



"Full Coverage": Ratio

This worksheet is designed to cover one question of each type seen in past papers, for each GCSE Higher Tier topic. This worksheet was automatically generated by the DrFrostMaths Homework Platform: students can practice this set of questions interactively by going to www.drfrostmaths.com/homework, logging on, *Practise* → *Past Papers/Worksheets* (or *Library* → *Past/Past Papers* for teachers), and using the 'Revision' tab.

Question 1

Categorisation: Simplify a ratio.

[Edexcel GCSE(9-1) Mock Set 2 Spring 2017 1F Q13]

In a year group there are 100 boys and 120 girls.

Write as a ratio the number of boys to the number of girls.
Give your answer in its simplest form.

..... :

Question 2

Categorisation: Determine the fraction that a number within a ratio represents.

[Edexcel GCSE Nov2007-3I Q13a]

Lillian, Max and Nazia share a sum of money in the ratio 2 : 3 : 5

What fraction of the money does Max receive?

.....

Question 3

Categorisation: Convert a ratio into an equation to indicate the relative size of two variables.

[Edexcel GCSE 9-1 FAQ document]

Purple paint is made from using red paint and blue paint in the ratio 1: 2 .

Write an equation for y in terms of x to show the relationship between the amount of red paint (y) and the amount of blue paint (x).

.....

Question 4

Categorisation: Convert a ratio into the form 1: n or n : 1 (where n will often not be an integer)

[Edexcel IGCSE May2013(R)-4H Q1]

There are 20 students in a class. 12 of the students are girls.

Find the ratio of the number of girls to the number of boys.

Give your ratio in the form $n : 1$.

..... :

Question 5

Categorisation: As above, but with standard form.

[Edexcel IGCSE Jan2013-3H Q9c]

The diameter of the Moon is 3.5×10^3 km.

The diameter of the Sun is 1.4×10^6 km.

Calculate the ratio of the diameter of the Moon to the diameter of the Sun.

Give your answer in the form $1 : n$.

..... :

Question 6

Categorisation: Convert an equation involving two variables into a ratio, e.g. $x = 4y$ gives $x : y = 4 : 1$ (and NOT $1 : 4$)

[Edexcel GCSE(9-1) Mock Set 3 Autumn 2017 1H Q17a]

$$x^2 - 9y^2 = 0 \text{ where } x > 0 \text{ and } y > 0$$

Work out the ratio $x : y$

..... :

Question 7

Categorisation: Use a ratio to determine probabilities.

[Edexcel GCSE(9-1) Mock Set 3 Autumn 2017 3F Q22a, 3H Q4a]

There are only red counters, blue counters and green counters in a bag.

number of red counters : number of blue counters : number of green counters = $1 : 3 : 7$

A counter is going to be taken at random from the bag.

Complete the table below to show each of the probabilities that the counter will be red or blue or green.

Colour	red	blue	green
Probability			

Question 8

Categorisation: Determine a fraction of the total amount after a further subdivision.

[Edexcel GCSE June2013-2F Q25, June2013-2H Q7]

Colin, Dave and Emma share some money. Colin gets $\frac{3}{10}$ of the money. Emma and Dave share the rest of the money in the ratio $3 : 2$.

What is Dave's share of the money?

.....

Question 9

Categorisation: As above, but whether the percentage of the total amount is required.

[Edexcel GCSE(9-1) Mock Set 2 Spring 2017 2F Q23, 2H Q2]

On a school trip the ratio of the number of teachers to the number of students is 1: 15

The ratio of the number of male students to the number of female students is 7: 5

Work out what percentage of all the people on the trip are female students.

Give your answer correct to the nearest whole number.

..... %

Question 10

Categorisation: As with Question, but where two ratios are given.

[Edexcel GCSE(9-1) Mock Set 3 Autumn 2017 2F Q24b, 2H Q6b]

Only blue vans and white vans are made in a factory.

The ratio of the number of blue vans to the number of white vans is 4 : 3

For blue vans,

the number of small vans : the number of large vans = 3 : 5

Work out the fraction of the number of vans made in the factory that are blue and large.

