

Metric Unit Conversions

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 (1 mark)

How many millimetres are there in 0.35 metres?

Circle your answer.

Options: 3.5, 35, 350, 3500

1 m = 100 cm and 1 cm = 10 mm

So 1 m = $100 \times 10 = 1000$ mm

Metres to millimetres: multiply by 1000.

$0.35 \times 1000 = 350$

Answer: 350

Tip: There are 1000 mm in a metre. Multiplying by 100 gives centimetres (35 cm), not millimetres.

2 (1 mark)

How many seconds are there in 4.5 minutes?

Circle your answer.

Options: 45, 245, 270, 450

1 minute = 60 seconds

4 minutes = $4 \times 60 = 240$ seconds

0.5 of a minute = 30 seconds

$$240 + 30 = 270$$

Answer: 270

Tip: There are 60 seconds in a minute, not 100. So 4.5 minutes is not 450 seconds.

3 (4 marks)

- (a) Convert 850 centimetres to metres.

$$100 \text{ cm} = 1 \text{ m}$$

Centimetres to metres: divide by 100.

$$850 \div 100 = 8.5$$

Answer: 8.5 m

- (b) Convert 2.4 kilograms to grams.

$$1 \text{ kg} = 1000 \text{ g}$$

Kilograms to grams: multiply by 1000.

$$2.4 \times 1000 = 2400$$

Answer: 2400 g

Tip: 1 kg is 1000 g, not 100 g. This is one of the most common mistakes.

- (c) Convert 3500 millilitres to litres.

$$1000 \text{ ml} = 1 \text{ litre}$$

Millilitres to litres: divide by 1000.

$$3500 \div 1000 = 3.5$$

Answer: 3.5 litres

- (d) Convert 45 millimetres to centimetres.

$$10 \text{ mm} = 1 \text{ cm}$$

Millimetres to centimetres: divide by 10.

$$45 \div 10 = 4.5$$

Answer: 4.5 cm

4 (2 marks)

A road sign shows that a town is 45 miles away.

Use 8 kilometres = 5 miles

How far away is the town in kilometres?

Find how many lots of 5 miles there are in 45 miles:

$$45 \div 5 = 9$$

Each 5 miles is 8 km.

$$9 \times 8 = 72$$

Answer: 72 km

Tip: A kilometre is shorter than a mile, so the number of kilometres must be bigger than 45. If your answer is smaller, you have used the rate the wrong way round.

Marks: 1 mark for $45 \div 5$ or $45 \times \frac{8}{5}$. 1 mark for 72.

5 (2 marks)

The fuel tank of a car holds 54 litres.

Use 1 gallon = 4.5 litres

How many gallons does the fuel tank hold?

Each gallon is 4.5 litres.

Find how many lots of 4.5 litres there are in 54 litres:

$$54 \div 4.5 = 12$$

Answer: 12 gallons

Tip: A gallon is bigger than a litre, so there are fewer gallons than litres. Divide, do not multiply.

Marks: 1 mark for $54 \div 4.5$. 1 mark for 12.

6 (2 marks)

Write these masses in order, starting with the smallest.

1.2 kg 1250 g 0.9 kg 980 g

Change them all to grams ($\times 1000$ for kg):

$$1.2 \text{ kg} = 1200 \text{ g}$$

$$0.9 \text{ kg} = 900 \text{ g}$$

In order: 900 g, 980 g, 1200 g, 1250 g

Now write them in their original units.

Answer: 0.9 kg, 980 g, 1.2 kg, 1250 g

Tip: Always change to the same unit before you compare. Then give your answer using the units in the question.

Marks: 1 mark for changing them all to the same unit. 1 mark for the correct order.

7 (3 marks)

Dev swims 14 lengths of a pool.

Each length takes him 1 minute 50 seconds.

Work out the total time he spends swimming.

Give your answer in minutes and seconds.

Change the time for one length into seconds.

$$1 \text{ minute } 50 \text{ seconds} = 60 + 50 = 110 \text{ seconds}$$

$$\text{Total} = 14 \times 110 = 1540 \text{ seconds}$$

$$1540 \div 60 = 25 \text{ remainder } 40$$

So 1540 seconds = 25 minutes 40 seconds

Answer: 25 minutes 40 seconds

Tip: $1540 \div 60 = 25.66 \dots$ does **not** mean 25 minutes 66 seconds. Find the seconds left over:
 $1540 - 25 \times 60 = 40$.

Marks: 1 mark for 110 seconds (or 14×1 min and 14×50 s). 1 mark for 1540 seconds. 1 mark for 25 minutes 40 seconds.

8 (2 marks)

A jug holds 1.5 litres of juice.
Each glass holds 250 ml.

How many glasses can be filled from a full jug?

Use the same units: change litres to millilitres.

$$1.5 \text{ litres} = 1.5 \times 1000 = 1500 \text{ ml}$$

$$1500 \div 250 = 6$$

Answer: 6

Marks: 1 mark for 1500 ml. 1 mark for 6.

9 (2 marks)

A recipe needs 350 g of flour.
Sam has a 2 kg bag of flour.

How many times can Sam make the recipe with one bag of flour?

Use the same units: $2 \text{ kg} = 2000 \text{ g}$

$$2000 \div 350 = 5.71 \dots$$

Sam only has enough flour for 5 whole recipes.

Answer: 5

Tip: Do not round 5.71 up to 6. There is not enough flour for a 6th recipe, so round down.

Marks: 1 mark for $2000 \div 350$. 1 mark for 5.

10 (2 marks)

A train leaves at 10:47 and arrives at 13:12

How long is the journey?

Give your answer in hours and minutes.

Count on from 10:47.

10:47 to 12:47 is 2 hours.

12:47 to 13:00 is 13 minutes.

13:00 to 13:12 is 12 minutes.

Total: 2 hours and $13 + 12 = 25$ minutes

Answer: 2 hours 25 minutes

Tip: Do not subtract times like ordinary numbers ($1312 - 1047 = 265$). There are 60 minutes in an hour, so count on instead.

Marks: 1 mark for a correct method, e.g. counting on from 10:47. 1 mark for 2 hours 25 minutes.

11 (2 marks)

You may use a calculator for this question.

A tin holds 2.5 litres of paint.

Use 1 pint = 0.568 litres

How many pints of paint does the tin hold?

Give your answer to 1 decimal place.

Each pint is 0.568 litres.

Find how many lots of 0.568 litres there are in 2.5 litres:

$$2.5 \div 0.568 = 4.401\dots$$

$$= 4.4 \text{ (to 1 decimal place)}$$

Answer: 4.4 pints

Tip: A pint is smaller than a litre, so the number of pints must be bigger than 2.5. Multiplying gives 1.42, which is too small.

Marks: 1 mark for $2.5 \div 0.568$. 1 mark for 4.4.
