

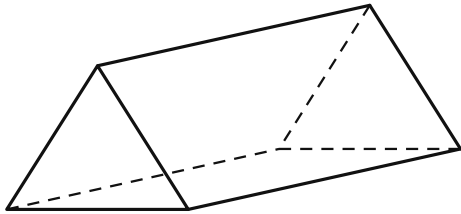
Volume and 3D Shapes

ANSWERS

Calculator | 30 minutes | Total marks: 30

Name Class

1 Here is a triangular prism.



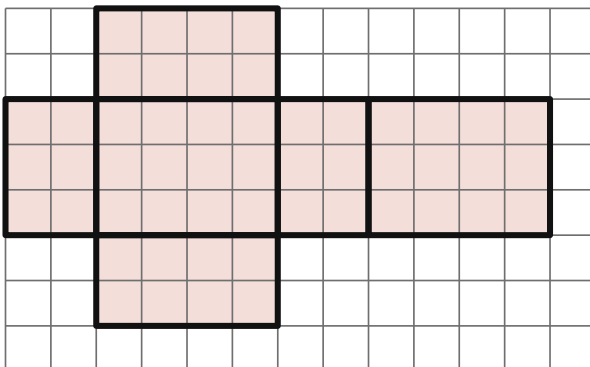
Write down the number of

faces 5 (1) [1 mark]

edges 9 (1) [1 mark]

vertices 6 (1) [1 mark]

2 The diagram shows the net of a cuboid on a centimetre grid.



(a) Work out the surface area of the cuboid.

$$12 + 12 + 6 + 6 + 8 + 8 \text{ (1)}$$

Answer 52 (1) cm² [2 marks]

(b) Work out the volume of the cuboid.

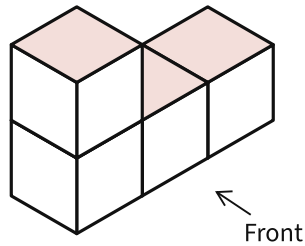
$$4 \times 3 \times 2 \text{ (1)}$$

Answer 24 (1) cm³ [2 marks]

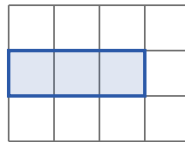
3

The solid is made from 4 centimetre cubes.

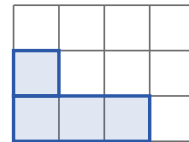
On the centimetre grids, draw the plan, the front elevation and the side elevation of the solid.



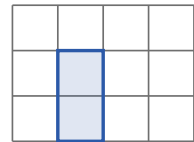
Plan



Front elevation



Side elevation



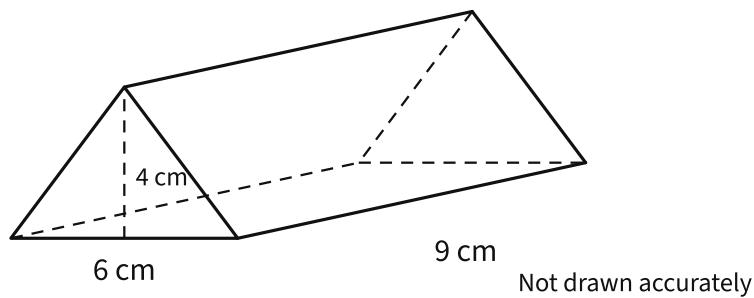
Plan (1) Front elevation (1) Side elevation (1)

[3 marks]

4

The cross section of this prism is a triangle with base 6 cm and height 4 cm.

The prism is 9 cm long.



Work out the volume of the prism.

