The Maths Society

THE RATIO CAN BE WRITTEN IN THE FOLLOWING FORMATS:

2 TO 3 2 : 3 2 / 3

BLUE
2 LITRES

RED
3 LITRES

RATIOS

3:4

$X : 6 = 15 : 18$

$\frac{1}{2} = \frac{X}{8}$

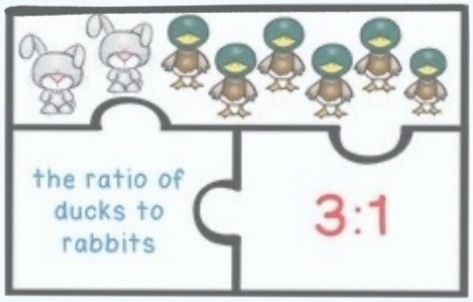
RATIOS

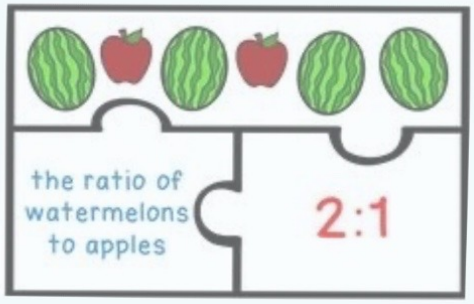
$3 : 5 = X : 15$

$\frac{X}{3} = \frac{5}{2}$

$X : 3 = 16 : 24$

$\frac{6}{3} = \frac{X}{10}$





Question 1

Ralf and Susie share $57 in the ratio 2 : 1.

(a) Calculate the amount Ralf receives. [2]

3 units = 57
1 unit = 19
2 units = $38

(b) Ralf gives $2 to Susie. [2]

Calculate the new ratio Ralf's money : Susie's money.
Give your answer in its simplest form.

36 : 21
12 : 7

Question 2

Pip and Ali share $785 in the ratio Pip : Ali = 4 : 1. [2]

Work out Pip's share.

5 units = 785
1 unit = 157
4 units = $628

Question 3

Ahmed and Babar share 240 g of sweets in the ratio 7 : 3.

Calculate the amount Ahmed receives. [2]

10 units = 240 g
1 unit = 24 g
Ahmed = 7 units
= 168 g

Question 4

Ahmed, Batuk and Chand share $1000 in the ratio 8 : 7 : 5. [3]

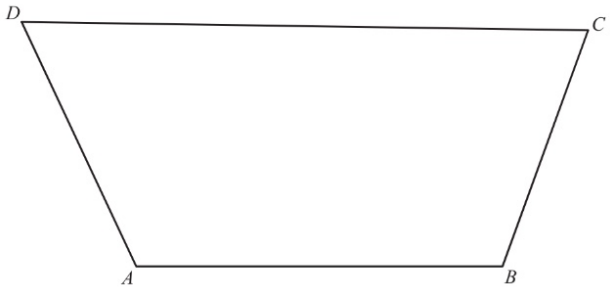
Calculate the amount each receives.

20 units = $1000
1 unit = $50

Ahmed = 400$
Batuk = 350$
Chand = 250$

Question 5

The diagram shows the plan, *ABCD*, of a park.
The scale is 1 centimetre represents 20 metres.



Scale: 1 cm to 20 m

(a) Find the actual distance *BC*. [2]

Question 6

Hans draws a plan of a field using a scale of 1 centimetre to represent 15 metres.
The actual area of the field is 10 800 m².

Calculate the area of the field on the plan. [2]

1 cm = 15 m
1 cm² = 225 m²
? = 10800 m²
= $\frac{10800}{225}$ = 48 cm²

Question 7

Pedro and Eva do their homework.
Pedro takes 84 minutes to do his homework.

The ratio Pedro's time : Eva's time = 7 : 6. [2]

Work out the number of minutes Eva takes to do her homework.

7 units = 84
1 unit = 12 min
Eva = 6 unit = 72 mins

Question 8

Jamie needs 300 g of flour to make 20 cakes.

How much flour does he need to make 12 cakes? [2]

20 cakes = 300 g
12 = ?
= $\frac{12}{20} \times \overset{15}{\cancel{300}}$
= 180 g

Question 9

Martha divides \$240 between spending and saving in the ratio

spending : saving = 7 : 8 .

[2]

Calculate the amount Martha has for spending.

15 units = 240\$

7 unit = 112\$

Question 10

The scale on a map is 1: 20 000.

(a) Calculate the actual distance between two points which are 2.7 cm apart on the map. Give your answer in kilometres.

[2]

1 cm = 20000 cm

2.7 cm = 54000 cm

= 0.54 km

(b) A field has an area of 64 400 m^2. ← $64400\,0000\ cm^2$

Calculate the area of the field on the map in cm^2.

