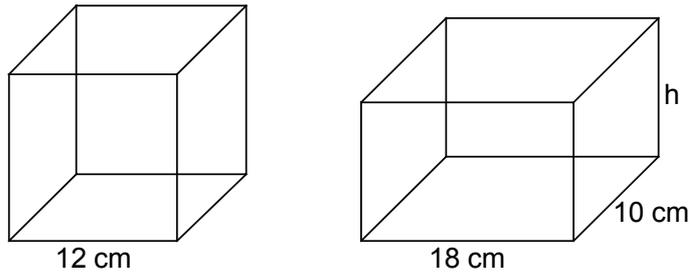


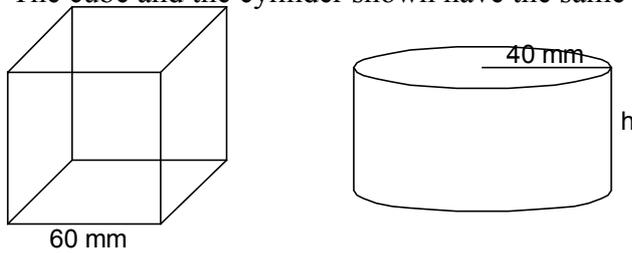
## Volume 4

1. A cube has length of side 12 centimetres. This cube and a cuboid have the same volume.



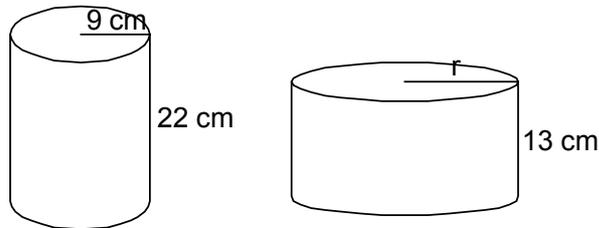
Calculate  $h$ , the height of the cuboid.

2. The cube and the cylinder shown have the same volume.



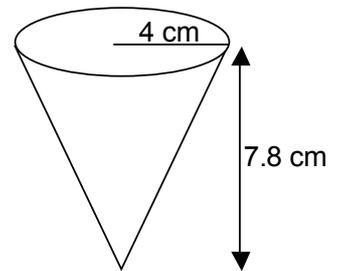
Calculate the height  $h$ , of the cylinder.

3. The two cylinders shown have the same volume.

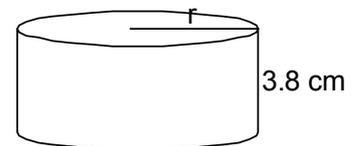


Calculate the radius  $r$ , of the second cylinder.

4. (a) Find the volume of the cone shown opposite.

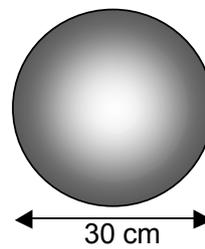


- (b) The cylinder shown has the same volume as the cone in part (a).

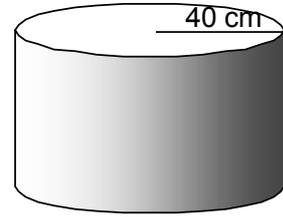


Find the radius of this cylinder.

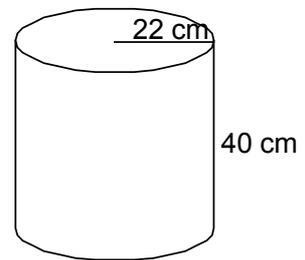
5. (a) The diagram shows a sphere of diameter 30 cm.  
Calculate the volume of this sphere.



- (b) The cylinder shown has a volume **double** that of the sphere.  
Calculate the height of this cylinder.

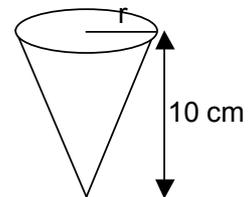


6. (a) A cylindrical container is filled with water.  
Calculate the volume of water in the container.



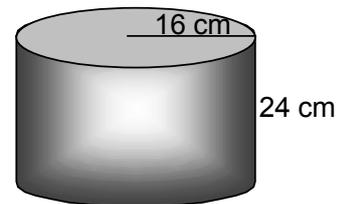
- (b) The container above can fill 500 paper cups in the shape of a cone.

Find the radius  $r$ , of the cone.



7. (a) A solid metal cylinder of height 24 cm and radius of base 16 cm, is shown opposite.

Calculate the volume of this cylinder.



- (b) This cylindrical piece of metal is melted down to make 400 identical ball-bearings.

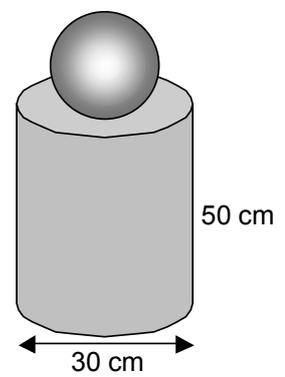
Calculate the radius of one of these ball-bearings.



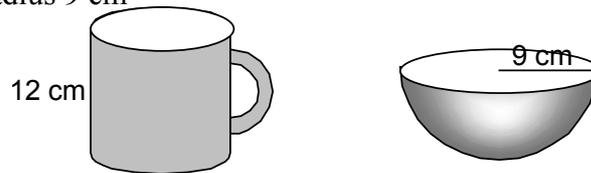
8. A concrete bollard is in the shape of a cylinder with a sphere placed on top.  
The height of the cylinder is 50 cm and the diameter of its base is 30 cm.

