

Properties of operations – order and inverse links

MODULE 10 · ALGEBRA — PATTERNS, RULES AND NUMBER SENTENCES 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
- **Solve for x.** Do the OPPOSITE operation to both sides. + becomes -; $\times$ becomes $\div$.
 $x + 7 = 15 \rightarrow x = 15 - 7 = 8$ · $3x = 21 \rightarrow x = 21 \div 3 = 7$

STRETCH PROBLEMS

- Cian packs treats in his lunchbox and writes down that $(3 \times 8) \times 6 = 3 \times (8 \times 6)$. Which property of operations does his equation show: commutative, associative, or distributive?
 Which property of operations does this equation show: $(3 \times 8) \times 6 = 3 \times (8 \times 6)$? (Choose: commutative, associative, or distributive.)
- For their autumn art lesson, 4th class arrange the leaves they collected. Tadhg lays out 2 rows of 10 leaves, while Aoife lays out 10 rows of 2 leaves, and they notice $2 \times 10 = 10 \times 2$. Which property of operations does this show: commutative, associative, or distributive?
 Which property of operations does this equation show: $2 \times 10 = 10 \times 2$? (Choose: commutative, associative, or distributive.)
- For World Book Day, 4th class add up book stickers on their display in two groups. One pupil writes $(8 + 9) + 14 = 8 + (9 + 14)$ to show the total stays the same either way. Which property of operations does this equation show: commutative, associative, or distributive?
- Mr Ó Sé is stacking worksheets in the photocopier room and notices that $(9 \times 9) \times 4 = 9 \times (9 \times 4)$ gives the same total either way. Which property of operations does this equation show: commutative, associative, or distributive?
- Some pupils are already lined up at the door before going to the yard. When 6 more pupils join the line, there are 17 pupils in total. If x is the number of pupils who were lined up first, then $x + 6 = 17$. How many pupils were lined up first?



Find x so the scale balances.