



- 1** A map has a scale of 1 : 50 000.

On the map, the distance between two churches is 6 cm.

Work out the real distance between the churches. Give your answer in kilometres.

(2 marks)

A scale of 1 : 50 000 compares lengths in the same units: 1 cm on the map represents 50 000 cm in real life. Convert to kilometres after applying the scale

$$\text{Real distance} = 6 \times 50\,000 = 300\,000 \text{ cm}$$

$$300\,000 \text{ cm} = 3000 \text{ m} = 3 \text{ km}$$

3 km

- 2** A model car is made using a scale of 1 : 18.

The real car is 4.5 m long.

Work out the length of the model car. Give your answer in centimetres.

(2 marks)

Change the real length to centimetres

$$4.5 \text{ m} = 450 \text{ cm}$$

$$\text{Model length} = 450 \div 18 = 25 \text{ cm}$$

25 cm

- 3** Priya is making a scale drawing of her school field.

She uses a scale of 1 cm to 4 m.

A path across the field is 24 m long.

Work out the length of the path on the scale drawing.

(2 marks)

Each centimetre on the drawing represents 4 m

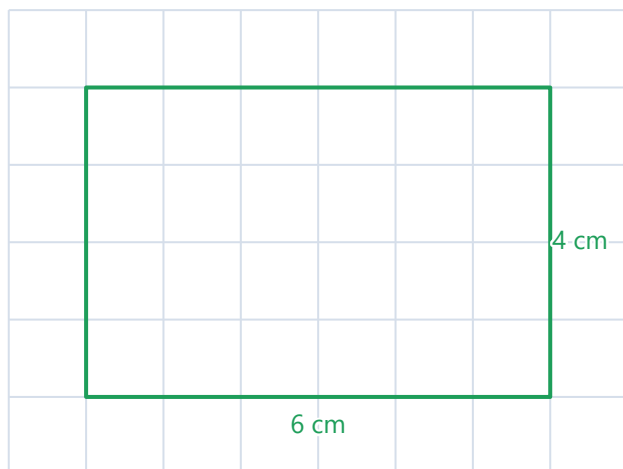
$$\text{Drawing length} = 24 \div 4 = 6 \text{ cm}$$

6 cm

4

A playground is a rectangle 12 m long and 8 m wide.

Draw an accurate scale drawing of the playground. Use a scale of 1 cm to 2 m.



(2 marks)

Length on drawing = $12 \div 2 = 6 \text{ cm}$

Width on drawing = $8 \div 2 = 4 \text{ cm}$

Draw an accurate rectangle 6 cm by 4 cm

An accurate rectangle 6 cm by 4 cm

5

A map uses a scale of 1 cm to 5 km.

a. A real distance is 35 km. Work out the distance on the map.

b. The distance on the map between two towns is 12.4 cm. Work out the real distance.

(3 marks)

a)

$$35 \div 5 = 7$$

7 cm

b)

$$12.4 \times 5 = 62$$

62 km

- 6 A map of a national park has a scale of 1 : 25 000.
On the map, the distance from a car park to a waterfall is 9.6 cm.
Work out the real distance from the car park to the waterfall. Give your answer in kilometres. (3 marks)

$$\text{Real distance} = 9.6 \times 25\,000 = 240\,000 \text{ cm}$$

$$240\,000 \text{ cm} = 2400 \text{ m}$$

$$2400 \text{ m} = 2.4 \text{ km}$$

2.4 km

- 7 Two villages are 4.5 km apart.
A map has a scale of 1 : 30 000.
Work out the distance between the two villages on the map. Give your answer in centimetres. (3 marks)

Change the real distance to centimetres

$$4.5 \text{ km} = 450\,000 \text{ cm}$$

$$\text{Map distance} = 450\,000 \div 30\,000 = 15 \text{ cm}$$

15 cm

- 8 A model aeroplane is made using a scale of 1 : 72.
The wingspan of the model is 25 cm.
Work out the wingspan of the real aeroplane. Give your answer in metres. (3 marks)

$$\text{Real wingspan} = 25 \times 72 = 1800 \text{ cm}$$

$$1800 \text{ cm} = 18 \text{ m}$$

18 m

- 9 A scale drawing of a school hall uses a scale of 1 cm to 3 m. On the drawing, the width of the hall is 7.5 cm.
Work out the real width of the hall. (2 marks)

$$7.5 \times 3 = 22.5$$

22.5 m

- 10 In a photograph, Marcus is standing next to a lamp post.

Marcus is 1.8 m tall.

