

MATHEMATICS



N.S. Yr. 6 P.71

Developing calculator skills.

Equipment

Paper, pencil, calculator with four functions plus square root button (for later use) and, if possible, change of sign button.

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Concepts

This module is concerned with using a calculator efficiently, checking results and developing a sense for when the results are meaningless i.e. a bad result given following a typing error.

A good calculator is essential. There is a great variety available today and one should be chosen that has the four functions (+, −, ×, ÷), a square root button and a change of sign button (this normally looks like this: +/−). The square root button will be used later.

It is possible to use a scientific calculator if one has already been purchased, and it is often useful to compare results on a scientific calculator and a non-scientific calculator as these are not always the same. A scientific calculator will generally be of more use in a secondary school.

Children should be able to use the keys properly. They should know how to clear the calculator, how to enter numbers and operations and how to read the results. Interpreting the results is also important and this will develop more in different contexts as time progresses (eg. 3.2 on a calculator means £3.20 if the problem is about money).

Children should recognise a negative output.

They should be able to carry out calculations of sums that involve several steps (eg. $4 \times (34 + 89)$). They should be able to interpret a rounding error such as 5.9999999 as 6.

They should be able to extract the information from a question that needs to be typed into the calculator and do this properly.

N.B. In writing this module, we have tried to be aware of the great variety of calculators available today, but some of the points we make may be slightly different on different calculators. For example, some calculators show 6 digits, most show 8 and some show 10. Some calculators handle rounding errors better than others (ie some will show 5.9999999 as 6, other will show it as 5.9999999). Be prepared to be flexible in interpreting the questions and answers.

Children should begin to appreciate the decimal representation of some fractions, eg. 0.3333333 represents $\frac{1}{3}$ and they should be using the memory of the calculator and the associated keys.



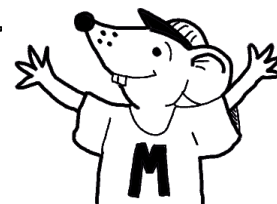
Remember that when using a calculator you should always clear the display before you begin.

1. Become familiar with your calculator by trying the following calculations:

- a. 98.7×7.8 b. $37.83 - 12.64$ c. $64.7^2 \times 3.2$ d. $9\,408 \div 168$
 e. $2.86 + 6.54$ f. 12.3^2 g. $34.9 \div 6.8$ h. $1\,590.64 \div 674$

2. Experiment with the **clear entry** key. Type in the numbers in each sum and then correct them to the number in brackets before pressing the = key.

For example, in number 1, type in 2.4×6.7 , press the **clear entry** key and then type in 6.8 instead of 6.7.



- a. 2.4×6.7 (6.8) b. $23.76 + 24.67$ (25.67) c. 2.346 (2.366) $\div 8$
 d. 34.2^2 (34.4^2) $- 23.8$ (23.7)

Now you know how to correct a mistake.



3. These sums all produce a **negative** answer.

Try them and look for the negative sign on your calculator display.

- a. $34.6 - 37.8$ b. $6.9 - 10.21$ c. $0.3 - 0.34$ d. $0 - 9.2$ e. $\pounds 4.65 - \pounds 7.56$

4. If your calculator has a change sign button, you should be able to try these sums. The change sign button normally looks like this: \pm/\mp Enter the number first and then press this key.

- a. $-3.5 + 2.4$ b. -4.3×2.7 c. 7.5×-1.9 d. $45 + -67.8$ e. 43.7×-2.4



Don't forget to clear your calculator before you begin.

1. Become familiar with your calculator by trying the following calculations:

- a. 28.4×8.6 b. $454.35 - 87.27$ c. $38.6^2 \times 4.6$ d. $42\,135 \div 265$
 e. $3.65 + 2.65$ f. 27.3^2 g. $65.3 \div 4.9$ h. $83\,420 \div 388$

2. Experiment with the **clear entry** key. Type in the numbers in each sum and then correct them to the number in brackets before pressing the = key.

For example, in number 1, type in 4.3×5.2 , press the **clear entry** key and then type in 5.3 instead of 5.2 .



