

JustMaths

Methods

A selection of questions collated to explore the different methods you could use across a variety of topics.

Name: _____

Total Marks: _____

Q1. Here is a list of four fractions.

$$\frac{4}{16}$$

$$\frac{2}{8}$$

$$\frac{15}{60}$$

$$\frac{3}{9}$$

One of these fractions is **not** equivalent to $\frac{1}{4}$

Write down this fraction.

..... (1)

Q2. Write $\frac{4}{50}$ as a percentage.

..... % (1)

Q3. There are 210 counters in a bag.
30% of these counters are red.
Work out the number of red counters in the bag.

..... (2)

Q4. Increase 240 by 20%

..... (3)

- Q5.** There are 84 calories in 100 g of banana.
There are 87 calories in 100 g of yogurt.
Priti has 60 g of banana and 150 g of yogurt for breakfast.
Work out the total number of calories in this breakfast.

..... (4)

- Q6.** Here is a list of ingredients for making 10 scones.

Mia wants to make 25 scones.
Work out how much sugar she needs.

Ingredients for 10 scones	
75 g	butter
350 g	self-raising flour
40 g	sugar
150 ml	milk
2	eggs

..... g (2)

Q7. A company orders a large number of plates from a factory.
It would take 30 hours to make all the plates using 4 machines.
How many machines are needed to make all the plates in 6 hours?

..... (2)

Q8. Ali, Ben and Cathy share an amount of money in the ratio 6 : 9 : 10
What fraction of the money does Ben get?

..... (2)

Q9. John makes clay cups. He makes 18 cups each hour.
He makes cups for $6\frac{1}{2}$ hours each day, on 5 days of the week.
The cups are packed in boxes.
4 cups are packed into each box.
How many boxes are needed for all the cups John makes in a week?

..... (4)

Q10. Suha has a full 600 ml bottle of wallpaper remover.
 She is going to mix some of the wallpaper remover with water.
 Here is the information on the label of the bottle.

<p>Wallpaper remover 600 ml</p> <p>Mix $\frac{1}{4}$ of the wallpaper remover with 4500 ml of water</p>

Suha is going to use 750 ml of water.
 How many millilitres of wallpaper remover should
 Suha use?
 You must show your working.

..... ml (4)

Q11. Sarah wants to buy some fruit.
 She wants to buy

3 oranges at 30p each
 and $\frac{1}{2}$ kg apples at £1.20 per kg.

The only money Sarah has is one 50p coin and six 20p coins.
 She pays for the fruit.

Work out how much money Sarah has left. You must show all your working.

- Q12.** 30% of the people at a concert are female.
1295 of the people at the concert are male.

Work out the number of people at the concert who are female.

(3)

- Q13.** There are 165 counters in a bag.

Each counter is either black or white.

There are twice as many black counters as white counters in the bag.

Martine takes 40% of the black counters from the bag.

Work out the ratio of the number of black counters to the number of white counters now in the bag.

Give your ratio in its simplest form.

..... (4)

Q14. 5 schools sent some students to a conference.

One of the schools sent both boys and girls.

This school sent 16 boys.

The ratio of the number of boys it sent to the number of girls it sent was 1 : 2

The other 4 schools sent only girls.

Each of the 5 schools sent the same number of students.

Work out the total number of students sent to the conference by these 5 schools.

(4)

Q15. Pat and Julie share some money in the ratio 2 : 5

Julie gets £45 more than Pat.

How much money did Pat get?

£. (3)

Q16. A supermarket car park has 200 spaces.
10% of the spaces are for staff.

The other spaces are for disabled people, for parents and for other customers in the ratio 1 : 2: 7

Paul is going to paint a sign for each of the spaces for staff, for disabled people and for parents.

He is **not** going to paint signs for the spaces for other customers.

Work out the total number of spaces Paul is going to paint a sign for.

..... (4)

Q17. On Saturday, some adults and some children were in a theatre.

The ratio of the number of adults to the number of children was 5 : 2

Each person had a seat in the Circle or had a seat in the Stalls.

