



Ratios





RATIO



Learning Objectives

To be able to :

- To be able to use scale factors, scale diagrams and maps
- To be able to measure line segments and angles in geometric figures, including interpreting maps and scale drawings

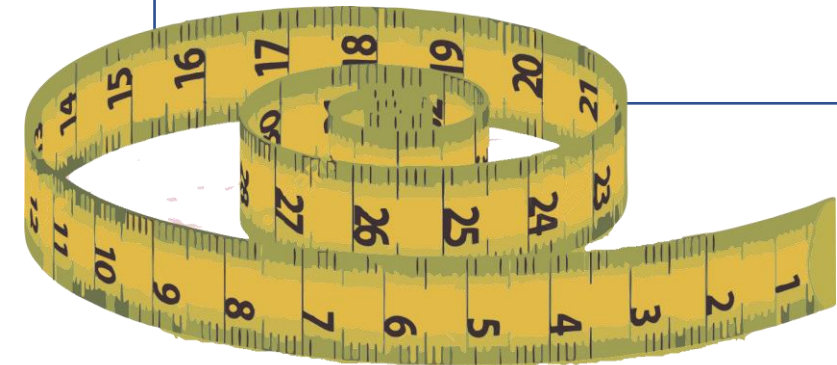
- 1) A tiled floor has blue and white tiles in the ratio 4 : 5. What fraction of the tiles are blue?
- 2) A piece of string is 180cm long. It is cut into 3 pieces in the ratio 2:3:4. Workout the longest piece.

Scale



The floor plan of a house is drawn to a scale of $1\text{cm} : 2\text{m}$.
Find the actual dimensions of the rooms if they are shown on the plan
as:
a) 2.7cm by 1.5cm

A drawing has a scale of $1 : 1000$.
One line of this was 10cm . How large is the real dimension?



Your turn...



1. A map scale is given as 2cm:1km.
Convert the following distances on the map to actual distances.
a) 4cm b) 6cm c) 22cm d) 3cm e) 0.5cm

2. Using the same scale, convert the following actual distances to distances on the map.
a) 5km b) 8km c) 14km d) 3.5km e) 0.5km



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A drawing has a scale of $1 : 40$

On the drawing, a bedroom is a rectangle measuring 10 cm by 18 cm

A kitchen has an actual area of $300\,000\text{ cm}^2$

Which has the bigger actual area, the kitchen or the bedroom?

You **must** show your working.

[4 marks]



Scale Drawing

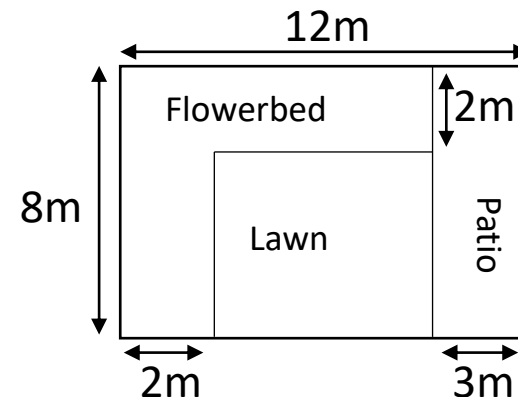


The floor plan of a house is drawn to a scale of 1cm : 2m.

Find the actual dimensions of the rooms if they are shown on the plan as:

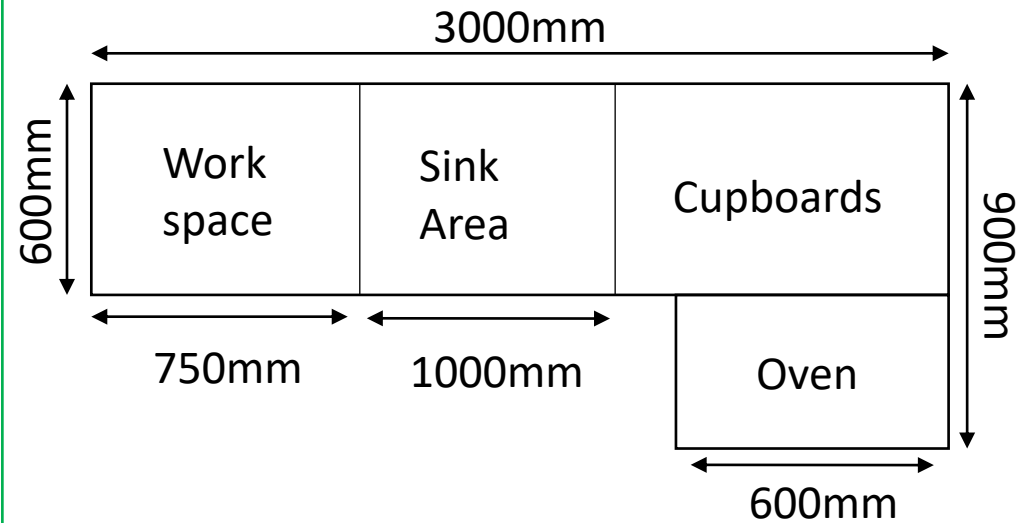
- a) 2.7cm by 1.5cm
- b) 3.2cm by 2.2cm
- c) 1.85cm by 1.4cm
- d) 0.9cm by 1.35cm

The diagram shows a rough sketch of a garden. Use the scale 1 : 400 to draw an accurate plan of the garden.



