Ratio 1 (H)

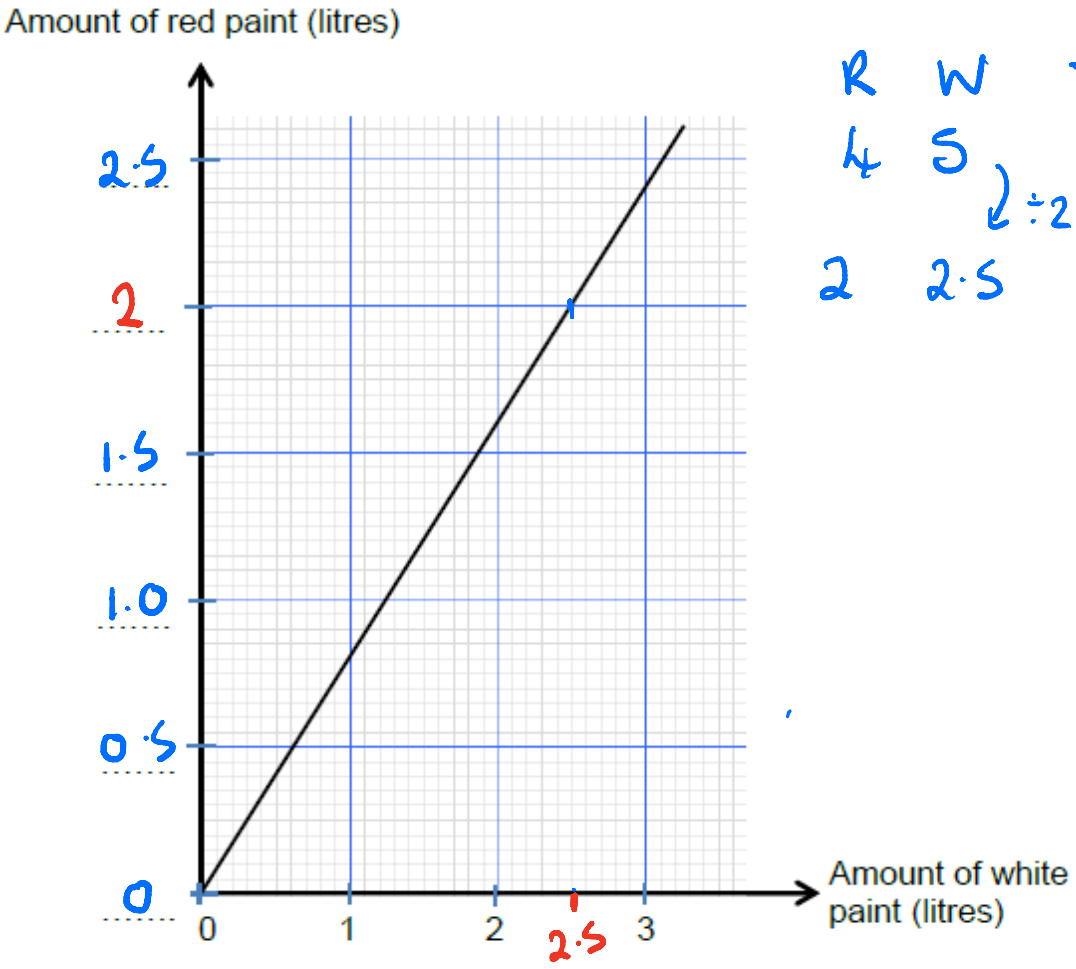
A collection of 9-1 Maths GCSE Sample and Specimen questions from AQA, OCR, Pearson-Edexcel and WJEC Eduqas.

Name:	Mel@JustMaths
Total Marks:	

1. Cherry Blossom paint is made by mixing red and white paint in a certain ratio.

   4 litres of red paint is used to make 9 litres of Cherry Blossom paint.

   The diagram below shows the relationship between the amount of red paint and the amount of white paint needed to make Cherry Blossom paint.



