

Ratio

Exam questions

Foundation and Higher tiers

Please write clearly in block capitals.

Name

Class

Teacher

Time allowed: 115 minutes

Materials

For this booklet you need a black pen, a pencil, a ruler, a rubber and a calculator for Section B.

Instructions

- Use black ink or black ballpoint pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions in the spaces provided.
- **Section A** (questions 1 to 20): you must not use a calculator.
- **Section B** (questions 21 to 36): you may use a calculator.
- Do all rough work in this booklet. Cross through any work you do not want marked.

Information

- The marks for each question are shown in brackets.
- The maximum mark for this booklet is 102.

Advice

- Read each question carefully.
- In all calculations, show clearly how you work out your answer.

For teacher's use

Q	Mark	Q	Mark
1		19	
2		20	
3		21	
4		22	
5		23	
6		24	
7		25	
8		26	
9		27	
10		28	
11		29	
12		30	
13		31	
14		32	
15		33	
16		34	
17		35	
18		36	
TOTAL			

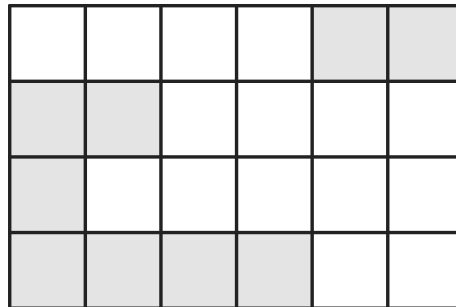
Section A



You must not use a calculator

Do not
write
outside
the box

- 1 Here is a grid of squares.



- (a) Write down the ratio of shaded squares to unshaded squares.
Give your ratio in its simplest form.

Answer _____

[2 marks]

- (b) What fraction of the grid is shaded?
Give your answer in its simplest form.

Answer _____

[1 mark]

- 2 (a) Write $30 : 45$ in its simplest form.

Answer _____

[2 marks]

- (b) One of these ratios is **not** equivalent to $3 : 4$
Circle it.

$6 : 8$ $9 : 12$ $12 : 15$ $15 : 20$

[1 mark]

- (c) Complete the equivalent ratio.

$2 : 7 = 10 : \dots\dots$

[1 mark]

- 3** In a car park, $\frac{3}{8}$ of the cars are electric.
The rest of the cars are not electric.

(a) Write down the ratio of electric cars to cars that are not electric.

Answer _____

[1 mark]

(b) There are 96 cars in the car park.
How many of the cars are electric?

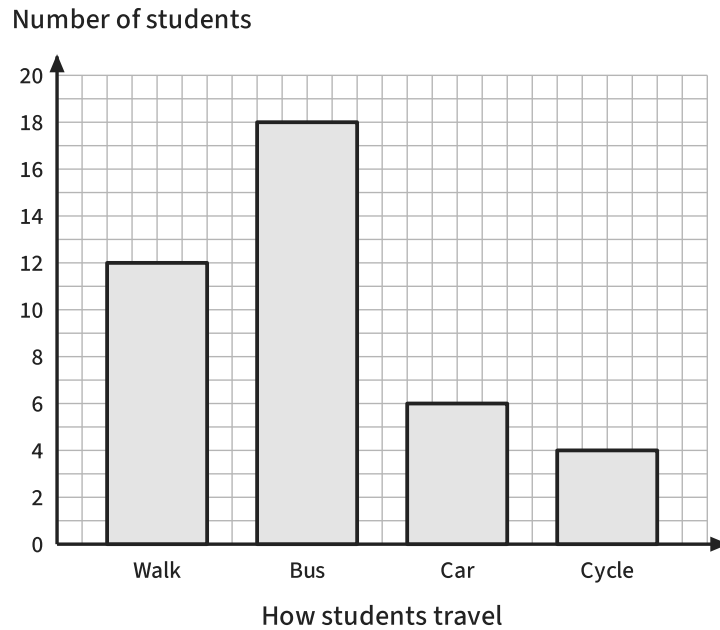
Answer _____

[2 marks]

4

The bar chart shows how the students in a class travel to school.

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write
outside
the box



- (a) Write down the ratio of students who walk to students who travel by bus.
Give your ratio in its simplest form.

Answer _____

[2 marks]

- (b) For one way of travelling, the ratio of the number of students who travel that way to the number who travel by car is 3 : 1
Which way of travelling is it?

