1. Nov/2023/Paper_0580/11/No.17
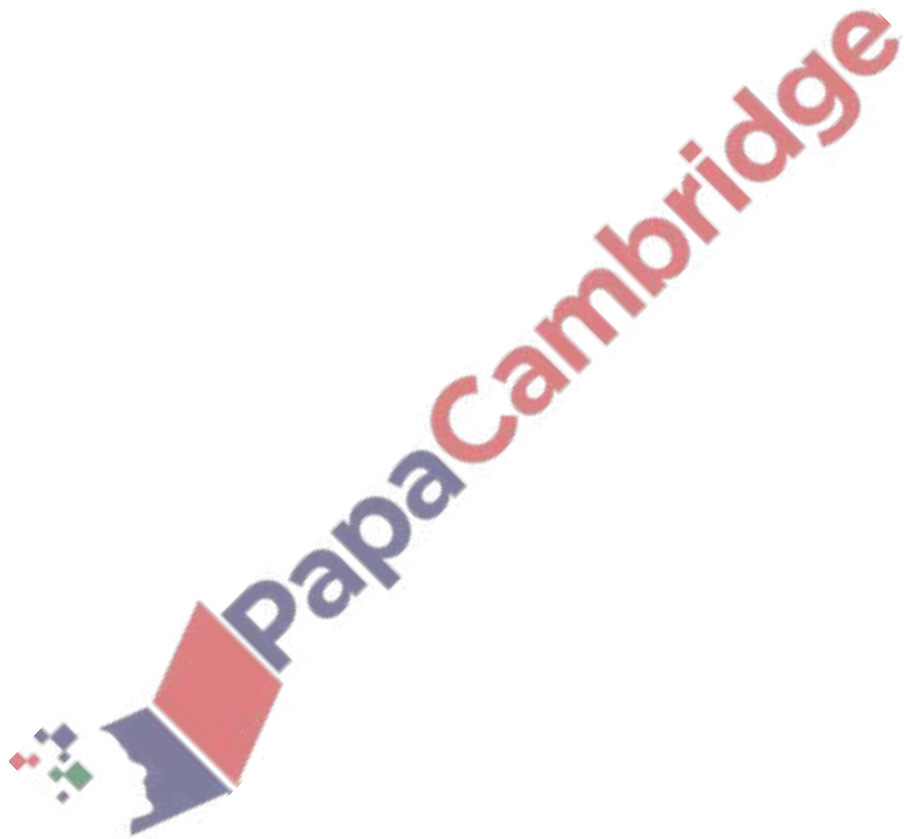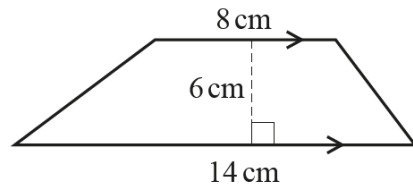
The circumference of a circle is 59 cm.

Calculate the radius of the circle.

.... cm [2]
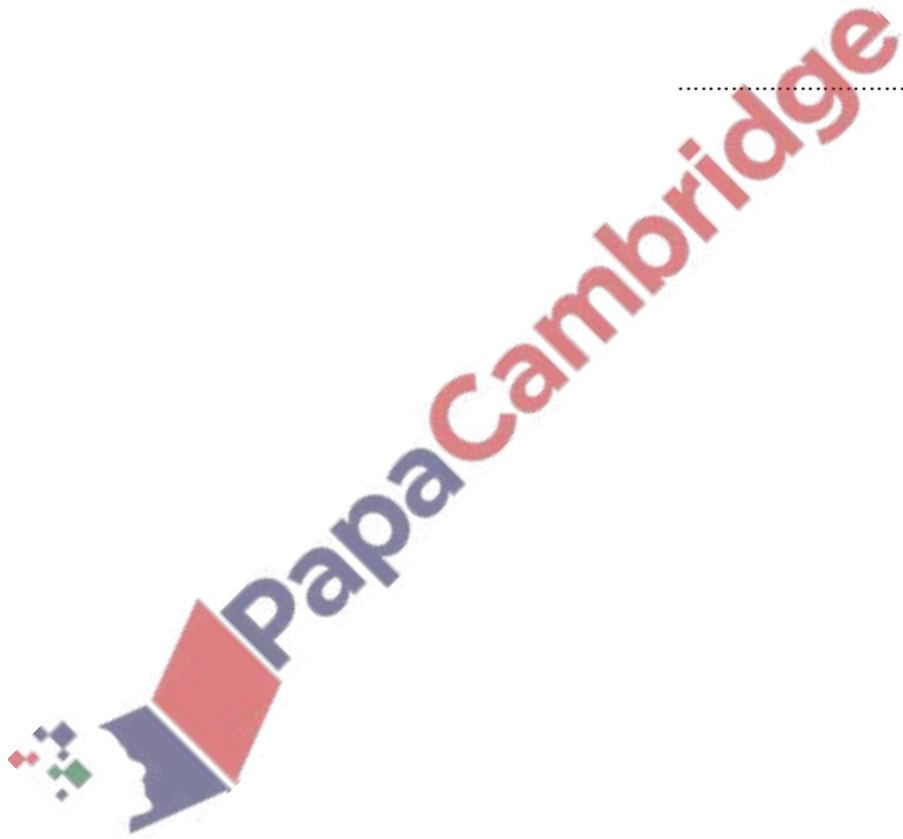
2.

