



Working with Ratio

← REVISE THIS TOPIC

- 1 Two friends share £30 in the ratio 5 : 1



Work out the value of the larger share.

	Total
5 : 1	6
25 : 5	30

$$5 + 1 = 6$$

$$30 \div 6 = 5$$

$$5 \times 5 = 25$$

£ 25

(Total for Question 1 is 2 marks)

- 2 A bag contains 40 counters that are either red or blue.



number of red counters : number of blue counters = 2 : 3

Work out the number of blue counters in the bag.

R : B	Total
2 : 3	5
16 : 24	40

$$2 + 3 = 5$$

$$40 \div 5 = 8$$

$$3 \times 8 = 24$$

24

(Total for Question 2 is 2 marks)

- 3 There are 200 students in Year 11.



number of students who study history : number of students who do **not** study history = 3 : 7

Work out the number of students who do **not** study history.

H : H'	Total
3 : 7	10
60 : 140	200

$$3 + 7 = 10$$

$$200 \div 10 = 20$$

$$7 \times 20 = 140$$

140

(Total for Question 3 is 2 marks)





- 4 Adam and Bella share £63 in the ratio 2 : 5
Work out how much money Bella receives.



	A : B	Total
$\times 9 \downarrow$	2 : 5	7
	18 : 45	63
$\uparrow \times 9$		

$$2 + 5 = 7$$

$$63 \div 7 = 9$$

$$2 \times 9 = 18$$

$$5 \times 9 = 45$$

£ **45**

(Total for Question 4 is 2 marks)

- 5 A bag contains 32 counters that are either green or blue.



green counters : blue counters = 5 : 3

Work out the number of blue counters in the bag.

	G : B	Total
$\times 4 \downarrow$	5 : 3	8
	20 : 12	32
$\uparrow \times 4$		

$$5 + 3 = 8$$

$$32 \div 8 = 4$$

$$5 \times 4 = 20$$

$$3 \times 4 = 12$$

..... **12**

(Total for Question 5 is 2 marks)

- 6 Alice and Ben share £42 in the ratio 2 : 1
Work out how much money Alice receives.



	A : B	Total
$\times 14 \downarrow$	2 : 1	3
	28 : 14	42
$\uparrow \times 14$		

$$2 + 1 = 3$$

$$42 \div 3 = 14$$

$$2 \times 14 = 28$$

$$1 \times 14 = 14$$

£ **28**

(Total for Question 6 is 2 marks)



7 A bag contains 40 red counters and some blue counters.



red counters : blue counters = 5 : 3

Work out the number of blue counters.

$$\begin{array}{rcl}
 R : B & & \\
 \times 8 \downarrow 5 : 3 & & \downarrow \times 8 \\
 40 : 24 & &
 \end{array}$$

$$\begin{aligned}
 40 \div 5 &= 8 \\
 8 \times 3 &= 24
 \end{aligned}$$

24

(Total for Question 7 is 2 marks)

8 Charlie and Daisy share some money in the ratio 2 : 5



Charlie receives £28

Work out how much Daisy receives.

$$\begin{array}{rcl}
 C : D & & \\
 \times 14 \downarrow 2 : 5 & & \downarrow \times 14 \\
 28 : 70 & &
 \end{array}$$

$$\begin{aligned}
 28 \div 2 &= 14 \\
 14 \times 5 &= 70
 \end{aligned}$$

70

£

(Total for Question 8 is 2 marks)

9 A piece of rope is cut into two pieces.

Length of shorter piece : length of longer piece = 4 : 5

The longer piece is 90 cm long.

Work out the length of the shorter piece.

$$\begin{array}{rcl}
 S : L & & \\
 \times 18 \downarrow 4 : 5 & & \downarrow \times 18 \\
 72 : 90 & &
 \end{array}$$

$$\begin{aligned}
 90 \div 5 &= 18 \\
 18 \times 4 &= 72
 \end{aligned}$$

72

..... cm

(Total for Question 9 is 2 marks)



10 Ethan, Freya and Grace share £65 in the ratio 2 : 3 : 5

Work out how much money each of them receives.

$$\begin{aligned}
 2 + 3 + 5 &= 10 \\
 65 \div 10 &= 6.5 \\
 2 \times 6.5 &= 13 \\
 3 \times 6.5 &= 19.50 \\
 5 \times 6.5 &= 32.50
 \end{aligned}$$

