Notes & Steps

Key idea

Expanding a bracket means multiplying each term inside the bracket by the term outside. This uses the distributive property: $a(b+c) = ab + ac$. The number (or variable) outside multiplies **every** term inside, one at a time.

Steps

1. Identify the term outside the bracket (the multiplier).
2. Multiply it by the first term inside the bracket.
3. Multiply it by the next term inside the bracket.
4. Write as a sum: $\text{term}_1 + \text{term}_2$.
5. Watch the signs! A negative outside flips the signs inside: $-3(x-2) = -3x + 6$.

Examples

- $4(x+3) = 4x + 12$
- $-2(y+5) = -2y - 10$
- $3(2x-1) = 6x - 3$
- $-5(4a-2) = -20a + 10$
- $x(x+4) = x^2 + 4x$
- $2a(3a-1) = 6a^2 - 2a$

Common mistake

Only multiplying the first term inside the bracket. The multiplier goes to **every** term. $4(x+3) = 4x + 12$, not $4x + 3$. Check by substituting $x = 1$: $4(1+3) = 16$ vs $4(1) + 3 = 7$ — only the first answer is right.

Notes & Steps

Example 1: positive multiplier

Expand $5(2x + 3)$.

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

Answer: $10x + 15$

Example 2: negative multiplier

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

$$-4 \times 3a = -12a, \quad -4 \times (-2) = 8$$

Answer: $-12a + 8$

Example 3: expand and simplify

Simplify $3(2x + 4) - 5$.

$$3 \times 2x = 6x, \quad 3 \times 4 = 12$$

So $6x + 12 - 5 = 6x + 7$

Example 4: double expansion

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

$$6x + 2 + 8x - 12 = 14x - 10$$

Try these

1. Expand $3(x + 7)$.
2. Expand $-2(4a - 3)$.
3. Expand and simplify $4(2x + 5) - 3$.

Common mistake

Forgetting to multiply the sign too. $-3(x - 4)$ gives $-3x + 12$, because $-3 \times (-4) = +12$. Some students write $-3x - 12$ — that's wrong.