

Check-Up

11

The associative laws

Each pupil in a class of A pupils requires B kilograms of flour for a series of food technology lessons. Flour costs $\pounds C$ per kilogram.

- What will be the total cost if $A = 29$, $B = 2.5$ and $C = 0.46$?
- Which of the following formulas gives the total cost in pounds:
 $A (B C)$ or $(A B) C$?

You will probably have guessed by now that subtraction and division are not associative. These operations are explored in the further practice questions.

Summary of key ideas

- ◆ Addition is associative.
- ◆ In algebraic notation: $A + (B + C) = (A + B) + C$, for any numbers A, B and C.
- ◆ This allows us to write 'A + B + C' to mean either of these.
- ◆ Multiplication is also associative.
- ◆ In algebraic notation: $A (B C) = (A B) C$, for any numbers A, B and C.
- ◆ This allows us to write A B C to mean either of these.
- ◆ Subtraction and division are not associative.

Further practice

- 11.1** Confirm that subtraction is not associative by evaluating ' $30 - (18 - 10)$ ' and ' $(30 - 18) - 10$ '. Which of these corresponds to this situation: in a class of 30, the 18 pupils who still have to return their school-home contracts were asked to bring them in on Monday, but 10 of them forgot again; how many contracts were now returned?
- 11.2** Do two calculations involving the numbers 160, 8 and 4, to demonstrate that division is not associative.
- 11.3** Use the associative law to calculate mentally the cost of 28 books at £25 each, by thinking of the 28 as 7×4 .