E : F : G	Total
2 : 3 : 5	10
13 : 19.50 : 32.50	65

Ethan £ 13
 Freya £ 19.50
 Grace £ 32.50

(Total for Question 10 is 3 marks)

11 Isla takes part in a triathlon where she must swim, ride a bike and then run.
The ratio of the time she spends swimming, riding and running is:

swimming : riding : running = 5 : 14 : 8

Isla spent 20 minutes running.
Work out how long she spent swimming and riding.

$$\begin{aligned}
 20 \div 8 &= 2.5 \\
 5 \times 2.5 &= 12.5 \\
 14 \times 2.5 &= 35
 \end{aligned}$$

S : Ri : Ru
5 : 14 : 8
12.5 : 35 : 20

12.5 minutes swimming
35 minutes riding

(Total for Question 11 is 3 marks)



12 Kai buys one tea, one coffee and one cake from a shop.

price of a tea : price of a coffee : price of a cake = 3 : 5 : 8

Kai pays a total of £6.72

Work out the price of a tea from the shop.

	T : Co : Ca	Total
$\times 42$	3 : 5 : 8	16
	126 : 210 : 336	672

$$\begin{aligned}
 3 + 5 + 8 &= 16 \\
 672 \div 16 &= 42 \\
 3 \times 42 &= 126p \\
 &(\pounds 1.26)
 \end{aligned}$$

£ 1.26

(Total for Question 12 is 3 marks)

13 A country kept track of the gold, silver and bronze medals they win at a sporting competition.

gold medals : silver medals : bronze medals = 1 : 4 : 7

The country won 24 silver medals.

Work out how many medals the country won in total.

	G : S : B	Total
$\times 6$	1 : 4 : 7	12
	6 : 24 : 42	72

$$\begin{aligned}
 24 \div 4 &= 6 \\
 1 + 4 + 7 &= 12 \\
 12 \times 6 &= 72
 \end{aligned}$$

72

(Total for Question 13 is 3 marks)





14 Leo and Millie share some money in the ratio 2 : 9

Millie receives £35 more than Leo.

Work out how much money Leo receives.

	L : M	D:ft
$\times 5 \leftarrow$	2 : 9	7
	10 : 45	35
$\rightarrow \times 5$		

$$9 - 2 = 7$$

$$35 \div 7 = 5$$

$$2 \times 5 = 10$$

10

£

(Total for Question 14 is 2 marks)

15 A bag contains black and white counters in the ratio 7 : 2

There are 85 more black counters than white counters.

Work out how many counters are in the bag in total.

	B : W	D:ft
$\times 17 \leftarrow$	7 : 2	5
	119 : 34	85
	119 + 34 = 153	
$\rightarrow \times 17$		

$$7 - 2 = 5$$

$$85 \div 5 = 17$$

$$7 + 2 = 9$$

$$9 \times 17 = 153$$

153

(Total for Question 15 is 2 marks)

16 Hannah uploads the same video to YouTube, TikTok and Instagram.

YouTube views : TikTok views : Instagram views = 7 : 9 : 3

The video receives 14 400 more views on TikTok than YouTube.

Work out how many views the video received on Instagram.

	Y : T : I	D:ft
$\times 7200 \leftarrow$	7 : 9 : 3	2
	50400 : 64800 : 21600	14400
$\rightarrow \times 7200$		

$$9 - 7 = 2$$

$$14400 \div 2 = 7200$$

$$3 \times 7200 = 21600$$

21600

(Total for Question 16 is 2 marks)



17 Flour, butter and sugar are used to make biscuits in the ratio shown below.

$$\text{flour} : \text{butter} : \text{sugar} = 3 : 2 : 1$$

Gordan uses 480 g of flour to make biscuits.

Work out how much butter and sugar he should use.

	<u>F : B : S</u>	
	3 : 2 : 1	
x160 ↗	480 : 320 : 160	↘ x160

$$480 \div 3 = 160$$

$$160 \times 2 = 320$$

$$160 \times 1 = 160$$

butter..... **320** g

sugar..... **160** g

(Total for Question 17 is 3 marks)

18 Ruby and Paige both throw the shot put.

$$\text{Ruby's distance thrown} : \text{Paige's distance thrown} = 5 : 9$$

Paige threw the shotput 3.6 m further than Ruby.

