Name: _____

GCSE (1 – 9)

Spheres and Cones

Instructions

• Use **black** ink or ball-point pen.
• Answer all Questions.
• Answer the Questions in the spaces provided
– *there may be more space than you need.*
• Diagrams are **NOT** accurately drawn, unless otherwise indicated.
• You must **show all your working out.**

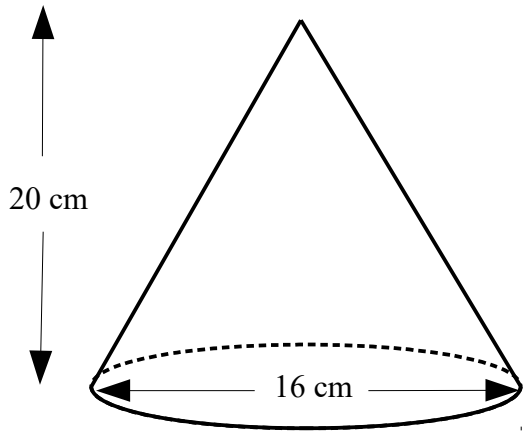
Information

• The marks for each Question are shown in brackets
– *use this as a guide as to how much time to spend on each Question.*

Advice

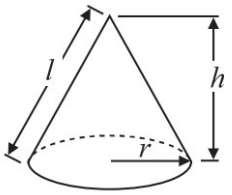
• Read each Question carefully before you start to answer it.
• Keep an eye on the time.
• Try to answer every Question.
• Check your answers if you have time at the end

1 The diagram shows a cone.



Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi r l$



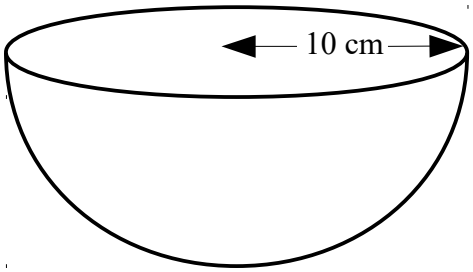
The height of the cone is 20 cm.
The base of the cone has a diameter of 16 cm.

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

..... cm^3

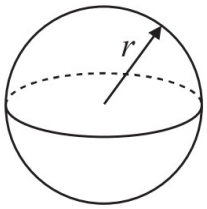
(Total for Question 1 is 2 marks)

2 The diagram shows a solid hemisphere with a radius of 10 cm.



Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$

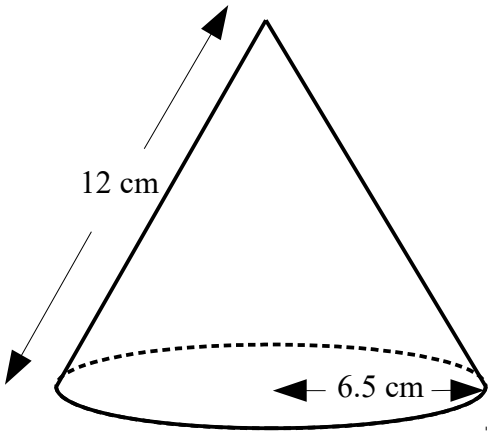


Work out the total surface area of the hemisphere.
Give your answer in terms of π.

..... cm^2

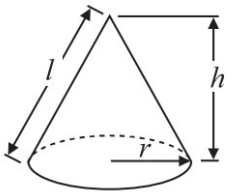
(Total for Question 2 is 3 marks)

3 The diagram shows a solid cone.



Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi r l$



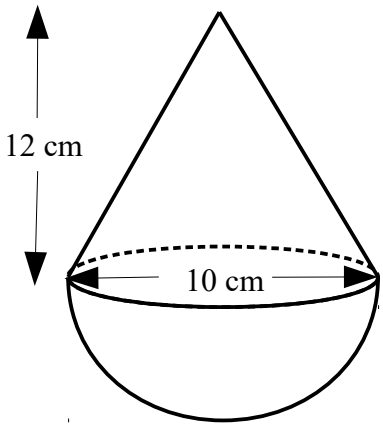
The slanted height of the cone is 12 cm.
The base of the cone has a radius of 6.5 cm.

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

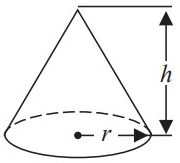
..... cm^2

(Total for Question 3 is 3 marks)

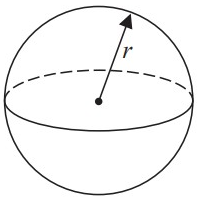
4 The diagram shows a solid shape.
The shape is a cone on top of a hemisphere.



