Volume Surface Area

GCSE Maths · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

A triangular prism has a right-angled cross-section with legs 6 cm and 8 cm, and length 15 cm. Find its volume.

Step 1 · Cross-section

$\frac{1}{2} \times 6 \times 8 = 24\ \text{cm}^2$

Step 2 · × length

$24 \times 15 = 360\ \text{cm}^3$

Answer: 360 cm³

Check: Units cubed ✓

2. Now try one with the steps

Find the total surface area of the same prism (hypotenuse 10 cm).

Step 1 · Two triangles

Step 2 · Three rectangles

Step 3 · Total

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Find the volume of a cuboid 5 cm × 4 cm × 3 cm, in cm³. [1]

2. Find the surface area of the same cuboid, in cm². [2]

3. A prism has cross-sectional area 18 cm² and length 7 cm. Find its volume, in cm³. [1]

4. A cylinder has radius 3 cm and height 10 cm. Find its volume in terms of π (cm^3). [2]

5. Find the volume of a cylinder with radius 2.5 cm and height 8 cm, to 1 decimal place (cm^3). [2]

6. Find the total surface area of a cylinder with radius 3 cm and height 10 cm, in terms of π (cm^2). [2]

7. A triangular prism has a cross-section with base 10 cm and height 4 cm, and length 12 cm. Find its volume, in cm^3. [2]

8. How many cm^3 are in 2.5 litres? [1]

9. Convert 3 m^3 to cm^3. [2]

10. A cuboid has volume 240 cm^3, length 10 cm and width 6 cm. Find its height, in cm. [2]

11. A cylinder has volume 500 cm^3 and radius 4 cm. Find its height to 1 decimal place (cm). [3]

12. An L-shaped prism has cross-section area 34 cm^2 and length 5 cm. Find its volume, in cm^3. [1]

13. A cylindrical tank (radius 0.5 m, height 1.2 m) is filled with water. How many litres does it hold, to the nearest litre? [3]

14. A cube has surface area 150 cm^2. Find its volume, in cm^3. [3]

15. A label wraps exactly round the curved surface of a tin of radius 3.5 cm and height 11 cm. Find the area of the label to 1 decimal place (cm^2). [2]

4. Before you hand it in

Cylinder volume = 2πrh
Volume uses the circle's AREA: $\pi r^2 h$. $2\pi rh$ is the curved surface.

Using the diameter
Halve the diameter before squaring.

1 m^3 = 100 cm^3
Cube the conversion: 100^3 = 1 000 000 cm^3 in 1 m^3.

Forgetting one end of a cylinder (or a face of a prism)
Sketch the net and tick off each face. A closed cylinder has TWO circles.