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- 1 The diagram shows a cylinder.

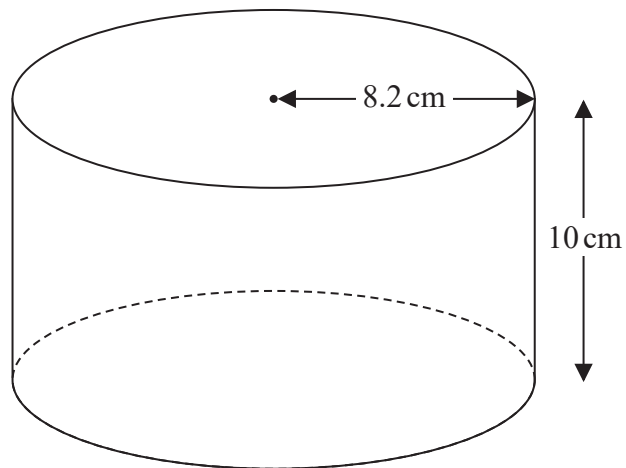


Diagram **NOT**
accurately drawn

The cylinder has radius 8.2 cm and height 10 cm.
The cylinder is empty.

Pam pours 1.5 litres of water into the cylinder.

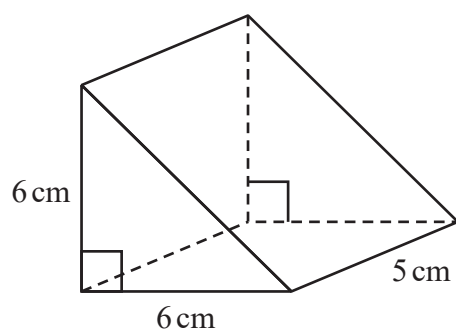
Work out the depth of the water in the cylinder.
Give your answer correct to 1 decimal place.

.....cm

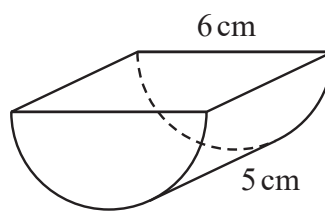
(Total for Question 1 is 3 marks)



- 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)

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- 4 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 4 is 2 marks)

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- 5 The diagram shows a cylinder.

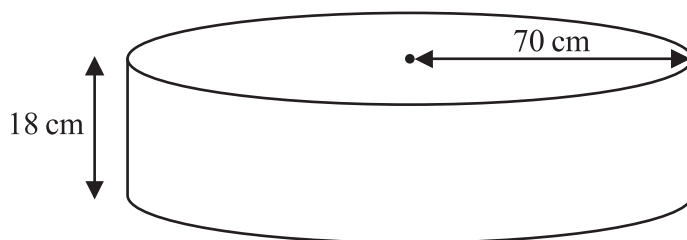


Diagram **NOT**
accurately drawn

The radius of the cylinder is 70 cm

The height of the cylinder is 18 cm

Work out the volume of the cylinder.

Give your answer in litres correct to the nearest litre.

..... litres

(Total for Question 5 is 4 marks)



- 5 The diagram shows a cuboid and a cylinder.

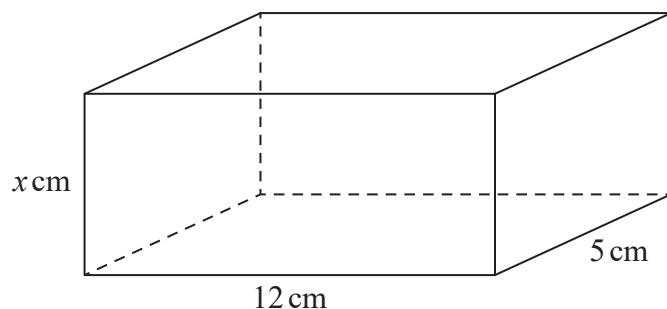
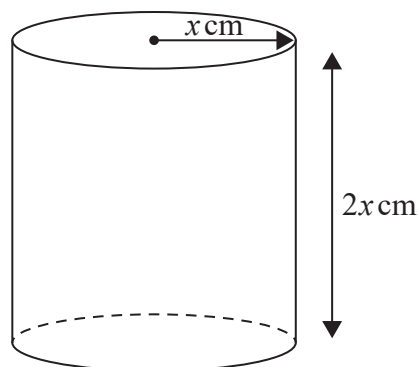


Diagram **NOT**
accurately drawn



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 5 is 4 marks)



- 7 A cylinder is placed on the ground.