Volume of a cone = $\frac{1}{3}\pi r^2 h$



Volume of a sphere = $\frac{4}{3}\pi r^3$



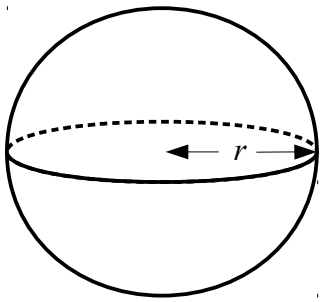
The height of the cone is 12 cm.
The base of the cone has a diameter of 10 cm.
The diameter of the hemisphere is 10 cm.

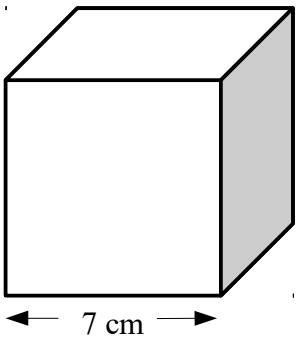
Work out the total volume of the solid shape.
Give your answer in terms of π.

..... cm^3

(Total for Question 4 is 4 marks)

5 The diagram shows a sphere and a cube.





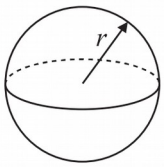
The cube has length 7 cm.

The sphere and the cube have the same volume.
Work out the radius of the sphere.

Give your answer correct to 3 significant figures.

Volume of sphere = $\frac{4}{3}\pi r^3$

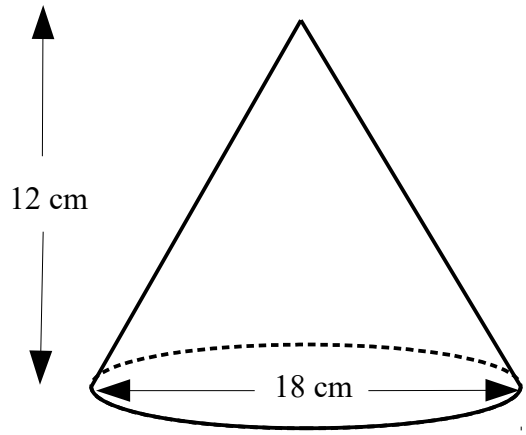
Surface area of sphere = $4\pi r^2$



..... cm

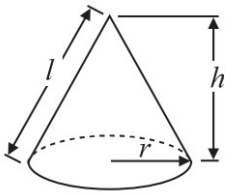
(Total for Question 5 is 3 marks)

6 The diagram shows a solid cone.



Volume of cone $= \frac{1}{3}\pi r^2 h$

Curved surface area of cone $= \pi r l$



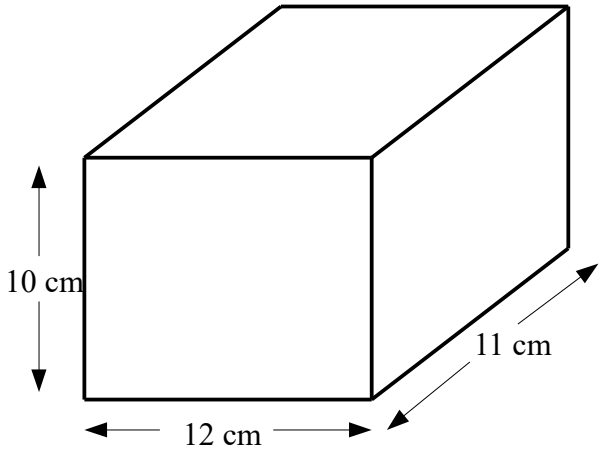
The height of the cone is 12 cm.
The base of the cone has a diameter of 18 cm.

Work out the total surface area of the cone.
Give your answer in terms of π.

.....

(Total for Question 6 is 4 marks)

7



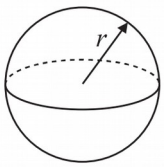
A rectangular container is 12 cm long, 11 cm wide and 10 cm high.
The container is filled with water to a depth of 8 cm.

A metal sphere of radius 3.5 cm is placed in the water.
It sinks to the bottom.

Calculate the rise in the water level.
Give your answer correct to 3 significant figures

Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$



..... cm

(Total for Question 7 is 4 marks)