

FREE SAMPLE

GCSE Maths: Ratio and Proportion

Grade 4 starter questions

Questions	20
Total marks	83
Sub-topics covered	10
Papers drawn from	20
Years	2017 to 2024

Sharing, percentages, units, rates and scale.

Every question is taken from the opening section of a real Edexcel Higher paper - the part where grade 4 marks are won - and is worth five marks or fewer.

The mark schemes are in a separate booklet, so you can work through these without the answers in front of you.

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R1 Converting Between Units

Question 1

November 2017 · Paper 3 · Q2

3 marks

- 2 In London, 1 litre of petrol costs 108.9p
In New York, 1 US gallon of petrol costs \$2.83

1 US gallon = 3.785 litres

£1 = \$1.46

In which city is petrol better value for money, London or New York?

You must show your working.

(Total for Question 2 is 3 marks)

Question 2

June 2022 · Paper 2 · Q7

4 marks

- 7 In Spain, Sam pays 27 euros for 18 litres of petrol.
In Wales, Leo pays £40.80 for 8 gallons of the same type of petrol.

$$\begin{aligned} 1 \text{ euro} &= \text{£}0.85 \\ 4.5 \text{ litres} &= 1 \text{ gallon} \end{aligned}$$

Sam thinks that petrol is cheaper in Spain than in Wales.

Is Sam correct?

You must show how you get your answer.

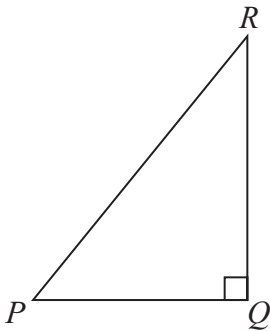
(Total for Question 7 is 4 marks)

Question 3

June 2024 · Paper 2 · Q8

3 marks

8 A playground is in the shape of a right-angled triangle.



Dan makes a scale drawing of the playground.
He uses a scale of 1 cm represents 5 m
The area of the playground on the scale drawing is 28 cm^2
The real length of QR is 40 m
Work out the real length of PQ .

..... m

(Total for Question 8 is 3 marks)

R4 Ratio Notation

Question 4

November 2019 · Paper 1 · Q2

4 marks

- 2 There are 60 people in a choir.
Half of the people in the choir are women.

The number of women in the choir is 3 times the number of men in the choir.
The rest of the people in the choir are children.

the number of children in the choir : the number of men in the choir = $n : 1$

Work out the value of n .

You must show how you get your answer.

$n = \dots\dots\dots$

(Total for Question 2 is 4 marks)

R5 Dividing Quantities in a Given Ratio

Question 5

June 2017 · Paper 3 · Q4

5 marks

- 4 Daniel bakes 420 cakes.
He bakes only vanilla cakes, banana cakes, lemon cakes and chocolate cakes.
- $\frac{2}{7}$ of the cakes are vanilla cakes.
35% of the cakes are banana cakes.
The ratio of the number of lemon cakes to the number of chocolate cakes is 4:5
- Work out the number of lemon cakes Daniel bakes.

.....

(Total for Question 4 is 5 marks)

Question 6

November 2020 · Paper 2 · Q3

5 marks

3 Carlo puts tins into small boxes and into large boxes.

He puts 6 tins into each small box.

He puts 20 tins into each large box.

Carlo puts a total of 3000 tins into the boxes so that

number of tins in small boxes : number of tins in large boxes = 2 : 3

Carlo says that less than 30% of the boxes filled with tins are large boxes.

Is Carlo correct?

You must show all your working.

(Total for Question 3 is 5 marks)

Question 7

June 2022 · Paper 1 · Q3

5 marks

- 3 A delivery company has a total of 160 cars and vans.

the number of cars : the number of vans = 3 : 7

Each car and each van uses electricity or diesel or petrol.

$\frac{1}{8}$ of the cars use electricity.