.....

Question 11

Categorisation: Combine multiple pieces of information to determine the ratio between more than 2 variables.

[Edexcel GCSE(9-1) Mock Set 3 Autumn 2017 2H Q11]

Anna and Bill share some money in the ratio 2 : 5

Anna gets £ A Bill gets £ B

Carl and Donna share twice as much money as Anna and Bill share.

They share the money in the ratio 3 : 1

Carl gets £ C Donna gets £ D

Find $A : B : C : D$

Give your answer in its simplest form.

..... : : :

Question 12

Categorisation: Use a worded relationship to determine a ratio.

[Edexcel New SAMS Paper 2H Q8]

In a box of pens, there are

three times as many red pens as green pens

and two times as many green pens as blue pens.

For the pens in the box, write down

the ratio of the number of red pens to the number of green pens to the number of blue pens.

..... : :

Question 13

Categorisation: Determine the ratio of a relationship that can be derived from another (e.g. cost).

[Edexcel GCSE March2012-3H Q10]

Jim has only 5p coins and 10p coins.

The ratio of the number of 5p coins to the number of 10p coins is 2 : 3

Work out the ratio of

the total value of the 5p coins : the total value of the 10p coins.

Give your answer in its simplest form.

..... :

Question 14

Categorisation: Determine the amount that needs to be added to one value to yield a new ratio.

[Edexcel GCSE Nov2016-1F Q19c, Nov2016-1H Q3b]

There are some red counters and some yellow counters in a bag in the ratio 1 : 5

There are 20 yellow counters in the bag.

Janet puts some more red counters into the bag.

The ratio of the number of red counters to the number of yellow counters is now 1 : 2

How many red counters does Janet put into the bag?

..... red counters

Question 15

Categorisation: As above, but where one of the original values is required.

The ratio of Chris and Dom's ages is 3: 4

In 7 years time this ratio will be 4: 5

How old is Dom?

..... years old

Question 16

Categorisation: Combine two or more ratios to form one.

[Edexcel GCSE(9-1) Mock Set 1 Autumn 2016 - 2H Q8]

Given that $a: b = 8: 5$ and $b: c = 3: 4$,
find the ratio $a: b: c$

Give your answer in its simplest form.

..... : :

Question 17

Categorisation: Understand ratio in the context of surds.

[Edexcel GCSE(9-1) Mock Set 2 Spring 2017 3H Q14]

$a = \sqrt{7} + \sqrt{c}$ and $b = \sqrt{63} + \sqrt{d}$ where c and d are positive integers.

Given that $c: d = 1: 9$

find, in its simplest form, the ratio $a: b$

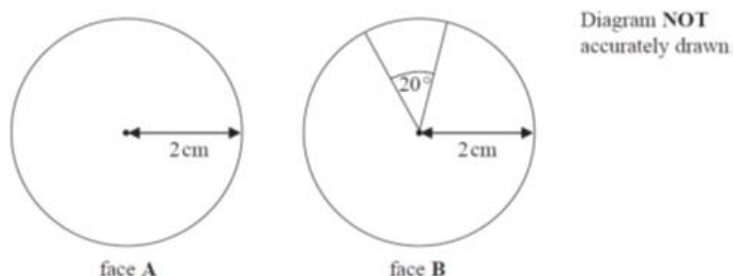
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Question 18

Categorisation: Use ratio in the context of sector area.

[Edexcel GCSE Nov2015-2H Q20]

Here are two watch faces, **A** and **B**.



Both watch faces are circular with radius 2 cm.

The materials used to make both watch faces have the same thickness.

A is made entirely of plastic.

B has a 20° sector of metal and a 340° sector of plastic.

The ratio of the cost per cm^2 of the metal to the cost per cm^2 of the plastic is 3 : 2

Work out the ratio of the cost of the materials for **A** to the cost of the materials for **B**.

Give your answer in its simplest form.

You must show all your working.

..... :

Question 19

Categorisation: Use a ratio to split a quantity into smaller amounts.

[Edexcel IGCSE Jan2013-4H Q11]

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.