R W Total
4 5 9
÷2
2 2.5

   Write down the correct scale on the 'Amount of red paint (litres)' axis.

   You must put a value on each of the dotted lines on the axis.

   You must show all your working to support your answer.

[4]

2. Two brothers, Richard and Andrew, share a sum of money in the ratio 2 : 7.

Andrew gets £30 more than Richard.

Calculate how much the brothers share.

R
A
30 ÷ 5 = 6

= 2 × 6 = 12

= 7 × 6 = 42

Total = 12 + 42
= £54

[4]

3. The diagram shows a circle split into two regions: A and B.

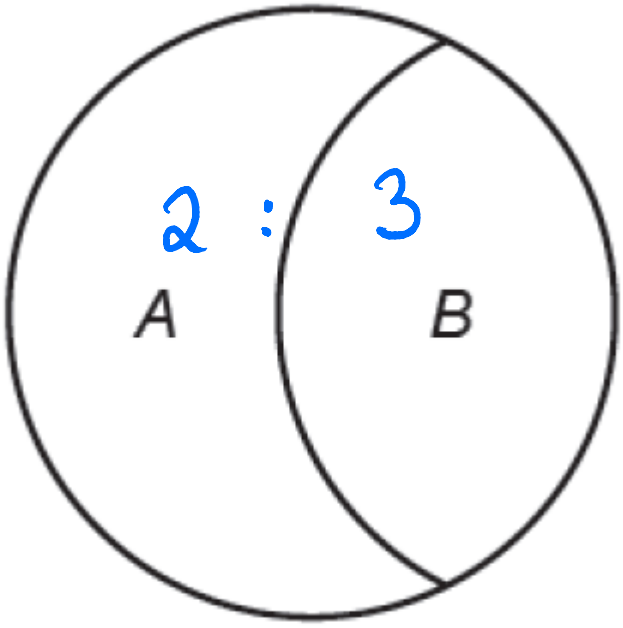


Diagram not drawn to scale

0·45
5 | 2·25

0·45
0·45
0·45
1·35

The ratio of the areas of the regions A and B is 2 : 3.

The radius of the circle is 1·5cm.

Calculate the area of region A.

A : B
2 : 3
2·25 ÷ 5
0·9 1·35

Area of circle = $\pi \times 1.5^2 = 2.25\pi$

area of A = 0.9π cm^2

[4]

4. White paint costs £2.80 per litre.

   Blue paint costs £3.50 per litre.

   White paint and blue paint are mixed in the ratio 3 : 2

   Work out the cost of 18 litres of the mixture.

W B
2.80 3.50
3 : 2
18 ÷ 5 = 3.6
10.8 litres 7.2 litres

Cost = 10.8 x 2.80 + 7.2 x 3.50
30.24 + 25.20

= £55.44

[4]

5. In a company, the ratio of the number of men to the number of women is 3:2

   40% of the men are under the age of 25

   10% of the women are under the age of 25

   What percentage of all the people in the company are under the age of 25?

m : w
3 : 2
60 : 40
40% ↙ ↘ 10%
24 4

assume there are 100 in total

$\frac{28}{100}$ = 28%

.....% [4]

6. Peter makes a large amount of pink paint by mixing red and white paint in the ratio 2 : 3.

   Red paint costs £80 per 10 litres. = £8 a litre

   White paint costs £5 per 10 litres. = 50p a litre

   Peter sells his pink paint in 10-litre tins for £60 per tin.

   Calculate how much profit he makes for each tin he sells.

R W
2 : 3
10
4 : 6 litres

Cost = 4 x 8 + 6 x 0.5 = 32 + 3 = £35

Profit = 60 - 35

£ 25 [5]

7. Frank, Mary and Seth shared some sweets in the ratio 4 : 5 : 7

Seth got 18 more sweets than Frank.

Work out the total number of sweets they shared.

