

Volume & Capacity @ GCSE Intermediate Tier

Just like with area, your ability to calculate a volume from given dimensions is assumed at this level.

The only volume formula you are given for the exams is the volume of a prism:



You need to be able to recall the others, in particular

Volume of a cuboid = length x width x height

Volume of a cylinder = $\pi r^2 \times$ height

1 litre = 1000 cm³

Grade C and Grade B standard questions will challenge you to use and apply these formulas in context and to change cm³ into litres

You may also be given a volume and asked to work out an unknown side.

Past Paper Questions (progressively more difficult)

1. A small, scale model of a large water tank is produced.
 The actual tank is a cuboid measuring 20 metres long, 15 metres wide and 10 metres high.
 The model is made using 10 centimetres to represent 5 metres.
 Calculate how many litres of water the model will contain when full. [5]

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2. A gold bar in the shape of a cuboid has dimensions 20 cm by 8 cm by 4.5 cm.
The gold bar is melted down to make small cubes of sides 2 cm.
How many of these small cubes can be made from the gold bar?

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[6]

Numerical Answers

06

3.

Kitchen cupboards and worktops are measured in mm.



(a) A worktop is 4500mm long.
How much is this in metres?

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(b) A rectangular worktop measures 3200mm long by 750mm wide.
Calculate the area of the top surface of the worktop in m^2 .

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(c) A kitchen cupboard is in the shape of a cuboid.
Its capacity is $405\,000\,000\text{mm}^3$.
Internally, the cupboard measures 600mm wide and 750mm deep.
Calculate the internal height of the cupboard in mm.

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4.

You will be assessed on the quality of your written communication in this question.

The height of a cuboid is 14.5 cm.
The difference between its length and its width is 4 cm.
The volume of the cuboid is 1392 cm^3 .
Find the length and width of this cuboid.
You must show all your working.

[5]

A series of horizontal dashed lines provided for the student to show their working.

5.

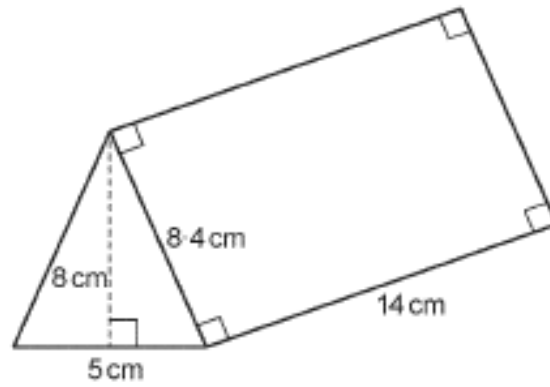


Diagram not drawn to scale

Calculate the volume of the triangular prism shown.
State the units of your answer.

[3]

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6. *Kingham Inc* is a company that makes cardboard boxes. One of their boxes, in the shape of a triangular prism, is shown below.

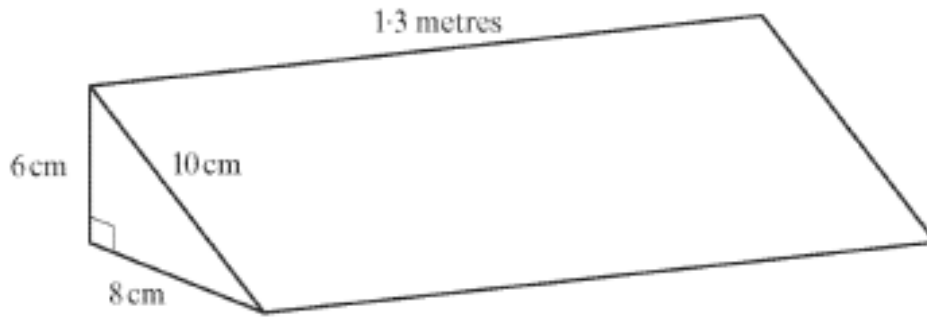


Diagram not drawn to scale

A customer asks if the box has a volume of 3 litres.

- (a) Calculate the volume of the box in cm^3 .

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[3]

- (b) Is the volume of the box greater or less than 3 litres?
State by how much it is greater or less than 3 litres, giving your answer in cm^3 .

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[1]

6. Calculate the volume of a cylinder radius 4.5 cm and height 10.3 cm.
State the units of your answer.

[3]



Diagram not drawn to scale

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655.3

7. An empty cylindrical tank has a base radius of three metres and is four metres high.

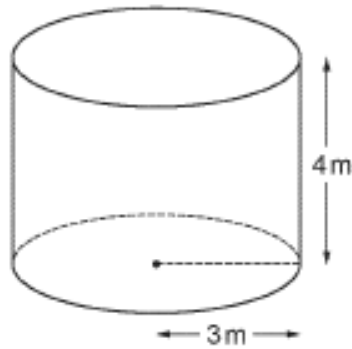


Diagram not drawn to scale

- (a) Calculate the volume of this tank. [2]

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- (b) Water is pumped into the tank at a constant rate of 1800 litres per minute. The pump stops automatically immediately before the tank overflows. For how many whole minutes is water pumped into the tank? [4]

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8. Oil is stored in cylindrical drums.



- (a) Each oil drum has a diameter of 46 cm and a height of 125 cm. Calculate the volume of an oil drum. Give your answer in litres.

[3]

- (b) A different oil drum holds 150 litres of oil. The oil from 4500 of these drums is sold for £1.2 million. Calculate the cost of 1 litre of this oil.

[3]

208

£1.78

9. Elin's old fish tank is leaking.

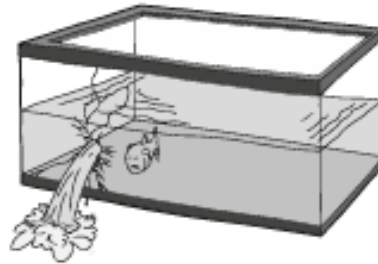


Diagram not drawn to scale

This old fish tank is in the shape of a cuboid.
The base of this tank measures 60 cm by 40 cm.
Before the leak, the height of the water level in Elin's old fish tank was 45 cm.

Elin decides to replace her fish tank with a cylindrical one.

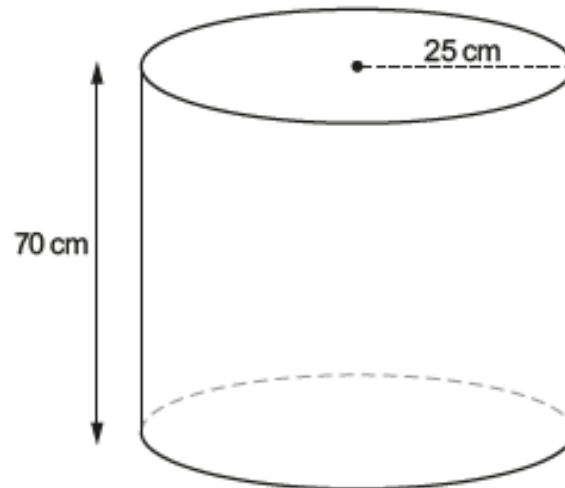


Diagram not drawn to scale

She selects a new cylindrical fish tank that has a radius of 25 cm and a height of 70 cm.

Will all the original contents, including the water and the fish, fit into this cylindrical tank?
You must show all your working.

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