

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Number

Finding fractions of amounts without a calculator

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments
- You may use a calculator



Information

- The marks for questions are shown in brackets

Advice

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

Questions 1 to 24 are **foundation** tier only

Q1.

Work out $\frac{3}{8} \times 11$

Give your answer as a mixed number.

(Total 2 marks)

Q2.

Circle the calculation which works out half of 12

$12 \div 0.5$

$2 \div 12$

$12 \times \frac{1}{2}$

$12 \div 50 \times 100$

(Total 1 mark)

Q3.

(a) Work out a quarter of 44

(1)

(b) Work out a tenth of 78

(1)

(Total 2 marks)

Q4.

In a game the average score was 50

Tom's score was $\frac{5}{2}$ of the average.
Circle Tom's score.

125

175

30

20

(Total 1 mark)

Q5.

(a) Work out $\frac{3}{5}$ of 200

(2)

(b) Work out $25.8 + 12.6 \div 2$

(2)

(Total 4 marks)

Q6.

(a) Work out $\frac{1}{5}$ of 65

(2)

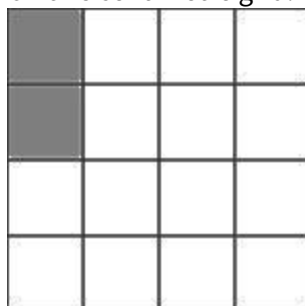
(b) Work out $3.4 \div 2 + 4.8$

(2)

(Total 4 marks)

Q7.

Kai has shaded two small squares on this centimetre grid.



He wants $\frac{3}{4}$ of the grid to be shaded.

How many **more** small squares must he shade?

(Total 2 marks)

Q8.

- (a) Cards in a pack are red or blue in the ratio
red : blue = 2 : 3

What fraction of the cards are **red**?

Circle your answer.

$$\frac{5}{6}$$

$$\frac{2}{3}$$

$$\frac{2}{5}$$

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

(1)

- (b) A different pack has 72 cards.

$$\frac{5}{9}$$

are yellow.

Work out the number of yellow cards.

(2)

(Total 3 marks)

Q9.

Lily's age is 2 years and 4 months.

Hugo's age is 1 year and 8 months.

Write Lily's age in months as a fraction of Hugo's age in months.

Give your fraction in its simplest form.

(Total 2 marks)

Q10.

Ali has £80

He gives $\frac{9}{10}$ of his money to Joe.

Joe spends $\frac{2}{3}$ of this money.

He gives the rest back to Ali.

What fraction of the £80 does Ali have now?

Give your answer in its simplest form.

(Total 4 marks)

Q11.

The only animals on a farm are 30 cows and 80 sheep.

$\frac{1}{5}$ of the 30 cows are sold and $\frac{5}{8}$ of the 80 sheep are sold.

Work out the **total** number of animals that are sold.

Q12.

Mo played 30 games of chess.

He won 18 of these games.

- (a) What fraction of the games did he win?

Give your answer in its simplest form.

(2)

- (b) He played 20 more games.

He had then won 64% of **all** of his games.

How many of the 20 games did he win?

(3)

(Total 5 marks)

Q13.

The table shows information about how 150 students travel to school.

	Walk	Bus	Car	
Girls	22	33	17	Total = 72
Boys	24	41	13	Total = 78

- (a) What fraction of the **girls** walk to school?

Give your answer in its simplest form.

(2)

- (b) One of the **boys** is chosen at random.

What is the probability that the boy travels to school by bus?

(1)

- (c) What percentage of the 150 **students** travel to school by car?

(2)

(Total 5 marks)

Q14.

On a farm, the only animals are 6 cows and 18 sheep.

- (a) What fraction of the animals are cows?

(2)

- (b) The farmer buys some pigs.

Half of the animals on the farm are now sheep.

How many pigs did he buy?

(2)

(Total 4 marks)

Q15.