F M S F

4 5 7 4

18

18 ÷ 3 = 6

5 × 6 = 30

7 × 6 = 42

4 × 6 = 24

96 sweets ..... [3]

8. 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.

R G B

2x x ½x

6x 2x x

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.

R : G : B

6 : 2 : 1

[2]

9. At a school

number of boys : number of girls = 9 : 7

There are 116 more boys than girls.

Work out the total number of students at the school.

B : G

9 : 7

116

116 ÷ 2 = 58

9 + 7 = 16

58 × 16 = 928 students.

[3]

10. John is going to make chocolate squares to sell.

There are just three ingredients, chocolate, peanut butter and crisped rice, mixed in the ratio 4 : 2 : 3 respectively.

a) How much of each ingredient will he need to make 900 g of mixture?

C P R
4 2 3
900g ÷ 9 = 100g

(a) chocolate ..... 400 ..... g

peanut butter ..... 200 ..... g

crisped rice ..... 300 ..... g

[2]

b) A bar of chocolate weighs 200 g and costs £2.50.
A jar of peanut butter contains 250 g and costs £1.70.
A packet of crisped rice contains 300 g and costs £2.00.

John makes 4.5 kg of mixture, from which he can cut 100 chocolate squares.
He charges 60p for each square and sells all 100 squares.

How much profit does he make?

100 x 60p = £60

To make 4.5kg (5 x 900g)

C = 400 x 5 = 2000g = 10 bars 10 x 2.5 = 25
P = 200 x 5 = 1000g = 4 jars 4 x 1.70 = 6.80
R = 300 x 5 = 1500g = 5 packets 5 x 2.00 = 10.00
} 41.80

Profit = 60 - 41.80

(b) £ ..... 18.20 ..... [5]

11. During a game, players can win and lose counters.

At the start of the game

Rob, Tim and Zak share the counters in the ratio 5 : 6 : 7

At the end of the game

Rob, Tim and Zak share the same number of counters in the ratio 7 : 9 : 8

Show that Rob ends the game with more counters than he started with.

start
R T Z
5 6 7 = 18
10 12 14 = 36
15 18 21 = 54
20 24 28 = 72

end
R T Z
7 9 8 = 24
14 18 16 = 48
21 27 24 = 72

Rob ends with 1 more than he started with

[3]

12. A bakery bakes small, medium and large pies.

The ratio small : medium : large is 3 : 5 : 2. = 10

a) What fraction of the pies are large?

a) $\frac{2}{10}$ ..... [1]

b) One day 460 medium pies are baked.

Work out how many small pies are baked.

S m L
3 5 2
460 ÷ 5 = 92

92 x 3 = 276

b) 276 ..... [2]

13. There are some red counters and some yellow counters in a bag. ✓

There are 30 yellow counters in the bag. ✓

The ratio of the number of red counters to the number of yellow counters is 1:6

a) Work out the number of red counters in the bag.

R Y
1 : 6
x5 (2 30) x5

5 ..... [2]

Riza 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

b) How many red counters does Riza put into the bag?

more → R Y
5 : 30
1 : 2

Red = 15 in total

15 - 5

10 ..... [2]

14. On a farm

the number of cows and the number of sheep are in the ratio 6 : 5

the number of sheep and the number of pigs are in the ratio 2 : 1

The total number of cows, sheep and pigs on the farm is 189

How many sheep are there on the farm?

C S S P
6 : 5 2 1
12 : 10 10 : 5

C S P
12 10 5

189 ÷ 27 = 7

7 x 10
= 70 sheep

[3]

15. The ratio of the number of boys to the number of girls in a school is 4:5

There are 95 girls in the school.

Work out the total number of students in the school.

B : G
4 : 5
95 ÷ 5 = 19
19 × 4 = 76

76 + 95

171

..... [3]

16. The ratio of $x : y$ is 2 : 3

Circle the correct statement.