8 cm

NOT TO
SCALE

6 cm

14 cm

Find the area of this trapezium.

.... cm^2 [2]

3.

Calculate the area of a semicircle with radius 10 cm.

.... cm^2 [2]

4.
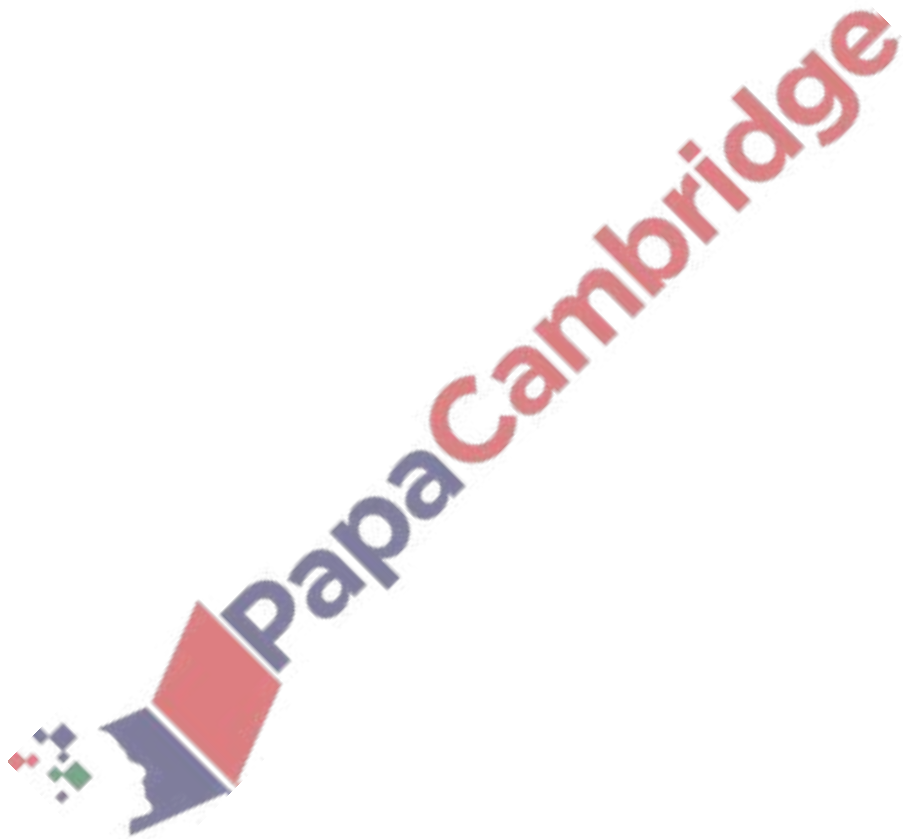
The surface area of a cube is 73.5 cm^2.

Find the length of one side of the cube.

