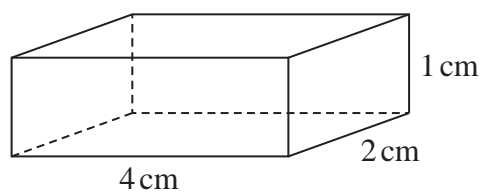


- 1 (a) Write down the mathematical name of this 3-D shape.



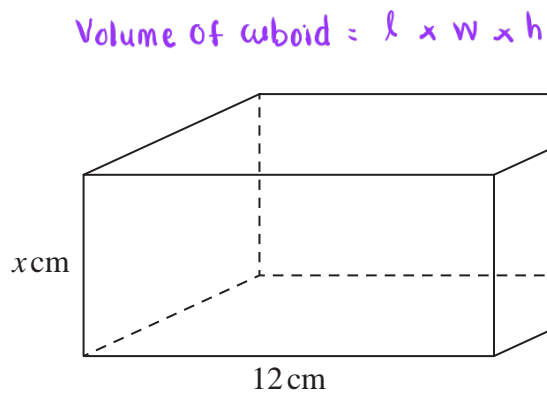
cuboid



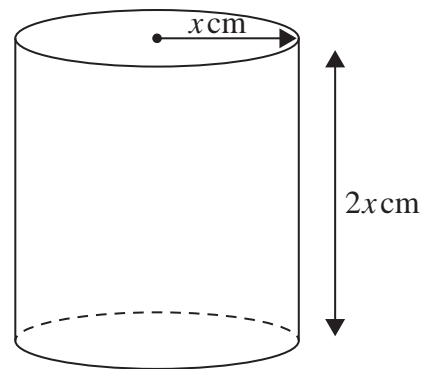
(1)

(Total for Question 1 is 1 marks)

2 The diagram shows a cuboid and a cylinder.



Volume of cylinder: $\pi r^2 \times h$ Diagram **NOT** accurately drawn



The dimensions of the cuboid are x cm by 12 cm by 5 cm.
The volume of the cuboid is 270 cm^3

The radius of the cylinder is x cm.
The height of the cylinder is $2x$ cm.

- (a) Work out the volume of the cylinder.
Give your answer correct to the nearest whole number.

$$\begin{aligned}\text{Volume of cuboid} &= 12 \times 5 \times x = 270 \\ &= 60x = 270 \\ x &= \frac{270}{60} \\ &= 4.5 \text{ cm (1)}\end{aligned}$$

$$\begin{aligned}\text{Volume of cylinder} &= \pi \times x^2 \times 2x \\ &= \pi \times (4.5)^2 \times 2(4.5) \text{ (1)} \\ &= 573 \text{ cm}^3 \text{ (1)}\end{aligned}$$

$$\begin{array}{r} 573 \\ \hline \end{array} \text{ cm}^3 \quad (3)$$

- (b) Change 1 m^3 to cm^3

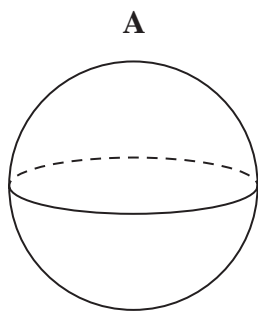
$$\begin{array}{c} \begin{array}{c} \times 100 \\ \text{m} \rightarrow \text{cm} \\ \div 100 \end{array} \quad \begin{array}{c} \times (100)^3 \\ \text{m}^3 \rightarrow \text{cm}^3 \\ \div (100)^3 \end{array} \\ 1 \text{ m}^3 \times \frac{(100)^3 \text{ cm}^3}{(1)^3 \text{ m}^3} = 1\,000\,000 \text{ (1)} \end{array}$$

$$\begin{array}{r} 1\,000\,000 \\ \hline \end{array} \text{ cm}^3 \quad (1)$$

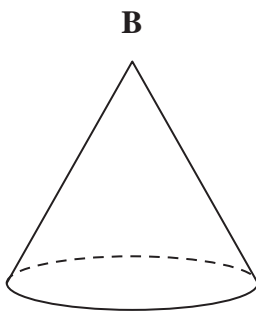
(Total for Question 2 is 4 marks)

