

Ratio Toolkit

Question Paper

Course	Edexcel IGCSE Maths
Section	1. Numbers & the Number System
Topic	Ratio Toolkit
Difficulty	Very Hard

Time allowed: 50
Score: /40
Percentage: /100

Question 1a

A factory makes 450 pies every day.
The pies are chicken pies or steak pies.

Each day Milo takes a sample of 15 pies to check.

The proportion of the pies in his sample that are chicken is the same as the proportion of the pies made that day that are chicken.

On Monday Milo calculated that he needed exactly 4 chicken pies in his sample.

Work out the total number of chicken pies that were made on Monday.

[2 marks]

Question 1b

On Tuesday, the number of steak pies Milo needs in his sample is 6 correct to the nearest whole number.

Milo takes at random a pie from the 450 pies made on Tuesday.

Work out the lower bound of the probability that the pie is a steak pie.

[2 marks]

Question 2

Each day a company posts some small letters and some large letters.

The company posts all the letters by first class post.

The tables show information about the cost of sending a small letter by first class post and the cost of sending a large letter by first class post.

Small Letter

Weight	First Class Post
0–100 g	60p

Large Letter

Weight	First Class Post
0–100 g	£1.00
101–250 g	£1.50
251–500 g	£1.70
501–750 g	£2.50

One day the company wants to post 200 letters.

The ratio of the number of small letters to the number of large letters is 3:2

70% of the large letters weigh 0–100 g.

The rest of the large letters weigh 101–250 g.

Work out the total cost of posting the 200 letters by first class post.

[5 marks]

Question 3

The surface gravity of a planet can be worked out using the formula

$$g = \frac{6.67 \times 10^{-11} m}{r^2}$$

where

m kilograms is the mass of the planet

r metres is the radius of the planet

For the Earth and Jupiter here are the values of m and r .

Earth
$m = 5.98 \times 10^{24}$
$r = 6.378 \times 10^6$

Jupiter
$m = 1.90 \times 10^{27}$
$r = 7.149 \times 10^7$

Work out the ratio of the surface gravity of Earth to the surface gravity of Jupiter.

Write your answer in the form $1 : n$

[3 marks]

Question 4

Danil, Gabriel and Hadley share some money in the ratios 3 : 5 : 9

The difference between the amount of money that Gabriel receives and the amount of money that Hadley receives is 196 euros.

Work out the amount of money that Danil receives.

..... euros

[3 marks]

Question 5

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

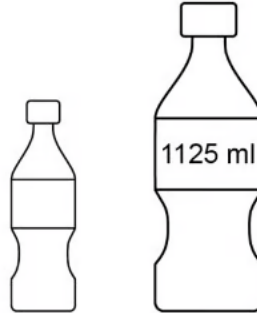
Show that $y = \frac{x(k+1)}{k-1}$

[3 marks]

Question 6

Juice is sold in small bottles and large bottles.

The volume of the large bottle is 1125 ml.



volume of small bottle : volume of large bottle = 2 : 5

A café has small glasses and large glasses.

volume of small glass : volume of large glass = 4 : 7

A small bottle fills 6 small glasses with no juice left over.

How many large glasses can be filled by a large bottle?

You **must** show your working.

[4 marks]

Question 7

At a party there are 90 people.

48 are women and 42 are men.

Some women leave.

Some men arrive.

The ratio of women to men is now 10 : 11

Are there now more than 90 people at the party?

Tick **one** box.

Yes No Cannot tell

Show working to support your answer.

[2 marks]

Question 8

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.

[3 marks]

Question 9

Here are two sets of numbers, A and B.

Set A		Set B		
200	160	270	400	483
104	100	300	x	

mean of Set A : mean of Set B = 3 : 8

Work out the value of x .

[4 marks]

Question 10

Hanif makes green paint by mixing blue paint and yellow paint in the ratio

$$\text{blue : yellow} = 7 : 3$$

He buys blue paint in 50-litre containers, each costing £225

He buys yellow paint in 20-litre containers, each costing £80

He wants to

sell the green paint in 5-litre tins

make 40% profit on each tin.

How much should he sell each tin for?

£.....

[5 marks]

Question 11

Volume of a sphere = $\frac{4}{3} \pi r^3$ where r is the radius

Volume of a cone = $\frac{1}{3} \pi r^2 h$ where r is the radius and h is the perpendicular height

A sphere has radius $2x$ cm

A cone has

radius $3x$ cm

perpendicular height h cm

The sphere and the cone have the same volume.

Work out radius of cone : perpendicular height of cone

Give your answer in the form $a : b$ where a and b are integers.

[4 marks]