Work out how far Paige threw the shot put.

	<u>R : P</u> <u>Diff</u>	
	5 : 9 4	
x0.9 ↗	4.5 : 8.1 3.6	↘ x0.9

$$9 - 5 = 4$$

$$3.6 \div 4 = 0.9$$

$$9 \times 0.9 = 8.1$$

8.1

..... m

(Total for Question 18 is 2 marks)



19 Sebastian did three maths exam papers.

Paper 1 mark : Paper 2 mark : Paper 3 mark = 7 : 6 : 9

Sebastian's Paper 1 mark was greater than 50 but less than 60.

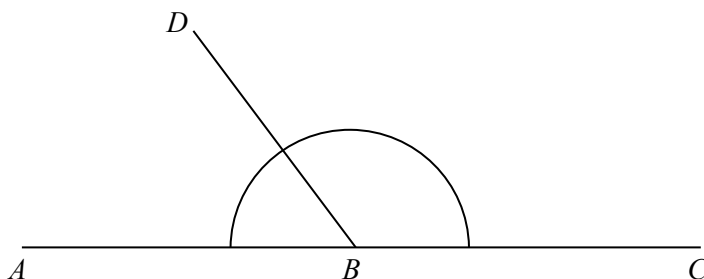
Work out how many marks he scored in total for all three papers.

$$\begin{array}{rcl}
 P1 & : & P2 & : & P3 \\
 7 & : & 6 & : & 9 \\
 \times 8 \downarrow & & & & \downarrow \times 8 \\
 56 & : & 48 & : & 72 \\
 56 + 48 + 72 & = & 176
 \end{array}$$

176

(Total for Question 19 is 3 marks)

20



ABC is a straight line.

angle ABD : angle DBC = 19 : 26

Work out the size of angle ABD .

ABD	DBC	Total
19	26	45
$\times 4 \downarrow$ 76	$\downarrow \times 4$ 104	180

$$19 + 26 = 45$$

$$180 \div 45 = 4$$

$$19 \times 4 = 76$$

76

(Total for Question 20 is 3 marks)



21 The angles of a triangle are in the ratio 2 : 3 : 7

Show that the triangle has exactly two acute angles.

	Total
2 : 3 : 7	12
30 : 45 : 105	180

$\times 15 \downarrow$

$\downarrow \times 15$

30° and 45° are
 acute as they are
 less than 90°
 105° is obtuse

$$\begin{aligned}
 2 + 3 + 7 &= 12 \\
 180 \div 12 &= 15 \\
 15 \times 2 &= 30^\circ \\
 15 \times 3 &= 45^\circ \\
 15 \times 7 &= 105^\circ
 \end{aligned}$$

(Total for Question 21 is 4 marks)

22 Sky Blue paint is made by mixing blue and white paint as shown below.

Sky Blue Paint
 blue : white = 5 : 3

Laura wants to make Sky Blue paint.

She mixes 720 ml of blue paint with 400 ml of white paint.

Work out how much more white paint she should add to make Sky Blue paint.

$$\begin{aligned}
 &B : W \\
 &5 : 3 \\
 &\times 144 \downarrow \quad \downarrow \times 144 \\
 &720 : 432 \\
 &432 - 400 = 32
 \end{aligned}$$

$$\begin{aligned}
 720 \div 5 &= 144 \\
 3 \times 144 &= 432 \\
 432 - 400 &= 32
 \end{aligned}$$

32

..... ml

(Total for Question 22 is 3 marks)



23 A drink is made using juice and water in the ratio shown below.

$$\text{juice} : \text{water} = 2 : 11$$

Umar has 500 ml of juice and 3000 ml of water.

Work out the maximum amount of drink Umar can make.

$$\begin{aligned}
 &\text{Juice } 500 \div 2 = 250 \leftarrow \text{lower} \\
 &\text{Water } 3000 \div 11 = 272.72... \\
 &2 \times 250 = 500 \text{ ml juice} \\
 &11 \times 250 = 2750 \text{ ml water} \\
 &500 + 2750 = 3250
 \end{aligned}$$

3250

..... ml

(Total for Question 23 is 3 marks)

24 A paint mixture is made by mixing yellow and white paint in the ratio shown.

$$\text{yellow} : \text{white} = 10 : 3$$

Zaria has 1.8 litres of yellow paint and 600 ml of white paint.