Your turn...

Using a scale of 1 : 20, draw an accurate plan of the kitchen shown below.



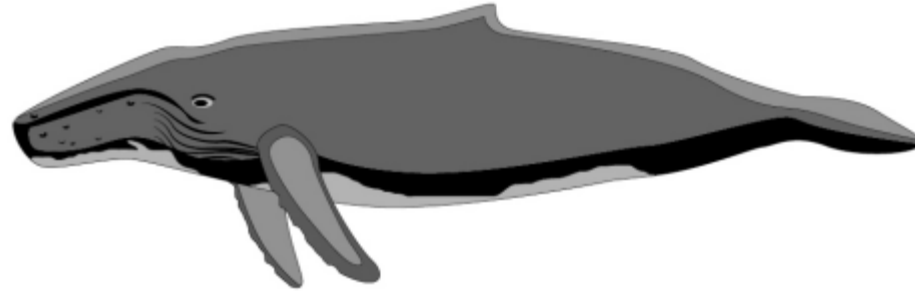


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A dolphin and a whale are drawn to scale.



Dolphin



Whale

The actual length of the dolphin is 3 metres.

Estimate the actual length of the whale.

You **must** show your working.

[2 marks]



A scale drawing shows the positions of P , Q and R .



Not drawn accurately

On the scale drawing

$$PQ = 4 \text{ cm} \quad QR = 6.5 \text{ cm}$$

The actual distance PQ is 50 metres less than the actual distance QR .

Work out the scale.

[3 marks]

RATIO



Learning Objectives

To be able to :

- To be able to use ratio notation, including reduction to simplest form
- To be able to divide a given quantity into two parts in given part : part or part : whole ratio
- To be able to write ratios in the form 1:n

1. Write down the highest common factor (HCF) of 12 and 36.
2. Write down the lowest common multiple (LCM) of 7 and 4.
3. Write down all the factors of 42.

SIMPLIFY

Isabel and Sophia share a bag of 42 sweets. Isabel has 16 sweets, and Sophia has the rest. Find the ratio of Sophia's sweets to Isabel's sweets, giving your answer in its simplest form.

Write the ratio 1 m : 40 cm in its simplest form.

Nigel makes a smoothie by mixing half a litre of blueberry juice with 100 millilitres of plain yoghurt. How much yoghurt does he use for every millilitre of juice?



Your turn...

1. Write these ratios in their simplest form

- a) 10p : £1
- b) 20 mm : 4 cm
- c) 2 weeks : 7 days
- d) 18 mins : 1 hour
- e) 30 cm : 2 m
- f) 1 m : 150 mm

2. Emma's mass is 54 kg. Her award-winning pumpkin has a mass of 6000g. Find the ratio of the pumpkin's mass to Emma's mass. Give your answer in its simplest form.

3. The icing for some cupcakes is made by mixing 1.6 kg of icing sugar with 640g of butter. Find the ratio of butter to icing sugar. Give your answer in its simplest form.

1. Write down the following ratios in the form of 1 : n.

- a) 2 : 6
- b) 30 : 120
- c) 8 : 26
- d) 30 mins : 2 hours
- e) 90 m : 7.2 km

2. Two towns 4.8km apart are shown on a map 12cm apart. Find the ratio of the map distance to the true distance in the form 1 : n.

3. A recipe uses 125ml of chocolate syrup and 2 ½ litres of milk. How much milk does it use for every millilitre of chocolate syrup.



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?

[2 marks]

Simplifying to 1:n

Simplify the ratio 4:8 in the form 1:n.

Simplify the ratio 5:3 in the form 1:n.



Simplifying 1:n: Your Turn

Write down the following ratios in the form of $n : 1$.

1) $18:6$

2) $25:5$

3) $30:3$

4) $44:11$

5) $63:7$



Exam Qs

Corbett Maths Ratio
– problem solving

The ratio $25\,000\,000\,000 : 500$ can be written in the form $n : 1$

Work out the value of n

Give your answer in standard form

RATIOS AND FRACTIONS

A box of doughnuts contains jam doughnuts and chocolate doughnuts in the ratio 3 : 5. What fraction of the doughnuts are chocolate flavoured?

Of Hannah's DVDs, $\frac{2}{7}$ are horror films and the rest are comedies. Find the ratio of comedies to horror films.



Your turn...

1. A tiled floor has blue and white tiles in the ratio 9 : 4. What fraction of the tiles are blue?

2. In a tournament the numbers of home wins and draws were in the ratio 7 : 2 : 5. What fraction of the games were home wins?

3. Amy's sock drawer has spotty, stripy and plain socks in the ratio 5 : 1 : 4. What fraction are stripy?

4. At a birthday party there are purple, red and blue balloons in the ratio 3 : 8 : 11.

- What fraction of the balloons are blue?
- What fraction of the balloons are purple?
- What fraction of the balloons aren't red?