.... cm [2]

5.
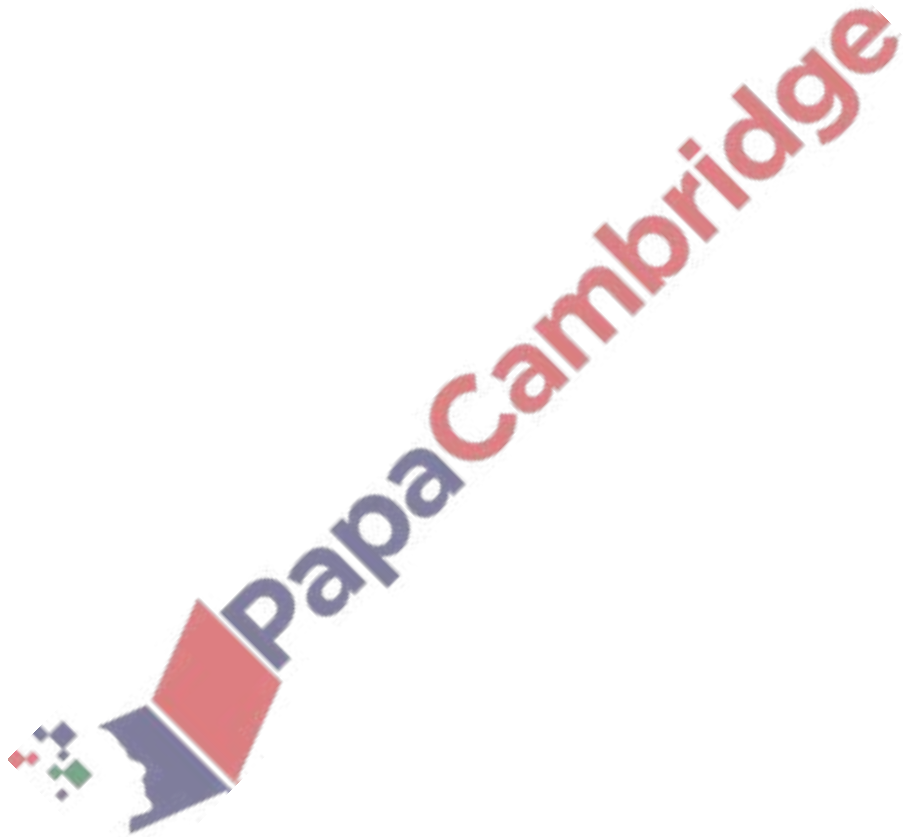
A solid cylinder has radius 5 cm and height 8 cm.

Calculate the total surface area of the cylinder.

.... cm^2 [4]
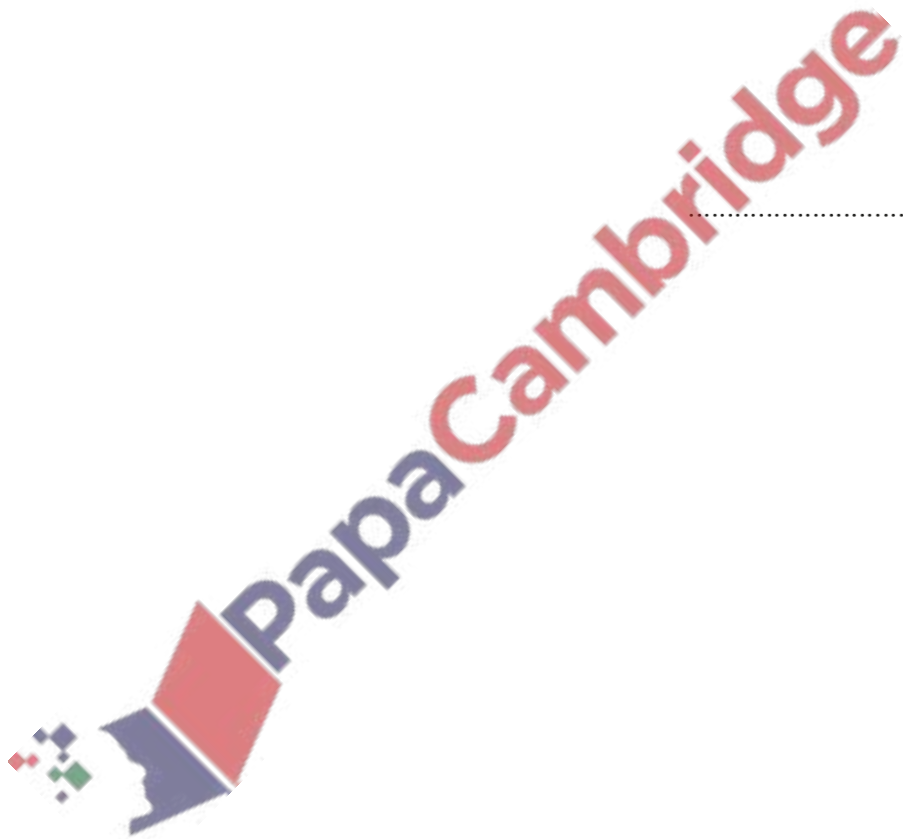
The area of a rectangle is $55.2\,\text{cm}^2$, correct to 1 decimal place.
The length of the rectangle is $9\,\text{cm}$, correct to the nearest cm.