- a. 4.3×5.2 (5.3) b. $42.86 + 23.43$ (23.44) c. 5.354 (6.354) $\div 7$
 d. 45.3^2 (46.3²) $- 49.8$ (48.9)

Now you know how to correct a mistake.



3. These sums all produce a **negative** answer. Try them and look for the negative sign on your calculator display.

- a. $47.8 - 49.4$ b. $7.3 - 9.6$ c. $0.4 - 0.47$ d. $0 - 3.62$ e. $\pounds 3.67 - \pounds 4.56$

4. If your calculator has a change sign button, you should be able to try these sums. The change sign button normally looks like this: \pm/\mp Enter the number first and then press this key.

- a. $-4.5 + 3.5$ b. -6.3×5.8 c. 9.7×-2.3 d. $38 + -47.2$ e. 32.4×-3.6

Remember, there are two problems with **money** calculations:

The first is that the calculator does not have a **£** sign.



The second is that we always write money with two decimal places.

If your calculator shows **3.4**, you must remember that means **£3.40**.

If your calculator shows **4.56355**, you must write that with two decimals places: **£4.56**

1. Here are some money sums. Work them out and remember these rules when you write down the answers.

- a. $£56.74 \times 87$ b. $£54.67 \times 12$ c. $£78.65 \div 9$ d. $£56.89 - £24.95$
e. $£56.83 \div 5$ f. $£78.99 \times 13$ g. $£46.76 \div 13$ h. $£24.76 - £18.99$

Sometimes we need to calculate two or more steps in a sum.

Don't forget to work out anything in brackets first.

You can use the memory key on your calculator, if you have one.



2. a. $23 \times (32 + 55)$ b. $(89 + 45) \times (23 + 42)$
c. $8.5 \times (5.6 - 2.8)$ d. $(7.9 - 4.7) \times (3.7 - 2.8)$
e. $65 \div (987 - 245)$ f. $(7.5 - 6.7) \times (3.1 + 2.8)$

3. Try these sums on your calculator. What do you notice?

- a. $64.94 \div 9 \times 9$ b. $78.36 \div 11 \times 11$ c. $78.65 \div 9 \times 9$

Typing fractions into a calculator can be very useful. For example, we can compare the sizes of fractions by typing them in as decimals.



Don't forget a fraction is really a division sum.

Eg. $\frac{3}{4}$ means $3 \div 4$

1. Put these fractions into your calculator by typing them in as a division sum.
Eg. In part **a.** type $4 \div 5$.

a. $\frac{4}{5}$ **b.** $\frac{1}{3}$ **c.** $\frac{2}{3}$ **d.** $\frac{1}{2}$ **e.** $\frac{1}{4}$ **f.** $\frac{3}{4}$ **g.** $\frac{1}{5}$ **h.** $\frac{3}{5}$

Which of these give you recurring decimals. Try to learn these.

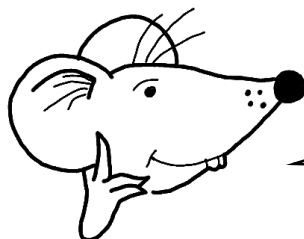
2. Here are some more fractions that give recurring decimals.
Put them in your calculator.

a. $\frac{1}{7}$ **b.** $\frac{4}{7}$ **c.** $\frac{5}{9}$ **d.** $\frac{7}{9}$ **e.** $\frac{1}{11}$ **f.** $\frac{5}{11}$ **g.** $\frac{11}{45}$ **h.** $\frac{3}{55}$

It is not easy to see that **a.** and **b.** give recurring decimals, but you could check by working them out on paper.

3. Can you recognise which fractions are represented by these decimals.
Check by putting them in your calculator.

a. 0.2 **b.** 0.3333333 **c.** 0.6666666 **d.** 0.4 **e.** 0.1428571



It is very easy to make mistakes when using a calculator, so always do a rough check of the answer in your head or on paper.

