

Outcome 3 - Similar volumes

Bronze example

Examples...

These 2 cans are mathematically similar.
Find the missing volume...



Calculate Linear S.F.
Calculate Volume S.F.
Multiply Volume S.F. by given volume.

Volume = 98 cm³ Volume = ?

Linear S.F. = $\frac{\text{big}}{\text{wee}} = \frac{12}{8} = \frac{3}{2}$

Volume S.F. = $\left(\frac{3}{2}\right)^3$ $V = \frac{27}{8} \times 98$

$= \frac{27}{8}$ $= 330.75 \text{ cm}^3$

Silver example

Examples...

These 2 tubs of popcorn are mathematically similar.
Find the missing volume...



Calculate Linear S.F.
Calculate Volume S.F.
Multiply Volume S.F. by given volume.

Volume = ? Volume = 1215 cm³

Linear S.F. = $\frac{\text{wee}}{\text{big}} = \frac{12}{36} = \frac{1}{3}$

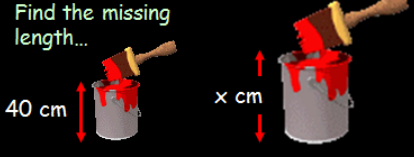
Volume S.F. = $\left(\frac{1}{3}\right)^3$ $V = \frac{1}{27} \times 1215$

$= \frac{1}{27}$ $= 45 \text{ cm}^3$

Gold example

Examples...

These 2 paint tins are mathematically similar.
Find the missing length...



Calculate volume scale factor...

Volume = 150 ml Volume = 4050 ml

Volume S.F. = $\frac{4050}{150} = 27$ Calculate linear scale factor...

Linear S.F. = $\sqrt[3]{27} = 3$

$x = 3 \times 40 = 120 \text{ cm}$ Find missing side...

Bronze Questions

The following objects are mathematically similar.
Calculate the missing volumes...

1  Volume 130 mm³ Volume ?
40 mm 140 mm

2  16 cm 24 cm
Volume = 450 cm³ Volume = ?

3  12 cm 30 cm
Volume = 1200 cm³ Volume = ?

Silver Questions

The following objects are mathematically similar.
Calculate the missing volumes...

1  Volume ? Volume 1000 cm³
6 cm 10 cm

2  4 cm 14 cm
Volume = ? Volume = 686 cm³

3  12 cm 20 cm
Volume = ? Volume = 1750 cm³

Gold Questions

The following objects are mathematically similar.
Calculate the missing sides...

1  Volume = 4 litres Volume = 864 litres
17 cm ? cm

2  20 cm ? cm
Volume = 384 ml Volume = 48 ml

2  8 cm ? cm
Volume = 320 ml Volume = 8640 ml

Bronze Answers

1. 5573.75 mm^3
2. 1518.75 cm^3
3. $18\,750 \text{ cm}^3$

Silver Answers

1. 216 cm^3
2. 16 cm^3
3. 378 cm^3

Gold Answers

1. 102 cm
2. 24 cm
3. 10 cm