Calculate the upper bound of the width of the rectangle.

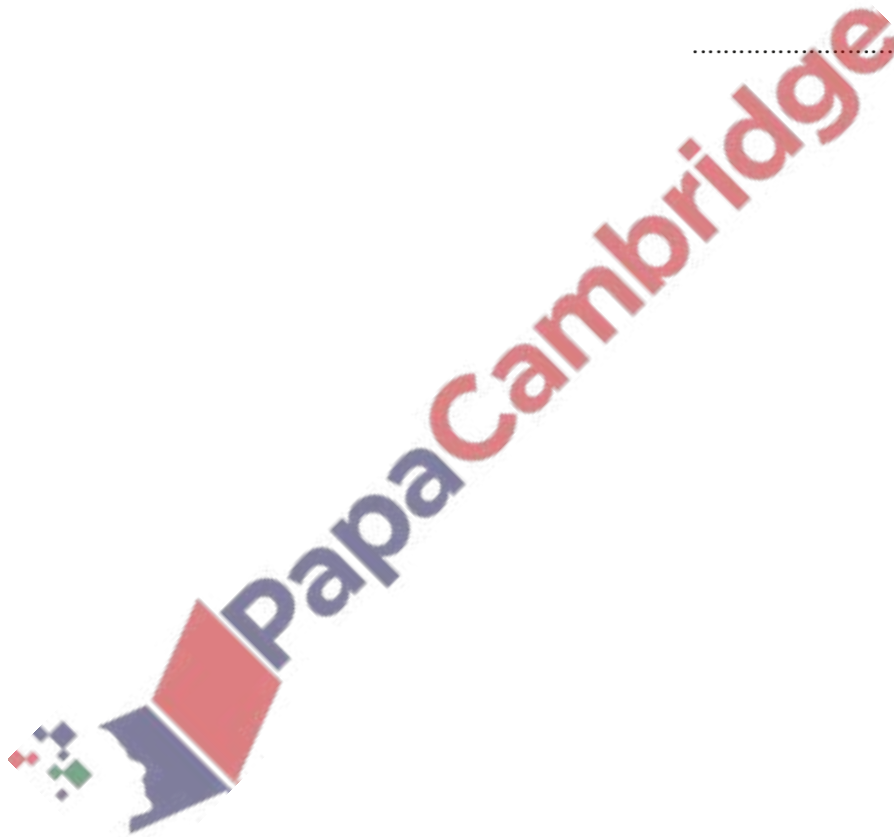.. cm [3]

