

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Ratio, proportion and rates of change

Converting between ratios, fractions and percentages

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments

Information

- The marks for questions are shown in brackets

Advice

- In all calculations, show clearly how you work out your answer

For questions 1 to 12 you must **NOT** use a calculator.



Q1.

$$\frac{1}{2} : \frac{2}{3} = x : 1$$

Circle the value of x .

$$\frac{1}{3}$$

$$\frac{3}{5}$$

$$\frac{3}{4}$$

$$\frac{4}{3}$$

(Total 1 mark)

Q2.

Anna plays a computer game.

Each game is a win or a loss.

She wins three quarters of her first 24 games.

She then wins her next 12 games.

For all 36 games, work out the ratio wins : losses

Give your answer in its simplest form.

(Total 3 marks)

Q3.

Here is some information about a group of children.

	Boys	Girls
Left-handed	3	8
Right-handed	12	20

(a) Write down the number of left-handed girls to right-handed girls as a ratio.

Give your answer in its simplest form.

(1)

(b) What percentage of the boys are left-handed?

(2)

(Total 3 marks)

Q4.

A bag contains red counters and blue counters in the ratio 1 : 2

What fraction of the counters are red?

(Total 1 mark)

Q5.

$x : y$ is 9 : 5

Circle the value of $\frac{2x}{y}$

$$\frac{5}{18}$$

$$\frac{18}{5}$$

$$\frac{9}{10}$$

$$\frac{10}{9}$$

(Total 1 mark)

Q6.

A tennis player wins or loses matches in the ratio win : lose = 5 : 9

What fraction of the matches do they win?

(Total 1 mark)

Q7.

One day 460 people visit a zoo.

280 are adults.

The ratio of women to men is 4 : 3

180 are children.

$\frac{3}{5}$ of them are boys.

Jane says that altogether there were more females.

Show that she is correct.

(Total 5 marks)

Q8.

A bag contains red counters and blue counters in the ratio 3 : 5
What fraction of the counters are red?
Circle your answer.

$$\frac{1}{3}$$

$$\frac{3}{5}$$

$$\frac{3}{8}$$

$$\frac{5}{8}$$

(Total 1 mark)

Q9.

A toy box contains red, yellow, blue and green bricks.
25% of the bricks are red.
There are 12 yellow bricks.
The ratio yellow to blue to green is 2 : 3 : 1
Show that there are 48 bricks in the box

(Total 4 marks)

Q10.

$$a : b = 4 : 3$$

Circle the correct statement.

b is $\frac{4}{7}$ of a

b is $\frac{3}{7}$ of a

b is $\frac{4}{3}$ of a

b is $\frac{3}{4}$ of a

(Total 1 mark)

Q11.

$$d = 2f$$

$$\frac{e-f}{d-e} = \frac{1}{4}$$

Work out the ratio $e : f$

(Total 3 marks)

Question 12 is **higher** tier only.

Q12.

A road has three sections, D, E and F.
The lengths of D, E and F are in the ratios
D : E = 3 : 5 E : F = 7 : 4
What fraction of the length of the road is section D?

(Total 3 marks)

For the rest of the questions, you may use a calculator.



Q13.

Before an election,
23% said they would vote for A
9% said they would vote for B
20% said they would **not** vote.
These all voted as they said.
The rest of the population actually voted for A and B in the ratio 1 : 2
(a) Who got the most votes?
You **must** show your working.
(b) 612 people did **not** vote.
How many did vote?

(4)

(2)

(Total 6 marks)

Q14.

Some boys and girls are asked if they can whistle.

There are 30 boys.

There are three times as many girls.

40% of the girls can whistle.

Boys that can whistle : girls that can whistle = 2 : 3

Complete the two-way table.

	Boys	Girls
Can whistle		
Cannot whistle		
Total	30	

(Total 5 marks)

Q15.

The people at a party are either adults or children.

adults : children = 9 : 11

What percentage are adults?

(Total 2 marks)

Q16.

The ratio of $x : y$ is 3 : 4

What fraction of y is x ?

(Total 1 mark)

Q17.