3 Here are three 3D shapes, **A**, **B** and **C**.

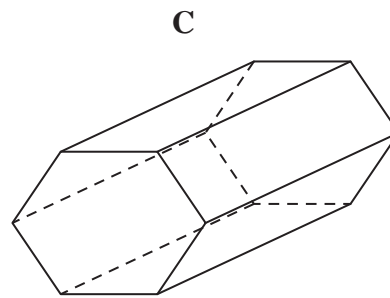
(a) Write down the mathematical name for each of these 3D shapes.



(i) Sphere (1)



(ii) Cone (1)



(iii) Prism (1)

(3)

(b) (i) How many faces does shape **C** have?

8 (1)

(ii) How many vertices does shape **C** have?

12 (1)

(2)

Here is a solid prism made from bricks.
The bricks are identical triangular prisms.

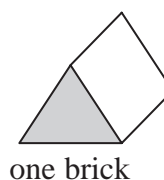
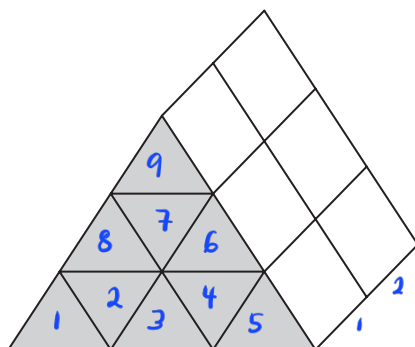


Diagram **NOT**
accurately drawn

The volume of the prism is 54 cm^3

(c) Work out the volume of each brick.

$$\begin{aligned} 1 \text{ prism} &= 2 \times 9 \\ &= 18 \text{ bricks} \end{aligned} \quad (1)$$

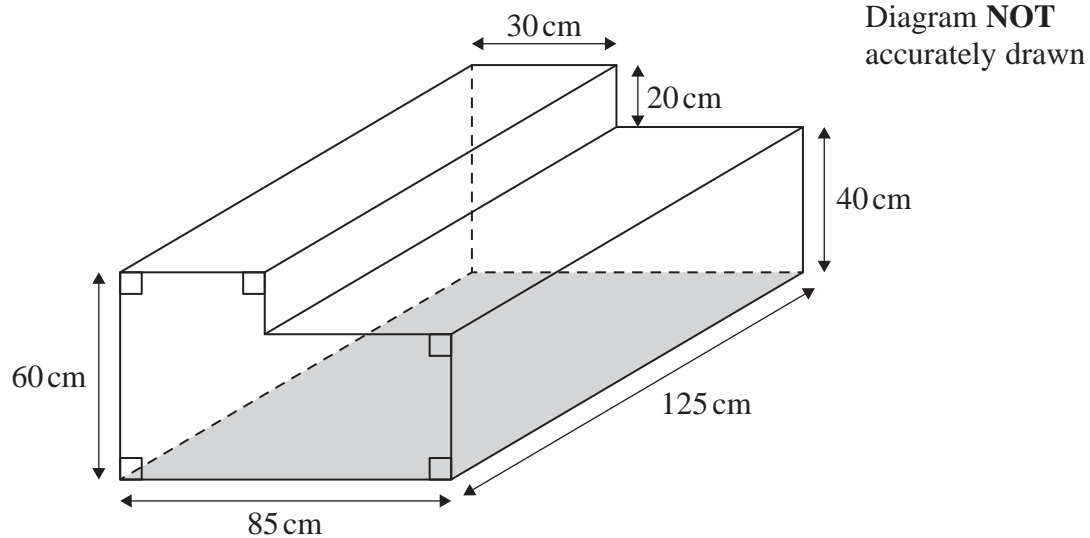
$$\text{Volume of each brick} = \frac{54 \text{ cm}^3}{18} = 3 \text{ cm}^3 \quad (1)$$

3 cm^3

(2)

(Total for Question 3 is 7 marks)

- 4 The diagram shows a container for water in the shape of a prism.



