GCSE HIGHER · REVISION MAT 3

Scale factors for length, area and volume

1 A drawing uses 1 cm to 5 m.

A room is 18 m long.

How long is it on the drawing?

2 Two shapes are similar with length scale factor 3.

The small one has area 7 cm².

Find the area of the large one.

3 Explain why the area scale factor is the square of the length scale factor.

4 A model building is made to a scale of 1 : 200.

The model is 45 cm tall.

Find the real height in metres.

5 Two similar boxes have lengths in the ratio 3 : 4.

Show that their volumes are in the ratio 27 : 64.

6 Two similar jugs are 20 cm and 30 cm tall.

The small jug holds 1.2 litres.

How much does the large jug hold?

7 Two similar shapes have areas in the ratio 16 : 25.

Show that their lengths are in the ratio 4 : 5.

8 Two similar cylinders have surface areas 80 cm² and 180 cm².

The smaller has volume 64 cm³.

Find the volume of the larger.

Mr&Mrs MATHS

ANSWERS · REVISION MAT 3

Scale factors for length, area and volume

1 **3.6 cm**

2 Area factor 9

63 cm²

3 **Area is length × length, so both are multiplied by k: $k \times k = k^2$.**

4 45 × 200 = 9000 cm

90 m

5 **$3^3 : 4^3 = 27 : 64$**

6 Length 2 : 3, volume 8 : 27

4.05 litres

7 **$\sqrt{16} : \sqrt{25} = 4 : 5$**

8 Area 4 : 9, length 2 : 3, volume 8 : 27

216 cm³

Mr&Mrs MATHS