Expanding brackets: fact sheet

Algebra · Planner week 8 · Work out which type it is, follow the example

1 One bracket

Expand $5(2m - 3)$

×	$2m$	-3
5	$10m$	-15

1. **Use a grid**: 5 on the side, $2m$ and -3 on top
2. **Multiply** into each box
3. = $\mathbf{10m - 15}$

Use this when: there is one bracket with a number or letter outside

2 Expand and simplify

Expand and simplify $4(x + 3) + 7(4 - 2x)$

×	x	3
4	$4x$	12

×	4	$-2x$
7	28	$-14x$

1. **A grid for each bracket**
2. Write all the terms in a line: $4x + 12 + 28 - 14x$
3. **Collect like terms: $40 - 10x$**

Use this when: "expand **and simplify**": collect the like terms at the end

3 Minus outside

Expand $-2(1 - 2p)$

×	1	$-2p$
-2	-2	$+4p$

1. The number on the side is **-2**, not 2
2. **$-$ × $-$ = +**: $-2 \times -2p = +4p$
3. = $\mathbf{-2 + 4p}$

Use this when: there is a minus just before the bracket

4 Two brackets

Expand and simplify $(x + 5)(x - 9)$

×	x	-9
x	x^2	$-9x$
$+5$	$5x$	-45

1. **2 × 2 grid**: one bracket on top, one on the side
2. **Multiply** to fill all four boxes
3. Collect the middle terms: $\mathbf{x^2 - 4x - 45}$

Use this when: two brackets next to each other: (…)(…)

The big question

Is there a **bracket** to multiply out (**expand**), or do I need to put a bracket **back in** (**factorise**)?

Draw a **grid** every time: the number outside goes on the side, the terms inside go on top.

Watch out

- $3(2x - 5)$ is **not** $6x - 5$: multiply the 5 too.
- Getting a sign wrong with a minus outside.
- Forgetting the middle terms with two brackets.
- **Expand** = take the brackets away. **Factorise** = put the brackets in.

Key words

- **Expand**: multiply out the brackets
- **Term**: e.g. $4x$ or -15
- **Like terms**: the same letter part

Exam tips

- "Expand **and simplify**": collect like terms at the end.
- Draw the **grid** every time.
- Check: put $x = 2$ into both.