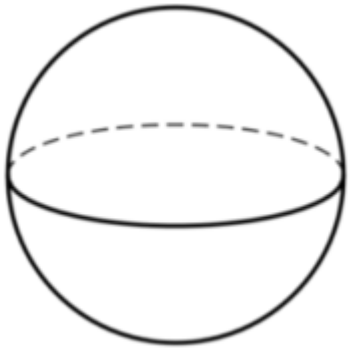
Volume – Lesson 5

If we know the volume of a sphere, we can work out its radius.

Work out the radius of this sphere if it has a volume of 500cm^3. Round your answer to two significant figures.



Volume = 500cm^3

$\frac{4}{3} \times \pi \times r^3 = V$

$\frac{4}{3} \times \pi \times r^3 = 500$

$\frac{4}{3} \times 3.1415.... \times r^3 = 500$

$4.1887.... \times r^3 = 500$

$r^3 = \frac{500}{4.1887....} = 119.3662.....$

$r = \sqrt[3]{119.3622...} = 4.9237....$

radius = 4.9cm (rounded to two sig. figs.)

Click for a video of this explanation. https://youtu.be/f1lEsyJUBwo

Calculate the radius of spheres with these volumes. Round your answer to two significant figures: -

1) 100cm^3 **2)** 200cm^3 **3)** 600cm^3 **4)** 900cm^3

Calculate the **diameter** of spheres with these volumes. Round your answer to two significant figures: -

5) 50cm^3 **6)** 300cm^3 **7)** 800cm^3

From National 4 we are expected to remember: -

Volume of cuboid = l × b × h

Volume of cylinder = π × r^2 × h

In National 5 we have learned: -

Volume of pyramid = $\frac{1}{3}$ × A × h

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

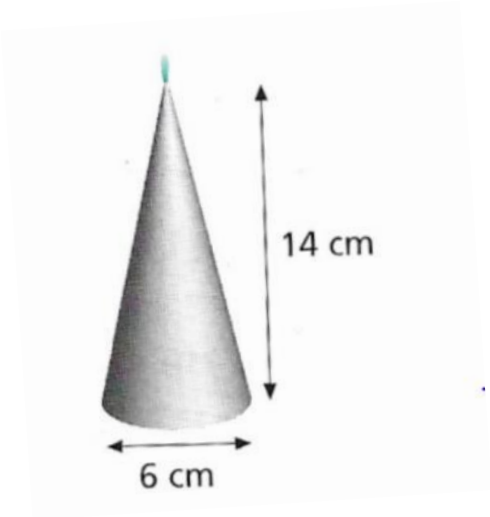
Volume of sphere = $\frac{4}{3}$ × π × r^3 (cubed!!!)

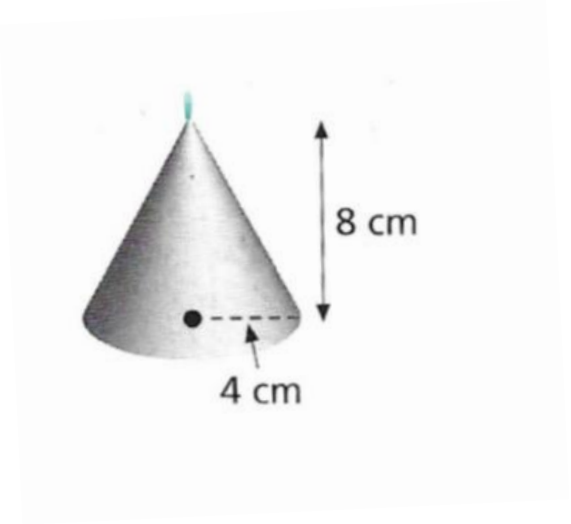
A hemisphere is half a sphere.

(These three formulas are given in the exam but the formula for cylinder is not.)

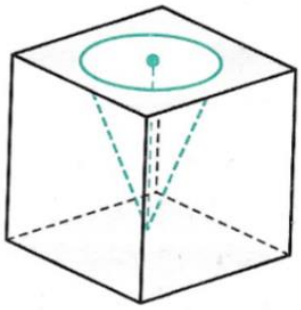
We will round off this section of work with some problems which may require you to calculate the volume of more than one shape.

8) A local craftsperson makes candles. Which of these candles would require more wax to make?





9) A metal cube has sides 10cm long. A conical hole is drilled in it. The hole has a diameter of 7cm and a depth of 9cm. Calculate the volume of metal left.

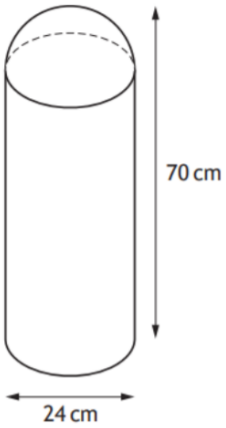


10) This question is taken from a National 5 past paper.

A traffic bollard is in the shape of a cylinder with a hemisphere on top.

The bollard has

- diameter 24 centimetres
- height 70 centimetres.



Calculate the volume of the bollard.

Give your answer correct to 3 significant figures.

11) A metal cuboid is melted down and the molten metal is used to make small metal spheres.

If the metal cuboid measures 15cm by 15cm by 10cm and the spheres have a radius of 0.3cm, how many spheres can be made from the block?