- (a) Work out 60% of 35

(2)

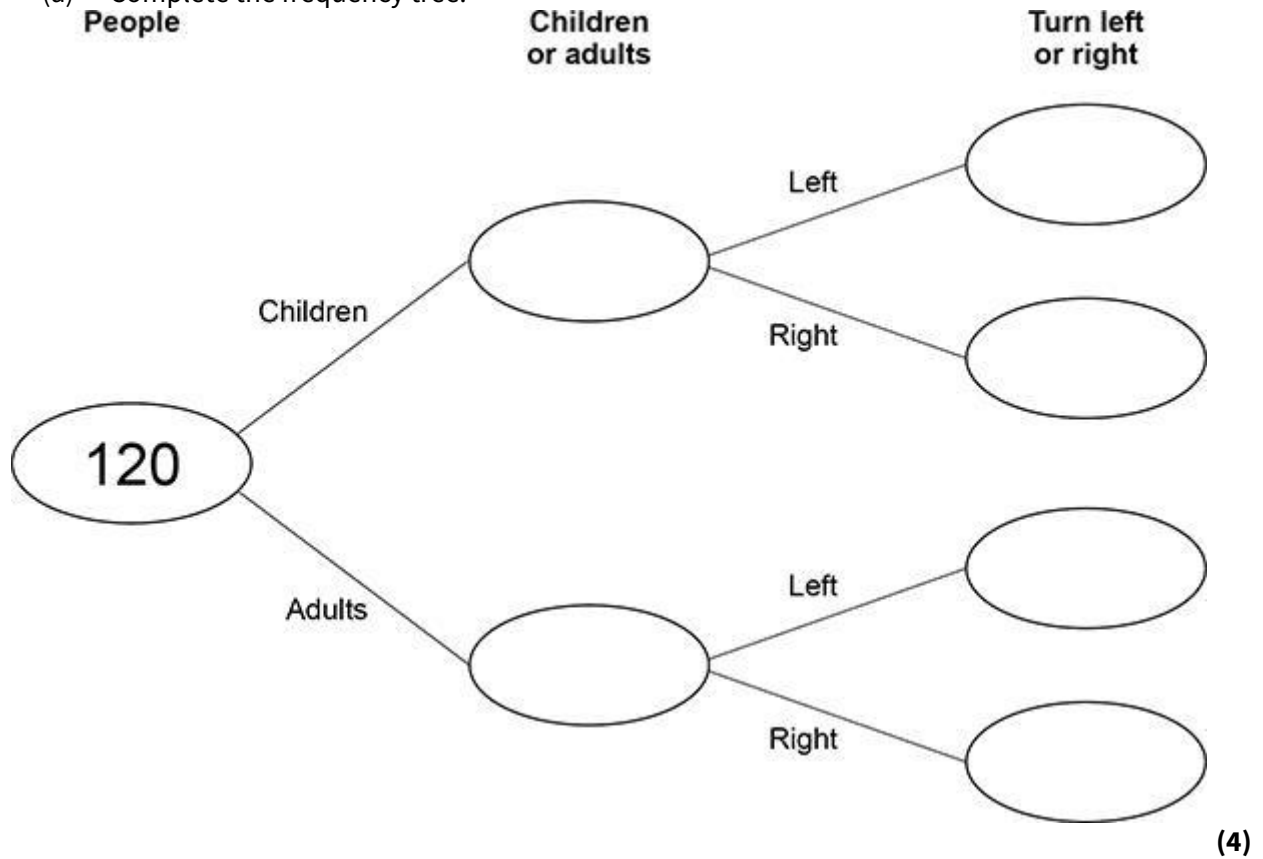
- (b) Work out $\frac{4}{5}$ of 150

(2)

(Total 4 marks)

Q16.

120 people visit a maze.
80 are children, the rest are adults.
At the start of the maze you can turn left or right.
45 children turn left.
75 people in total turn left.
(a) Complete the frequency tree.



(b) What fraction of the **children** turn left?
Give your answer in its simplest form.

(4)

(2)

(Total 6 marks)

Q17.

One-half of a number is 12.
What is one-third of the number?

(Total 3 marks)

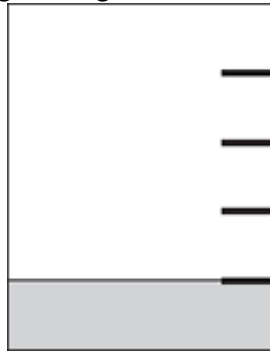
Q18.