1. In a bag of red sweets and green sweets, $\frac{1}{3}$ are red. Find the ratio of red to green sweets.

2. Al watched $\frac{3}{10}$ of the episodes in a series. Find the ratio of episodes he watched to ones he didn't.

3. $\frac{1}{8}$ of some counters are red, $\frac{5}{8}$ are blue and the rest green. Find the ratio of red to blue to green.

4. A cycling challenge has three routes – A, B and C. $\frac{7}{10}$ of the competitors choose route A, $\frac{1}{5}$ choose route B and the rest choose route C. What is the ratio of competitors choosing route A to those choosing route C.



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Some buttons are red or blue in the ratio red : blue = 3 : 5

What fraction of the buttons are red?

Circle your answer.

[1 mark]

$$\frac{2}{5}$$

$$\frac{3}{5}$$

$$\frac{3}{8}$$

$$\frac{5}{8}$$

DIVIDING IN A GIVEN RATIO

Find the smallest share when each amount below is divided in the given ratio

- a) 450g in the ratio 22 : 28
- b) 45kg in the ratio 2 : 3 : 4
- c) 1800 ml in the ratio 5 : 6 : 7



Your turn...

1. Find the largest share when each amount below is divided in the given ratio

- a) £30 in the ratio 1 : 3
- b) 36g in the ratio 3 : 2
- c) 150kg in the ratio 10 : 7 : 3
- d) 24000ml in the ratio 5 : 7 : 20

2. Share 32 sandwiches in the ratio 3 : 5

3. Kat and Lindsay share 30 cupcakes in the ratio 3 : 2. How many do they each get?

4. There are 112 dogs at a show. For every 14 dogs at the show, 9 are male. How many male and how many female dogs are at the show?

1a. The angles in a triangle are in the ratio 2 : 1 : 3. Find the sizes of three angles.

1b. The four angles in a quadrilateral are in the ratio 1 : 5 : 2 : 4. Calculate the sizes of all four angles.

2. A rope is cut into three pieces in the ratio 2 : 1 : 4. The third piece is 22cm longer than the first piece. What is the length of the second piece?

3. The length and width of a rectangle are in the ratio 5 : 1. If the perimeter of the rectangle is 72cm, calculate the length and the width of the rectangle.



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Jeff and Kaz share £270 in the ratio $\text{Jeff} : \text{Kaz} = 2.6 : 1$

How much **more** than Kaz does Jeff get?

[3 marks]

SCALE

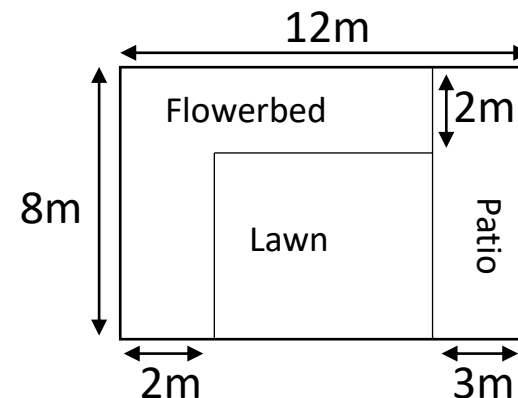


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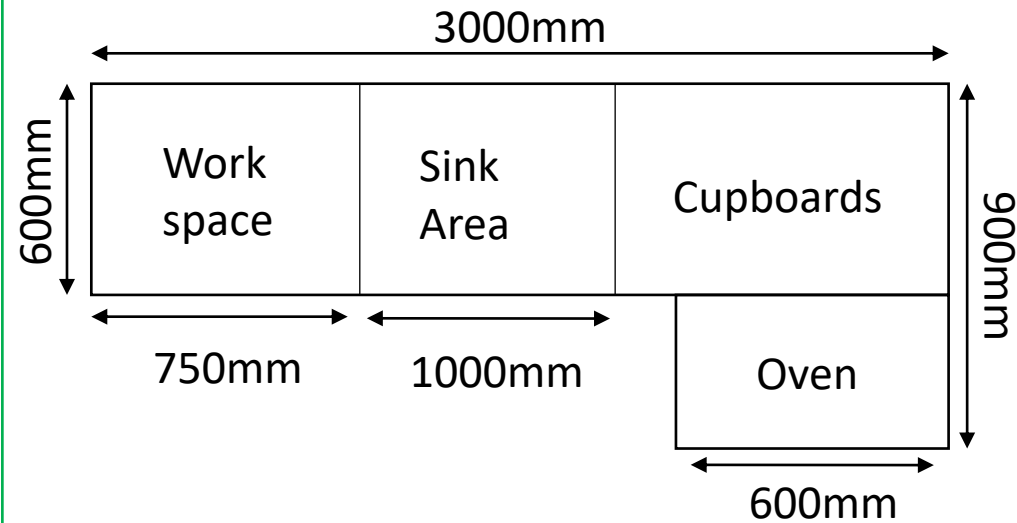
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[2 marks]

November 2018 paper 1



$$a : b = 1 : 6$$

$$a : c = 3 : 1$$

How many times bigger is b than c ?

[2 marks]