

Sharing in a Ratio

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)

A school raised £1240 at a summer fair.

The money is shared in the ratio 5 : 2 : 1 between an animal shelter, a food bank and a hospice.

How much money does the food bank get?

$$\text{Total number of parts} = 5 + 2 + 1 = 8$$

$$\text{One part} = 1240 \div 8 = \text{£}155$$

The food bank has 2 parts.

$$2 \times 155 = \text{£}310$$

Answer: £310

Marks: 1 mark for $1240 \div 8$. 1 mark for £310.

2 (3 marks)

A plank of wood is 180 cm long.

It is cut into three pieces with lengths in the ratio 2 : 3 : 4

Work out the length of each piece.

$$\text{Total number of parts} = 2 + 3 + 4 = 9$$

$$\text{One part} = 180 \div 9 = 20 \text{ cm}$$

$$\text{First piece: } 2 \times 20 = 40 \text{ cm}$$

$$\text{Second piece: } 3 \times 20 = 60 \text{ cm}$$

$$\text{Third piece: } 4 \times 20 = 80 \text{ cm}$$

Check: $40 + 60 + 80 = 180$ ✓

Answer: 40 cm, 60 cm and 80 cm

Tip: Add the parts first (9). Dividing 180 by 2, 3 and 4 separately is a common mistake. Check your lengths add up to 180 cm.

Marks: 1 mark for $180 \div 9$. 1 mark for one correct length. 1 mark for all three correct.

3 (3 marks)

On a tram, the ratio of the number of passengers sitting to the number of passengers standing is 5 : 2

(a) What fraction of the passengers are standing?

Total number of parts = $5 + 2 = 7$

Standing passengers are 2 of the 7 parts.

Answer: $\frac{2}{7}$

Tip: The bottom of the fraction is the total number of parts (7), so the answer is not $\frac{2}{5}$.

(b) There are 14 passengers standing.

Work out the total number of passengers on the tram.

Standing passengers are 2 parts, and 2 parts = 14

One part = $14 \div 2 = 7$

The whole tram is $5 + 2 = 7$ parts: $7 \times 7 = 49$

Answer: 49

Tip: 14 is the number standing, not the total. Do not share 14 in the ratio 5:2.

Marks: 1 mark for $14 \div 2$. 1 mark for 49.

4 (3 marks)

Ieuan makes 2 kg of trail mix.

He mixes raisins, peanuts and chocolate chips in the ratio 5 : 3 : 2 by mass.

- (a) Work out the mass of each ingredient he uses.

Change the mass to grams: $2 \text{ kg} = 2000 \text{ g}$

Total number of parts = $5 + 3 + 2 = 10$

One part = $2000 \div 10 = 200 \text{ g}$

Raisins: $5 \times 200 = 1000 \text{ g}$

Peanuts: $3 \times 200 = 600 \text{ g}$

Chocolate chips: $2 \times 200 = 400 \text{ g}$

Answer: raisins 1000 g, peanuts 600 g, chocolate chips 400 g

Marks: 1 mark for $2000 \div 10$ (or $2 \div 10$). 1 mark for all three masses.

- (b) Peanuts are sold in 250 g bags.
How many bags of peanuts does Ieuan need to buy?

$600 \div 250 = 2.4$

2 bags is only 500 g, which is not enough.

So he needs 3 bags.

Answer: 3

Tip: You cannot buy 2.4 bags. Round **up**, because 2 bags would not be enough.

5 (2 marks)

A badminton club has junior members and adult members only.

The ratio of the number of junior members to the number of adult members is 3 : 8

There are 24 junior members.

Work out the number of adult members.

Junior members are 3 parts, and 3 parts = 24

One part = $24 \div 3 = 8$

Adult members are 8 parts: $8 \times 8 = 64$

Answer: 64

Tip: 24 is the number of junior members, not the total. Do not share 24 in the ratio 3:8.

Marks: 1 mark for $24 \div 3$. 1 mark for 64.

6 (3 marks)

312 people took part in a charity walk.

Each person walked either the 10 km route or the 5 km route.

The ratio of the number of people on the 10 km route to the number of people on the 5 km route was 7 : 5

How many more people walked the 10 km route than the 5 km route?

Total number of parts = $7 + 5 = 12$

One part = $312 \div 12 = 26$

10 km route: $7 \times 26 = 182$

5 km route: $5 \times 26 = 130$

Difference = $182 - 130 = 52$

Answer: 52

Marks: 1 mark for $312 \div 12$. 1 mark for 182 or 130. 1 mark for 52.

7 (3 marks)

A box contains red, white and yellow tulip bulbs in the ratio 2 : 5 : 4

There are 42 red and yellow bulbs altogether.

Work out the total number of bulbs in the box.

Red and yellow together are $2 + 4 = 6$ parts.

6 parts = 42 bulbs

One part = $42 \div 6 = 7$

Total parts = $2 + 5 + 4 = 11$

$$\text{Total bulbs} = 11 \times 7 = 77$$

Answer: 77

Tip: The 42 bulbs are only the red and yellow ones, so they match $2 + 4 = 6$ parts, not all 11 parts.

Marks: 1 mark for 6 parts = 42. 1 mark for 7. 1 mark for 77.

8 (3 marks)

The ratio of the price of a child session to the price of an adult session at a climbing wall is 3 : 5

An adult session costs £1.60 more than a child session.

Work out the total cost of 1 adult session and 4 child sessions.

child : adult = 3:5, so an adult session costs $5 - 3 = 2$ parts more.

$$2 \text{ parts} = \text{£}1.60$$

$$\text{One part} = 1.60 \div 2 = \text{£}0.80$$

$$\text{Child session: } 3 \times 0.80 = \text{£}2.40$$

$$\text{Adult session: } 5 \times 0.80 = \text{£}4.00$$

$$\text{Total: } 4.00 + 4 \times 2.40 = 4.00 + 9.60 = \text{£}13.60$$

Answer: £13.60

Tip: £1.60 is the **difference** between the prices, so it matches $5 - 3 = 2$ parts.

Marks: 1 mark for £0.80 for one part. 1 mark for £2.40 and £4.00. 1 mark for £13.60.

9 (3 marks)

Ffion and Rhodri share some money in the ratio 3 : 5

Rhodri then gives £12 of his share to Ffion.

They now have the same amount of money.

How much money did they share?

At the start, Rhodri has $5 - 3 = 2$ more parts than Ffion.

After he gives her £12, they have the same amount.

So the difference between their shares was $2 \times 12 = £24$

2 parts = £24, so one part = £12

Total parts = $3 + 5 = 8$

Total money = $8 \times 12 = £96$

Check: Ffion £36, Rhodri £60; after the gift both have £48 ✓

Answer: £96

Tip: Giving away £12 closes a gap of £24: Rhodri goes down by £12 and Ffion goes up by £12.

Marks: 1 mark for the difference of £24 (or 2 parts). 1 mark for £12 for one part. 1 mark for £96.