[2]

$1\ cm = 2 \times 10^4\ cm$

$1\ cm^2 = 4 \times 10^8\ cm^2$

$? = 644 \times 10^6\ cm^2$

$= \frac{6.44 \times 10^8}{4 \times 10^8}$

$= 1.61\ cm^2$

Question 11

The scale of a map is 1 : 250 000.

(a) The actual distance between two cities is 80 km. ← 8000000 cm

Calculate this distance on the map. Give your answer in centimetres.

[2]

$1\ cm = 25 \times 10^4\ cm$

$? = 8 \times 10^6\ cm$

$= \frac{8 \times 10^6}{25 \times 10^4} = 32\ cm$

(b) On the map a large forest has an area of 6 cm^2.

Calculate the actual area of the forest. Give your answer in square kilometres.

[2]

$1\ cm^2 = 625 \times 10^8\ cm^2$

$6 = ?$

$= 3750 \times 10^8\ cm^2$

$= 37.5\ km^2$

km $\frac{}{10^3}$ m $\frac{}{10^2}$ cm

Question 1

A map is drawn to a scale of 1 : 1000 000.
A forest on the map has an area of 4.6 cm^2. [2]

Calculate the actual area of the forest in square kilometres.

$1\,cm = 10^6\,cm$

$1\,cm^2 = 10^{12}\,cm^2$

$4.6\,cm^2 = ?$

$= 4.6 \times 10^{12}\,cm^2$

$= 4.6 \times 10^2\,km^2$

$= 460\,km^2$

Question 2

The scale on a map is 1 : 50 000.
The area of a field on the map is 1.2 square centimetres. [2]

Calculate the actual area of the field in square kilometres.

$1\,cm = 50\,000\,cm$

$1\,cm^2 = 25 \times 10^8\,cm^2$

$1.2\,cm^2 = ?$

$= 30 \times 10^8\,cm^2$

$= 0.3\,km^2$

Question 3

The volume of a child's model plane is 1200 cm^3.
The volume of the full size plane is 4050 m^3. [3]

Find the scale of the model in the form 1 : n.

$1200\,cm^3 : 4050\,m^3$

$1200\,cm^3 : 4050 \times 100 \times 100 \times 100\,cm^3$

$12 : 40500000$

$1 : 3375000$

Question 4

A model of a ship is made to a scale of 1 : 200.
The surface area of the model is 7500 cm^2. [3]

Calculate the surface area of the ship, giving your answer in square metres.

$1\,cm = 200\,cm$

$1\,cm^2 = 40000\,cm^2$

$7500\,cm^2 = 4 \times 10^4 \times 75 \times 10^2$

$= 150 \times 10^6\,cm^2$

$= 15 \times 10^7\,cm^2 = 15 \times 10^3\,m^2$

100 cm - m

Question 5

The scale of a map is 1 : 500 000.

(a) The actual distance between two towns is 172 km. [2]
Calculate the distance, in centimetres, between the towns on the map.

172000000

$1\,cm = 500\,000\,cm$

$? = 172 \times 10^5\,cm$

$\frac{172 \times 10^5}{5 \times 10^5} = 34.4\,cm$

(b) The area of a lake on the map is 12 cm^2 [2]
Calculate the actual area of the lake in km^2.

$1\,cm^2 = 25 \times 10^5\,cm^2$

$12\,cm^2 = 3 \times 10^7\,cm^2$

$= 0.003\,km^2$

Question 6

A car company sells a scale model $\frac{1}{10}$ of the size of one of its cars.

Complete the following table. [3]

1 : 10

	Scale Model	Real Car
Area of windscreen (cm^2)	135	13500
Volume of storage space (cm^3)	408	408000

Question 7

A model of a car is made to a scale of 1 : 40.
The volume of the model is 45 cm^3.
Calculate the volume of the car. [3]
Give your answer in m^3.

$1cm = 40cm$

$1cm^3 = 64000cm^3$

$45cm^3 = 2880000cm^3$

$= 2.88m^3$

Question 8

A company makes two models of television.
Model *A* has a rectangular screen that measures 44 cm by 32 cm.
Model *B* has a larger screen with these measurements increased in the ratio 5:4. [2]

(a) Work out the measurements of the larger screen.

New : Original = 5 : 4

$x : 44 = 5 : 4$ (×11)

$x = 55$

$y : 32 = 5 : 4$ (×8)

$y = 40$

(b) Find the **fraction** $\frac{\text{model } A \text{ screen area}}{\text{model } B \text{ screen area}}$ in its simplest form. [1]

$\frac{1408}{2200} = \frac{16}{25}$

Question 9

The ratios of teachers : male students : female students in a school are 2 : 17 : 18. The total number of **students** is 665.
Find the number of **teachers**. [2]

35 units = 665

1 unit = 19

teachers = 2 units = 38