7.
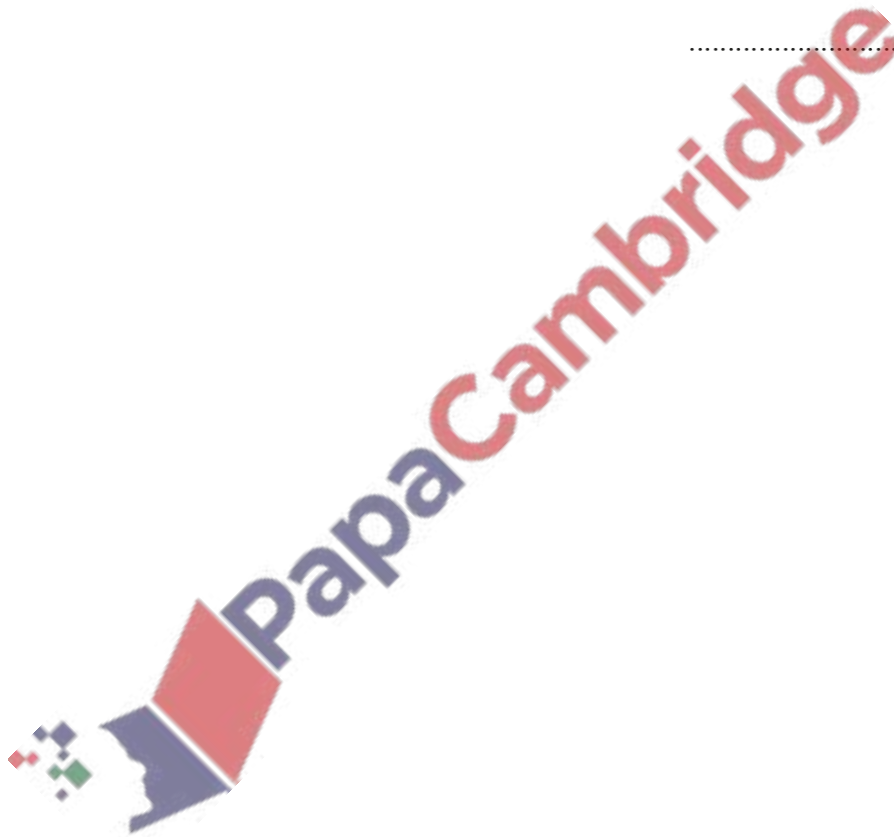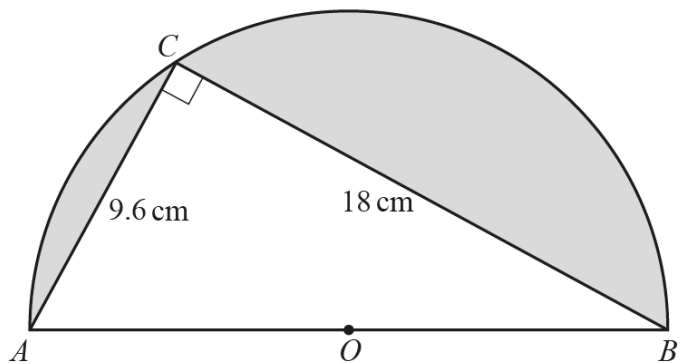
A cylinder with height 12.5 cm has a curved surface area of $105\pi\,\text{cm}^2$.

Calculate the volume of the cylinder.

.... cm^3 [4]

(a)

NOT TO
SCALE

The diagram shows a semicircle with diameter AB.
O is the midpoint of AB and C is a point on the circumference.

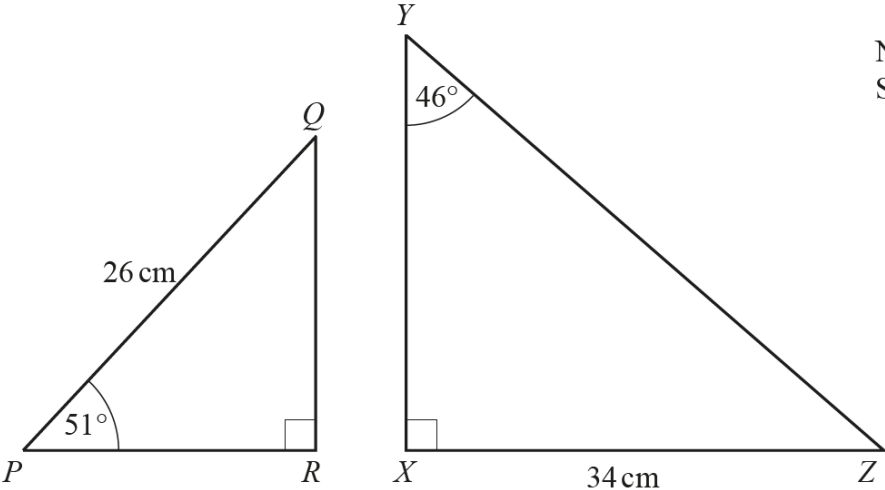**(i)** Calculate the area of triangle ABC.

.... cm^2 [2]

(ii) Show that $AB = 20.4$ cm.

[2]

(iii) Calculate the shaded area.

