Scale drawing

- Converting lengths from scale drawings to real life, and vice versa
- Drawing diagrams to scale
- Interpreting diagrams drawn to scale
- Interpreting scaled areas

Keywords

You should know

explanation 1a   explanation 1b

1 Boris draws a plan of his flat to a scale of $1:40$.
He measures these lengths from the plan. Calculate the actual lengths in metres.

  a Length of lounge: 12 cm   **b** Length of bathroom: 5.25 cm

2 In these questions, the plan lengths and the scales are given.
Calculate the actual lengths. Give your answers in metres.

  a 5 cm, $1:50$ **b** 11 mm, $1:25\,000$ **c** 7.5 cm, $3:1000$

3 In these questions, the actual lengths and the scales are given.
Calculate the scaled lengths. Give your answers in centimetres.

  a 120 m, $1:500$ **b** 6.5 km, $1:50\,000$ **c** 120 mm, $3:5$

4 On a map, the distance from Exeter to Cambridge is 16 cm and the distance
from Aberdeen to Cambridge is 34 cm.
Aidan knows that the real distance from Exeter to Cambridge is 400 km.

  What is the scale of the map?
  Find the real distance from Aberdeen to Cambridge.

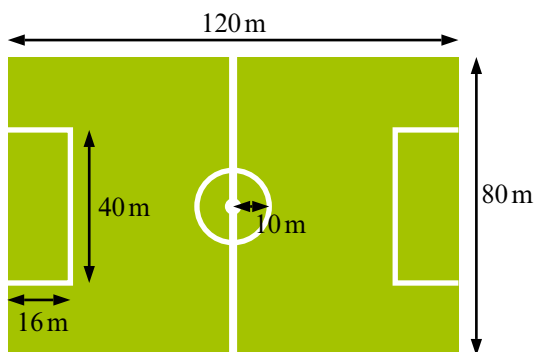**5** A swimming pool is rectangular and has a length of 50 m and a width of 25 m.

  a Draw a scale diagram of the pool. Use a scale of $1:1000$.

  b What is the area of the pool on the diagram?

  c What is the actual area of the pool? Give your answer in

      i square metres   **ii** square centimetres
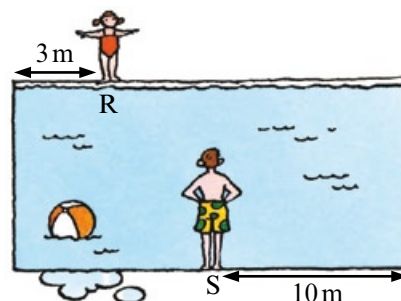
6 The diagram shows a football pitch.

Draw a scale diagram of the football pitch, using a scale of 3:4000.

7 The diagram below shows a rectangular pool 20 m long by 10 m wide.
Rachel stands at R and Steve stands at S.

a Draw a scale diagram of the pool, using 1 cm for 2 m.

b Tom swims across the pool. He is always the same distance from Rachel as from Steve. Construct Tom's path across the pool.
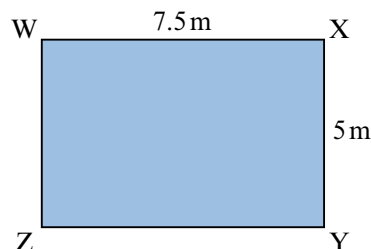
> Draw the line segment RS. Every point on the perpendicular bisector of RS is equidistant from R and S.

8 A small rectangular swimming pool WXYZ is 7.5 m long and 5 m wide.

A girl sets off from corner Z and swims towards the edge WX in such a way that she bisects the angle WZY.

On arrival at the edge WX she turns and heads directly towards the corner Y.

a Using a scale of 1:125, draw a scale diagram of the pool.

b Using a pair of compasses and a ruler, construct the path taken by the girl.

c By measuring the path taken, calculate the actual distance swum by the girl.

explanation 2

9 A plan of a classroom is drawn to a scale of 1:100.

On the plan, the area of the floor is $72\,cm^2$. Calculate the actual area

a in square centimetres   **b** in square metres

10 Bushra builds a doll's house to a scale of 1:50.
She models it on her own house.

The area of the roof is $100\,m^2$.

What is the area of the doll's house roof?

a in square metres

b in square centimetres

11 The area of Cheriton Wood is about $1\,km^2$.

What area will this cover on a 1:50000 Ordnance Survey map?

12 On a 1:50000 Ordnance Survey map, Winchester covers an area
of roughly $70\,cm^2$.

Roughly what area does Winchester cover in real life?

13 The Explorer maps for walking or mountain biking use a scale of 1:25000.

a What distance on the ground does 1 cm on the map represent?

i in metres   **ii** in kilometres

b What area on the ground does $1\,cm^2$ on the map represent?

i in square metres   **ii** in square kilometres

c Llyn Peris, the site of
a hydroelectric power plant in
Snowdonia, covers an area
of $8\,cm^2$ on the Explorer map.

What area does Llyn Peris
cover in reality?