The total volume of concrete used to make the bollard is  $42\,500\text{ cm}^3$ .

Calculate the radius of the sphere.



9. Below are shown a cylindrical mug of height 12 cm and a hemispherical bowl of radius 9 cm

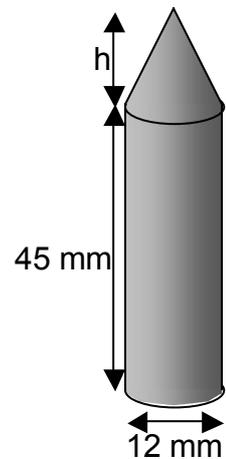


- (a) Calculate the volume of the bowl.  
(b) The mug has the same volume as the bowl. Calculate the radius of the mug.

10. The diagram shows a part of an industrial lathe.  
The part shown is in the shape of a cylinder with a conical top.

The total volume of the part is  $5466\text{ mm}^3$ .

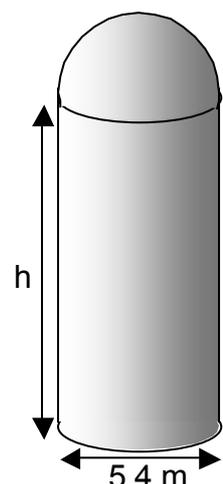
- (a) Calculate the volume of the cylindrical section.  
(b) Calculate the height of the conical section.



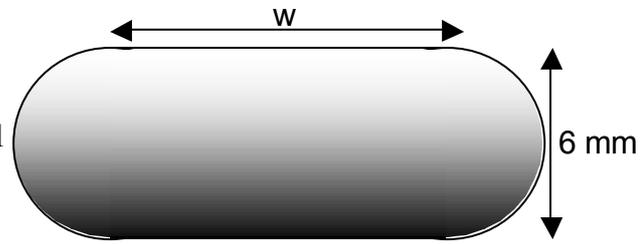
11. A grain silo is in the shape of a cylinder with a hemispherical top. The diameter of the base of the silo is 5.4 metres.

The total volume of the silo is  $499\text{ m}^3$ .

- (a) Calculate the volume of the hemispherical part of the silo.  
(b) Calculate the height,  $h$ , of the cylindrical part of the silo.  
(c) Calculate the total height of the silo.



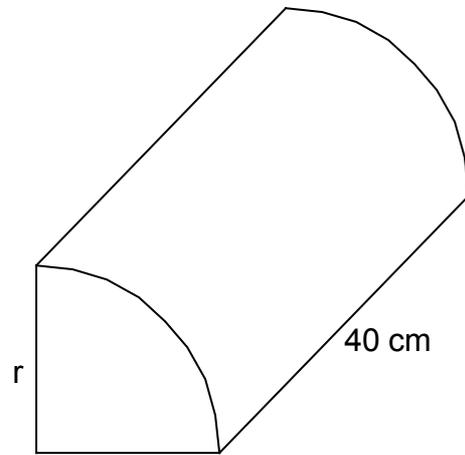
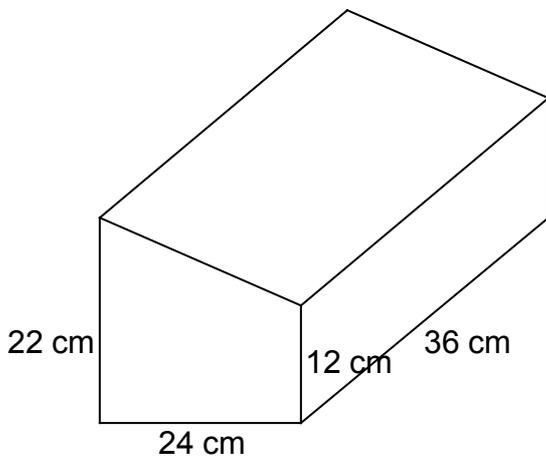
12. The diagram shows a painkilling capsule.  
The capsule is in the shape of a cylinder with hemispherical ends. The diameter of the cylindrical part of the capsule is 6 millimetres.



The total volume of the capsule is  $509 \text{ mm}^3$ .

- (a) Calculate the total volume of the hemispherical ends of the capsule.  
(b) Calculate the length  $w$ , and hence write down the length of the capsule.

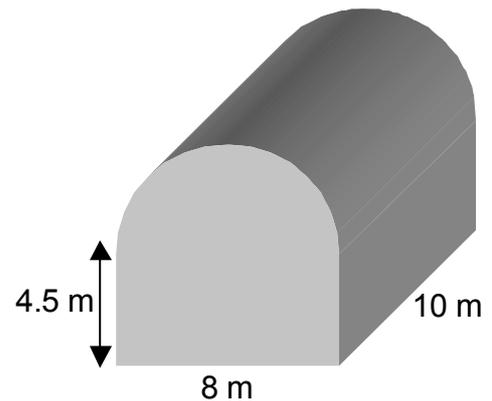
13. Two bread bins with the same volume are shown below.  
One bread bin has a cross-section in the shape of a rectangle and a right-angled triangle.  
The cross-section of the other bread bin is in the shape of a quarter circle.



Calculate the radius,  $r$ , of the second bread bin.

14. (a) The diagram shows a storage barn.  
The cross-section of the barn is in the shape of a rectangle with a semi-circular top.

Calculate the volume of this barn.



- (b) Another storage barn, with a cross-section in the shape of a semi-circle, has a volume 90% of the barn in (a).

Find the diameter,  $d$ , of this barn

