

KNOWLEDGE CHECK

5

THE DISTRIBUTIVE LAWS

There are A pupils in a class. The school charges them each $\pounds B$ to cover the cost of transport for a field trip, plus an additional $\pounds C$ to cover other costs.

- a) Without a calculator, find the total amount collected if $A = 30$, $B = 25$ and $C = 6$.
- b) Which of these formulas gives the total amount collected in pounds: $A(B + C)$ or $AB + AC$?

SUMMARY OF KEY IDEAS

- Multiplication is said to be *distributive* over addition or subtraction.
- This means that to multiply the sum (or difference) of two numbers by something you can multiply them separately and then find the sum (or difference) of the results.
- Algebraically, for any numbers A, B and C: $A(B + C) = AB + AC$, and $A(B - C) = AB - AC$.
- Division by a number is also distributive across addition and subtraction.
- Algebraically, for any numbers A, B and C: $(B + C) \div A = (B \div A) + (C \div A)$ and $(B - C) \div A = (B \div A) - (C \div A)$ [provided A does not equal 0].
- These laws are used extensively in multiplication and division calculations.



FURTHER PRACTICE

- 5.1 Use the distributive laws to calculate mentally the cost of 180 textbooks at £8 each, by thinking of the 180 as (a) $100 + 80$, (b) $200 - 20$.
- 5.2 Find mentally the total cost of equipping 25 pupils with a textbook costing £12 and a workbook costing £4:
- using the process represented by $A(B + C)$
 - using the process represented by $AB + AC$.

Describe in words the two processes.

- 5.3 The headteacher of a primary school receives additional funding of £1330 from the PTA for reading books, to be distributed equally across even year groups. How much is this per year group? Work this out mentally, using the distributive laws of division, by thinking of the £1330 as (a) £700 add something, (b) £1400 subtract something.