The rectangular base of the prism, shown shaded in the diagram, is horizontal.
The container is completely full of water.

Tuah is going to use a pump to empty the water from the container so that the volume of water in the container decreases at a constant rate.

The pump starts to empty water from the container at 1030 and at 1200 the water level in the container has dropped by 20 cm.

Find the time at which all the water has been pumped out of the container.

$$85 \times 125 \times 40 = 425\,000 \text{ cm}^3 \quad (\text{water left in container})$$

$$\textcircled{1} \quad 30 \times 20 \times 125 = 75\,000 \text{ cm}^3 \quad (\text{water that has been pumped out})$$

$$\frac{75\,000 \text{ cm}^3}{425\,000 \text{ cm}^3} = \frac{1.5 \text{ hour}}{x}$$

$$x = \frac{425\,000 \times 1.5}{75\,000} \quad \textcircled{2}$$

$$= 8.5 \text{ hours}$$

$$1200 + 8.5 \text{ hours} = 2030 \quad \textcircled{1}$$

$$2030$$

(Total for Question 4 is 4 marks)

5 The diagram shows a trapezium.

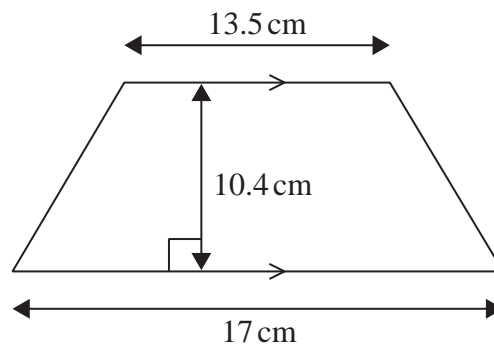


Diagram **NOT**
accurately drawn

(a) Work out the area of the trapezium.

$$= \frac{1}{2} \times (17 + 13.5) \times 10.4 \quad (1)$$

$$= \frac{1}{2} \times 30.5 \times 10.4$$

$$= 158.6 \quad (1)$$

$$\frac{158.6}{(2)} \text{ cm}^2$$

The diagram shows a cuboid.

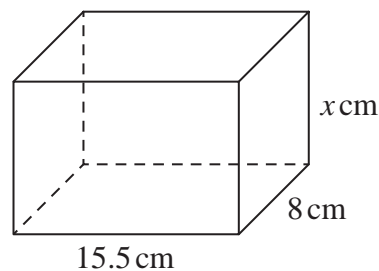


Diagram **NOT**
accurately drawn

The volume of the cuboid is 806 cm^3

(b) Work out the value of x .

$$\text{volume of cuboid} = 15.5 \times 8 \times x$$

$$= 124x$$

$$806 = 124x \quad (1)$$

$$x = 806 \div 124 \quad (1)$$

$$x = 6.5 \quad (1)$$

$$x = \frac{6.5}{(3)}$$

(Total for Question 5 is 5 marks)

6 The diagram shows a solid triangular prism.

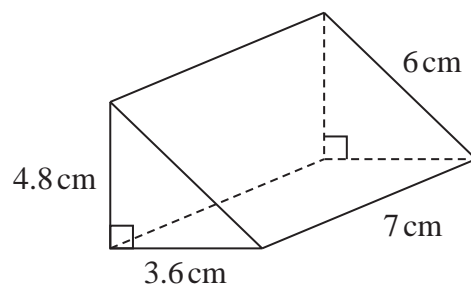


Diagram **NOT**
accurately drawn

Work out the **total** surface area of the triangular prism.
Give your answer correct to 3 significant figures.

$$\left(2 \times \frac{1}{2} \times 4.8 \times 3.6\right) + (7 \times 6) + (7 \times 3.6) + (4.8 \times 7)$$

$$= 17.28 + 42 + 25.2 + 33.6$$

$$= 118.08$$

$$\approx 118$$

118

..... cm²

(Total for Question 6 is 3 marks)