)$.

SOLUTION

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

$-2 \times a = -2a$, and $-2 \times (-4) = +8$

So $-2(a - 4) = -2a + 8$

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Practice questions

1 Expand $3(x + 1)$.

- **A** $3x + 1$
- **B** $3x + 3$
- **C** $x + 3$
- **D** $x + 1$

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2 Expand $2(5y + 2)$.

- **A** $10y + 2$
- **B** $5y + 2$
- **C** $10y + 4$
- **D** $7y + 4$

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3 Expand $-4(3x - 2)$.

A $-12x - 8$

B $-12x + 8$

C $12x + 8$

D $-12x + 2$

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4 Expand $-(x - 7)$.

A $-x - 7$

B $x - 7$

C $-x + 7$

D $x + 7$

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5 Expand $0.5(4x + 6)$.

- **A** 2x + 6
- **B** 4x + 3
- **C** 2x + 3
- **D** 4x + 6

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6 Expand $\frac{1}{2}(6x + 8)$.

- **A** 3x + 8
- **B** 6x + 4
- **C** 3x + 4
- **D** 6x + 8

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7 Expand $x(x + 4)$.

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

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8 Expand $3(2a + 1) + 2(a - 3)$.

- **A** $8a + 3$
- **B** $8a - 9$
- **C** $8a - 3$
- **D** $6a - 3$

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9 A rectangle is 4 cm wide and (a – 2) cm long. What is its area, expanded?

- **A** 4a – 2
- **B** 4a – 8
- **C** 4a + 8
- **D** a – 8

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10 Expand $-2(3x - 5) + 4x$.

- **A** −2x + 10
- **B** −6x + 10
- **C** −2x − 10
- **D** 2x + 10

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ANSWER KEY

1. $3x + 3$

2. $10y + 4$

3. $-12x + 8$

4. $-x + 7$

5. $2x + 3$

6. $3x + 4$

7. $x^2 + 4x$

8. $8a - 3$

9. $4a - 8$

10. $-2x + 10$

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