Andy has some sweets.
He gives one-quarter of the sweets to Dan.
Dan eats five sweets and has one left.
How many sweets does Andy start with?

(Total 2 marks)

Q19.

When a jug is $\frac{1}{5}$ full of water it weighs 250 grams.



When the same jug is $\frac{4}{5}$ full of water it weighs 550 grams.



How much does the jug weigh when it is empty?

(Total 4 marks)

Q20.

Amy, Ben, Colleen and Dave share some money.

Amy has $\frac{1}{6}$ of the money.

Ben has $\frac{1}{5}$ of the money.

The difference between Amy's share and Ben's share is added to Colleen's share.

The answer is equal to half the money.

Show that Amy and Dave each have the same amount of money.

(Total 5 marks)

Q21.

Two-thirds of a number is 8.

Work out four times the number.

(Total 3 marks)

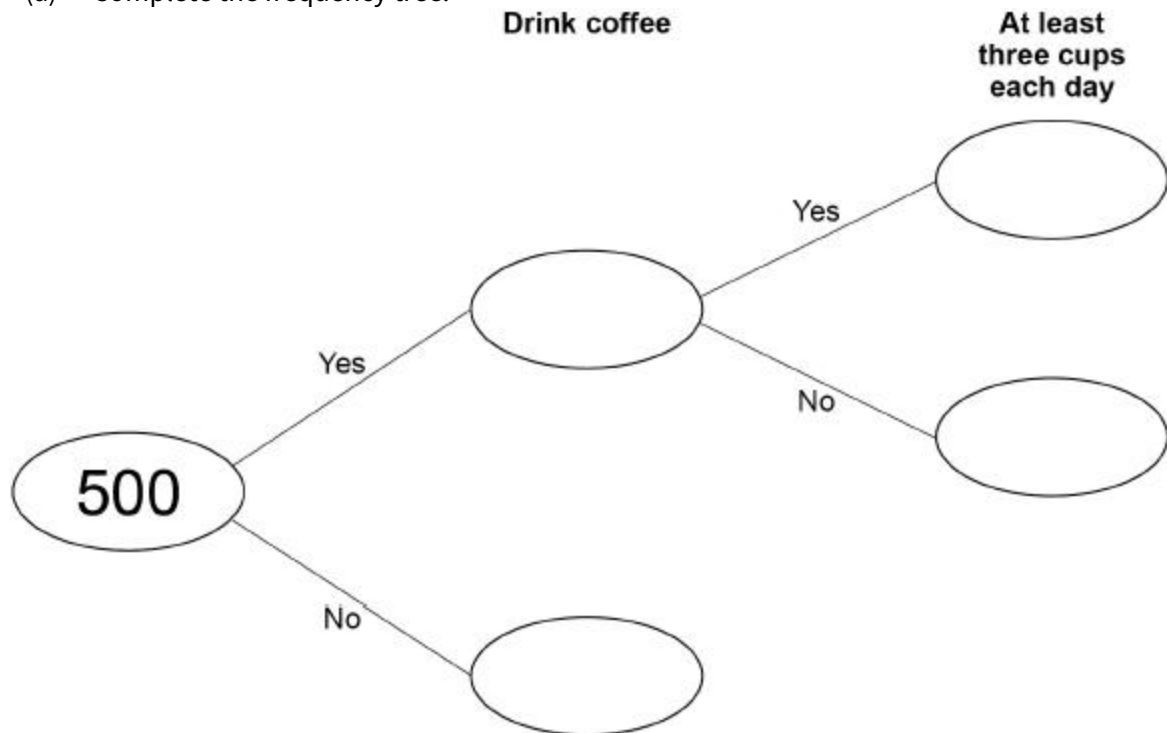
Q22.

500 people are asked if they drink coffee.

$\frac{9}{10}$ say Yes.

20% of the people who say Yes drink at least three cups each day.

(a) Complete the frequency tree.



(4)

(b) What fraction of the 500 people drink at least three cups of coffee each day?
Give your answer in its simplest form.

(2)

(Total 6 marks)

Q23.

I am thinking of a number.

Two-thirds of the number is 60.

What is $1\frac{1}{2}$ times the number?

