

1 A cylinder has diameter 14 cm and height 20 cm.

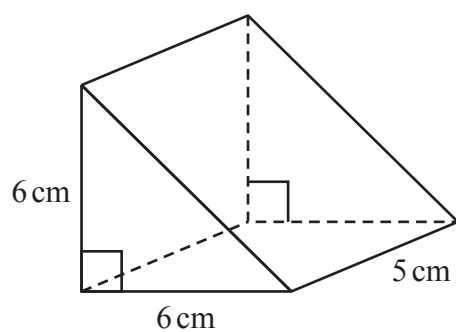
Work out the volume of the cylinder.

Give your answer correct to 3 significant figures.

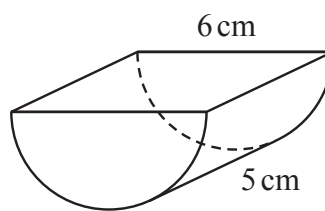
.....cm³

(Total for Question 1 is 2 marks)

- 2 The diagram shows two solid toy bricks, Brick A and Brick B.



Brick A



Brick B

Diagram **NOT**
accurately drawn

Brick A is a triangular prism of length 5 cm.

The cross section of Brick A is an isosceles right-angled triangle with equal sides of length 6 cm.

Brick B is half a cylinder of length 5 cm.

The semicircular cross section of Brick B has diameter 6 cm.

The volume of Brick A is greater than the volume of Brick B.

How much greater?

Give your answer correct to 1 decimal place.

cm³

(Total for Question 2 is 4 marks)

- 3 A cylinder is placed on the ground.

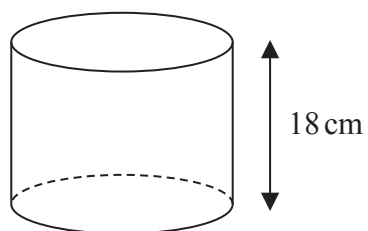


Diagram **NOT**
accurately drawn

The height of the cylinder is 18 cm.

The force exerted by the cylinder on the ground is 72 newtons.

The pressure on the ground due to the cylinder is 1.4 newtons/cm²

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

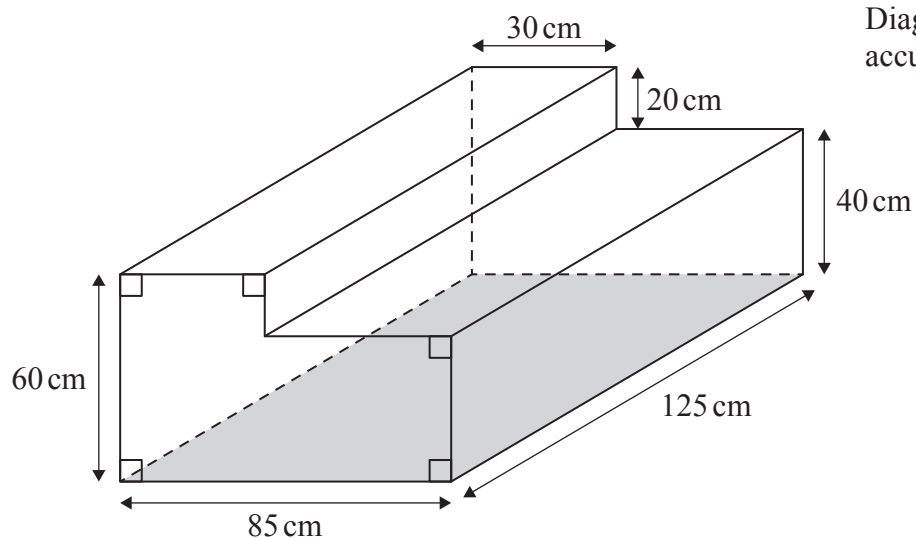
Work out the volume of the cylinder.

Give your answer correct to 3 significant figures.

..... cm³

(Total for Question 3 is 4 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.

