

Percentage of an Amount

Solutions

For AQA GCSE Mathematics (8300) • 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 (2 marks)

Work out 30% of 16 000

Find 10% by dividing by 10:

$$10\% \text{ of } 16\,000 = 16\,000 \div 10 = 1600$$

30% is 3 lots of 10%:

$$3 \times 1600 = 4800$$

Answer: 4800

Tip: Write down each step, e.g. “10% = 16 000 ÷ 10 = 1600”. Writing just “10% =” with a wrong number gets no method mark.

Marks: 1 mark for 1600 (10%) or $0.3 \times 16\,000$. 1 mark for 4800.

2 (1 mark)

Circle the value of 49% of 600

Options: 29.4, 294, 300, 649

49% is just under 50%.

$$50\% \text{ of } 600 = 600 \div 2 = 300$$

$$1\% \text{ of } 600 = 600 \div 100 = 6$$

$$49\% = 50\% - 1\% = 300 - 6 = 294$$

Answer: 294

3 (3 marks)

Work out 45% of 1400

$$10\% \text{ of } 1400 = 1400 \div 10 = 140$$

$$40\% = 4 \times 140 = 560$$

$$5\% \text{ is half of } 10\%: 140 \div 2 = 70$$

$$45\% = 40\% + 5\%$$

$$560 + 70 = 630$$

Answer: 630

Tip: To get 5%, halve 10%. Do not divide 10% by 5 or by 10.

Marks: 1 mark for finding 10% or 5%. 1 mark for building up to 45%. 1 mark for 630.

4 (3 marks)

Bryony works out 36% of 850

Here is her working.

$$10\% = 85$$

$$30\% = 255$$

$$1\% = 0.85$$

$$6\% = 5.1$$

$$36\% = 255 + 5.1 = 260.1$$

(a) Describe the mistake Bryony has made.

To find 1% of 850 you divide 850 by 100.

$$850 \div 100 = 8.5$$

Bryony divided 85 by 100 (she found 1% of 10%), so she got 0.85

Answer: 1% of 850 is 8.5, not 0.85

Tip: Say exactly which line is wrong and why. “Her answer is wrong” is not enough.

(b) Work out the correct value of 36% of 850

30% = 255 (Bryony’s first two lines are correct)

1% = 8.5, so 6% = $6 \times 8.5 = 51$

36% = $255 + 51 = 306$

Answer: 306

Marks: 1 mark for 51 (6%). 1 mark for 306.

5 (3 marks)

When Leona’s phone battery is 30% charged, the phone can play music for 6 hours. The time it can play music for is proportional to the charge in the battery.

How long can the phone play music for when the battery is 85% charged?

30% gives 6 hours, so 10% gives $6 \div 3 = 2$ hours.

80% = $8 \times 2 = 16$ hours

5% is half of 10%: $2 \div 2 = 1$ hour

85% = $16 + 1 = 17$ hours

Answer: 17 hours

Tip: Find the time for 10% first, then build up to 85%. Do not just work out 85% of 6 hours.

Marks: 1 mark for 2 hours (10%) or 0.2 hours (1%). 1 mark for a correct method to build up 85%. 1 mark for 17.

6 (1 mark)

Owen wants to work out 4% of 2300

His method is 2300×0.4

Is his method correct?

Tick a box.

Give a reason for your answer.

4% means 4 out of 100.

$$\frac{4}{100} = 0.04$$

So he should multiply by 0.04, not 0.4

0.4 is 40%, not 4%.

Answer: No, 4% is 0.04 (0.4 is 40%)

Tip: When asked why a method is wrong, say what the mistake is (0.4 is 40%, not 4%). Just showing a different correct method may not get the mark.

7 (4 marks)

Kerry's take-home pay is £1600 a month.

She spends

35% of this on rent

12% of this on food.

(a) How much does Kerry spend on rent and food altogether?

Rent and food together: $35\% + 12\% = 47\%$

10% of 1600 = 160, 1% of 1600 = 16

40% = $4 \times 160 = 640$

7% = $7 \times 16 = 112$

47% = $640 + 112 = 752$

Answer: £752

Marks: 1 mark for a correct method for 47% of 1600 (or for 560 and 192). 1 mark for 752.

- (b) Kerry saves 15% of the money she has left.
How much does she save?

Money left: $1600 - 752 = 848$ pounds

10% of 848 = 84.80

5% = $84.80 \div 2 = 42.40$

15% = $84.80 + 42.40 = 127.20$

Answer: £127.20

Tip: Find 15% of the money she has **left** (£848), not 15% of £1600.

Marks: 1 mark for 848 (follow-through from part (a)). 1 mark for 127.20.

8 (3 marks)

Three classes raise money for a charity.

They raise £420, £365 and £515

The school keeps 20% of the total for a minibus fund.

The rest of the money goes to the charity.

How much money goes to the charity?

Total raised: $420 + 365 + 515 = 1300$ pounds

The charity gets $100\% - 20\% = 80\%$

10% of 1300 = 130

80% = $8 \times 130 = 1040$

Answer: £1040

Tip: The question asks how much goes to the charity, so take the 20% away. £260 is the amount the school keeps.

Marks: 1 mark for 1300. 1 mark for 20% of 1300 (260) or a method for 80%. 1 mark for 1040.

9 (4 marks)

A field has an area of 1200 m^2

45% of the field is used to grow potatoes.

One third of the rest of the field is used to grow carrots.

The rest of the field is grass.

Work out the area of the field that is grass.

Potatoes: 45% of 1200

10% = 120, so 40% = 480 and 5% = 60

45% = $480 + 60 = 540 \text{ m}^2$

The rest of the field: $1200 - 540 = 660 \text{ m}^2$

Carrots: $\frac{1}{3}$ of 660 = $660 \div 3 = 220 \text{ m}^2$

Grass: $660 - 220 = 440 \text{ m}^2$

Answer: 440 m^2

Tip: The carrots are $\frac{1}{3}$ of the **rest** of the field (660 m^2), not $\frac{1}{3}$ of the whole field.

Marks: 1 mark for 540. 1 mark for 660. 1 mark for 220. 1 mark for 440.
