Planner

Calculator methods

- Rounding and estimating when using a calculator
- Using a calculator to find powers and roots
- Using fraction, π and reciprocal keys
- Using a calculator for money and percentage calculations
- Using a calculator for conversions, such as exchange rates and measurement problems

Keywords

You should know

explanation 1a | explanation 1b | explanation 1c | explanation 1d | online

1 Find the answers to these using your calculator.

Round the answers to two decimal places.

a $1.6 \times 8.2 + 43.01$ **b** $-5.03 \times (1.32 + 2.86)$ **c** $5.3 + -9.53 \div 0.65$

d $\dfrac{3.87 + 0.3}{2.3}$ **e** $\dfrac{154.7 \div -4.2}{3 \times 2}$ **f** $\dfrac{6.4 \times 5.78}{-4.02}$

g $\dfrac{-3.46 \times 23.8 - -3.4}{11.7 \times 0.38}$ **h** $\dfrac{1.6 + 3.8 \times 5}{1.7^2}$ **i** $\dfrac{(4.8 - 2.03) \times 12.3}{-5 \div 1.8 + 3.3}$

2 Shona worked out that $\sqrt{25} + 6.8 = 11.8$.

Winston worked out that $\sqrt{25} + 6.8 = 5.64$ (to 2 d.p.).

a Why are their answers different?

b Work these out.

i $\sqrt{56.3 - 23.1}$ **ii** $\sqrt{3.7 \times 18.6}$ **iii** $\sqrt{43.2 \div 12.5}$

3 Use your calculator to work these out.

Round your answers to two decimal places.

a $7.8^2\,(4.01 + 8.11)$ **b** $(2.5 \times 1.04)^2$ **c** $\sqrt{4.8 + 18.4}$

d $\dfrac{\sqrt{15.6 \times 12.03}}{3.2 \times 4}$ **e** $\dfrac{(5.2 - -4.3)^2}{\sqrt{6.5}}$ **f** $\dfrac{(2.83 \times 3.82)(1.5 \times 4.2)}{\sqrt{3.6 - 2.1}}$

g $\dfrac{\sqrt[3]{32} \times \sqrt{18}}{(-1.4)^2}$ **h** $\dfrac{(4.7^3 \times \sqrt{11})^2}{5.3 + 8.92}$ **i** $\sqrt{\dfrac{7.6 + 4.8 \times 12.63}{4.3}}$

4 Greg's square garden has an area of $615.04\,m^2$.

He wanted to divide the garden into squares each with sides of 6.2 m.

Can he get an exact number of these squares in the garden? If so, how many?

explanation 2 online

5 Estimate the answers to these. Show your working.

a $\dfrac{4.08 \times 35.23}{6.89 \times 1.9}$ **b** $\dfrac{8.32 \div 9.75}{10.2}$ **c** $\dfrac{12.56 \times 47.65}{23.7 \times 4.4}$

d $\dfrac{\sqrt{15.7 + 12.01}}{3.2 + 2.3}$ **e** $\dfrac{2.05^3 + (4.3 + 5.5)^2}{11.6}$ **f** $\dfrac{\sqrt{4.08 \times 8.7}}{\sqrt{15.6}}$

6 For each calculation

i Estimate the answer by rounding the numbers to one significant figure.

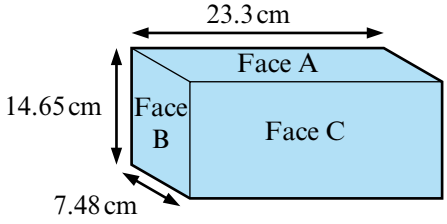
ii Work out the answer using a calculator.

a 409×34 **b** $764 \div 23.5$ **c** 89.3×6.82 **d** $3845.6 \div 7.8$

e 7.803×11.67 **f** $(3.68 + 6.8) \times 5.9^2$ **g** $12.35^3 \div 7.9$ **h** $8.35^2 \div 2.05^3$

7 The surface area of a cuboid is

$2 \times$ area of face A $+ 2 \times$ area of face B $+ 2 \times$ area of face C.



a Write *one* calculation that you could use to find the surface area of this cuboid.

b Find the answer to two decimal places.

c Check your answer by using an estimate.