(Total 3 marks)

Q24.

On a farm

one-fifth of the animals are goats

25% of the animals are sheep

the rest of the animals are cows.

What **fraction** of the animals on the farm are cows?

Give your answer in its simplest form.

(Total 4 marks)

Questions 25 to 31 are **higher** tier only

Q25.

$\frac{9}{10}$ of the runners who started a marathon completed it.

$\frac{1}{5}$ of those who completed it are women.

180 women completed the marathon.

How many runners started the marathon?

(Total 3 marks)

Q26.

$\frac{3}{5}$ of a number is 162

Work out the number.

(Total 2 marks)

Q27.

A , B and C are numbers.

Here is some information about B and C .

B	$\frac{7}{4}$ of A
C	A increased by 150%

Work out C as a fraction of B

(Total 4 marks)

Q28.

A piece of wood is $4\frac{1}{8}$ feet long.

Peter cuts a length of $1\frac{5}{6}$ feet off this piece of wood.

What fraction of the length of wood has Peter cut off?

Give your answer in its simplest form.

(Total 3 marks)

Q29.

A bag contains red discs, white discs and blue discs.

$\frac{1}{4}$ of the discs are red.

$\frac{1}{6}$ of the discs are white.

What is the **smallest** possible number of **blue** discs in the bag?

(Total 3 marks)

Q30.

In an office there are twice as many females as males.

$\frac{1}{4}$ of the females wear glasses.

$\frac{3}{8}$ of the males wear glasses.

84 people in the office wear glasses.

Work out the number of people in the office.

(Total 4 marks)

Q31.

In a box there are some buttons.

45 are large and the rest are small.

Some are yellow and the rest are green.

The number of small is $\frac{5}{3}$ of the number of large.

The number of green is 300% of the number of yellow.

There are 12 small yellow buttons.

How many large green buttons are there?

You may use the two-way table to help you.

	Large	Small	
Yellow		12	
Green			
	45		

(Total 4 marks)

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Questions 1 to 19 are **foundation** tier only

Q1.

Work out one quarter of 5 hours.
Give your answer in minutes.

(Total 2 marks)

Q2.

The average age of teachers at a school is 36 years.

Mr Smith's age is $\frac{11}{9}$ of the average.
How old is Mr Smith?

(Total 2 marks)

Q3.

In a class, the number of girls as a fraction of the number of boys is $\frac{5}{4}$
(a) Write down the number of boys as a fraction of the number of girls.

(1)

(b) There are 20 girls in the class.
Work out the number of boys.

(2)

(Total 3 marks)

Q4.

Nihal has savings of £168

He uses $\frac{5}{7}$ of his savings to buy sports equipment.

(a) Assume that he will use $\frac{1}{3}$ of the **rest** of the money to buy a shirt.
How much of his savings, in £, will he have left?

(3)

(b) In fact, he uses **more** than $\frac{1}{3}$ of the rest of the money to buy a shirt.
What does this tell you about how much of his savings he has left?
Tick **one** box.

☐
☐
☐
☐

It is more than the answer to part (a)

It is the same as the answer to part (a)

It is less than the answer to part (a)

It is not possible to tell

(1)

(Total 4 marks)

Q5.

A train has 1 first-class carriage and 6 standard carriages.

The first-class carriage has 64 seats.

$\frac{3}{8}$

are being used.

Each standard carriage has 78 seats.

$\frac{7}{13}$

in each carriage are being used.

Are **more than** half the seats on the train being used?

You **must** show your working.

(Total 5 marks)

Q6.

(a) Shade $\frac{2}{5}$ of this grid.

(1)

(b) Shade 10% of this grid.

(1)

(Total 2 marks)

Q7.

Which is longer, $\frac{3}{4}$ of a day or 1000 minutes?

You **must** show your working.

(Total 3 marks)

Q8.

Work out $\frac{3}{5}$ of 900

(Total 2 marks)

Q9.

(a) Work out 11% of 1400

(2)

(b) Work out $\frac{4}{5}$ of 295

(2)

(Total 4 marks)

Q10.

(a) Work out $\frac{2}{7} \times 3$

(1)

(b) Work out $\sqrt{529}$

(1)

(c) Work out 3^4

(1)

(Total 3 marks)

Q11.

