



Order of operations

An expression is a structure, not a to-do list

- Today: why $3 + 4 \times 5$ is not 35.

The natural reading

- $3 + 4 \times 5$.
- Left to right: $3 + 4$ is 7, then 7×5 is 35.

35 is a real answer — to $(3 + 4) \times 5$.

What it actually says

- 4×5 is ONE number: 20.
- So the expression is $3 + 20$.

23. The multiplication was already a single quantity.

The trap in the mnemonic

- PEMDAS read as six steps in a row.
- $20 - 6 + 3$: do the A first?

11. And the answer is 17.

× and ÷ are ONE rank

- So are + and −.
- Same rank → left to right.

$24 \div 6 \times 2 = 8$, not 2.

Brackets say “this is one number”

- $40 \div (2 + 3)$: the bottom is 5.
- Not $40 \div 2$, then $+ 3$.

8, not 23. Brackets are not decoration.

Nested: innermost first

- $\{12 + [3 \times (8 - 6)]\} \div 2$
- $(8 - 6) = 2 \rightarrow 3 \times 2 = 6 \rightarrow 12 + 6 = 18 \rightarrow 18 \div 2.$

9. The outer bracket is not a number until the inner one is.

Your turn

- Evaluate $100 - 15 + 5$. Then $100 - (15 + 5)$.
- Then: put brackets in $2 + 3 \times 4$ to make 20.

If your two answers match, one of them is wrong.