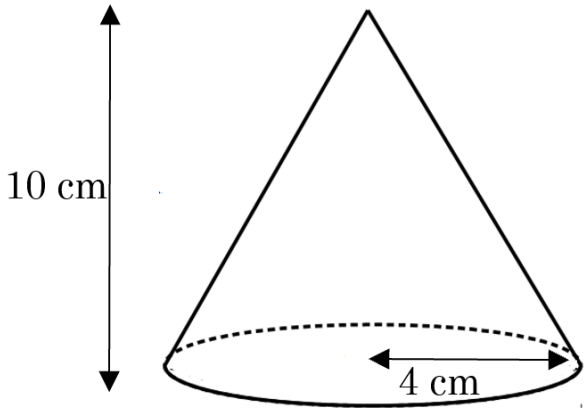
Spheres and Cones Exam Practice

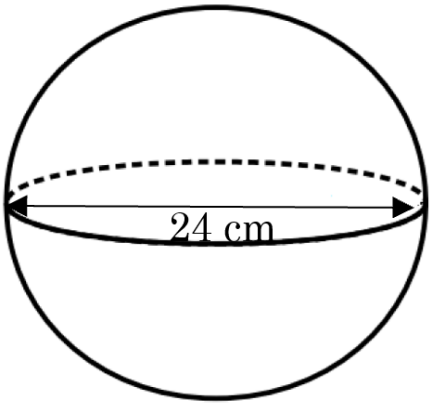
Q1. The height of a cone is 10 cm and the radius of the base is 4 cm.
Work out the volume of the cone to 1 d.p.



Answer: _____

(2 marks)

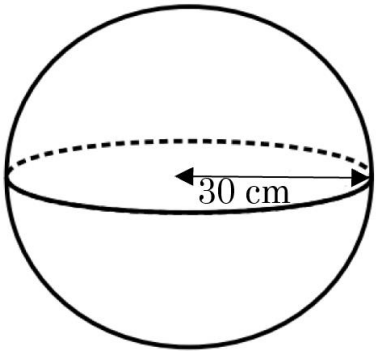
Q2. A sphere has diameter 24cm. Find the volume of the sphere to 2 d.p.



Answer: _____

(2 marks)

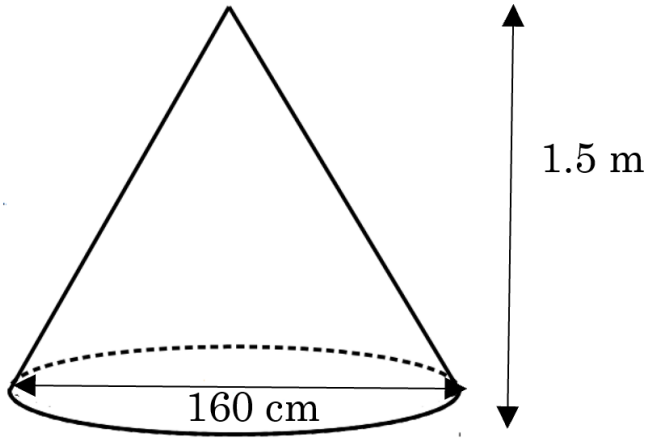
Q3. Work out the surface area of the sphere with radius shown. Leave your answer in terms of π.



Answer: _____

(2 marks)

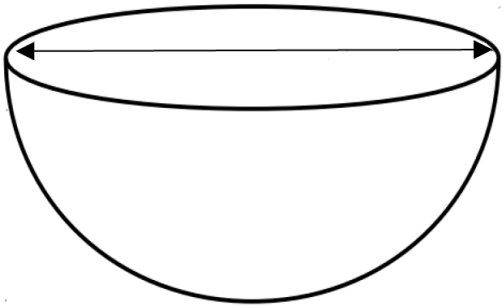
Q4. Work out the surface area of the cone shown. Leave your answer in terms of π.



Answer: _____

(2 marks)

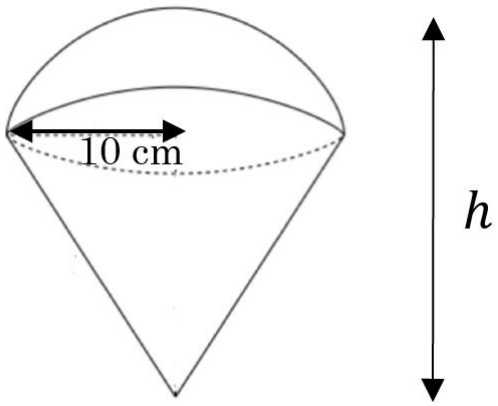
Q5. The volume of the semi-sphere below is $\frac{2197\pi}{6}$ cm^3. Find the diameter of the shape, shown.