1800 ml

Work out the greatest amount of paint mixture that Zaria can make.

Give your answer in millilitres.

$$\begin{aligned}
 &\text{Yellow } 1800 \div 10 = 180 \leftarrow \text{lower} \\
 &\text{White } 600 \div 3 = 200 \\
 &10 \times 180 = 1800 \text{ ml yellow} \\
 &3 \times 180 = 540 \text{ ml white} \\
 &1800 + 540 = 2340
 \end{aligned}$$

2340

..... ml

(Total for Question 24 is 3 marks)



25 A cake recipe uses butter, sugar and flour in the ratio shown below.

butter : sugar : flour = 2 : 3 : 5

Nadia has

400 g of butter

500 g of sugar

750 g of flour

Nadia makes the largest cake possible using the recipe.

Work out how much of each ingredient Nadia will use.

Butter $400 \div 2 = 200$
 Sugar $500 \div 3 = 166.6 \dots$
 Flour $750 \div 5 = 150 \leftarrow \text{lower}$
 $2 \times 150 = 300 \text{ g}$
 $3 \times 150 = 450 \text{ g}$
 $5 \times 150 = 750 \text{ g}$

butter..... 300 g
 sugar..... 450 g
 flour..... 750 g

(Total for Question 25 is 4 marks)



26 A shop sells red balloons and blue balloons.

Red balloons are sold in packs of 10
 Blue balloons are sold in packs of 12

Tom buys twice as many packs of red balloons as he does blue balloons.

In total Tom buys 128 balloons.

Work out how many packs of red balloons Tom buys.

$$\begin{array}{lcl}
 & R : B & \\
 \text{packs} & 2 : 1 & \\
 \text{balloons} & 20 : 12 &
 \end{array}$$

R : B	Total
20 : 12	32
<u>80 : 48</u>	128

$$80 \div 10 = 8 \text{ packs}$$

8

(Total for Question 26 is 4 marks)



27 A shop sells AA and AAA batteries.

AA batteries are sold in packs of 8

AAA batteries are sold in packs of 6.

One day the shop sells a total of 960 batteries.

AA battery packs sold : AAA battery packs sold = 5 : 4

Work out the number of AA battery packs that were sold.

$$\begin{array}{rcl}
 & \text{AA : AAA} & \\
 \text{packs} & 5 : 4 & \\
 \downarrow \times 8 & & \downarrow \times 6 \\
 \text{batteries} & 40 : 24 &
 \end{array}$$

AA : AAA	Total
40 : 24	64
600 : 360	960

$\times 15 \downarrow$ $\downarrow \times 15$

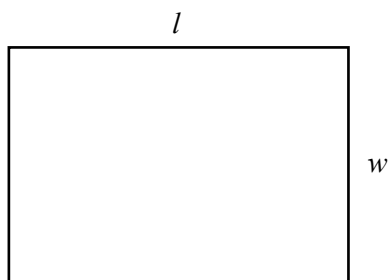
$$600 \div 8 = 75 \text{ packs}$$

75

(Total for Question 27 is 4 marks)



28 Here is a rectangle with a perimeter of 24 cm.



$$l : w = 3 : 2$$

Work out the area of the rectangle.

$$\begin{aligned}
 l + w + l + w &= 24 \\
 2w + 2l &= 24 \\
 w + l &= 12
 \end{aligned}$$

$l : w$		Total
3	2	5
7.2	4.8	12

$\times 2.4$ (next to 3 and 7.2)
 $\times 2.4$ (next to 2 and 4.8)

$$7.2 \times 4.8 = 34.56$$

$$34.56 \text{ cm}^2$$

(Total for Question 28 is 5 marks)



29 Richard has some 50 pence coins and some 20 pence coins.

number of 50 pence coins : number of 20 pence coins = 2 : 3

The total value of all the coins that Richard has is £56

Work out how many of each coin Richard has.

$$\begin{array}{rcl}
 & 50p & : \quad 20p \\
 \text{coins} & 2 & : \quad 3 \\
 \text{value} & 100 & : \quad 60
 \end{array}$$

50p	20p	Total
100	60	160
3500	2100	5600

$$3500 \div 50 = 70$$

$$2100 \div 20 = 105$$

50p coins

20p coins

..... 70 50 pence coins
 105 20 pence coins

(Total for Question 29 is 5 marks)