In the photograph, Marcus is 2 cm tall and the lamp post is 7 cm tall.

Estimate the real height of the lamp post.

Assume Marcus and the lamp post are the same distance from the camera and the photograph has a uniform scale.

(3 marks)

In the photograph, 2 cm represents 1.8 m, so 1 cm represents 0.9 m

Estimate of the real height = $7 \times 0.9 = 6.3$ m

6.3 m

- 11 On the plan of a community hall, the scale is 1 cm to 1.5 m.

On the plan, the main room is a rectangle 6 cm long and 4 cm wide.

Work out the real area of the main room. Give your answer in m^2 .

(3 marks)

Real length = $6 \times 1.5 = 9$ m

Real width = $4 \times 1.5 = 6$ m

Real area = $9 \times 6 = 54$ m^2

54 m^2

- 12 A map has a scale of 1 : 25 000. Work out the real distance, in kilometres, for each distance on the map.

a. 4 cm

b. 7.6 cm

(3 marks)

1 cm = 25 000 cm = 250 m = 0.25 km

a)

$4 \times 0.25 = 1$

1 km

b)

$7.6 \times 0.25 = 1.9$

1.9 km

13 A map has a scale of 1 : 200 000.

- a. On the map, the distance between two towns is 4.2 cm. Work out the real distance between the towns, in kilometres.
- b. The real distance between two bridges is 15 km. Work out the distance between the bridges on the map, in centimetres.

(4 marks)

$$a) 4.2 \times 200\,000 = 840\,000 \text{ cm} = 8400 \text{ m} = 8.4 \text{ km}$$

$$b) 15 \text{ km} = 1\,500\,000 \text{ cm}$$

$$1\,500\,000 \div 200\,000 = 7.5 \text{ cm}$$

14 On a map with a scale of 1 cm to 2 km, Town B is 6.5 cm from Town A on a bearing of 070°.

- a. Work out the real distance from A to B.
- b. Work out the bearing of A from B.

(3 marks)

a)

$$6.5 \times 2 = 13$$

13 km

b)

$$070^\circ + 180^\circ = 250^\circ$$

250°

15 Jade is planning a walk.

On a map with a scale of 1 : 50 000, her route is 14 cm long.

Jade walks at a steady speed of 4 km per hour.

Work out how long the walk will take. Give your answer in hours and minutes.

(4 marks)

$$\text{Real distance} = 14 \times 50\,000 = 700\,000 \text{ cm} = 7 \text{ km}$$

$$\text{Time} = 7 \div 4 = 1.75 \text{ hours}$$

$$1.75 \text{ hours} = 1 \text{ hour } 45 \text{ minutes}$$

1 hour 45 minutes

- 16 A square lawn is shown on a scale drawing with a scale of 1 cm to 2 m. The area of the lawn on the drawing is 9 cm^2 .

- a. Work out the real length of one side of the lawn.
b. Work out the real area of the lawn.

(3 marks)

a)

$$\text{side on drawing} = \sqrt{9} = 3 \text{ cm}$$

$$3 \times 2 = 6$$

$$\boxed{6 \text{ m}}$$

b)

$$6 \times 6 = 36$$

$$\boxed{36 \text{ m}^2}$$

- 17 A scale drawing of a rectangular garden uses a scale of 1 cm to 2.5 m.

On the drawing, the garden is 8 cm long and 5 cm wide.

Fencing costs £4.20 per metre.

Harry has £250 to fence the whole perimeter of the garden.

Does Harry have enough money? You must show your working.

(5 marks)

$$\text{Real length} = 8 \times 2.5 = 20 \text{ m and real width} = 5 \times 2.5 = 12.5 \text{ m}$$

$$\text{Perimeter} = 2 \times (20 + 12.5) = 65 \text{ m}$$

$$\text{Cost} = 65 \times £4.20 = £273$$

£273 is more than £250, so Harry does not have enough money

- 18 A plan of a rectangular room uses a scale of 1 cm to 0.5 m. On the plan, the room is 12 cm long and 8 cm wide.

Flooring is sold in packs. Each pack covers 2.5 m^2 . Nadia buys 9 packs.

Does she have enough packs to cover the floor? You must show your working.

(4 marks)

$$12 \times 0.5 = 6 \text{ m}$$

$$8 \times 0.5 = 4 \text{ m}$$

$$6 \times 4 = 24 \text{ m}^2$$

$$24 \div 2.5 = 9.6$$

she needs 10 packs

$\boxed{\text{No, 9 is not enough}}$