Answer _____

[1 mark]

- 5** 1260 people were asked if a new cycle path should be built.
Everyone answered yes or no.
yes : no = 7 : 5

(a) What fraction of the people answered no?

Answer _____
[1 mark]

(b) How many people answered yes?

Answer _____
[2 marks]

- 6** **(a)** Write 40 minutes as a fraction of 1 hour 15 minutes
Give your answer in its simplest form.

Answer _____
[2 marks]

(b) A bean plant was 12 cm tall on Monday.
One week later it was 21 cm tall.

Write its height after one week as a fraction of its height on Monday.
Give your answer in its simplest form.

Answer _____
[1 mark]

- 7** A youth orchestra has only string players and brass players.
The ratio of string players to brass players is 7 : 3

(a) What fraction of these players play brass?

Circle your answer.

$$\frac{3}{7} \quad \frac{3}{10} \quad \frac{7}{10} \quad \frac{1}{3}$$

[1 mark]

(b) Lena says,

“There must be 4 more string players than brass players.”

Explain why Lena might be wrong.

[1 mark]

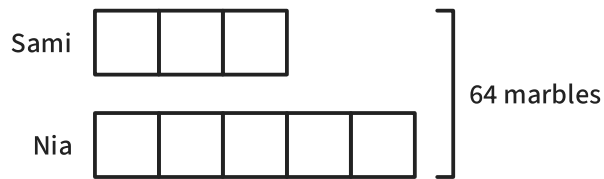
- 8** Ffion and Jack run a stall at a craft fair.
They share the profit of £126 in the ratio 2 : 5

How much more does Jack get than Ffion?

Answer £ _____

[3 marks]

- 9** Sami and Nia share 64 marbles in the ratio 3 : 5
The bar model shows this.



- (a)** How many marbles does Nia get?

Answer _____

[2 marks]

- (b)** Nia gives some of her marbles to Sami.
They now have the same number of marbles.
How many marbles does Nia give to Sami?

Answer _____

[2 marks]

- 10** One Saturday a bakery sells 168 white loaves, 252 brown loaves and 98 seeded loaves.

- (a)** Write the ratio white : brown : seeded in its simplest form.

Answer _____

[2 marks]

- (b)** What fraction of the loaves sold were seeded?
Give your answer in its simplest form.

Answer _____

[1 mark]

- 11** At a theme park, for every 8 tickets sold, 3 are child tickets.
The rest are adult tickets.
One day, 1352 tickets are sold.

How many adult tickets are sold?

Answer _____

[2 marks]

- 12** Kofi makes green paint by mixing blue paint and yellow paint in the ratio 2 : 7
He uses 1.4 litres of blue paint.

How much green paint does he make?

Answer _____ litres

[2 marks]

- 13** Megan makes plant food by mixing 40 ml of concentrate with 2.6 litres of water.

Write the ratio concentrate : water in the form 1 : n

Answer _____

[2 marks]

- 14** One day a vet sees only cats and dogs.
The number of cats is $\frac{3}{5}$ of the number of dogs.

(a) Write down the ratio cats : dogs

Answer _____

[1 mark]

(b) The vet sees 32 animals in total.
How many dogs does the vet see?

Answer _____

[2 marks]

- 15** Two smoothies are made from orange juice and mango only.

Sunrise	Tropic
orange juice : mango 3 : 5	orange juice : mango 2 : 3

Which smoothie has the greater proportion of orange juice?
You must show your working.

[2 marks]

- 16** A bird seed mix contains only wheat, barley and oats.
The masses of wheat, barley and oats are in the ratio 5 : 2 : 3
There is 750 g more wheat than barley in the mix.

Work out the total mass of the seed mix.

Answer _____ g
[3 marks]

- 17** In a car park there are only cars, vans and motorbikes.
cars : vans = 9 : 2
vans : motorbikes = 3 : 4
There are 82 vehicles in the car park.

How many cars are in the car park?

Answer _____
[3 marks]

- 18** A climbing club has junior members and senior members only.
The ratio juniors : seniors is 4 : 5
12 more juniors join the club. No one leaves.
The ratio juniors : seniors is now 6 : 5
How many members did the club have before the new juniors joined?

Answer _____
[3 marks]

- 19** Asha spends $\frac{1}{4}$ of her wages on rent.
She spends $\frac{2}{5}$ of the rest of her wages on food.
She saves all the money that is left.

Work out the ratio rent : food : savings
Give your answer in its simplest form.

Answer _____

[3 marks]

- 20** $x : y = 2 : 7$

(a) Write y in terms of x .