$\frac{3}{4}$ of the children had seats in the Stalls.

117 children had seats in the Circle.

There are exactly 2600 seats in the theatre.

On this Saturday, were there people on more than 60% of the seats?

You must show how you get your answer.

(5)

Q18. A solid cuboid is made of metal. The metal has a density of 9 g/cm^3
 The volume of the cuboid is 72 cm^3
 Work out the mass of the cuboid.

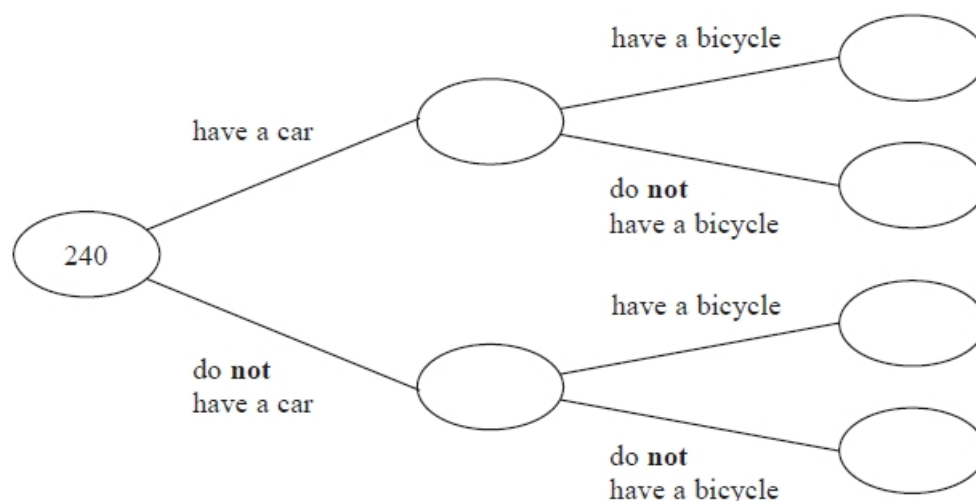
..... g (2)

Q19. Paulo drives at an average speed of 56 km / h for 1 hour 45 minutes.
 Work out the distance Paulo drives.

..... km (3)

Q20. 240 people work at a factory.
 Of these people
 150 have a car
 110 have a bicycle
 65 of the people who have a bicycle do **not** have a car.

(a) Use this information to complete the frequency tree.



(3)

(b) What percentage of the 150 people who have a car also have a bicycle?

(2)

Q21. Bronwin works in a restaurant. The table gives her rates of pay.

Day	Rate of pay
Monday to Friday	£8.40 per hour
Weekend	£11.20 per hour

Bronwin worked for a total of 20 hours last week.

She worked 8 of these 20 hours at the weekend.

Show that Bronwin was paid less than £200 last week.

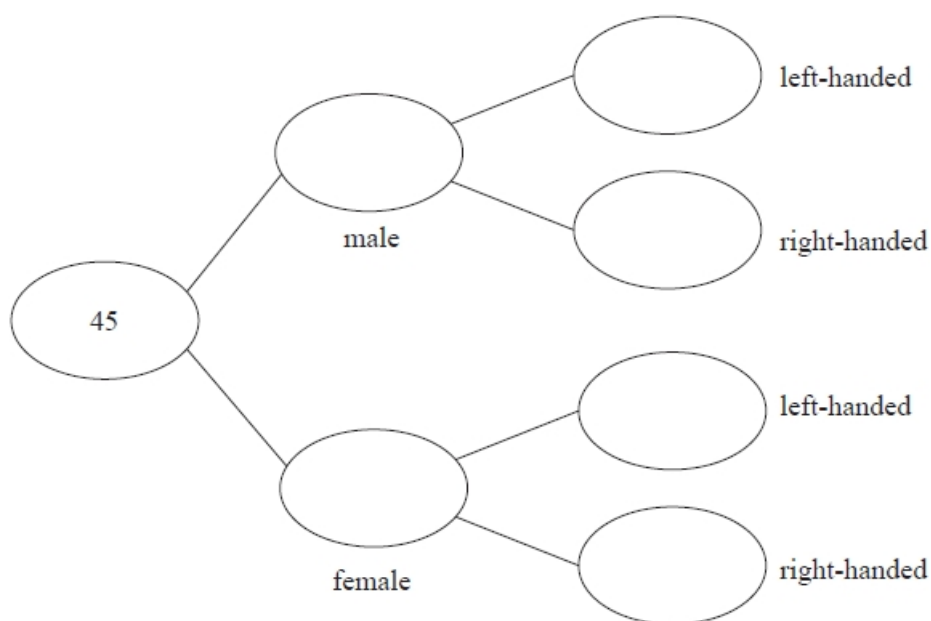
(3)