$\frac{x}{y} = \frac{2}{3}$ ∴ $x = \frac{2}{3}y$ OR $y = \frac{3}{2}x$

x is $\frac{2}{3}$ of y ✓

y is $\frac{2}{3}$ of x ✗

x is $\frac{2}{5}$ of y ✗

y is $\frac{3}{5}$ of x ✗

[1]

17. The ratio of the number of boys to girls at a party is 3 : 4

Six boys leave the party.

The ratio of the number of boys to girls at the party is now 5 : 8

Work out the number of girls at the party.

B : G
3 : 4

B : G
8 : 5 (+6 = 11) 8 : 11
16 : 10 (+6 = 16) 16 : 16
24 : 15 (+6 = 21) 21 : 24
32 : 20 (+6 = 26) 26 : 32
40 : 25 (+6 = 31) 31 : 40
48 : 30 (+6 = 36) 36 : 48

B : G
3 : 4
36 : 48
-6
30 : 48
5 : 8

48 GIRLS

[3]

18. There are between 25 and 35 students in a class.

The ratio of boys to girls is 4 : 7

How many students are in the class?

B G
4 7 11
8 14 22 ✗
12 21 33 ✓
16 28 44 ✗

33 students

[2]

19. Here are two piles of the same type of paper.

Each sheet of paper is $\frac{7}{1000}$ cm thick.

The taller pile is $10\frac{1}{2}$ cm high.

3 : 2

height of taller pile : height of shorter pile = 3 : 2

Work out the number of sheets of paper in the shorter pile.

$7 \div \frac{7}{1000} = \cancel{7} \times \frac{1000}{\cancel{7}} =$ 1000 sheets

[3]

20. 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.

m	:	w	w		c
5	:	3	7	:	4
35		21	21		12

×7 ×1 ×3 ×3

[3]

m	w	c
35	21	12

half the people

men = $\frac{35}{68}$ $\frac{35}{68} > \frac{34}{68}$

CREDITS AND NOTES

Q	Awarding Body	Q	Awarding Body	Q	Awarding Body
1	WJEC Eduqas	11	AQA	21	
2	WJEC Eduqas	12	OCR	22	
3	WJEC Eduqas	13	Pearson Edexcel	23	
4	AQA	14	Pearson Edexcel	24	
5	Pearson Edexcel	15	Pearson Edexcel	25	
6	OCR	16	AQA	26	
7	Pearson Edexcel	17	AQA	27	
8	Pearson Edexcel	18	AQA	28	
9	AQA	19	AQA		
10	OCR	20	AQA		

Notes:

These questions have been retyped from the original sample/specimen assessment materials and whilst every effort has been made to ensure there are no errors, any that do appear are mine and not the exam board s (similarly any errors I have corrected from the originals are also my corrections and not theirs!).

Please also note that the layout in terms of fonts, answer lines and space given to each question does not reflect the actual papers to save space.

These questions have been collated by me as the basis for a GCSE working party set up by the GLOW maths hub - if you want to get involved please get in touch. The objective is to provide support to fellow teachers and to give you a flavour of how different topics "could" be examined. They should not be used to form a decision as to which board to use. There is no guarantee that a topic will or won't appear in the "live" papers from a specific exam board or that examination of a topic will be as shown in these questions.

Links:

AQA http://www.aqa.org.uk/subjects/mathematics/gcse/mathematics-8300

OCR http://ocr.org.uk/gcsemaths

Pearson Edexcel http://qualifications.pearson.com/en/qualifications/edexcel-gcses/mathematics-2015.html

WJEC Eduqas http://www.eduqas.co.uk/qualifications/mathematics/gcse/

Contents:

This version contains questions from:

AQA – Sample Assessment Material, Practice set 1 and Practice set 2

OCR – Sample Assessment Material and Practice set 1

Pearson Edexcel – Sample Assessment Material, Specimen set 1 and Specimen set 2

WJEC Eduqas – Sample Assessment Material