

Fractions of Amounts

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 (3 marks)

Work out

(a) $\frac{1}{5}$ of 45

To find $\frac{1}{5}$, divide by 5.

$$45 \div 5 = 9$$

Answer: 9

(b) $\frac{3}{4}$ of 60

Divide by the bottom number to find $\frac{1}{4}$:

$$60 \div 4 = 15$$

Multiply by the top number to find $\frac{3}{4}$:

$$15 \times 3 = 45$$

Answer: 45

Tip: Divide by the bottom, then multiply by the top. Stopping at 15 gives only one quarter.

(c) $\frac{7}{10}$ of £350

$$\frac{1}{10} \text{ of } £350: 350 \div 10 = 35$$

$$\frac{7}{10} \text{ of } £350: 35 \times 7 = 245$$

Answer: £245

2 (1 mark)

Circle the value of $\frac{2}{3}$ of 27

Options: 9, 18, 54, 81

$$\frac{1}{3} \text{ of } 27: 27 \div 3 = 9$$

$$\frac{2}{3} \text{ of } 27: 9 \times 2 = 18$$

Answer: 18

3 (2 marks)

Write 15 as a fraction of 40

Give your answer in its simplest form.

“15 as a fraction of 40” means $\frac{15}{40}$.

The HCF of 15 and 40 is 5.

Divide top and bottom by 5:

$$\frac{15}{40} = \frac{3}{8}$$

Answer: $\frac{3}{8}$

Marks: 1 mark for $\frac{15}{40}$. 1 mark for $\frac{3}{8}$.

4 (2 marks)

There are 240 students in Year 9.

$\frac{5}{8}$ of the students walk to school.

How many students walk to school?

Find $\frac{5}{8}$ of 240.

$\frac{1}{8}$ of 240: $240 \div 8 = 30$

$\frac{5}{8}$ of 240: $30 \times 5 = 150$

Answer: 150

Marks: 1 mark for $240 \div 8$ or $\frac{5}{8} \times 240$. 1 mark for 150.

5 (2 marks)

In a sale, the price of a coat is reduced by $\frac{2}{5}$.

The reduction is £24

Work out the original price of the coat.

The reduction is $\frac{2}{5}$ of the original price.

So $\frac{2}{5}$ of the price is £24.

$\frac{1}{5}$ of the price is $24 \div 2 = 12$

The whole price is $\frac{5}{5}$, so $5 \times 12 = 60$

Answer: £60

Tip: Here you know the fraction, not the whole amount. Do not work out $\frac{2}{5}$ of £24. Work backwards: find $\frac{1}{5}$ first, then the whole.

Marks: 1 mark for $24 \div 2$ (= £12). 1 mark for £60.

6 (2 marks)

Which is larger, $\frac{2}{3}$ of 48 or $\frac{3}{5}$ of 55?

Tick a box.

You must show your working.

$\frac{2}{3}$ of 48: $48 \div 3 = 16$, $16 \times 2 = 32$

$\frac{3}{5}$ of 55: $55 \div 5 = 11$, $11 \times 3 = 33$

33 is larger than 32.

Answer: $\frac{3}{5}$ of 55 (33 is larger than 32)

Marks: 1 mark for working out either value. 1 mark for both values and the correct box ticked.

7 (2 marks)

Write 450 m as a fraction of 2 km.

Give your answer in its simplest form.

Both amounts must be in the same units.

$2 \text{ km} = 2000 \text{ m}$

So the fraction is $\frac{450}{2000}$.

Divide top and bottom by 10: $\frac{45}{200}$

Divide top and bottom by 5: $\frac{9}{40}$

Answer: $\frac{9}{40}$

Tip: Change to the same units before you write the fraction. $\frac{450}{2}$ makes no sense.

Marks: 1 mark for $\frac{450}{2000}$ (or an equivalent fraction). 1 mark for $\frac{9}{40}$.

8 (3 marks)

Kate earns £1200 a month.

She spends $\frac{1}{3}$ of it on rent and $\frac{1}{4}$ of it on food.

How much money does she have left?

Rent: $\frac{1}{3}$ of £1200 = $1200 \div 3 = 400$

Food: $\frac{1}{4}$ of £1200 = $1200 \div 4 = 300$

Total spent: $400 + 300 = 700$

Left: $1200 - 700 = 500$

Answer: £500

Tip: Do not change $\frac{1}{3}$ to a rounded percentage like 30% or 33%. Divide by 3 to get an exact answer.

Marks: 1 mark for £400 or £300. 1 mark for subtracting both from £1200. 1 mark for £500.

9 (4 marks)

A water butt holds 160 litres when it is full.

It is $\frac{3}{4}$ full.

Rhian uses $\frac{2}{5}$ of the water in the butt to water her garden.

(a) How many litres of water are left in the water butt?

Water in the butt: $\frac{3}{4}$ of 160

$160 \div 4 = 40$, $40 \times 3 = 120$ litres.

Rhian uses $\frac{2}{5}$ of the 120 litres:

$120 \div 5 = 24$, $24 \times 2 = 48$ litres.

Left: $120 - 48 = 72$ litres.

Answer: 72 litres

Tip: The $\frac{2}{5}$ is a fraction of the water that is **in** the butt (120 litres), not of the full 160 litres.

Marks: 1 mark for 120 litres. 1 mark for 48 litres (or $\frac{3}{5} \times 120$). 1 mark for 72.

(b) Rhian says,

‘I have used $\frac{2}{5}$ of the amount the water butt holds when it is full.’

Is she correct? Tick a box.

Give a reason for your answer.

She used 48 litres.

$\frac{2}{5}$ of the full 160 litres is $160 \div 5 \times 2 = 64$ litres.

48 is not 64, so she is not correct.

(She used $\frac{2}{5}$ of the water that was in the butt, which is less.)

Answer: No: she used 48 litres, but $\frac{2}{5}$ of 160 litres is 64 litres

Tip: The butt was not full to start with, so $\frac{2}{5}$ of the water in it is less than $\frac{2}{5}$ of a full butt.

10 (4 marks)

A car park has 360 spaces.

At noon, $\frac{5}{6}$ of the spaces have a car parked in them.

$\frac{3}{10}$ of these cars are electric cars.

What fraction of the 360 spaces have a car that is **not** electric parked in them?

Give your answer in its simplest form.

Spaces with a car: $\frac{5}{6}$ of 360

$360 \div 6 = 60$, $60 \times 5 = 300$ cars.

Electric cars: $\frac{3}{10}$ of 300

$300 \div 10 = 30$, $30 \times 3 = 90$ electric cars.

Cars that are not electric: $300 - 90 = 210$

As a fraction of the 360 spaces: $\frac{210}{360}$

Divide top and bottom by 30: $\frac{210}{360} = \frac{7}{12}$

Answer: $\frac{7}{12}$

Tip: The $\frac{3}{10}$ is a fraction of the **cars** (300), not of all 360 spaces. Your final fraction must be out of 360.

Marks: 1 mark for 300 cars. 1 mark for 90 electric cars. 1 mark for 210 or $\frac{210}{360}$. 1 mark for $\frac{7}{12}$.