Work out which distance is longer,

20% of 320 miles or $\frac{1}{2}$ of 130 miles.

You **must** show your working.

(Total 4 marks)

Q12.

A pack of pegs costs 40p

A bar of soap costs £2.20

A basket costs £7

Dan buys **two** packs of pegs, **one** bar of soap and **one** basket.

What fraction of the total cost is the cost of the basket?

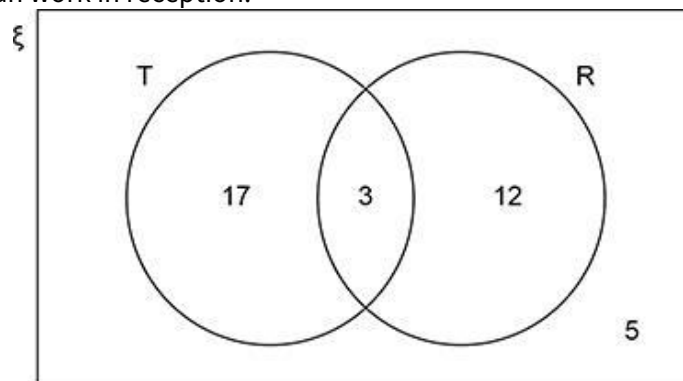
(Total 3 marks)

Q13.

The Venn diagram shows information about people who work in a gym.

T = people who can work as a trainer.

R = people who can work in reception.



(a) How many people can work as a trainer **and** in reception?

(1)

(b) How many people can work in reception but **not** as a trainer?

(1)

(c) What fraction of **all** the people can work as a trainer?

(2)

(Total 4 marks)

Q14.

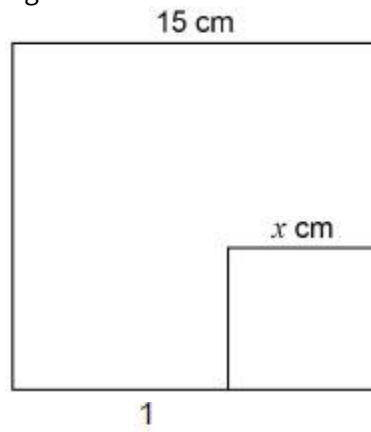
Work out $\frac{1}{4}$ of 780

(Total 1 mark)

Q15.

A small square has length x cm

A large square has length 15 cm



Not drawn
accurately

The area of the small square is $\frac{1}{9}$ of the area of the large square.
Work out the value of x .

(Total 3 marks)

Q16.

A water tank is $\frac{3}{4}$ full.

56 litres of water are taken from the tank.

The tank is now $\frac{2}{5}$ full.

Show clearly that the tank holds 160 litres when full.

(Total 4 marks)

Q17.

- (a) On Saturday a museum had 175 visitors.
28% of them were given a questionnaire.
How many visitors were given the questionnaire?

(2)

- (b) On Sunday the museum had 242 visitors.
 $\frac{2}{11}$ of them were given the questionnaire.
Were **more** people given the questionnaire on Saturday or Sunday?
You **must** show your working.

(3)