Answer _____

[1 mark]

(b) Work out the ratio $(3x + y) : (x + 2y)$
Give your answer in its simplest form.

Answer _____

[2 marks]

Section B



You may use a calculator

Do not
write
outside
the box

- 21** Ewan changes £240 into euros.
The exchange rate is £1 = €1.16
On holiday he spends €213.50

How many euros does Ewan have left?

Answer _____ euros

[2 marks]

- 22** Ola, Bea and Tariq share a taxi.
The fare is £52.38
They share the fare in the ratio 2 : 3 : 4

Work out how much each person pays.

Ola £ _____

Bea £ _____

Tariq £ _____

[3 marks]

- 23** Jade makes a potting mix from grit and compost.
grit : compost = 1 : 3.5 by mass
She uses 2.6 kg of grit.

How much compost does she use?

Answer _____ kg
[2 marks]

- 24** A football ground has 23 712 seats for home fans and 2964 seats for away fans.

(a) Write the ratio of home seats to away seats in its simplest form.

Answer _____
[2 marks]

(b) What fraction of all the seats are for away fans?

Answer _____
[1 mark]

25

Mia saves money.

For every £1 that Mia saves, her dad adds 40p.

Mia saves £27.65

(a) How much does her dad add?

Answer £ _____

[2 marks]**(b)** Write the ratio of the money Mia saves to the money her dad adds.
Give your ratio in its simplest form.

Answer _____

[1 mark]**26**

A cleaning spray is made by mixing bleach and water.

bleach : water = 1 : 40

Ravi makes 750 ml of the spray.

How much bleach does he use?

Give your answer to 1 decimal place.

Answer _____ ml

[2 marks]

- 27** Tomasz has a recipe for pancakes for 6 people.
He wants to make pancakes for 15 people.

Ingredient	For 6 people	For 15 people
Plain flour	135 g	
Eggs	2	
Milk	340 ml	
Butter	30 g	75 g

Complete the table.

[3 marks]

- 28** Blackcurrant cordial is mixed with water to make a drink.
cordial : water = 1 : 6
A bottle holds 0.85 litres of cordial.

How many litres of drink can be made with all the cordial in the bottle?

Answer _____ litres

[2 marks]

- 29** Here is a recipe for 8 flapjacks.

Oats	120 g
Butter	75 g
Brown sugar	60 g
Golden syrup	3 tablespoons

Dimitri wants to make 30 flapjacks.

He has 250 g of butter.

Does Dimitri have enough butter?

You must show your working.

[3 marks]

- 30** In a café, the tips are shared between the kitchen staff and the counter staff.
 kitchen staff : counter staff = 3 : 4
 One week the kitchen staff get £79.98
 How much do the counter staff get?

Answer £ _____

[3 marks]

- 31** Grandad shares £5000 between his three grandchildren in the ratio of their ages.
Their ages are 15, 12 and 8
The eldest grandchild, Maisie, says,
"I will get more than £2000"

Is she correct?

You must show your working.

[3 marks]

- 32** A small watering can holds 3.6 litres.
A large watering can holds 1.75 times as much as the small one.

(a) How much does the large watering can hold?

Answer _____ litres

[1 mark]

(b) Write the ratio small : large in its simplest form.

Answer _____

[2 marks]

33

Hana changes £400 into Japanese yen.

The exchange rate is £1 = 172.4 yen

On holiday she spends 48 960 yen.

When she gets home, she changes the yen she has left back into pounds.

The exchange rate is now £1 = 168.5 yen

How many pounds does Hana get back?

Give your answer to the nearest penny.

Answer £ _____

[3 marks]

34

Rhys and Amara wash cars one weekend.

Rhys works for 18 hours and Amara works for 27 hours.

They share the £281.25 they earn in the ratio of the hours they work.

How much does Amara get?

Answer £ _____

[3 marks]

- 35** The same pair of trainers is sold in Paris and in Manchester.

Paris	Manchester
€96	£84

The exchange rate is $\text{£}1 = \text{€}1.17$

In which city are the trainers cheaper, and by how much in pounds?
You must show your working.

Answer _____

[3 marks]

- 36** A builder makes concrete by mixing cement, sand and gravel in the ratio 2 : 5 : 8 by mass. She has 64.5 kg of cement, 158 kg of sand and 250 kg of gravel.

What is the greatest mass of concrete she can make?

Answer _____ kg

[4 marks]

END OF QUESTIONS