8 Mary estimated the answer to $\dfrac{52.6}{3.19 + 1.78}$ as $\dfrac{50}{5} = 10$.

Write three more calculations that could have an estimated answer of 10.

Use at least three of the operations +, −, × and ÷.

Include a square or a square root in one of the calculations.

explanation 3a | explanation 3b | online

9 Use your calculator to work these out. Round answers to one decimal place.

a $80 \times (\sqrt{34 + 5.3})$

b $\sqrt{47} \div \sqrt{10} \times 2.45$

c $100 \times (\sqrt{7 - 2.3})$

d $135 \div \sqrt{39} - 6$

10 $r = \sqrt{11}$ and $s = \dfrac{93}{r - 3}$

a Calculate the value of r to one decimal place.

b Calculate the value of s to one decimal place, using the rounded value of r.

c Calculate the value of s to one decimal place, using $r = \sqrt{11}$ (not rounded). What is the difference?

d Which answer is more accurate?

11 The formula for finding the surface area of a sphere is $4\pi r^2$.

a Using $\pi = 3.14$, find the surface area of a sphere with radius 34.6 cm to 1 d.p.

b Using the π key on your calculator, find the surface area of a sphere with radius 34.6 cm to 1 d.p.

c Did you get the same answer to parts **a** and **b**?

Which is the most accurate answer? Why?

12 The volume of a sphere is $\frac{4}{3}\pi r^3$.

a Find the volumes of spheres with these radii, using the most accurate method.

Round answers to two decimal places.

i radius = 2.3 cm **ii** radius = 4.84 cm **iii** radius = 9.07 cm

b Check the answers to part **a** by estimating.

explanation 4a explanation 4b

13 Use a calculator to find the reciprocals of these.

If any answer has more than two decimal places, round to 2 d.p.

a 0.35 **b** 4.8 **c** 0.62 **d** 2.5

e 63 **f** 15.56 **g** 2.004 **h** 0.009 99

14 The reciprocal of a whole number between 20 and 50 is 0.028 □71 correct to 5 significant figures.

Find the number and the missing digit in its reciprocal.

15 Work out these using the fraction key on your calculator.

a $1\frac{5}{11} - \frac{3}{5}$

b $\frac{6}{7} \div \frac{5}{16}$

c $7\frac{4}{13} \times \left(\frac{1}{5}\right)^2$

d $5\frac{3}{5} \div 1\frac{1}{2}$

e $2\frac{5}{6} + 3\frac{11}{15} \times \frac{3}{4}$

f $3\frac{1}{7} - \sqrt{\frac{1}{4}} \times \frac{3}{5}$

g $2\frac{7}{15} \times \frac{3}{4} + 9\frac{2}{7}$

h $\dfrac{\left(\frac{3}{4}\right)^3 \times \left(\frac{2}{3} \div \frac{1}{2}\right)^2}{\sqrt{\frac{9}{25}}}$

If your calculator does not have a fraction key you will need to solve these using the memory key or using a written method. Check how you add, subtract, multiply and divide fractions first.

16 The local store did a stock take of their boxes of crisps.

They had $2\frac{2}{3}$ boxes of salt and vinegar, $4\frac{1}{4}$ of cheese and onion, $3\frac{1}{6}$ of smoky bacon, $4\frac{5}{8}$ of chicken and $2\frac{5}{6}$ boxes of plain crips.

a How many boxes was that in total?

b What was the minimum number of packets in a complete box?

17 Steve built a fence round his garden in three days.

The final length of the fence was $76\frac{4}{5}$ m.

He built $\frac{3}{4}$ of the fence on the first day.

a Write a fraction calculation to calculate how much fence he had built.

Solve your calculation.

b On the second day Steve only managed to complete $\frac{7}{12}$ of the length of fence still to be built. What length did he have left to build on the third day?

explanation 5

18 Convert each of these into hours and minutes

a 5.6 hours	**b** 8.75 hours	**c** 14.15 hours	**d** 13.35 hours
e 0.85 days	**f** 5.4 days	**g** 12.45 days	**h** 6.95 days

19 A year on Mars is equivalent to 686.98 Earth days.

How many Earth hours and minutes are there in a Mars year?

Round your answer to the nearest minute.