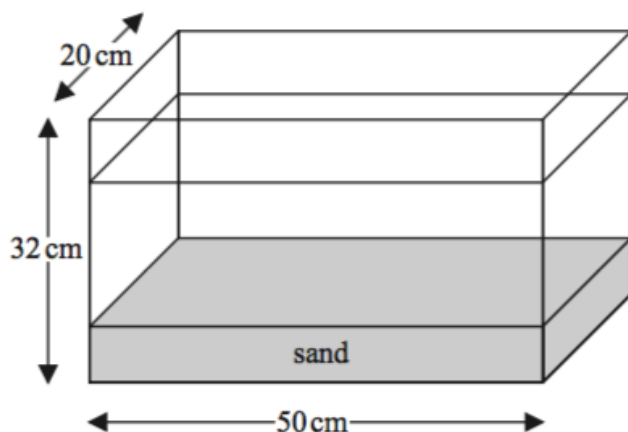
£

Question 20

Categorisation: Use ratio in the context of volume.

[Edexcel GCSE(9-1) Mock Set 3 Autumn 2017 1F Q21, 1H Q2 Edited]

The diagram shows a fish tank in the shape of a cuboid.



The dimensions of the tank are 50 cm by 32 cm by 20 cm.

The tank is $\frac{3}{4}$ full of water and sand.

The ratio of the volume of water to the volume of sand is 5 : 1

Work out the number of litres of water in the tank.

..... litres

Question 21

Categorisation: Determine one value involved in a ratio when the other value is given.

[Edexcel IGCSE May2013-4H Q2]

Green paint can be made by mixing yellow paint and blue paint in the ratio 2 : 3.

Wendy makes 15 litres of green paint.

Work out how many litres of blue paint Wendy uses.

..... litres

Question 22

Categorisation: Use ratio in the context of density.

[Edexcel GCSE(9-1) Mock Set 2 Spring 2017 3H Q9]

The densities of three metal alloys, A , B and C , are in the ratio

13: 15: 21

1 m^3 of alloy B has a mass of 8600 kg.

Work out the difference between the mass of 5 m^3 of alloy A and 3 m^3 of alloy C .

Give your answer correct to 3 significant figures.

..... kg

Question 23

Categorisation: Determine value in a ratio when the difference between two amounts is given.

[Edexcel IGCSE May2015-2F Q19, May2015-4H Q2]

Pritam, Sarah and Emily share some money in the ratios 3: 6: 4

Sarah gets \$15 more than Emily.

Work out the amount of money that Pritam gets.

\$

Question 24

Categorisation: Use worded relationships between variables to determine a particular amount.

[Edexcel GCSE June2011-1F Q27, June2011-3H Q11]

Peter, Tarish and Ben share £54.

Tarish gets three times as much money as Peter.

Ben gets twice as much money as Tarish.

How much money does Ben get?

£

Question 25

Categorisation: Use ratio in the context of changing the subject. (Hint: if $a:b = c:d$ then $\frac{a}{b} = \frac{c}{d}$ or alternatively, $\frac{a}{c} = \frac{b}{d}$)

The ratio $(y + x):(y - x)$ is equivalent to $k:1$.

Find an expression for y in terms of k and x .

$y =$

Answers

Question 1

5:6

Question 2

$$\frac{3}{10}$$

Question 3

$$y = \frac{1}{2}x$$

Question 4

1.5:1

Question 5

1:400

Question 6

3:1

Question 7

$$red = \frac{1}{11}, blue = \frac{3}{11}, green = \frac{7}{11}$$

Question 8

$$\frac{14}{50}$$

Question 9

39 %

Question 10

$$\frac{20}{56}$$

Question 11

4:10:21:7

Question 12

6:2:1

Question 13

1:3

Question 14

6 red counters

Question 15

28 years old

Question 16

24:15:20

Question 17

1:3

Question 18

36:37

Question 19

£ 24

Question 20

20 litres

Question 21

9 litres

Question 22

any value in the range 1146 kg to 1150 kg

Question 23

\$ 22.5

Question 24

£ 32.40

Question 25

$$y = \frac{x(k+1)}{k-1}$$