

Name

ANSWERS

Class



**MATHS TEACHER HUB**

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# Spheres

(9 – 1) Topic booklet

## Foundation

These questions have been collated from previous years GCSE Mathematics papers.

**You must have:** Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.

Total Marks

### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- 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.**
- If the question is a **1F** question you are not allowed to use a calculator.
- If the question is a **2F** or a **3F** question, you may use a calculator to help you answer.

### Information

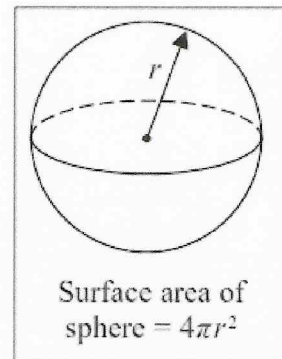
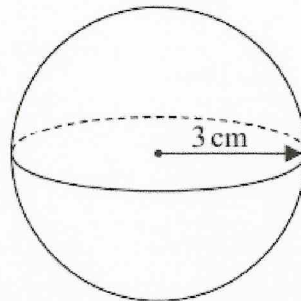
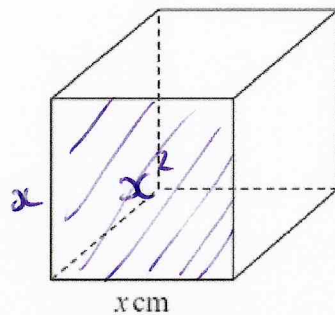
- The marks for **each** question are shown in brackets
  - *use this as a guide as to how much time to spend on each question.*

### 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.

**Answer ALL questions**  
**Write your answers in the space provided.**  
**You must write down all the stages in your working.**

**26** The diagram shows a cube with edges of length  $x$  cm and a sphere of radius 3 cm.



The surface area of the cube is equal to the surface area of the sphere.

Show that  $x = \sqrt{k\pi}$  where  $k$  is an integer.

$$\text{Cube area} = x^2$$

$$\text{Cube surface area} = 6x^2$$

$$\begin{aligned}\text{sphere surface area} &= 4 \times \pi \times 3^2 \\ &= 4 \times \pi \times 9 \\ &= 36\pi\end{aligned}$$

$$\begin{aligned}\therefore 6x^2 &= 36\pi \\ x^2 &= 6\pi \\ x &= \sqrt{6\pi}\end{aligned}$$