

# Check-Up

14

## Using a four-function calculator for money calculations

Use a calculator to find:

- a) The total cost of equipping a class of 26 pupils with a textbook costing £5.99 and a workbook costing 86p.
- b) What is the cost per pupil of materials costing £948 bought for a year group of 123 pupils?
- c) How many textbooks costing £8.79 can you purchase from a budget of £650?

## Answers to check-up 14

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- a) £178.10.      b) £7.71.      c) 73.

## Discussion and explanation of check-up 14

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Here are just a few important, but straightforward, reminders about doing money calculations on a calculator. First, when calculating the total cost of a bill, make sure that all the amounts involved are expressed in the same units. So, in (a) we would change the 86p to £0.86, before entering it onto the calculator. With a basic four-function calculator the key sequence would be:  $5.99 + 0.86 \times 26 =$ . Second, note that there is a convention when expressing amounts of money in pounds always to give two figures after the point. The calculator does not know this convention, so it displays the result as 178.1. This is not £178 and one penny. We have to interpret it as £178.10, writing in the extra zero to make it clear that we have ten pence.

Third, when you do a division on a calculator it will always display all available figures after the decimal point in the answer. In example (b), entering '948  $\div$  123 =' produces the result 7.707317... It makes sense to give the 'cost per pupil' to the nearest penny, so this answer has to be rounded and interpreted as £7.71. We have rounded up, because we are working to the nearest penny and the next figure after 7.70 indicates that we are nearer to 7.71 than 7.70.

In example (c) we enter '650  $\div$  8.79 =' and obtain the result 73.947667. We actually round this answer down to 73. It is the context that determines this, not the figures after the decimal point. We can only buy whole textbooks, so the answer must be given as a whole number. We can only afford 73 textbooks. We have nearly enough for 74, but not quite: that would actually require a budget of £650.46... though I suppose in practice, if we really needed 74 books we would be able to find the extra 46p somewhere!

Finally, remember to check whether your calculator answer looks reasonable, by doing some mental approximations. It is very easy to press a wrong button or make a slip in entering the data. If, for example, I had by accident forgotten to write the 86p as £0.86 in example (a) and entered ' $5.99 + 86 \times 26 =$ ' onto the calculator, I would have got the answer £2391.74. Is this a reasonable answer for the cost of equipping under 30 pupils with less than £7's worth of materials? Obviously, no! I would expect the answer to be less than £210 (30 £7) and more than £150 (25 £6).

### Summary of key ideas

- ◆ When calculating the total cost of a bill, express all the amounts involved in the same units (e.g. all in pound-notation).
- ◆ The convention for amounts of money in pounds is to give two figures after the point. The calculator does not know this and will display a result such as £5.20 with only one figure after the point (5.2).
- ◆ Results displayed on a calculator that represent amounts of money may have to be rounded to the nearest penny, if there are more than two figures after the point. But sometimes the context determines whether the result should be rounded up or down.
- ◆ Use mental approximations to check whether a calculator result is reasonable.

## Further practice

**14.1** If you need to practise using your calculator, find the total cost of the items in this table. Make an estimate first of the total cost.

Item	pencils	cm-square paper	30-cm rulers	markers	erasers
Cost per pack	£4.15	£2.95	£5.45	£3.00	95p
Number of packs	5	3	3	12	4

**14.2** Three pupils (A, B and C) get different answers when using a calculator to find the total cost of providing a drink (37p), a packet of crisps (28p) and a sandwich (£1.29) for all 68 pupils on a trip: A gets £4507.72, B gets £152.72 and C gets £131.92. Without using a calculator, which of these is likely to be correct? Now use a calculator to find the total cost.

**14.3** A pupil uses a calculator and finds the cost of 46 calculators at £3.95 each to be 'one hundred and eighty-one pounds, seven pence'. What mistake has been made here?