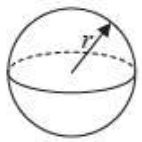
GCSE QUESTIONS

Q1. NON-CALCULATOR

Jan has some metal that she is going to make into solid metal spheres.

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



Each sphere will have a radius of 2.15 cm.

Jan has 1490 cm^3 of metal.

(a) Work out an estimate for the number of spheres that Jan can make.

.....

(3)

(b) If you calculate the number of spheres accurately, how do you think your answer to part (a) will change?

Give a reason for your answer.

.....

.....

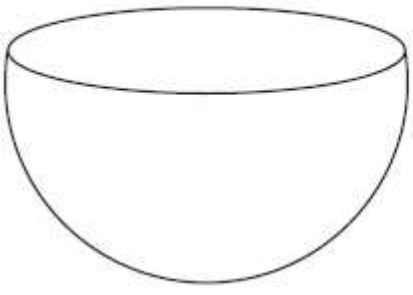
.....

(1)

(Total for question = 4 marks)

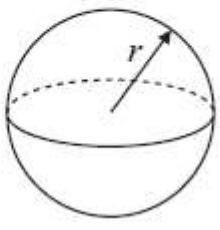
Q2. NON-CALCULATOR

The diagram shows a solid hemisphere.



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

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



The volume of the hemisphere is $\frac{250\pi}{3}$

Work out the exact total surface area of the solid hemisphere.
Give your answer as a multiple of π.

..... cm^2

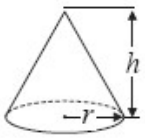
(Total for question is 4 marks)

Q3. NON-CALCULATOR

A cone has a volume of 98 cm^3.
The radius of the cone is 5.13 cm.

(a) Work out an estimate for the height of the cone.

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



..... cm

(3)

John uses a calculator to work out the height of the cone to 2 decimal places.

(b) Will your estimate be more than John's answer or less than John's answer? Give reasons for your answer.

.....

.....

.....

(1)

(Total for question = 4 marks)

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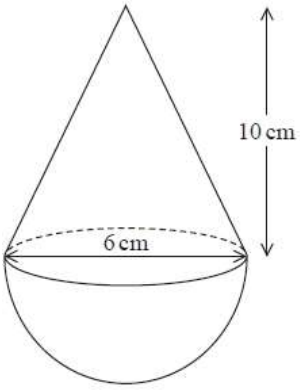
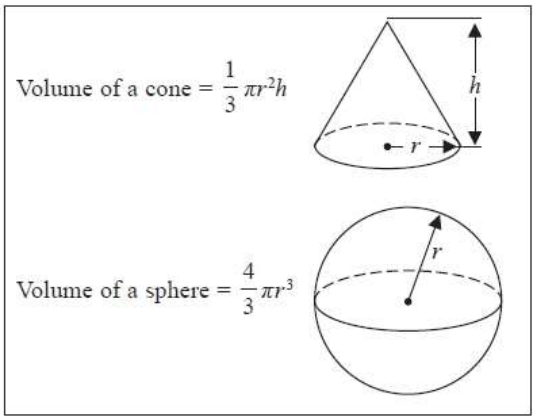
Q4. NON-CALCULATOR

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





The height of the cone is 10 cm.
The base of the cone has a diameter of 6 cm.
The hemisphere has a diameter of 6 cm.

The total volume of the shape is $k\pi$ cm^3, where k is an integer.

Work out the value of k.

k = ...

(Total for question = 4 marks)

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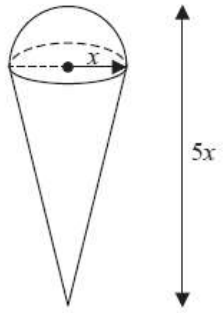
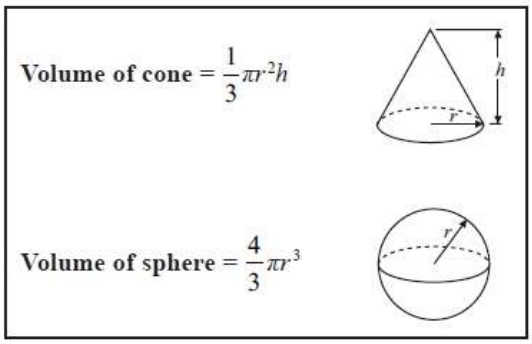
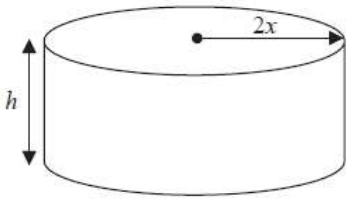
Q5. NON-CALCULATOR

A solid is made by putting a hemisphere on top of a cone.





The total height of the solid is 5*x*
The radius of the base of the cone is *x*
The radius of the hemisphere is *x*



A cylinder has the same volume as the solid.
The cylinder has radius 2*x* and height *h*
All measurements are in centimetres.

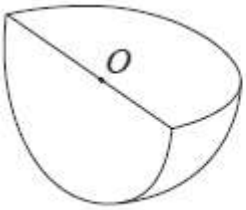
Find a formula for *h* in terms of *x*
Give your answer in its simplest form.

.....

(Total for question = 5 marks)

Q6. CALCULATOR ALLOWED

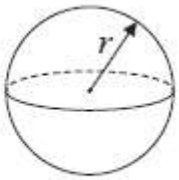
Shape **S** is one quarter of a solid sphere, centre *O*.



Shape S

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

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



The volume of **S** is 576π cm^3

Find the surface area of **S**.
Give your answer correct to 3 significant figures.
You must show your working.

..... cm^2

(Total for question = 5 marks)

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