Revision – Volume and Surface Area

1.

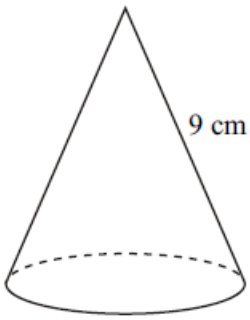


Diagram **NOT** accurately drawn

A solid cone has a slant height of 9 cm.
The **curved** surface area of the cone is 100 cm^2.

Calculate the volume of the cone.
Give your answer correct to 3 significant figures.

(5 marks)

2.

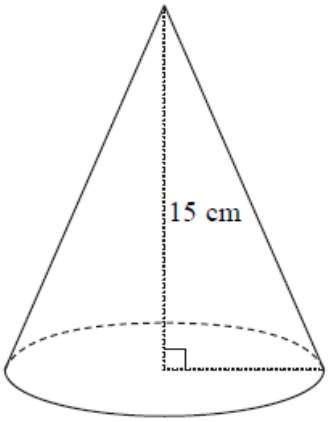


Diagram **NOT** accurately drawn

A solid cone has a height of 15 cm.
The volume of the cone is 320π cm^3

Work out the curved surface area of the cone.
Give your answer correct to 3 significant figures.

(5 marks)

3.

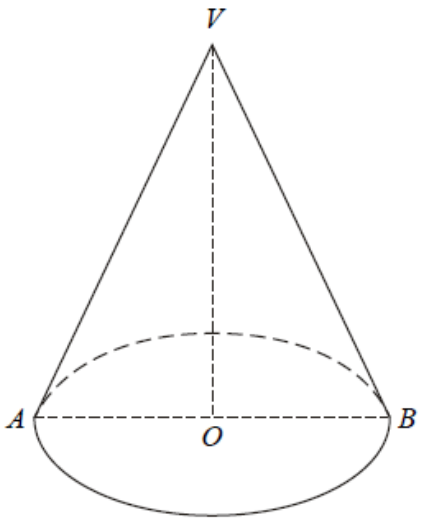


Diagram **NOT** accurately drawn

The diagram shows a solid cone.
The base of the cone is a horizontal circle, centre O, with radius 4.5 cm.
AB is a diameter of the base and OV is the vertical height of the cone.
The curved surface area of the cone is 130 cm^2

Calculate the size of the angle AVB.

Give your answer correct to 1 decimal place.

(4 marks)

4.

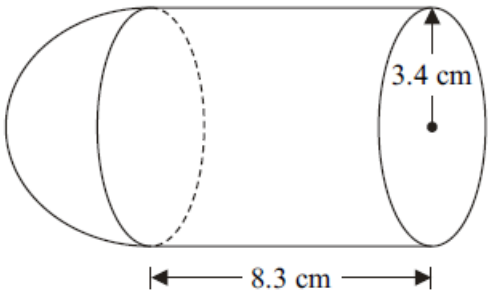


Diagram **NOT** accurately drawn

The diagram shows a shape made from a solid cylinder and a solid hemisphere.
The cylinder has a radius of 3.4 cm and a length of 8.3 cm.
The hemisphere has a radius of 3.4 cm.

Calculate the total surface area of the solid shape.
Give your answer correct to 3 significant figures.

(4 marks)

5.

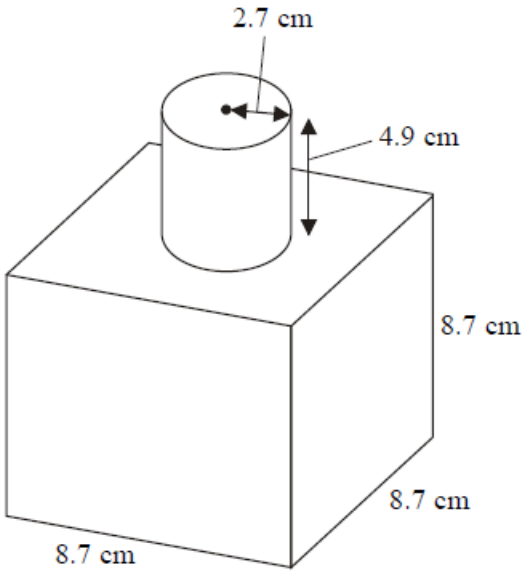


Diagram **NOT** accurately drawn

The diagram shows a shape made from a solid cube and a solid cylinder.
The cube has sides of length 8.7 cm.
The cylinder has a radius of 2.7 cm and a height of 4.9 cm.

Calculate the total surface area of the solid shape.
Give your answer correct to 3 significant figures.

(3 marks)

6.

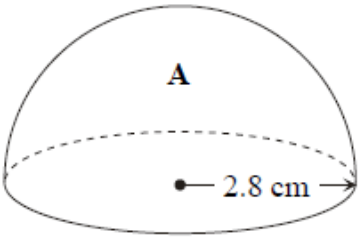


Diagram **NOT** accurately drawn

A solid hemisphere **A** has a radius of 2.8 cm.

(a) Calculate the **total** surface area of hemisphere **A**.
Give your answer correct to 3 significant figures.

..... cm^2
(3)

A larger solid hemisphere **B** has a **volume** which is 125 times the volume of hemisphere **A**.