Q22. Each worker in a factory is either left-handed or right-handed.

22 of the 45 workers are male.

16 of the 34 right-handed workers are female.

Complete the frequency tree for this information.



(3)

Q23. 148 students each choose to study Geography or to study History.
72 of the students choose History.
34 boys choose Geography.
28 girls choose History.

Use this information to complete the two-way table.

	Geography	History	Total
Boys			
Girls			
Total			

(3)

Q24. Emma has 45 rabbits.
30 of the rabbits are male.
8 of the female rabbits have short hair.
12 of the rabbits with long hair are male.

(a) Use the information to complete the two-way table.

	Male	Female	Total
Long hair			
Short hair			
Total			

(3)

One of Emma's rabbits is chosen at random.

(b) Write down the probability that this rabbit is a female with short hair.

.....

(1)

Q25. Machine A and machine B both make car parts.

Machine A makes 6 parts every 10 minutes.

Machine B makes 13 parts every 15 minutes.

On Monday

machine A makes parts for 12 hours

machine B makes parts for 10 hours

Work out the total number of parts made by the two machines on Monday.

..... (4)

Q26. The density of ethanol is 1.09 g/cm^3

The density of propylene is 0.97 g/cm^3

60 litres of ethanol are mixed with 128 litres of propylene to make 188 litres of antifreeze.

Work out the density of the antifreeze. Give your answer correct to 2 decimal places.

..... g/cm^3 (4)

- Q27.** Jessica runs for 15 minutes at an average speed of 6 miles per hour.
She then runs for 40 minutes at an average speed of 9 miles per hour.
It takes Amy 45 minutes to run the same total distance that Jessica runs.
Work out Amy's average speed.
Give your answer in miles per hour.

..... miles per hour (4)

- Q28.** Wayne begins walking at 8 30 am.
He walks for 1 hour and 45 minutes.
Wayne then rests for 15 minutes.
He then walks for 85 minutes to a cafe.
Does Wayne get to the cafe before 12 noon? You must show how you get your answer.

Q29. A piece of glass has a mass of 27 g and a volume of 10 cm^3
Work out the density of the piece of glass.

..... g/cm^3 (2)

Q30. Riley travelled by car and by aeroplane.

He travelled 143 miles by car at an average speed of 55 miles per hour.
Riley then travelled for 5 hours and 20 minutes by aeroplane.

Work out, in hours and minutes, Riley's total travelling time.

..... hours minutes (3)

Q31. On an activity day students play one sport. They play football or hockey or tennis.

120 students are on the activity day.

30 of the students are boys.

12 of the boys and 26 of the girls play hockey.

45 of the students play football.

35 of the 45 students who play football are girls.

Work out the number of girls who play tennis.

Q32. Jean is going to the beach.
 It takes her 25 minutes to get from her home to the beach.
 It takes her 25 minutes to get from the beach to her home.
 Jean leaves home at 2.40 pm.
 She has to get home by 6 pm.
 What is the greatest length of time Jean can stay at the beach?

..... (4)

Q33. Change 9 metres into centimetres.

..... centimetres (1)

Q34. There are only red beads and green beads in a bag.
 number of red beads : number of green beads = 1 : 4
 There are 35 red beads in the bag.
 Work out the total number of beads in the bag.

