

Properties of operations – commutative, associative, distributive

MODULE 8 · ALGEBRA — PATTERNS, EXPRESSIONS AND EQUATIONS ALGEBRA

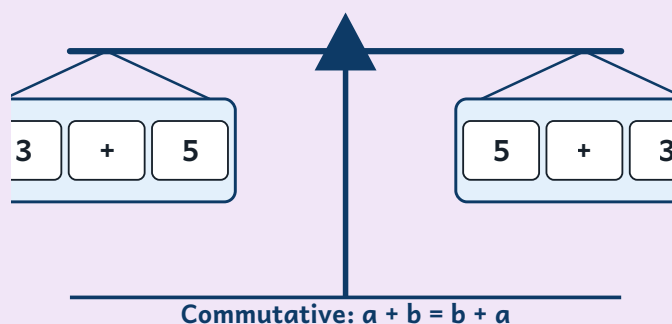
HOW TO ANSWER TODAY

- **Property names.** Order swaps ($a + b = b + a$) → commutative. Brackets move ($(a+b)+c = a+(b+c)$) → associative. One spreads over two ($a(b+c) = ab+ac$) → distributive.

$5 + 3 = 3 + 5$ → commutative · $2 \times (4 + 5) = 2 \times 4 + 2 \times 5$ → distributive

TRY IT ON THE LINE

Each balance shows a property of operations. Complete the right pan so it matches the left.



1. Above: commutative for addition — both pans show the same total.
2. Commutative for multiplication: $4 \times 7 = \underline{\quad} \times \underline{\quad}$.
3. Associative: $(2 + 3) + 4 = 2 + (\underline{\quad} + \underline{\quad})$.
4. Distributive: $3 \times (5 + 2) = (3 \times \underline{\quad}) + (3 \times \underline{\quad})$.

PRACTICE

- 1 Mr Ó Briain is sorting the classroom store and writes this on the board: $(7 \times 9) \times 2 = 7 \times (9 \times 2)$. He asks 5th class which property of operations it shows. Is it the commutative, associative, or distributive property?

Which property of operations does this equation show: $(7 \times 9) \times 2 = 7 \times (9 \times 2)$? (Choose: commutative, associative, or distributive.)

- 2 On Monday morning, Master Ó Briain is checking the roll in 5th class. He notices that the equation $(9 \times 9) \times 4 = 9 \times (9 \times 4)$ is written on the whiteboard from Friday's maths lesson. Which property of operations does this equation show: commutative, associative, or distributive?

ALWAYS, SOMETIMES, NEVER

Always true, sometimes true, or never true? Write A, S or N.

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|---|--|
| a. Order of multiplication doesn't matter: $3 \times 4 = 4 \times 3$. ☐ | c. Adding zero to a number changes its value. ☐ |
| b. Order of subtraction doesn't matter: $8 - 5 = 5 - 8$. ☐ | d. Multiplying by 1 changes the number. ☐ |
| | e. $(a + b) + c = a + (b + c)$. ☐ |
| | f. $(a - b) - c = a - (b - c)$. ☐ |