(b) Calculate the **total** surface area of hemisphere **B**.
Give your answer correct to 3 significant figures.

..... cm^2
(3)

7.

A cone has slant height 4 cm and base radius r cm.

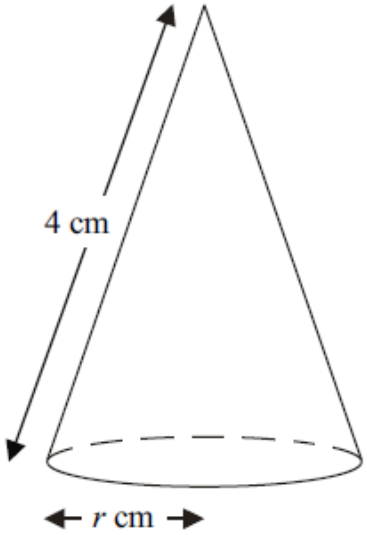


Diagram **NOT** accurately drawn

The **total** surface area of the cone is $\frac{33}{4}\pi$ cm^2.

Calculate the value of r.

(4 marks)

8.

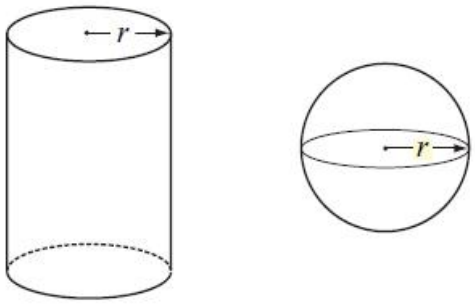


Diagram **NOT** accurately drawn

The diagram shows a solid cylinder and a solid sphere.
The cylinder has radius r.
The sphere has radius r.

Given that $\dfrac{\textbf{Total surface area of cylinder}}{\text{Surface area of sphere}} = 2$

find the value of $\dfrac{\text{Volume of cylinder}}{\text{Volume of sphere}}$

(5 marks)

9.

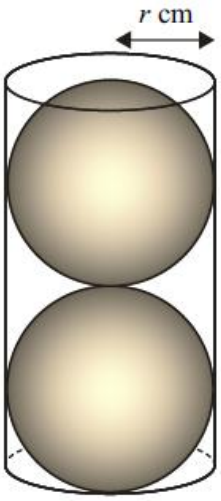


Diagram **NOT** accurately drawn

Two solid spheres, each of radius r cm, fit exactly inside a hollow cylinder.
The radius of the cylinder is r cm.
The height of the cylinder is equal to $4r$ cm.

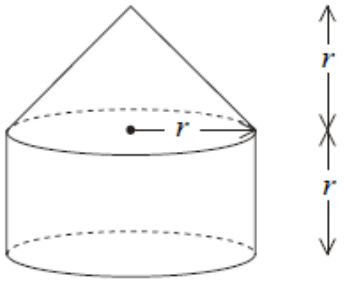
The volume of the space inside the cylinder, not occupied by the spheres, is $\frac{125}{6}\pi$ cm^3

Calculate the value of r.

Show your working clearly.

(5 marks)

10.



The diagram shows a solid made from a cone and a cylinder.
The cylinder has radius r and height r.
The cone has base radius r and height r.

(a) Show that the total volume of the solid is equal to the volume of a sphere of radius r.

(2)

The curved surface area of a cylinder with base radius r and height h is $2\pi rh$.
The curved surface area of a cone with base radius r and slant height l is πrl.

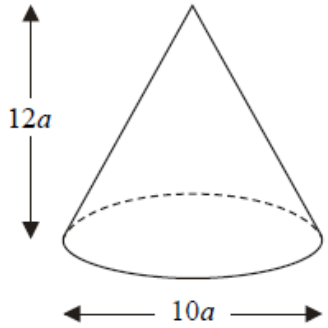
(b) Show that the **total** surface area of the above solid is greater than the surface area of a sphere of radius r.

(3)

11.

The diagram shows a solid cone.

Diagram **NOT** accurately drawn



The diameter of the base of the cone is $10a$ cm.
The height of the cone is $12a$ cm.

The total surface area of the cone is 360π cm^2
The volume of the cone is $k\pi$ cm^3, where k is an integer.

Find the value of k.

(6 marks)

12.

The diagram shows a cylinder and a sphere.

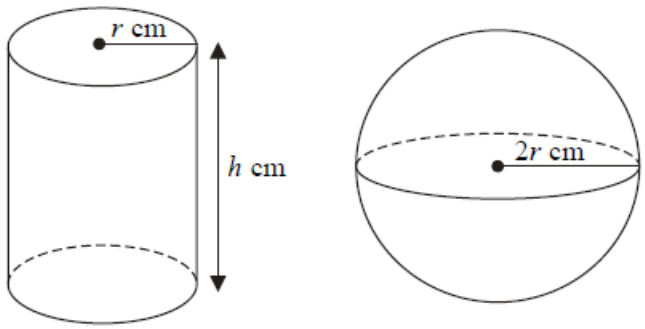


Diagram **NOT** accurately drawn

The cylinder has radius r cm and height h cm.
The sphere has radius $2r$ cm.

The volume of the cylinder is equal to the volume of the sphere.
Find an expression for h in terms of r.
Give your answer in its simplest form.

(3 marks)