25% of the cars use diesel.

The rest of the cars use petrol.

Work out the number of cars that use petrol.

You must show all your working.

.....
(Total for Question 3 is 5 marks)

R7 Proportion as Equality of Ratios

Question 8

November 2022 · Paper 1 · Q5

2 marks

5 A car factory is going to make four different car models **A**, **B**, **C** and **D**.

80 people are asked which of the four models they would be most likely to buy.

The table shows information about the results.

Car model	Number of people
A	23
B	15
C	30
D	12

The factory is going to make 40 000 cars next year.

Work out how many model **B** cars the factory should make next year.

.....
(Total for Question 5 is 2 marks)

Question 9

November 2020 · Paper 3 · Q4

5 marks

- 4 Maisie knows that she needs 3 kg of grass seed to make a rectangular lawn 5 m by 9 m.

Grass seed is sold in 2 kg boxes.

Maisie wants to make a rectangular lawn 10 m by 14 m.

She has 5 boxes of grass seed.

- (a) Has Maisie got enough grass seed to make a lawn 10 m by 14 m?

You must show all your working.

(4)

Maisie opens the 5 boxes of grass seed.

She finds that 4 of the boxes contain 2 kg of grass seed.

The other box contains 1 kg of grass seed.

- (b) Does this affect whether Maisie has enough grass seed to make her lawn?

Give a reason for your answer.

(1)

(Total for Question 4 is 5 marks)

R9 Percentages and Percentage Change

Question 10

June 2018 · Paper 2 · Q4

5 marks

- 4 Raya buys a van for £8500 plus VAT at 20%

Raya pays a deposit for the van.

She then pays the rest of the cost in 12 equal payments of £531.25 each month.

Find the ratio of the deposit Raya pays to the total of the 12 equal payments.

Give your answer in its simplest form.

(Total for Question 4 is 5 marks)

Question 11

November 2018 · Paper 1 · Q3

5 marks

- 3 A bonus of £2100 is shared by 10 people who work for a company.
40% of the bonus is shared equally between 3 managers.
The rest of the bonus is shared equally between 7 salesmen.

One of the salesmen says,

“If the bonus is shared equally between all 10 people I will get 25% more money.”

Is the salesman correct?

You must show how you get your answer.

(Total for Question 3 is 5 marks)

Question 12

November 2024 · Paper 3 · Q5

5 marks

5 Robyn buys a total of 240 pens and pencils, where

$$\text{number of pens} : \text{number of pencils} = 3 : 5$$

Robyn pays 9p for each pen.

She sells each pen for 11p.

Robyn pays 6p for each pencil.

She sells each pencil for 10p.

Robyn sells all of the pens and pencils.

Work out Robyn's percentage profit.

Give your answer correct to 1 decimal place.

You must show all your working.

..... %

(Total for Question 5 is 5 marks)

R10 Direct and Inverse Proportion

Question 13

June 2023 · Paper 3 · Q4

2 marks

- 4 It takes 14 hours for 5 identical pumps to fill a water tank.

How many hours would it take 4 of these pumps to fill another water tank of the same size?

..... hours

(Total for Question 4 is 2 marks)

Question 14

November 2018 · Paper 3 · Q5

4 marks

5 Lara is a skier.

She completed a ski race in 1 minute 54 seconds.

The race was 475 m in length.

Lara assumes that her average speed is the same for each race.

- (a) Using this assumption, work out how long Lara should take to complete a 700 m race.
Give your answer in minutes and seconds.

..... minutes seconds
(3)

Lara's average speed actually increases the further she goes.

- (b) How does this affect your answer to part (a)?

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

(Total for Question 5 is 4 marks)

Question 15

November 2019 · Paper 3 · Q6

4 marks

- 6 Nimer was driving to a hotel.
He looked at his Sat Nav at 13 30

Time	13 30
Distance to destination	65 miles

Nimer arrived at the hotel at 14 48

Work out the average speed of the car from 13 30 to 14 48

You must show all your working.

