

Percentage of an Amount

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 (1 mark)

Work out 50% of 360

50% is a half.

$$360 \div 2 = 180$$

Answer: 180

2 (2 marks)

Work out 30% of 90

Find 10% by dividing by 10:

$$10\% \text{ of } 90 = 90 \div 10 = 9$$

30% is 3 lots of 10%:

$$3 \times 9 = 27$$

Answer: 27

Marks: 1 mark for a correct method, e.g. $90 \div 10 \times 3$. 1 mark for 27.

3 (3 marks)

Write these values in order of size.

Start with the smallest value.

30% of 70 25% of 88 45% of 40

You must show your working.

30% of 70: $10\% = 7$, so $30\% = 3 \times 7 = 21$

25% of 88: 25% is a quarter, so $88 \div 4 = 22$

45% of 40: $10\% = 4$, so $40\% = 16$ and $5\% = 2$

$45\% = 16 + 2 = 18$

In order: 18, 21, 22

Answer: 45% of 40, 30% of 70, 25% of 88

Tip: Write the order using the original percentages (or show which value is which). A list of numbers on its own may not be clear.

Marks: 1 mark for one correct value. 1 mark for all three values (21, 22, 18). 1 mark for the correct order.

4 (3 marks)

A bakery made 1200 bread rolls on Saturday.

It sold 85% of the bread rolls.

(a) How many of the bread rolls were not sold?

The rolls not sold are $100\% - 85\% = 15\%$ of the rolls.

10% of 1200 = 120

$5\% = 120 \div 2 = 60$

$15\% = 120 + 60 = 180$

Answer: 180

Marks: 1 mark for a correct method, e.g. 15% of 1200 or $1200 - 1020$. 1 mark for 180.

- (b) The bread rolls that were not sold are put into bags of 12
The bags are given to a food bank.
How many bags are given to the food bank?

$$180 \div 12 = 15$$

Answer: 15

5 (3 marks)

Kemi makes 2.5 litres of fruit punch.
30% of the punch is orange juice.
15% of the punch is lemonade.
The rest of the punch is apple juice.

How many millilitres of apple juice does Kemi use?

Apple juice is $100\% - 30\% - 15\% = 55\%$ of the punch.

$$2.5 \text{ litres} = 2500 \text{ ml}$$

$$10\% \text{ of } 2500 = 250, \text{ so } 50\% = 1250$$

$$5\% = 125$$

$$55\% = 1250 + 125 = 1375 \text{ ml}$$

Answer: 1375 ml

Tip: Change litres to millilitres: 1 litre = 1000 ml, so 2.5 litres = 2500 ml, not 250 ml.

Marks: 1 mark for 55% or 2500 ml. 1 mark for a correct method for 55% of 2500 (or 45% of 2500 = 1125). 1 mark for 1375.

6 (2 marks)

Sanjay is running one lap of a 400 m track.
He has run 65% of the lap.

How many more metres must Sanjay run to finish the lap?

He still has $100\% - 65\% = 35\%$ of the lap to run.

$$10\% \text{ of } 400 = 40, \text{ so } 30\% = 3 \times 40 = 120$$

$$5\% = 40 \div 2 = 20$$

$$35\% = 120 + 20 = 140$$

Answer: 140 m

Marks: 1 mark for 35% or 260 m. 1 mark for 140.

7 (3 marks)

Lowri works in a clothes shop.
She buys a coat that has a price of £84
She gets a staff discount of 15%
She pays with a £100 note.

How much change should Lowri get?

Discount: 15% of £84

$$10\% = 8.40, \quad 5\% = 4.20$$

$$15\% = 8.40 + 4.20 = 12.60$$

$$\text{Price Lowri pays: } 84 - 12.60 = 71.40$$

$$\text{Change: } 100 - 71.40 = 28.60$$

Answer: £28.60

Marks: 1 mark for 12.60. 1 mark for 71.40. 1 mark for 28.60.

8 (4 marks)

There are 1200 students at a school.
55% of the students have a pet.
40% of the students who have a pet have a dog.

What percentage of all the students at the school have a pet that is not a dog?

Students with a pet: 55% of 1200

$$10\% = 120, \quad 50\% = 600, \quad 5\% = 60, \quad \text{so } 55\% = 660$$

$$\text{Students with a dog: } 40\% \text{ of } 660 = 4 \times 66 = 264$$

Pet but not a dog: $660 - 264 = 396$

As a percentage of 1200: $\frac{396}{1200} \times 100 = 33\%$

Answer: 33%

Tip: The 40% is 40% of the students **with a pet**, not 40% of all 1200 students.

Marks: 1 mark for 660. 1 mark for 264 (or 60% of 660). 1 mark for 396. 1 mark for 33%.

9 (4 marks)

A charity shop has 300 books to sell.

40% of the books are paperbacks.

The rest of the books are hardbacks.

The shop sells all of the paperbacks for £1.50 each.

It sells 75% of the hardbacks for £2.50 each.

Work out the total amount of money the shop gets from selling these books.

Paperbacks: $40\% \text{ of } 300 = 4 \times 30 = 120 \text{ books}$

Hardbacks: $300 - 120 = 180 \text{ books}$

Hardbacks sold: $75\% \text{ of } 180 = \frac{3}{4} \times 180 = 135 \text{ books}$

Money from paperbacks: $120 \times 1.50 = 180 \text{ pounds}$

Money from hardbacks: $135 \times 2.50 = 337.50 \text{ pounds}$

Total: $180 + 337.50 = 517.50 \text{ pounds}$

Answer: £517.50

Tip: The 75% is 75% of the **hardbacks** (180 books), not 75% of all 300 books.

Marks: 1 mark for 120 or 180 books. 1 mark for 135. 1 mark for £180 or £337.50. 1 mark for £517.50.