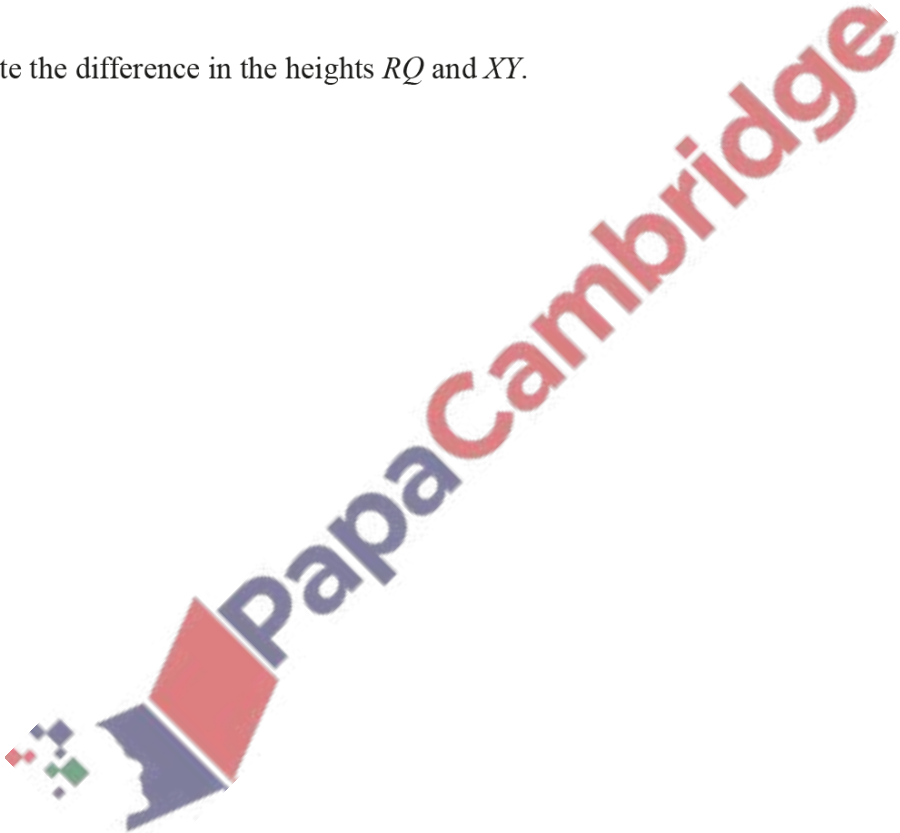.. cm^2 [2]

(b) The diagram shows two right-angled triangles, *PQR* and *XYZ*.

NOT TO SCALE

Calculate the difference in the heights *RQ* and *XY*.

.... cm [4]

(a)
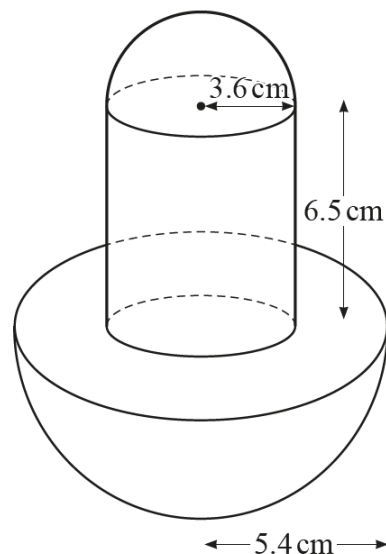
NOT TO
SCALE

The diagram shows a solid formed by joining two hemispheres and a cylinder.
The radius of the large hemisphere is 5.4 cm.
The radius of the small hemisphere and the radius of the cylinder are both 3.6 cm.
The height of the cylinder is 6.5 cm.

(i) Show that the volume of the solid is $692\,\text{cm}^3$, correct to the nearest cubic centimetre.

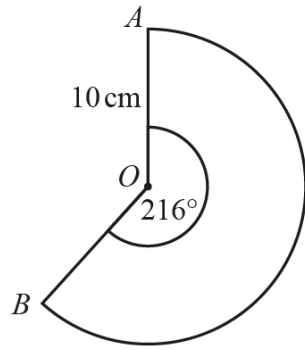[The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

[4]

(ii) A mathematically similar solid is made of silver.
In this solid, the cylinder has radius 0.6 cm.
$1\,\text{cm}^3$ of silver has a mass of 10.49 grams.

Calculate the total mass of this silver solid.

(b)

AOB is a sector of a circle, centre *O*.
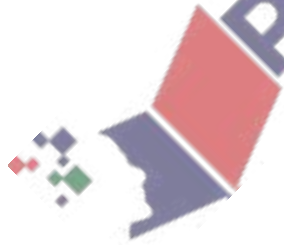*AO* = 10 cm and the sector angle is 216°.

