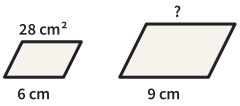
Interleaved: length, area and volume scale factors

ANSWERS

1

The two parallelograms are similar.
The smaller one has an area of 28 cm^2.
Find the area of the larger one.



Which method? Length: $\times k$ | Area: $\times k^2$ | Volume: $\times k^3$

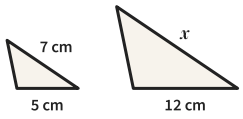
an area: $k = 9 \div 6 = 1.5$, 28×1.5^2

63 cm^2

Answer

2

The two triangles are similar.
Find the length marked x.



Which method? Length: $\times k$ | Area: $\times k^2$ | Volume: $\times k^3$

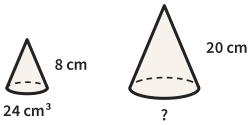
a length: $k = 12 \div 5 = 2.4$, 7×2.4

16.8 cm

Answer

3

The two cones are similar. The smaller cone has a volume of 24 cm^3. Find the volume of the larger cone.



Which method? Length: $\times k$ | Area: $\times k^2$ | Volume: $\times k^3$

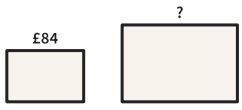
$k = 20 \div 8 = 2.5$, 24×2.5^3

375 cm^3

Answer

4

Turf for a rectangular lawn 6 m long costs £84. A similar lawn is 9 m long.
Turf costs the same per square metre.
How much does turf for the larger lawn cost?



Which method? Length: $\times k$ | Area: $\times k^2$ | Volume: $\times k^3$

turf covers an area: $k = 1.5$, 84×1.5^2

£189

Answer

5

Two similar solid wooden chess pieces are 6 cm and 9 cm tall. The smaller one has a mass of 32 g. Find the mass of the larger one.

Which method? Length: $\times k$ | Area: $\times k^2$ | Volume: $\times k^3$

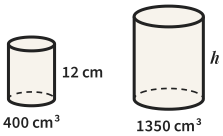
mass goes with volume: $k = 1.5$, 32×1.5^3

108 g

Answer

6

Two similar plant pots hold 400 cm^3 and 1350 cm^3 of compost. The smaller pot is 12 cm tall. How tall is the larger pot?



Which method? Length: $\times k$ | Area: $\times k^2$ | Volume: $\times k^3$

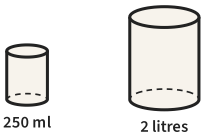
$k^3 = 1350 \div 400 = 3.375$, $k = 1.5$

18 cm

Answer

7

Two similar tins hold 250 ml and 2 litres. The label on the smaller tin covers 85 cm^2. What area does the label on the larger tin cover?



Which method? Length: $\times k$ | Area: $\times k^2$ | Volume: $\times k^3$

$k^3 = 2000 \div 250 = 8$, $k = 2$, 85×2^2

340 cm^2

Answer

8

A model of a swimming pool is made to a scale of 1 : 25. The model holds 4 litres of water. How much water does the real pool hold?

Which method? Length: $\times k$ | Area: $\times k^2$ | Volume: $\times k^3$

$k = 25$, 4×25^3

62,500 litres

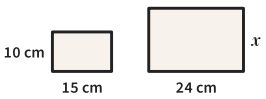
Answer

Interleaved: length, area and volume scale factors *further practice*

ANSWERS

9

A photo is 15 cm long and 10 cm wide.
It is enlarged to a similar photo 24 cm long.
How wide is the enlarged photo?



$k = 24 \div 15 = 1.6$, 10×1.6

16 cm

Answer

10

Two similar pentagons have perimeters of 18 cm and 30 cm. The smaller pentagon has an area of 27 cm^2. Find the area of the larger pentagon.

perimeters are lengths: $k = 30 \div 18$,
$27 \times (30 \div 18)^2 = 27 \times 25 \div 9$

75 cm^2

Answer

11

A solid bronze statue 60 cm tall has a mass of 48 kg. A similar solid bronze statue is 15 cm tall. Find its mass.

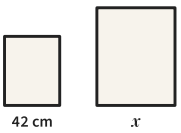
$k = 15 \div 60 = 0.25$, 48×0.25^3

0.75 kg

Answer

12

A poster is 42 cm wide. A similar poster has twice the area. How wide is it?
Give your answer to 1 decimal place.



$k^2 = 2$, $k = \sqrt{2}$, $42 \times \sqrt{2} = 59.39...$

59.4 cm

Answer

13

It takes 1.5 litres of paint to cover the outside of a garden shed. A similar shed has a volume 2.744 times as big.
How much paint does the larger shed need?

$k = \sqrt[3]{2.744} = 1.4$; paint covers the surface: 1.5×1.4^2

2.94 litres

Answer

14

The surface areas of two similar solids are in the ratio 4 : 9. Find the ratio of their volumes.

lengths $\sqrt{4} : \sqrt{9} = 2 : 3$, volumes $2^3 : 3^3$

8 : 27

Answer

15

A solid is enlarged to make a similar solid. Its volume goes up by 72.8%.
By what percentage does its surface area go up?

$k^3 = 1.728$, $k = 1.2$, $k^2 = 1.44$

44%

Answer

16

Two similar statues have surface areas of 50 cm^2 and 200 cm^2. Zoe says the larger statue is 4 times as tall as the smaller one. Explain her mistake, and find how many times as tall it is.

4 is the area scale factor; heights are lengths, so $\sqrt{4} = 2$

2 times as tall

Answer