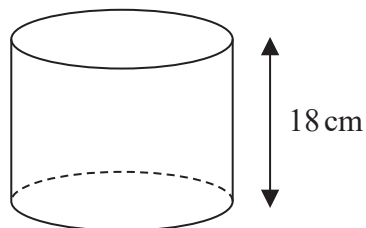


Diagram **NOT**
accurately drawn

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 7 is 4 marks)



- 8 A cylinder is placed on a table.

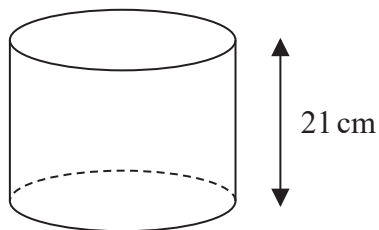


Diagram **NOT**
accurately drawn

The volume of the cylinder is 1575 cm^3

The force exerted by the cylinder on the table is 84 newtons.

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

Work out the pressure on the table due to the cylinder.

..... newtons/cm²

(Total for Question 8 is 3 marks)



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

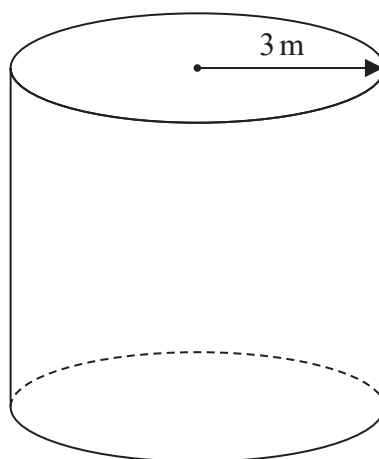


Diagram **NOT**
accurately drawn

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.

.....m²

(Total for Question 9 is 5 marks)



- 21 A solid is made from a hemisphere and a cylinder.
The plane face of the hemisphere coincides with the upper plane face of the cylinder.

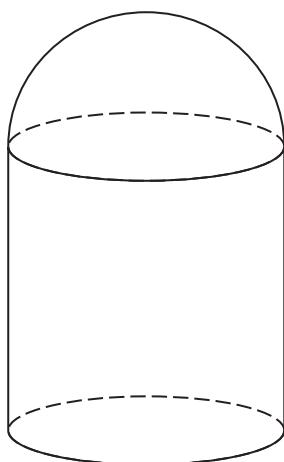


Diagram NOT
accurately drawn

The hemisphere and the cylinder have the same radius.

The ratio of the radius of the cylinder to the height of the cylinder is 1 : 3

Given that the solid has volume $792\pi \text{ cm}^3$
work out the height of the solid.

..... cm

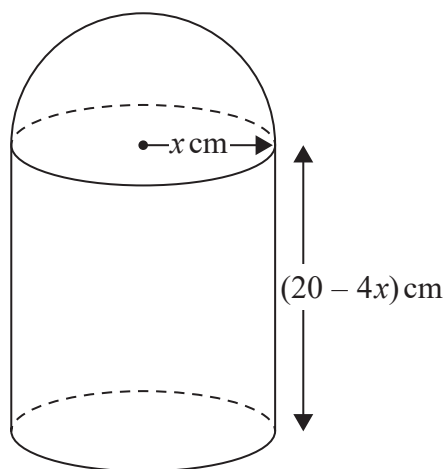
(Total for Question 21 is 5 marks)



- 17 A solid, **S**, is made from a hemisphere and a cylinder.

The centre of the circular face of the hemisphere and the centre of the top face of the cylinder are at the same point.

Diagram **NOT**
accurately drawn



The radius of the cylinder and the radius of the hemisphere are both $x \text{ cm}$.
The height of the cylinder is $(20 - 4x) \text{ cm}$.

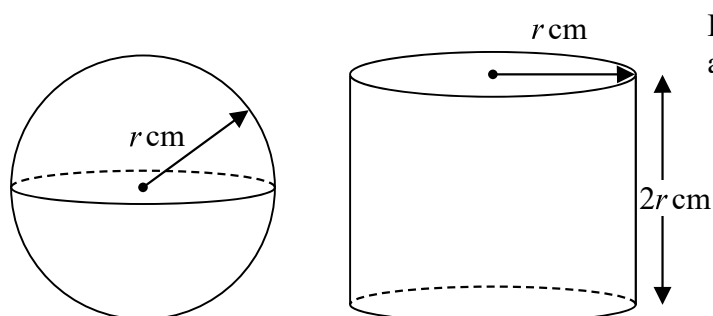
The volume of **S** is $V \text{ cm}^3$ where $V = \frac{1}{3} \pi y$

Find the maximum value of y .
Show clear algebraic working.

(Total for Question 17 is 5 marks)



17 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 .

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(2)



(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 17 is 5 marks)

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