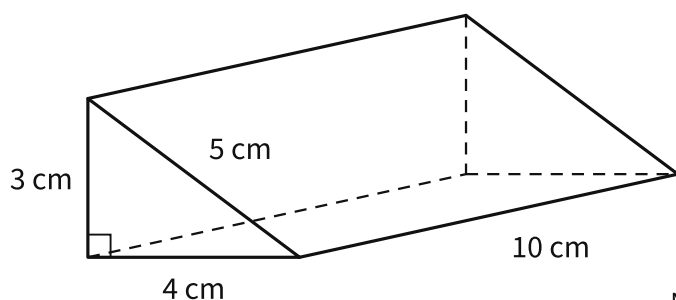
$$\frac{1}{2} \times 6 \times 4 = 12 \text{ (1)}$$

$$12 \times 9 \text{ (1)}$$

Answer 108 (1) cm³ [3 marks]

5

The cross section of this prism is a right angled triangle.



Not drawn accurately

Work out the total surface area of the prism.

$$\text{two triangles: } 2 \times \frac{1}{2} \times 4 \times 3 = 12 \text{ (1)}$$

$$\text{rectangles: } 3 \times 10 + 4 \times 10 + 5 \times 10 \text{ (1)}$$

$$= 120 \text{ (1)}$$

Answer 132 (1) cm² [4 marks]

6

(a) Volume of a cone = $\frac{1}{3}\pi r^2 h$

A cone has radius 3 cm and height 7 cm.

Work out the volume of the cone.

Give your answer to 1 decimal place.

$$\frac{1}{3} \times \pi \times 3^2 \times 7 \text{ (1)}$$

Answer 66.0 (1) cm³ [2 marks]

(b) Volume of a sphere = $\frac{4}{3}\pi r^3$

A sphere has radius 6 cm.

Work out the volume of the sphere.

Give your answer to 1 decimal place.

$$\frac{4}{3} \times \pi \times 6^3 \text{ (1)}$$

Answer 904.8 (1) cm³ [2 marks]

7

Surface area of a sphere = $4\pi r^2$

A sphere has radius 5 cm.

Work out the surface area of the sphere.

Give your answer to 1 decimal place.

$$4 \times \pi \times 5^2 \quad (1)$$

Answer 314.2 (1) cm² [2 marks]

8

A cuboid is 5 cm long, 4 cm wide and 2.5 cm high.

Work out the total surface area of the cuboid.

$$5 \times 4 = 20 \quad 5 \times 2.5 = 12.5 \quad 4 \times 2.5 = 10 \quad (1)$$

$$2 \times (20 + 12.5 + 10) \quad (1)$$

Answer 85 (1) cm² [3 marks]

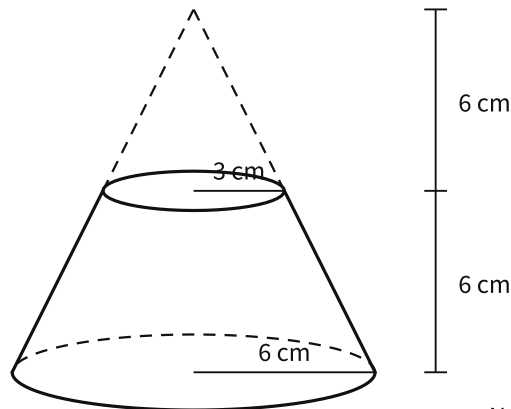
9

Volume of a cone = $\frac{1}{3}\pi r^2 h$

A cone has radius 6 cm and height 12 cm.

A smaller cone with radius 3 cm and height 6 cm is cut off the top.

The solid that is left is called a frustum.



Not drawn accurately

Work out the volume of the frustum.

Give your answer in terms of π .

$$\text{large cone: } \frac{1}{3} \times \pi \times 6^2 \times 12 = 144\pi \text{ (1)}$$

$$\text{small cone: } \frac{1}{3} \times \pi \times 3^2 \times 6 = 18\pi \text{ (1)}$$

$$144\pi - 18\pi \text{ (1)}$$

Answer 126 π (1) cm³ [4 marks]

Question	Topic	RAG
1	I can count faces, edges and vertices	
2	I can use a net to find surface area and volume	
3	I can draw a plan and elevations	
4	I can find the volume of a prism	
5	I can find the surface area of a prism	
6	I can find the volume of a cone and a sphere	
7	I can find the surface area of a sphere	
8	I can find the surface area of a cuboid	
9	I can find the volume of a frustum	