

Foundation GCSE: Scale Drawings

Name: _____

Class: _____

Instructions: Answer all questions. Questions are ordered from easiest (1) to hardest (20). Working out should be shown where appropriate.

1. A map has a scale of 1 : 100. If a room measures 3 cm on the map, what is its actual length in metres?
2. On a scale drawing, a line is 5 cm long. The scale is 1 : 50. Find the actual length in metres.
3. The scale of a drawing is 1 : 200. Find the length on the drawing for an actual distance of 6 m.
4. A model car is built to a scale of 1 : 24. If the model is 15 cm long, find the actual length of the car in centimetres.
5. On a map with a scale of 1 : 25000, two towns are 4 cm apart. What is the actual distance between them in kilometres?
6. A garden path is 12 m long. On a plan drawn to scale, the path is represented by a line of length 24 cm. Find the scale of the plan in the form 1 : n .
7. A rectangular room on a map measures 2 cm by 3 cm with a scale of 1 : 500. Find the actual area of the room in square metres.
8. A blueprint has a scale of 1 : 50. A window is drawn with an area of 4 cm² on the plan. What is the actual area of the window in square centimetres?
9. An architectural model of a tower is built to a scale of 1 : 150. If the actual height of the tower is 45 m, find the height of the model in centimetres.
10. A map is drawn to a scale of 1 : 10000. A forest covers an area on the map represented by a square of side 5 cm. Calculate the actual area of the forest in square metres.
11. A triangular park has sides represented on a scale drawing (1 : 400) as 5 cm, 12 cm, and 13 cm. Calculate the actual perimeter of the park in metres.
12. A scale drawing uses a ratio of 2 : 500. Simplify this ratio to the form 1 : n and find the map length in centimetres for an actual distance of 250 m.
13. On a map with a scale of 1 : 20000, a lake has an area of 1.5 cm² on paper. Calculate the actual area of the lake in square kilometres.
14. A scale model of a cylindrical water tank has a radius of 2 cm and a height of 7 cm, built to a scale of 1 : 40. Using $\pi \approx 3.14$, find the actual volume of the tank in cubic metres.
15. Two points on a map are separated by 8.5 cm. The scale of the map is 1 : 10000. Calculate the actual straight-line distance in kilometres.
16. A floor plan is drawn to a scale of 1 : 75. A rectangular room has actual dimensions of 6 m by 4.5 m. Find the area of this room on the floor plan in square centimetres.
17. An aerial photograph uses a scale where 1 cm represents 125 m. A plot of land is represented by a rectangle measuring 6.4 cm by 3.2 cm. Calculate the actual area of the plot in hectares (1 hectare = 10000 m²).
18. A relief map is constructed on a scale of 1 : 250000. A mountain peak has a height represented on the map by 2.4 cm. Find the actual vertical height of the mountain in metres.
19. A complex machine part is drawn to an enlargement scale of 5 : 1. On the drawing, a critical bore diameter is measured as 45 mm. Find the actual diameter of the bore in millimetres.
20. A geological survey map uses a scale of 1 : 100000. A mineral deposit is shaped like an irregular polygon whose area on the map is 12.4 cm². If the depth of the deposit averages 15 m, calculate the actual volume of the mineral deposit in cubic kilometres.

Answers & Worked Solutions

1. 3 m : $3 \times 100 \text{ cm} = 300 \text{ cm} = 3 \text{ m}$.
2. 2.5 m : $5 \times 50 = 250 \text{ cm} = 2.5 \text{ m}$.
3. 3 cm : $600 \text{ cm} \div 200 = 3 \text{ cm}$.
4. 360 cm : $15 \times 24 = 360 \text{ cm}$.
5. 1 km : $4 \times 25000 = 100000 \text{ cm} = 1 \text{ km}$.
6. 1 : 50 : 12 m = 1200 cm; scale is 24 : 1200 = 1 : 50.
7. 150 m^2 : Actual dims 10 m by 15 m; area = $10 \times 15 = 150 \text{ m}^2$.
8. 10000 cm^2 : Area scale factor $50^2 = 2500$; actual area = $4 \times 2500 = 10000 \text{ cm}^2$.
9. 30 cm : $4500 \text{ cm} \div 150 = 30 \text{ cm}$.
10. 250000 m^2 : Ground side = 500 m; area = $500^2 = 250000 \text{ m}^2$.
11. 120 m : Perimeter on map = 30 cm; actual = $30 \times 400 = 12000 \text{ cm} = 120 \text{ m}$.
12. 1 : 250 and 100 cm : $25000 \text{ cm} \div 250 = 100 \text{ cm}$.
13. 0.06 km^2 : Area scale factor 4×10^8 ; actual area = $1.5 \times 4 \times 10^8 \text{ cm}^2 = 0.06 \text{ km}^2$.
14. 5.63 m^3 : Radius 0.8 m, height 2.8 m; volume = $3.14 \times 0.8^2 \times 2.8 \approx 5.63 \text{ m}^3$.
15. 0.85 km : $8.5 \times 10000 = 85000 \text{ cm} = 0.85 \text{ km}$.
16. 48 cm^2 : Plan dims 8 cm by 6 cm; area = $8 \times 6 = 48 \text{ cm}^2$.
17. 32 hectares : Actual dims 800 m by 400 m; area = $320000 \text{ m}^2 = 32 \text{ hectares}$.
18. 6000 m : $2.4 \times 250000 = 600000 \text{ cm} = 6000 \text{ m}$.
19. 9 mm : $45 \text{ mm} \div 5 = 9 \text{ mm}$.
20. 0.186 km^3 : Actual area 12.4 km^2 , depth 0.015 km; volume = $12.4 \times 0.015 = 0.186 \text{ km}^3$.