$x : y : z = 2 : 3 : 5$

Circle the value of x as a fraction of $x + y + z$

$\frac{1}{5}$

$\frac{1}{4}$

$\frac{2}{3}$

$\frac{2}{5}$

(Total 1 mark)

Q18.

In a class, the ratio boys : girls is $x : y$

Circle the fraction of the class that are girls.

$\frac{x}{y}$

$\frac{y}{x}$

$\frac{x}{x+y}$

$\frac{y}{x+y}$

(Total 1 mark)

Q19.

Some buttons are red or blue in the ratio red : blue = 3 : 5

What fraction of the buttons are red?

Circle your answer.

$\frac{2}{5}$

$\frac{3}{5}$

$\frac{3}{8}$

$\frac{5}{8}$

(Total 1 mark)

Q20.

A sauce is made from olive oil and tomato juice in the ratio

olive oil : tomato juice = 1 : 14

What fraction of this sauce is olive oil?

(Total 1 mark)

Q21.

Abby and Judy share some money.

Abby gets 25%

- (a) Write Abby's share : Judy's share as a ratio.
Give your answer in its simplest form.

(2)

- (b) Judy gets £19.50
How much does Abby get?

(2)

(Total 4 marks)

Q22.

In a class

students wearing glasses : students not wearing glasses = 3 : 8

What fraction of students in this class wear glasses?

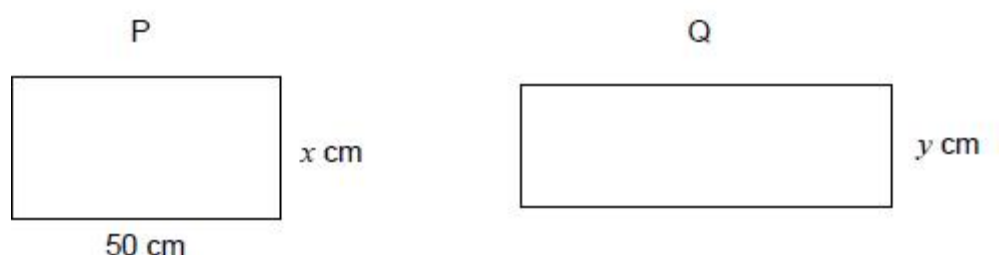
(Total 1 mark)

Q23.

P is a rectangle with length 50 cm and width x cm.

Q is a rectangle with width y cm.

Not drawn
accurately



The length of Q is 20% **more** than the length of P.

The area of Q is 10% **less** than the area of P.

Work out the ratio $x : y$

Give your answer in its simplest form.

(Total 4 marks)

Q24.

- (a) A shop sells red roses and white roses in the ratio 7 : 2
One day 392 red roses are sold.
How many white roses are sold?

(2)

- (b) A different shop sells red roses and white roses in the ratio 8 : 3
What is the probability that a rose, sold at random, is red?

(1)

(Total 3 marks)

Q25.

Joe, Kim and Lisa each have an amount of money.

Joe has £72

Joe's amount : Kim's amount = 6 : 5

Lisa's amount is $1\frac{1}{2}$ times Joe's amount.

Show that, in total, they have **less** than £250

(Total 3 marks)

Q26.

To get to college, 120 students either walk, cycle or travel by car.

$\frac{3}{8}$

of the students walk.

students who cycle : students who travel by car = 1 : 2

How many students travel by car?

(Total 3 marks)

Q27.

The people at a party are from Spain, France or Germany.

68% are from Spain

number from France = number from Germany

Work out number from Spain : number from France

Give your answer in the form $n : 1$

(Total 3 marks)

Q28.

At a concert the ratio of men to women is 5 : 3

The ratio of women to children is 7 : 4

Show that more than half of the people at the concert are men.

(Total 3 marks)

Q29.

$a : b = 9 : 4$ and $10b = 7c$

Work out $a : c$ in its simplest form.

(Total 3 marks)

Question 30 is **higher** tier only.

Q30.

Andrew is paid £250 a week.

Each week, he

shares his pay with his sister in the ratio 3 : 2

saves 12% of his share.

How many weeks will it take Andrew to save £360?

(Total 5 marks)