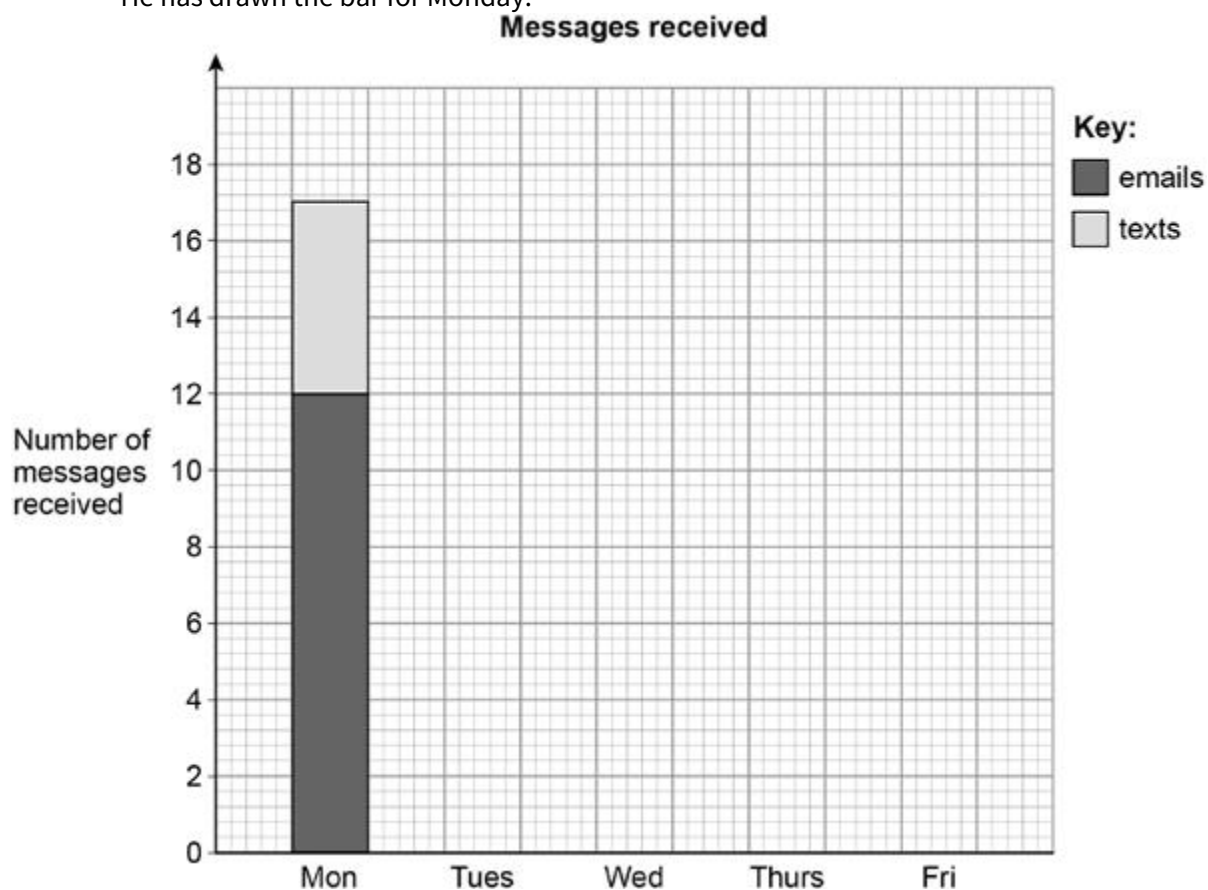
(Total 5 marks)

Q18.

The table shows the number of messages Sam received each day for five days.

	Messages	
	Number of emails	Number of texts
Monday	12	5
Tuesday	8	6
Wednesday	10	3
Thursday	6	6
Friday	12	4

- (a) Sam draws a composite bar chart to represent the data.
He has drawn the bar for Monday.



Complete the chart.

- (b) In total, what fraction of the messages were emails?
Give your answer in its simplest form.

(2)

(3)

(Total 5 marks)

Q19.

John buys a phone.

He looks at the cost of 60 applications (apps).

Cost of application	Number of applications
free (0p)	30
59p	16
99p	5
£1.29	2
£1.49	1
£1.99	6

- (a) John buys all the applications costing £1.99
How much does he pay? (2)
- (b) What fraction of the 60 applications are free?
Give your answer in its simplest form. (2)
- (c) What percentage of the 60 applications cost £1.99?
Circle the correct answer. (2)
- 6% 10% 16% 60%
- (d) John wants to know the make of phone used by people in his class.
Write down a suitable data collection method. (1)
- (Total 6 marks)**

Questions 20 to 22 are **higher** tier only

Q20.

Which is greater?

$\frac{5}{8}$ of 900

or 320 increased by 68%

You **must** show your working.

(Total 5 marks)

Q21.

In a crowd, the ratio home supporters : away supporters is $x : y$

Write down the fraction of the crowd that are home supporters.

(Total 1 mark)

Q22.

A is half of B.

Work out the ratio $A : B$

Circle your answer.

1 : 2

2 : 1

1 : 3

3 : 1

(Total 1 mark)