

Multi-Step Worded Problems

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 (2 marks)

Buses leave a bus stop every 12 minutes.

The first bus leaves at 07:05

Aisha arrives at the bus stop at 07:50

How many minutes does Aisha have to wait for a bus?

Keep adding 12 minutes, starting at 07:05:

07:05, 07:17, 07:29, 07:41, 07:53

Aisha arrives at 07:50, just after the 07:41 bus has gone.

The next bus is at 07:53.

She waits from 07:50 to 07:53, which is 3 minutes.

Answer: 3 minutes

Marks: 1 mark for listing the bus times (or finding 07:53). 1 mark for 3 minutes.

2 (3 marks)

Tobias has a plank of wood 3 m long.

He cuts as many shelves of length 45 cm as he can from the plank.

How much more wood would Tobias need to cut one more shelf?

Use the same units: 3 m = 300 cm

$300 \div 45 = 6$ remainder 30

So Tobias cuts 6 shelves: $6 \times 45 = 270$ cm

Wood left over: $300 - 270 = 30$ cm

One more shelf needs 45 cm, so he needs $45 - 30 = 15$ cm more.

Answer: 15 cm

Tip: A calculator gives $300 \div 45 = 6.66 \dots$ The 0.66 is not a length in cm. Work out the wood used, $6 \times 45 = 270$ cm, then the wood left, 30 cm.

Marks: 1 mark for changing 3 m to 300 cm. 1 mark for 6 shelves or 30 cm left over. 1 mark for 15 cm.

3 (3 marks)

Hanna works 6 hours each day from Monday to Friday.

She is paid £10.90 per hour.

She also works 4 hours on Saturday.

She is paid £13.50 per hour on Saturday.

Work out how much Hanna earns in one week.

Monday to Friday is 5 days: $5 \times 6 = 30$ hours

Pay: $30 \times 10.90 = £327$

Saturday: $4 \times 13.50 = £54$

Total: $327 + 54 = £381$

Answer: £381

Marks: 1 mark for £327. 1 mark for £54. 1 mark for £381.

4 (3 marks)

Max fills an empty tank with water.

The tank holds 180 litres.

Water flows into the tank at 12 litres per minute.

Max starts filling the tank at 9:48 am.

At what time will the tank be full?

Time to fill: $180 \div 12 = 15$ minutes

$9:48 + 15 \text{ minutes} = 10:00$

$$10:00 + 3 \text{ more minutes} = 10:03$$

Answer: 10:03 am

Marks: 1 mark for $180 \div 12$. 1 mark for adding your time to 9:48. 1 mark for 10:03.

5 (3 marks)

The table shows the charges at a car park.

First 2 hours	£3.20
Each extra hour or part of an hour	£1.50

Oscar parks his car from 09:40 until 14:15

How much does Oscar have to pay?

From 09:40 to 13:40 is 4 hours.

From 13:40 to 14:15 is 35 minutes.

So he parks for 4 hours 35 minutes.

The first 2 hours cost £3.20.

That leaves 2 hours 35 minutes.

Part of an hour counts as a whole hour, so this is 3 extra hours.

Cost: $3.20 + 3 \times 1.50 = 3.20 + 4.50 = £7.70$

Answer: £7.70

Tip: Count on from 09:40 to find the time parked. Do not subtract $14.15 - 9.40$ like decimals, because an hour has 60 minutes, not 100.

Marks: 1 mark for 4 hours 35 minutes. 1 mark for 3 extra hours. 1 mark for £7.70.

6 (4 marks)

There are 1200 students at a school.

$\frac{3}{8}$ of the students walk to school.

35% of the students come to school by bus.

All the other students come to school by car.

Work out the number of students who come to school by car.

Walk: $\frac{3}{8}$ of 1200 = $1200 \div 8 \times 3 = 450$

Bus: 35% of 1200 = $0.35 \times 1200 = 420$

Car: everyone else.

$1200 - 450 - 420 = 330$

Answer: 330

Tip: Both the $\frac{3}{8}$ and the 35% are of **all** 1200 students. Do not take 35% of the students who are left after the walkers.

Marks: 1 mark for 450. 1 mark for 420. 1 mark for $1200 - 450 - 420$. 1 mark for 330.

7 (3 marks)

A bakery has two ovens, oven A and oven B.

A tray of bread rolls comes out of oven A every 40 minutes.

A tray of scones comes out of oven B every 25 minutes.

At 6:30 am, a tray comes out of each oven at the same time.

At what time will trays next come out of both ovens at the same time?

List the times (in minutes after 6:30 am) when trays come out of each oven.

Oven A, multiples of 40: 40, 80, 120, 160, 200, ...

Oven B, multiples of 25: 25, 50, 75, 100, 125, 150, 175, 200, ...

The first number in both lists is 200. This is the lowest common multiple (LCM).

200 minutes = 3 hours 20 minutes

6:30 am + 3 hours 20 minutes = 9:50 am

Answer: 9:50 am

Tip: 200 minutes is 3 hours 20 minutes, not 2 hours. Divide by 60 to change minutes to hours.

Marks: 1 mark for listing multiples of 40 and 25. 1 mark for 200 minutes. 1 mark for 9:50 am.

8 (3 marks)

Ella is planning a party for 58 people.

Each pizza is cut into 8 slices.

Each person will eat 3 slices.

Pizzas cost £6.50 each.

Work out the total cost of the pizzas Ella needs to buy.

Slices needed: $58 \times 3 = 174$

Pizzas: $174 \div 8 = 21.75$

21 pizzas are not enough, so she needs 22 pizzas.

Cost: $22 \times 6.50 = £143$

Answer: £143

Tip: She has to buy whole pizzas, so round 21.75 **up** to 22 before you work out the cost.

Marks: 1 mark for 174 slices. 1 mark for 22 pizzas. 1 mark for £143.
