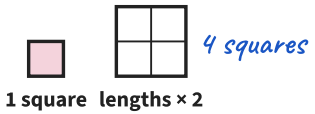
Area and volume scale factors

ANSWERS

1

Two similar shapes have lengths 3 cm and 6 cm. The small area is 7 cm^2. Find the large area.



length scale factor

2

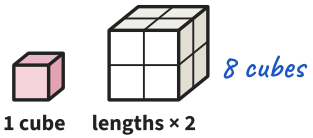
area scale factor: square it

4

Answer 28 cm^2

2

Two similar shapes have lengths 4 cm and 8 cm. The small volume is 5 cm^3. Find the large volume.



length scale factor

2

volume scale factor: cube it

8

Answer 40 cm^3

3

Two similar shapes have lengths 4 cm and 20 cm. The small area is 2 cm^2. Find the large area.

length scale factor

5

area scale factor: square it

25

Answer 50 cm^2

4

Two similar shapes have lengths 2 cm and 6 cm. The small volume is 3 cm^3. Find the large volume.

length scale factor

3

volume scale factor: cube it

27

Answer 81 cm^3

5

Two similar shapes have lengths 4 cm and 6 cm. The small area is 8 cm^2. Find the large area.

1.5

2.25

Answer 18 cm^2

6

Two similar shapes have areas 5 cm^2 and 45 cm^2. The small one is 3 cm long. How long is the large one?

area scale factor 9, so length scale factor 3

Answer 9 cm

7

Two similar solids have volumes 6 cm^3 and 48 cm^3. The small one is 7 cm tall. Maya says the large one is 56 cm tall, because 48 ÷ 6 = 8 and 7 × 8 = 56. Explain her mistake and find the height.

8 is the volume scale factor

$\sqrt[3]{8} = 2$, $7 \times 2 = 14$

Answer 14 cm

8

Two similar solids have surface areas 32 cm^2 and 72 cm^2. The volume of the small one is 8 cm^3. Find the volume of the large one.

$72 \div 32 = 2.25$, $\sqrt{2.25} = 1.5$

$1.5^3 = 3.375$, 8×3.375

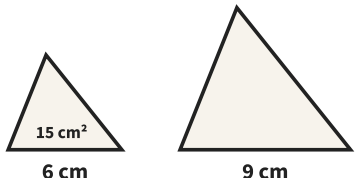
Answer 27 cm^3

Area and volume scale factors *further practice*

ANSWERS

9

These triangles are similar.
The small one has an area of 15 cm².
Find the area of the large one.



$9 \div 6 = 1.5$, $1.5^2 = 2.25$, 15×2.25

Answer 33.75 cm²

10

Two similar solids have heights in the ratio 2 : 5. Write the ratio of their surface areas, and the ratio of their volumes.

square the ratio, then cube it

Surface areas 4 : 25

Volumes 8 : 125

11

A flag 40 cm long uses 0.3 m² of fabric.
A similar flag is 1 m long.
How much fabric does it use?

1 m = 100 cm, $100 \div 40 = 2.5$,
0.3×2.5^2

Answer 1.875 m²

12

Two similar paperweights are made of the same glass. They have masses of 120 g and 405 g. The small one is 6 cm tall. How tall is the large one?

$405 \div 120 = 3.375$, $\sqrt[3]{3.375} = 1.5$,
6×1.5

Answer 9 cm

13

Two similar water tanks have bases with areas 1.2 m² and 4.8 m².
The small tank holds 900 litres.
How many litres does the large tank hold?

$4.8 \div 1.2 = 4$, $\sqrt{4} = 2$, 900×2^3

Answer 7200 litres

14

Two similar vases have volumes 250 cm³ and 2000 cm³. The small vase takes 30 ml of glaze to cover it.
How much glaze does the large vase take?

$2000 \div 250 = 8$, $\sqrt[3]{8} = 2$, 30×2^2

Answer 120 ml

15

A model of a ship is made to a scale of 1 : 50. The deck of the model has an area of 600 cm². Find the area of the real deck in m².

$50^2 = 2500$,
$600 \times 2500 = 1\,500\,000$ cm²,
$\div 10\,000$

Answer 150 m²

16

Two similar solids have volumes 10 cm³ and 30 cm³. Jo says their lengths are in the ratio 1 : 3. Is she right? Explain.

$30 \div 10 = 3$ is the volume scale factor,
lengths $\times \sqrt[3]{3}$

Answer No: 1 : $\sqrt[3]{3}$, about 1 : 1.44