

Check-Up

21

Finding a percentage of a quantity using a calculator

- a) One question in a Key Stage 2 reading assessment asks pupils to identify the main contrasts that a poet makes in two parts of a poem. This proves to be challenging, with the QCA reporting that 61.98% pupils out of a sample of 2207 score zero out of a possible three marks for this question. How many pupils is this?
- b) In 1998, out of 1508 requests for review of the marking of the work of individual pupils in the Key Stage 3 English national tests, 63.26% resulted in a change of level. How many was this?

Answer to check-up 21

- a) 1368. b) 954.

Discussion and explanation of check-up 21

For the calculation of percentages as complicated as those in this check-up, clearly the use of a calculator is justified and appropriate.

There are three procedures for using a basic calculator to find a percentage of a quantity. For example, consider finding 79% of 186.

First you can use the fact that 79% means $\frac{79}{100}$. So, we have to find 100th of 186 (i.e. divide it by 100) and then multiply this by 79. The key sequence would be: $186 \div 100 \quad 79 =$. This gives the result 146.94, which we may or may not want to round, depending on the context. Actually, you can enter the multiplication and the division here in any order. For example, you could enter '186 $79 \div 100 =$ ', or '79 $186 \div 100 =$ ', or '79 $\div 100 \quad 186$ '. Try them all and confirm that the answers are the same.

Secondly, you might have a percent key (%) on your calculator. These can be quite idiosyncratic, so you will need to find out how yours works. On one of my calculators I would enter '79, %, , 186, =' and get the right result. On my more basic calculator this would not work; I would have to enter '186, , 79, %'.

On-screen calculators often do not have a percent key. So in this case you may choose to use the first procedure given above. But the third procedure I have to offer seems to me the simplest and quickest. Remember that a percentage can very easily be converted to a decimal number, just by moving the figures two places to the right in relation to the decimal point. So 79% becomes 0.79. This means I can find 79% of 186 just by calculating $0.79 \quad 186$.

So, in (a) we have to find 61.98% of 2207. I would just use my calculator to find $0.6198 \quad 2207$, which gives 1367.8986, which, to the nearest whole number, is 1368 pupils. Alternatively, you could enter, say, '61.98 $2207 \div 100 =$ ', or use the percent key if you have one.

Similarly, in (b) we have to find 63.26% of 1508. My calculator gives me $0.6326 \quad 1508 = 953.9608$, which, to the nearest whole number, is 954 reviews. Alternatively, you could enter, say, '1508 $\div 100 \quad 63.26 =$ ', or use the percent key if you have one.

Summary of key ideas

- ◆ There are three procedures for using a calculator to find a percentage of a number (e.g. to find 37% of 89).
- ◆ First, you can multiply by the percentage and divide by 100 (e.g. $89 \times 37 \div 100 =$).
- ◆ Second you can use the percent key, if you have one (e.g. $89 \times 37\%$), but you need to find out how your calculator does this.
- ◆ Third, change the percentage mentally to a decimal (e.g. $0.37 \times 89 =$).

Further practice

- 21.1** Nationally, 47.8% of Year 11 pupils achieved five or more grades A*–C in the GCSE examinations, in one particular year. A school with 279 pupils in Year 10 aims to surpass that in the following year's examinations. How many of these pupils must achieve five or more grades A*–C? Answer this using all three of the calculator methods explained in this check-up.