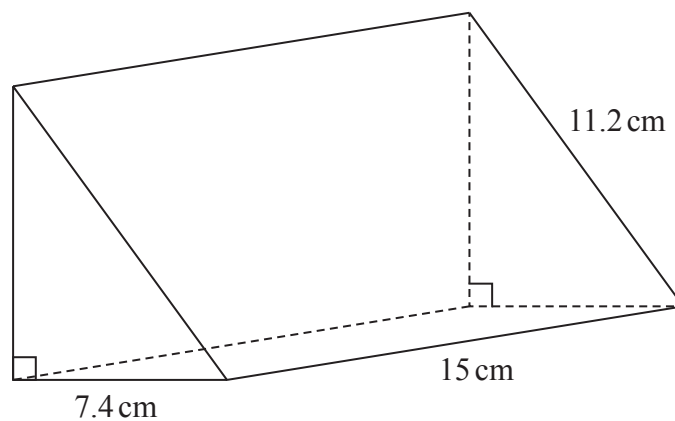
Tuah is going to use a pump to empty the water from the container so that the volume of water in the container decreases at a constant rate.

The pump starts to empty water from the container at 10 30 and at 12 00 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.

(Total for Question 4 is 4 marks)

5 Here is a triangular prism.



Work out the volume of the prism.
Give your answer correct to 3 significant figures.

..... cm³

(Total for Question 5 is 5 marks)

- 6 The diagram shows a cuboid and a cylinder.

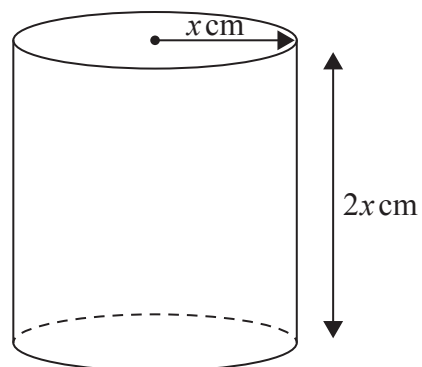
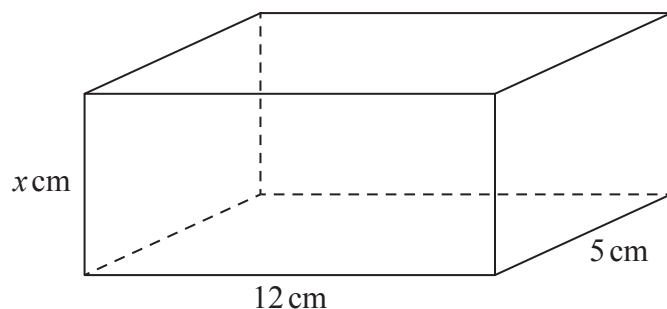


Diagram **NOT**
accurately drawn

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.

..... cm^3
(3)

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

..... cm^3
(1)

(Total for Question 6 is 4 marks)

- 7 The diagram shows a solid cube.
The cube is placed on a table so that the whole of one face of the cube is in contact with the table.

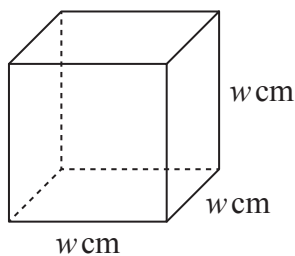


Diagram **NOT**
accurately drawn

The cube exerts a force of 56 newtons on the table.
The pressure on the table due to the cube is $0.14 \text{ newtons/cm}^2$

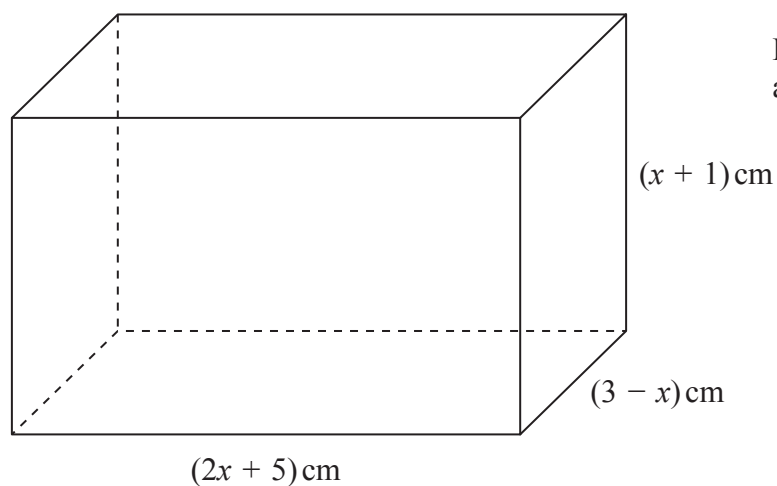
$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

Work out the volume of the cube.