(i) Calculate the length of the arc of this sector.
Give your answer as a multiple of π.

....cm [2]
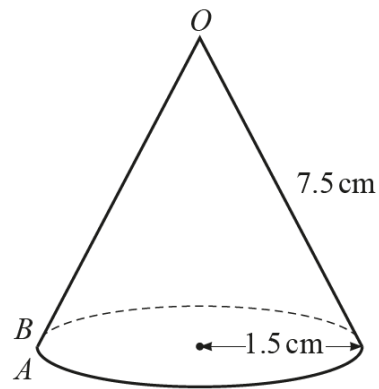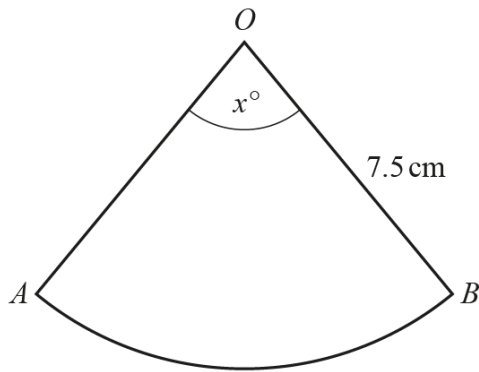
(ii) A cone is made from this sector by joining *OA* to *OB*.

Calculate the volume of the cone.
[The volume, *V*, of a cone with radius *r* and height *h* is $V = \frac{1}{3}\pi r^2 h$.]

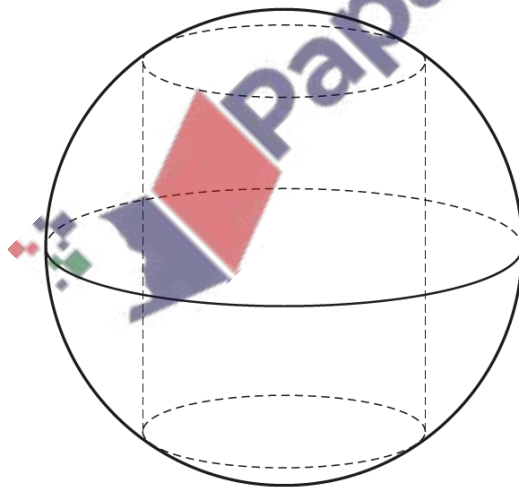.. cm^3 [4]

(a)

NOT TO SCALE

The diagram shows a sector of a circle that is made into a cone by joining OA to OB.
The sector angle is $x°$ and the radius of the sector is 7.5 cm.
The base radius of the cone is 1.5 cm.

Calculate the value of x.

$x =$ .... [3]

(b)

NOT TO SCALE

The diagram shows a cylinder with radius 8 cm inside a sphere with radius 17 cm.
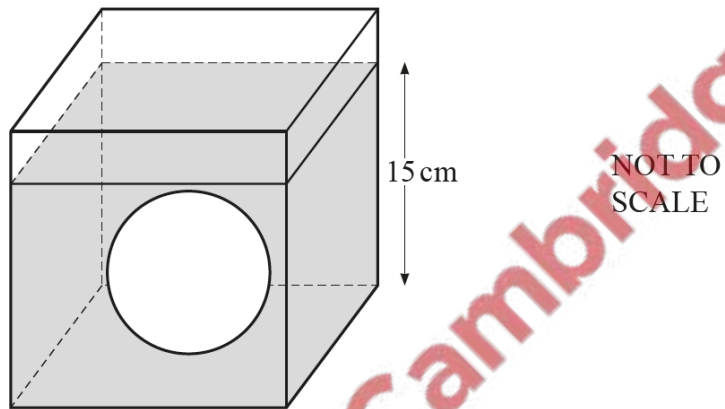Both ends of the cylinder touch the curved surface of the sphere.

(i) Show that the height of the cylinder is 30 cm.

(ii) Calculate the volume of the cylinder as a percentage of the volume of the sphere.

[The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

.... % [4]

(c)

The diagram shows a solid sphere with radius 6 cm inside a cube with side length 20 cm.
The cube contains water to a depth of 15 cm.
The sphere is removed.

Calculate the new depth of water in the cube.

[The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]