

Using a Calculator

Solutions

For Pearson Edexcel GCSE Mathematics (1MA1) • Foundation tier

Each question is shown in grey, followed by the working, one step per line. The final answer is in a box. *Marks* shows how the marks are usually given in the exam, and **Tip** points out a common mistake.

1 (3 marks)

- (a) Use your calculator to work out $\frac{23.4 + 6.8^2}{\sqrt{5.29}}$
Write down all the figures on your calculator display.

Work out the top first:

$$6.8^2 = 46.24$$

$$23.4 + 46.24 = 69.64$$

$$\text{Then the bottom: } \sqrt{5.29} = 2.3$$

$$\text{Divide: } 69.64 \div 2.3 = 30.27826087$$

Answer: 30.27826087

Tip: Work out the top and the bottom separately and write them down. If you type it in one go, the calculator may divide only 6.8^2 by $\sqrt{5.29}$.

Marks: 1 mark for 69.64 or 2.3. 1 mark for 30.27826087.

- (b) Write your answer to part (a) correct to 2 decimal places.

$$30.27 \mid 826 \dots$$

The next digit is 8, so round up.

Answer: 30.28

2 (2 marks)

Work out $\frac{9.4^2}{3.25 + \sqrt{7.84}}$
Write down all the figures on your calculator display.

Top: $9.4^2 = 88.36$

Bottom: $\sqrt{7.84} = 2.8$

$3.25 + 2.8 = 6.05$

Divide: $88.36 \div 6.05 = 14.60495868$

Answer: 14.60495868

Tip: Work out the whole of the bottom before you divide. Dividing by 3.25 and then adding $\sqrt{7.84}$ gives the wrong answer.

Marks: 1 mark for 88.36 or 6.05. 1 mark for 14.60495868.

3 (3 marks)

(a) Work out the value of 2.6^4

$$\begin{aligned} 2.6^4 &= 2.6 \times 2.6 \times 2.6 \times 2.6 \\ &= 45.6976 \end{aligned}$$

Answer: 45.6976

(b) Work out the cube root of 1331

Use the cube root button: $\sqrt[3]{1331} = 11$

Check: $11 \times 11 \times 11 = 1331$ ✓

Answer: 11

(c) Find the reciprocal of 0.08

The reciprocal of a number is 1 divided by the number.

$$1 \div 0.08 = 12.5$$

Answer: 12.5

Tip: Work out the value. Writing $\frac{1}{0.08}$ and stopping is not enough.

4 (3 marks)

- (a) Work out $\frac{\sqrt{58.6} + 3.1}{2.4^2}$
Write down all the figures on your calculator display.

Top: $\sqrt{58.6} = 7.65506 \dots$

$7.65506 \dots + 3.1 = 10.75506 \dots$

Bottom: $2.4^2 = 5.76$

Divide: $10.75506 \dots \div 5.76 = 1.867198556 \dots$

Answer: 1.867198556

Marks: 1 mark for 10.755... or 5.76. 1 mark for 1.867198556.

- (b) Write your answer to part (a) correct to 3 significant figures.

$1.86|7 \dots$

The next digit is 7, so round up.

Answer: 1.87

Tip: 3 significant figures is not 3 decimal places. 1.867 has 4 significant figures.

5 (1 mark)

Sam uses his calculator to work out how long a journey will take.

The display shows 4.35 hours.

Sam says, 'The journey will take 4 hours 35 minutes.'

Is Sam correct?

You must give a reason for your answer.

4.35 hours is 4 hours and 0.35 of an hour.

There are 60 minutes in an hour.

$$0.35 \times 60 = 21 \text{ minutes}$$

So the journey takes 4 hours 21 minutes, not 4 hours 35 minutes.

Answer: No, it is 4 hours 21 minutes

Tip: The digits after the decimal point are not minutes. Multiply the decimal part by 60.

6 (2 marks)

Kim wants to work out $\frac{24.5}{3.5 \times 2}$

She types $24.5 \div 3.5 \times 2 =$ and gets 14

(a) Explain what Kim has done wrong.

The calculator works from left to right with $\div$ and $\times$.

So it worked out $24.5 \div 3.5 = 7$ first, then multiplied by 2 to get 14.

Kim needed brackets around 3.5×2 .

Answer: She should have used brackets: $24.5 \div (3.5 \times 2)$

(b) Work out the correct answer.

$$\text{Bottom: } 3.5 \times 2 = 7$$

$$24.5 \div 7 = 3.5$$

Answer: 3.5

7 (2 marks)

Work out $\frac{4.7 \times 10^5}{2.3 \times 10^{-2}}$

Give your answer in standard form correct to 3 significant figures.

Use the $\times 10^x$ button, or change to ordinary numbers:

$$4.7 \times 10^5 = 470\,000 \text{ and } 2.3 \times 10^{-2} = 0.023$$

$$470\,000 \div 0.023 = 20\,434\,782.6 \dots$$

In standard form: $2.04347 \dots \times 10^7$

To 3 significant figures: 2.04×10^7

Answer: 2.04×10^7

Tip: Put brackets around the bottom number if you type it all in one go. Otherwise the calculator divides by 2.3 and then multiplies by 10^{-2} .

Marks: 1 mark for 20 434 782.6... (or $2.043 \dots \times 10^7$). 1 mark for 2.04×10^7 .

8 (2 marks)

Use your calculator to work out $\sqrt{\frac{19.2 \times 3.6}{2.5^2 + 1.7}}$

Write down all the figures on your calculator display.

Top: $19.2 \times 3.6 = 69.12$

Bottom: $2.5^2 + 1.7 = 6.25 + 1.7 = 7.95$

Divide: $69.12 \div 7.95 = 8.694339 \dots$

The square root covers the whole fraction:

$$\sqrt{8.694339 \dots} = 2.948616561 \dots$$

Answer: 2.948616561

Tip: The square root is over the **whole** fraction. A common mistake is to square root only the top.

Marks: 1 mark for 69.12 or 7.95. 1 mark for 2.948616561.

9 (3 marks)

Plant pots cost £3.85 each.

Dev has £50 to spend on plant pots.

He buys as many plant pots as he can.

How much money will Dev have left?

Number of pots: $50 \div 3.85 = 12.98 \dots$

Dev cannot buy part of a pot, so he buys 12 pots.

Cost of 12 pots: $12 \times 3.85 = 46.20$, so £46.20

Money left: $50 - 46.20 = 3.80$

Answer: £3.80

Tip: Do not round 12.98 ... up to 13: Dev does not have enough money for 13 pots. Write money with two decimal places: £3.80, not £3.8.

Marks: 1 mark for $50 \div 3.85$ (12.98...). 1 mark for $12 \times 3.85 = 46.20$. 1 mark for £3.80.