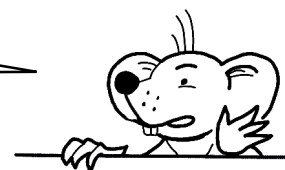
Use your calculator to answer these questions:

1. How many boxes of drawing pins can be filled from a container of 38 000 drawing pins if each box holds 160 pins?
2. The area of a square is 361 cm^2 . What is the length of the side of the square?
3. Mary receives £327.60 pocket money in a year. How much is this per week?
4. How many pieces of tape, each 37cm long, can be cut from a roll 40m long?
5. 500 sheets of A4 paper weighs 2 511.5g. What is the average weight of a piece of paper?
6. The Centre Court at Dimbledon can hold 13 500 people. If each person pays £23.75 to watch a match, how much money was taken if the court was full of spectators?
7. How many CDs, each costing £9.75, could be bought for £11 700 ?
8. What is the average (mean) of 67.89, 35.54 and 27.76 ?
9. What is the number in the box?

$$543.552 \div \boxed{} = 35.76$$

10. Find three consecutive numbers with a sum of 528.
11. Find two consecutive numbers with a product of 7 832
12. Find two consecutive numbers with a quotient of 0.96

Objection, please! There are no questions here about cake!



Answers**Page 3**

1. a. 769.86 b. 25.19 c. 13 395.488 d. 56 e. 9.4 f. 151.29
 g. 5.1323529 h. 2.36
2. a. 16.32 b. 49.43 c. 0.29575 d. 1 159.66
3. a. $^{-}3.2$ b. $^{-}3.31$ c. $^{-}0.04$ d. $^{-}9.2$ e. $^{-}\pounds 2.91$
4. a. $^{-}1.1$ b. $^{-}11.61$ c. $^{-}14.25$ d. $^{-}22.8$ e. $^{-}104.88$

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1. a. 244.24 b. 367.08 c. 6 853.816 d. 159 e. 6.3 f. 745.29
 g. 13.32653 h. 215
2. a. 22.79 b. 66.3 c. 0.9077142 d. 2 094.79
3. a. $^{-}1.6$ b. $^{-}2.3$ c. $^{-}0.07$ d. $^{-}3.62$ e. $^{-}\pounds 0.89$
4. a. $^{-}1$ b. $^{-}36.54$ c. $^{-}22.31$ d. $^{-}9.2$ e. $^{-}116.64$

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1. Some children may round up to the next penny. These figures are shown in brackets

- a. $\pounds 4\,936.38$ b. $\pounds 656.04$ c. $\pounds 8.73$ ($\pounds 8.74$) d. $\pounds 31.94$ e. $\pounds 11.36$ ($\pounds 11.37$)
 f. $\pounds 1\,026.87$ g. $\pounds 3.59$ ($\pounds 3.60$) h. $\pounds 5.77$
2. a. 2 001 b. 8 710 c. 23.8 d. 2.88 e. 0.087601 f. 4.72
3. a. 64.939999 b. 78.359999 c. 78.649999

These calculations introduce 'rounding errors'. In part a., for example, the answer should be 64.94, but the calculator introduces the rounding error. (N.B. Not all calculators will do this - some give the correct answer). Children need to learn to watch out for this and interpret the answer correctly (i.e. as 64.94, in this case).

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1. a. 0.8 b. 0.3333333 c. 0.6666666 d. 0.5 e. 0.25 f. 0.75
 g. 0.2 h. 0.6
2. a. 0.1428571 b. 0.5714285 c. 0.5555555 d. 0.7777777 e. 0.090909
 f. 0.4545454 g. 0.2 True True 444444 h. 0.0545454

3. Accept equivalent fractions

- a. $\frac{1}{5}$
 b. $\frac{1}{3}$
 c. $\frac{2}{3}$
 d. $\frac{2}{5}$
 e. $\frac{1}{7}$

Answers (Contd)**Page 7**

- 1.** 237 **2.** 19 cm **3.** £6.30 **4.** 108 **5.** 5.023g **6.** £320 625
7. 1 200 **8.** 43.73 **9.** 15.2 **10.** $175 + 176 + 177$ **11.** 88×89
12. $24 \div 25$