..... mph

(Total for Question 6 is 4 marks)

Question 16

November 2021 · Paper 3 · Q4

4 marks

- 4 A water tank is empty.
Anil needs to fill the tank with 2400 litres of water.

Company **A** supplies water at a rate of 8 litres in 1 minute 40 seconds.

Company **B** supplies water at a rate of 2.2 gallons per minute.

1 gallon = 4.54 litres

Company **A** would take more time to fill the tank than Company **B** would take to fill the tank.

How much more time?

Give your answer in minutes correct to the nearest minute.

..... minutes

(Total for Question 4 is 4 marks)

Question 17

June 2017 · Paper 2 · Q4

5 marks

- 4 Olly drove 56 km from Liverpool to Manchester.
He then drove 61 km from Manchester to Sheffield.

Olly's average speed from Liverpool to Manchester was 70 km/h.
Olly took 75 minutes to drive from Manchester to Sheffield.

- (a) Work out Olly's average speed for his total drive from Liverpool to Sheffield.

..... km/h
(4)

Janie drove from Barnsley to York.

Janie's average speed from Barnsley to Leeds was 80 km/h.
Her average speed from Leeds to York was 60 km/h.

Janie says that the average speed from Barnsley to York can be found by working out the mean of 80 km/h and 60 km/h.

- (b) If Janie is correct, what does this tell you about the two parts of Janie's journey?

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

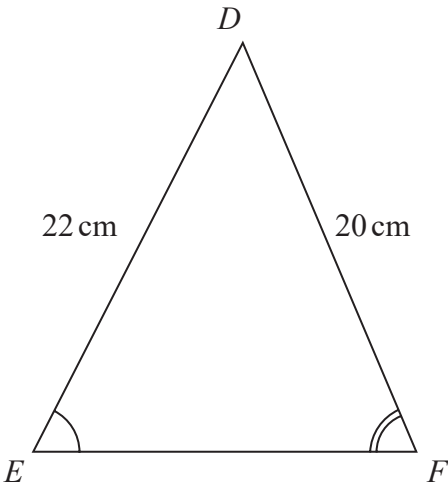
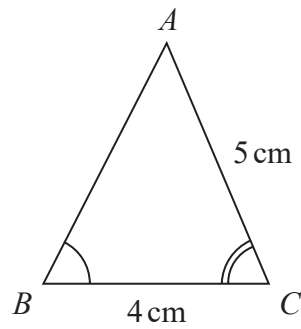
(Total for Question 4 is 5 marks)

Question 18

November 2022 · Paper 3 · Q5

4 marks

5 Triangle ABC and triangle DEF are similar.



(a) Work out the length of EF .

..... cm
(2)

(b) Work out the length of AB .

..... cm
(2)

(Total for Question 5 is 4 marks)

Question 19

June 2023 · Paper 2 · Q8

4 marks

- 8 Tamsin buys a house with a value of £150 000
The value of Tamsin's house increases by 4% each year.
- Rachel buys a house with a value of £160 000
The value of Rachel's house increases by 1.5% each year.
- At the end of 2 years, whose house has the greater value?
You must show how you get your answer.

(Total for Question 8 is 4 marks)

Question 20

November 2018 · Paper 2 · Q4

5 marks

- 4 Northern Bank has two types of account.
Both accounts pay compound interest.

Cash savings account

Interest
2.5% per annum

Shares account

Interest
3.5% per annum

Ali invests £2000 in the cash savings account.

Ben invests £1600 in the shares account.

- (a) Work out who will get the most interest by the end of 3 years.
You must show all your working.

(4)

In the 3rd year the rate of interest for the shares account is changed to 4% per annum.

- (b) Does this affect who will get the most interest by the end of 3 years?
Give a reason for your answer.

(1)

(Total for Question 4 is 5 marks)