Scale Drawings and Maps

GCSE Mathematics • **Foundation Tier** • Grades 3–4 • Non-calculator

WORKED SOLUTIONS

Name: worked example Class: _____ Total: 65 / 65

Show all your working. Marks are given for correct method as well as the final answer.

1. A scale drawing uses 1 cm to represent 2 m. Work out the real length of a wall drawn 6 cm long. **[2 marks]**



Scale: 1 cm represents 2 m

$6 \times 2 = 12$

Answer: 12 **m**

2. Using the same scale, work out the real height of the room drawn 4 cm tall. **[2 marks]**



Scale: 1 cm represents 2 m

$4 \times 2 = 8$

Answer: 8 **m**

3. A scale is 1 cm to 5 m. Work out the drawing length for a real distance of 45 m. **[2 marks]**

going BACK to the drawing, so divide

$45 \div 5 = 9$

Answer: 9 **cm**

4. A model car is made to a scale of 1:50. The model is 9 cm long. Work out the real length, in metres. **[3 marks]**

$9 \times 50 = 450$ cm

$450 \div 100 = 4.5$ m

Answer: 4.5 **m**

5. A model is made to a scale of 1:20. The real object is 3 m tall. Work out the model's height, in centimetres. **[3 marks]**

3 m = 300 cm

same units before you use the ratio

$300 \div 20 = 15$

Answer: 15 **cm**

6. A map has a scale of 1:25 000. Work out the real distance, in kilometres, for 4 cm on the map. **[3 marks]**

$4 \times 25\,000 = 100\,000$ cm
100 000 cm = 1000 m = 1 km

Answer: 1 **km**

7. On a 1:25 000 map, work out the map distance for 3 km. **[3 marks]**

3 km = 300 000 cm
$300\,000 \div 25\,000 = 12$

Answer: 12 **cm**

8. A map has a scale of 1:50 000. Work out the real distance for 7 cm, in kilometres. **[3 marks]**

$7 \times 50\,000 = 350\,000$ cm
= 3500 m = 3.5 km

Answer: 3.5 **km**

9. A drawing of a garden uses 1 cm to 3 m. The real garden is 24 m by 15 m. Work out the drawing's dimensions. **[3 marks]**

$24 \div 3 = 8$
$15 \div 3 = 5$

Answer: 8 cm by 5 cm

10. A 12 m wall is drawn 4 cm long. Write the scale in the form 1 cm to n m. **[2 marks]**

$12 \div 4 = 3$

Answer: 1 cm to 3 m

11. A 6 m room is drawn 15 cm long. Write the scale as a ratio in the form 1:n. **[3 marks]**

6 m = 600 cm
15 : 600
divide both by 15
1 : 40

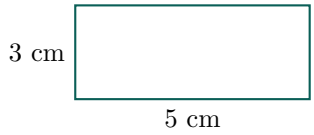
Answer: 1:40

12. A model plane has scale 1:72 and wingspan 50 cm. Work out the real wingspan, in metres, to 1 d.p. **[3 marks]**

$50 \times 72 = 3600$ cm
$3600 \div 100 = 36.0$ m

Answer: 36.0 **m**

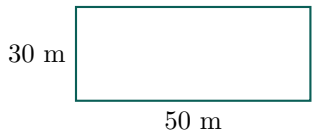
13. A field is drawn as a rectangle 5 cm by 3 cm at 1 cm to 10 m. **[3 marks]**



$5 \times 10 = 50$
$3 \times 10 = 30$

Answer: 50 m by 30 m **m**

14. Using that field, work out its real area. **[3 marks]**



50×30
$= 1500\ m^2$

Answer: 1500 m^2

15. Explain why a scale of 1:100 makes a 2 m door only 2 cm tall on the drawing. **[2 marks]**

2 m = 200 cm
200 ÷ 100 = 2 cm

Answer: 200 cm divided by 100 is 2 cm

16. Two towns are 8.5 cm apart on a 1:200 000 map. Work out the real distance in kilometres. **[3 marks]**

$8.5 \times 200\,000 = 1\,700\,000$ cm
$= 17\,000$ m $= 17$ km

Answer: 17 **km**

17. A room measures 4.8 m by 3.6 m and is drawn at 1 cm to 60 cm.

(a) Work out the drawing's dimensions in centimetres. **[3 marks]**

4.8 m = 480 cm, 480 ÷ 60 = 8 cm
3.6 m = 360 cm, 360 ÷ 60 = 6 cm

(b) Work out the drawing's area. **[2 marks]**

8×6
$= 48\ cm^2$

Answer: 8 cm by 6 cm ; 48 cm^2

18. A footpath is 6 cm long on a 1:25 000 map. A walker covers 4 km/h.

(a) Work out the real length of the path in kilometres. **[3 marks]**

$6 \times 25\,000 = 150\,000$ cm
$= 1500$ m $= 1.5$ km

(b) Work out how long the walk takes, in minutes. **[3 marks]**

1.5 ÷ 4 = 0.375 hours
0.375 × 60
= 22.5 minutes

Answer: 1.5 km ; 22.5 minutes

19. A architect's plan uses 1:50. A room on the plan is 12 cm by 9 cm.

(a) Work out the real dimensions in metres. **[3 marks]**

$12 \times 50 = 600$ cm $= 6$ m

$9 \times 50 = 450$ cm $= 4.5$ m

(b) Work out the real floor area. **[3 marks]**

6×4.5

$= 27$ m^2

Answer: 6 m by 4.5 m ; 27 m^2

20. On a map, 1 cm represents 2 km.

(a) Write this scale in the form 1:n. **[3 marks]**

2 km = 2000 m = 200 000 cm

both sides in the same unit

1 : 200 000

(b) Work out the map distance for 15 km. **[2 marks]**

$15 \div 2$

$= 7.5$ cm

Answer: 1:200 000 ; 7.5 cm

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