Answer: _____

(3 marks)

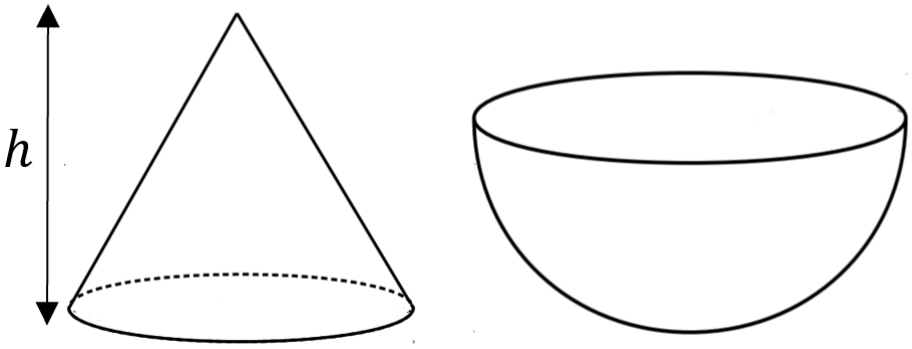
Q6. The shape below is a cone with a hemi-sphere on top. If the volume of the shape is 2000π cm^3, find the height of the shape h.



Answer: _____

(3 marks)

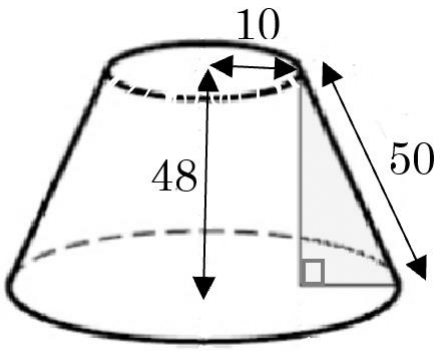
Q7. The two shapes below have the same volume. The ratio of the radius of the cone to the diameter of the hemi-sphere is 2 : 5. Find an exact expression for the value of h in terms of r.



Answer: _____

(4 marks)

Q8. The top of the frustum below has a radius of 10 cm, and the perpendicular height of the shape is 48 cm. Find the volume to 3 s.f.

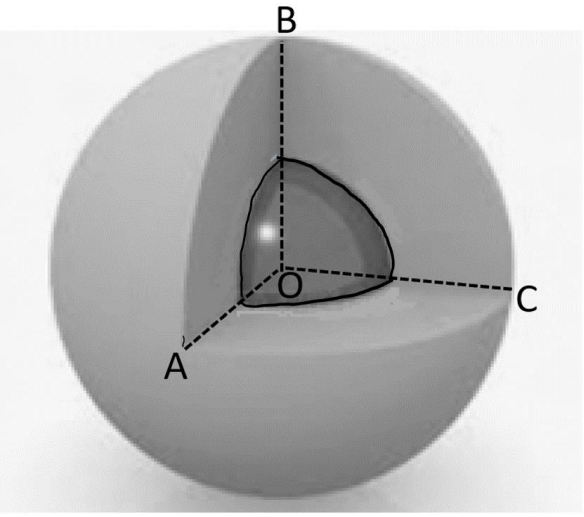


Answer: _____

(3 marks)

Q9. A model of the planet Mercury is made in the shape below, consisting of a smaller sphere, representing the planets core, inside a larger sphere. As shown, a portion of the shape has been removed to reveal the core, from which nothing has been removed.

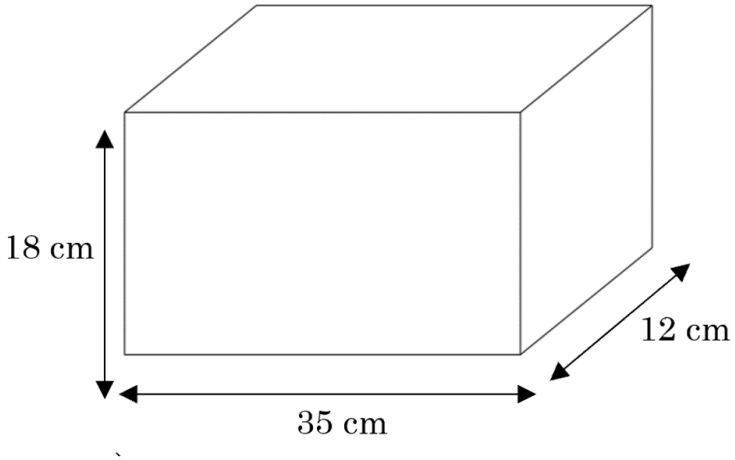
The centre of the model is O, with angles AOB and BOC are 90°. If the radius of the larger sphere is 15 cm and the radius of the smaller sphere is 9 cm, find the surface area of the model.



Answer: _____

(4 marks)

Q10. Below is a tank in the shape of a cuboid. As part of an experiment, it is filled to two-thirds of its capacity with water.
A number metal spheres, each of radius 8 mm, are dropped into the water and sink to the bottom. Work out the number of spheres required to raise the water level in the tank by at least 5%.



Answer: _____

(3 marks)