..... (2)

Q35. There are 24 red counters and 40 blue counters in a bag.
 Write down the ratio of the number of red counters to the number of blue counters in the bag. Give your ratio in its simplest form.

..... (2)

Q36. Last week, 73% of the tickets sold at a cinema were adult tickets.

(a) What percentage of the tickets sold were **not** adult tickets?

..... % **(1)**

Some people watched a film at the cinema.

number of adults : number of children = 2 : 5

(b) What fraction of these people were adults?

..... **(1)**

On Friday,

500 people watched a film at the cinema.

70% of these people were children.

On Saturday,

720 people watched the film at the cinema.

$\frac{5}{8}$ of these people were children.

Kasim thinks more children watched the film on Friday than on Saturday.

(c) Is Kasim correct? You must show how you get your answer.

(3)

- Q37.** Rafael and Roger played tennis against each other 30 times.
Each of the times they played, either Rafael won or Roger won.
The ratio of the number of times Rafael won to the number of times Roger won is 7 : 3
- (a) Work out the number of times Rafael won.

..... (2)

- In a school, there are 75 girls in the tennis squad.
The ratio of the number of boys in the tennis squad to the number of girls in the tennis squad is 4 : 3
- (b) Work out the number of boys in the tennis squad.

..... (2)

- Q38.** Here is a list of ingredients to make 12 chocolate cupcakes.
James wants to make exactly 30 cupcakes.
- (a) How much butter does James need?

Chocolate cupcakes
Ingredients for 12 cupcakes
110 g butter
100 g sugar
75 g flour
25 g cocoa
2 eggs

..... g (2)

- Sophie made some chocolate cupcakes for a party.
She used 375 g of sugar.
- (b) How many cupcakes did Sophie make?

..... (2)

Q39. Work out the difference between the largest share and the smallest share when 3450 yen is divided in the ratios 2 : 6 : 7

..... yen (3)

Q40. Louis makes a model of a plane.

The wingspan of the model is 50 centimetres.

The wingspan of the real plane is 80 metres.

(a) Work out the scale of the model. Give your answer in the form 1: n

1: (2)

The length of the real plane is 72 metres.

(b) Work out the length of the model.
Give your answer in centimetres.

..... centimetres (2)

- Q41.** In a box,
number of red buttons : number of blue buttons = 5 : 3
number of blue buttons : number of green buttons = 1 : 2

There are 48 green buttons in the box.

Work out the number of red buttons in the box.

..... (4)

- Q42.** The perimeter of a triangle is 90 cm.
The lengths of the sides of the triangle are in the ratios 3 : 5 : 7.
Work out the length of the longest side of the triangle.

..... cm (5)

Q43. Jack, Kate and Lila share some money in the ratios 5 : 9 : 6
In total, Jack and Kate receive £56
Work out the amount of money Lila receives.

£ (3)

Q44. Lisa, Max and Punita share £240 in the ratio 3 : 4 : 8
How much more money than Lisa does Punita get?

£ (3)

Q45. A school has 840 pupils and 40 teachers.

(a) Find the ratio of the number of pupils to the number of teachers. Give your ratio in the form $n : 1$

..... : 1 (2)

In Year 11 at the school, the ratio of the number of pupils who study Chemistry to the number of pupils who study Physics is 3 : 2

(b) 105 pupils in Year 11 study Chemistry. Work out the number of pupils in Year 11 who study Physics.

..... (2)

For the 105 pupils who study Chemistry, the ratio of the number of boys to the number of girls is 4 : 3

- (c) Work out the number of girls in Year 11 who study Chemistry.

..... (2)

Q46. In a school, there are 320 girls and 500 boys.

- (a) Write down the ratio of the number of girls to the number of boys.
Give your ratio in its simplest form.

.....
(2)

In a different school, there is a total of 640 children.

In this school, the ratio of the number of girls to the number of boys is 7 : 9

- (b) How many boys are there in this school?

..... (2)