20 Use this part of the London to Glasgow train timetable to work out how long these journeys would take.

London Euston		12:35	
Birmingham	11:30		13:26
Preston	13:42	14:48	15:56
Carlisle	14:53	15:05	16:04
Glasgow	16:04		17:23

a London Euston to Preston.

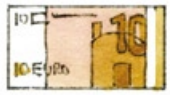
b Preston to Glasgow on the 11:30 Birmingham train.

c Birmingham to Carlisle on the 13:26 Birmingham train.

d Which train is faster, the morning or afternoon Birmingham to Glasgow train? By how many minutes?

explanation 6

Use these exchange rates for questions **21** to **26**.

£1 = 1.14 euros (€) 

£1 = US$1.45 (US dollar) 

£1 = 1.67 Swiss francs 

£1 = 9.95 Chinese yuan 

£1 = 139.9 Japanese yen 

£1 = A$2.24 (Australian dollar) 

21 How many pounds (£ sterling) would you get for these amounts?

a €750 (euros) **b** 1000 Chinese yuan **c** US$137.65

d €348 **e** A$437.15 **f** 570 Japanese yen

g 250 Swiss francs **h** US$1000

Round all answers to the nearest £0.01.

22 Change £110.50 into these currencies.

Round all answers to two decimal places.

US $1 = 100 cents
A$1 = 100 cents

a euros (€) **b** US dollars **c** Chinese yuan

d Swiss francs **e** Australian dollars **f** Japanese yen

23 On holiday in Australia Anna paid A$165.50 per night for her hotel room.

Breakfast cost an extra A$16.80 each day.

a How much was her bill for three nights' accommodation, with breakfast each morning, in pounds?

b She also hired a rental car for the three days at a cost of A$35.40 per day plus a one-off insurance cost of A$56.75.

What was the cost in pounds of the car hire?

24 A bus trip to the Great Wall of China from Beijing cost Peter 65 Chinese yuan.

a How much did the ticket cost in pounds?

b Peter bought tickets for six people in his party and received a 5% discount.

How much did it cost him in pounds for the six tickets?

25 Megan saw this advert on the internet.

Buy your favourite DVDs direct from the USA.

US$14.95 for each DVD + shipping US$1.99 per DVD.

Special deal:

Buy 5 DVDs and each DVD costs US$11.75 + total shipping of US$5.99.

a How much would Megan pay in pounds for three DVDs to be shipped to her?

b She later ordered another two DVDs.

What was the total cost in pounds for Megan to get all five DVDs?

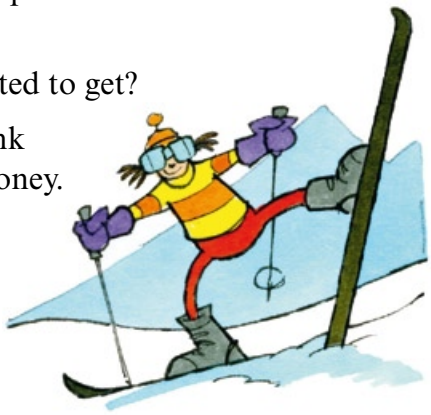
c How much money, in pounds, would she have saved if she had ordered all five DVDs at the same time?

26 When Sara returned from her Swiss skiing trip she took 214 Swiss francs into her bank to change back into pounds.

a How many pounds would she have expected to get?

b Sara got less than she expected as the bank took 3% commission for changing her money.

How much did Sara actually get?



explanation 7

27 Sam wanted to buy a new laptop computer costing £525.

Three high-street computer stores were offering these deals on purchases over one year.

Which store is offering the best deal? How much will Sam pay?

28 The local hockey club decided to deposit £1750 in a bank account at an annual compound interest rate of 3.5%.

a Which of these gives the amount the club will have after two years?

£1750 × 1.035 × 2 £1750 × 0.035^2 £1750 × 1.035^2

£1750 × 0.035 × 2 £$(1750 \times 0.035)^2$ £$(1750 \times 1.035)^2$

Calculate the answer.

b Calculate how much the club will have after five years.

29 Gina invested £325 in a savings account at 4% compound interest for three years.

a How much will she have at the end of three years?

b Her friend invested £340 at 2.5% compound interest for three years.

How much more or less money than Gina did he have at the end of the three-year period?