

Name: \_\_\_\_\_

## ASM Tuition Academy

### 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 you're working out**.

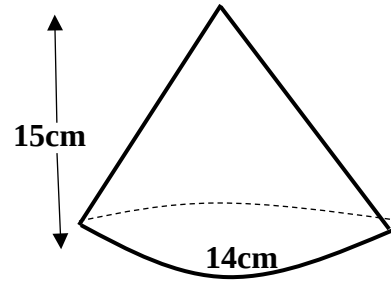
#### Information:

- 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 time.
- Try to answer every question.
- Check your answers if you have time at the end.

1. The diagram shows a cone.



The height of the cone is 15cm.

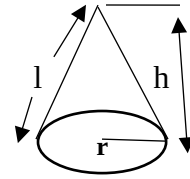
The base of the cone has a diameter of 14cm.

Work out the volume of the cone.

Give your answer correct to 3 significant figures.

Volume of cone =  $(1/3) \pi r^2 h$

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

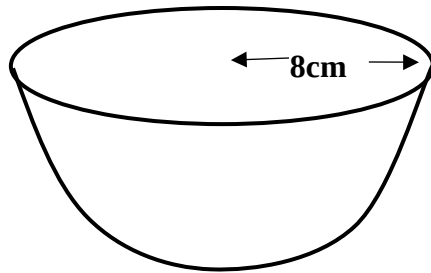


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(Total for question 1 is 2 marks)

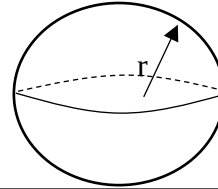
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2. The diagram shows a solid hemisphere with a radius of 8 cm.



Volume of sphere =  $(4/3) \pi r^3$

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

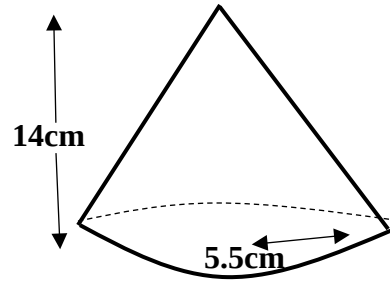


Work out the total surface area of the hemisphere  
Give your answer in terms of  $\pi$ .

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(Total for question 2 is 3 marks)

3. The diagram shows a solid cone.



The slanted height of the cone is 14cm.

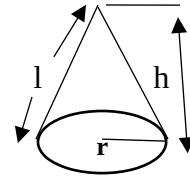
The base of the cone has a radius of 5.5cm.

Work out the total surface area of the cone.

Give your answer correct to 3 significant figures.

Volume of cone =  $(1/3) \pi r^2 h$

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

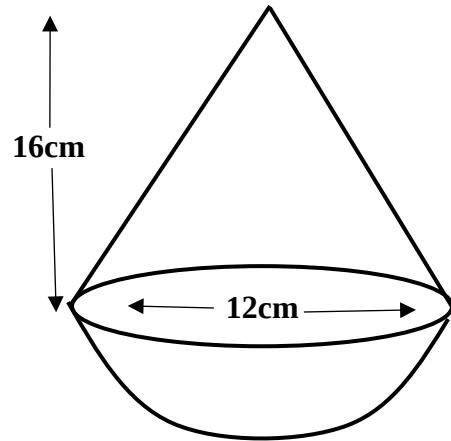


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(Total for question 3 is 2 marks)

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



The height of the cone is 16 cm.  
The base of the cone has a diameter of 12 cm.  
The diameter of the hemisphere is 12 cm.

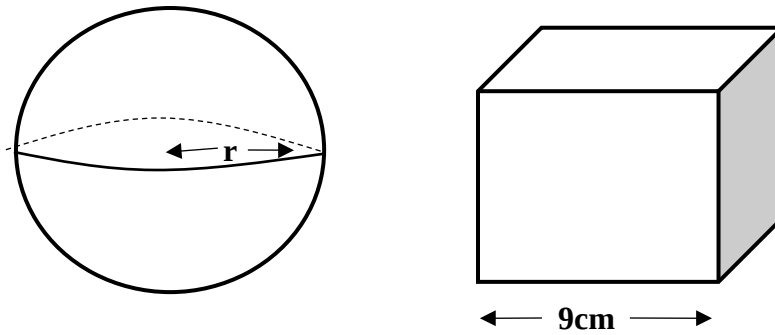
Work out the total volume of the solid shape.  
Give your answer in terms of  $\pi$ .

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(Total for question 4 is 4 marks)

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5. The diagram shows a sphere and a cube.



The cube has length 9cm.

The sphere and the cube have the same volume.

Work out the radius of the sphere.

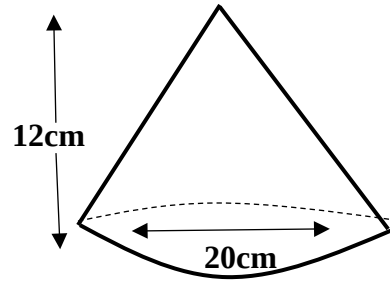
Give your answer correct to 3 significant figures.

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(Total for question 5 is 4 marks)

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6. The diagram shows a solid cone.



The height of the cone is 12cm.

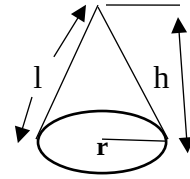
The base of the cone has a diameter of 20 cm.

Work out the total surface area of the cone.

Give your answer in terms of  $\pi$ .

Volume of cone =  $(1/3) \pi r^2 h$

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

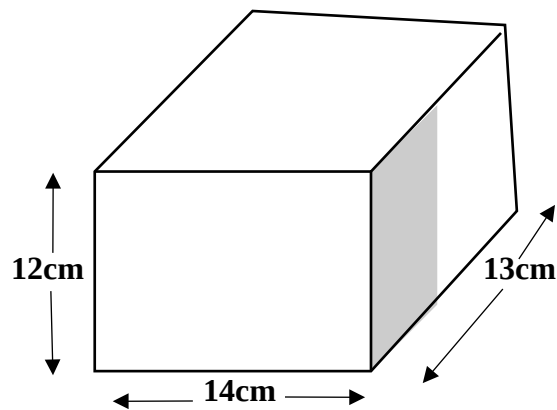


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(Total for question 6 is 4 marks)

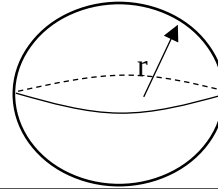
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7.



Volume of sphere =  $(4/3) \pi r^3$

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



A rectangular container is 14cm long, 13 cm wide and 12 cm height.  
The container is filled with water to a depth of 10 cm.

A metal sphere of radius 4.5cm 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.

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(Total for question 7 is 4 marks)