..... cm^3

(Total for Question 7 is 4 marks)

8



The diagram shows a cuboid of volume $V \text{ cm}^3$

(a) Show that $V = 15 + 16x - x^2 - 2x^3$

(Total for Question 8 is 3 marks)

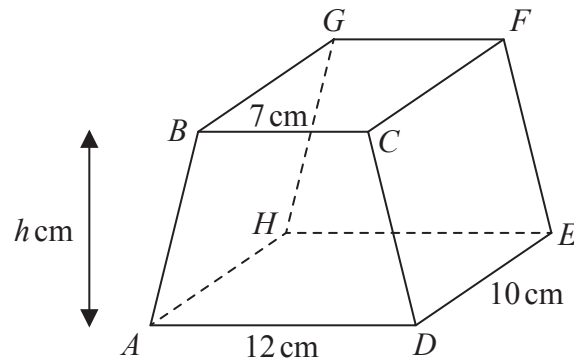


Diagram **NOT**
accurately drawn

The diagram shows a prism $ABCDEFGH$ in which $ABCD$ is a trapezium with BC parallel to AD and $CDEF$ is a rectangle.

$$BC = 7 \text{ cm} \quad AD = 12 \text{ cm} \quad DE = 10 \text{ cm}$$

The height of trapezium $ABCD$ is $h \text{ cm}$

The volume of the prism is 608 cm^3

Work out the value of h .

$$h = \dots\dots\dots$$

(Total for Question 9 is 3 marks)

- 10 The diagram shows a solid cylinder with radius 3 m.

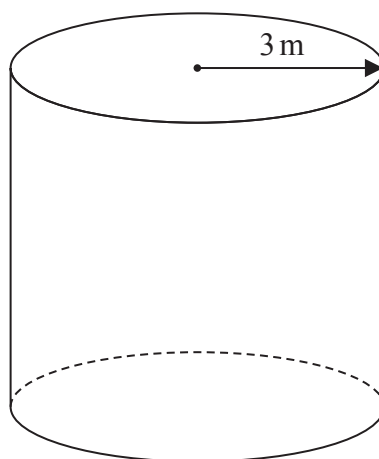


Diagram **NOT**
accurately drawn

The volume of the cylinder is $72\pi \text{ m}^3$

Calculate the **total** surface area of the cylinder.
Give your answer correct to 3 significant figures.

..... m^2

(Total for Question 10 is 5 marks)

11 The total surface area of a solid hemisphere is equal to the curved surface area of a cylinder.

The radius of the hemisphere is r cm.

The radius of the cylinder is twice the radius of the hemisphere.

Given that

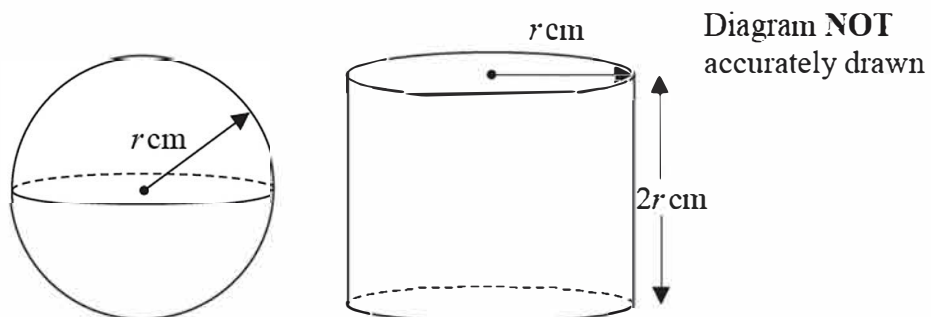
$$\text{volume of hemisphere} : \text{volume of cylinder} = 1 : m$$

find the value of m .

$$m =$$

(Total for Question 11 is 4 marks)

12 Here are a solid sphere and a solid cylinder.



The radius of the sphere is $r \text{ cm}$.

The radius of the cylinder is $r \text{ cm}$.

The height of the cylinder is $2r \text{ cm}$.

The total surface area of the cylinder is $k\pi \text{ cm}^2$

(a) Find an expression for k in terms of r .

(b) Show that the ratio

total surface area of the cylinder : total surface area of the sphere

is the same as the ratio

volume of the cylinder : volume of the sphere

(3)

(Total for Question 12 is 5 marks)