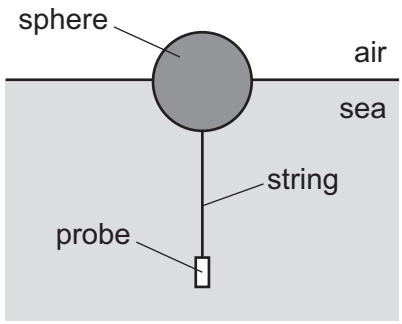
14 A probe is used to monitor the quality of the water in the sea. The probe is suspended by a vertical string which is attached to a sphere. The stationary sphere floats in equilibrium on the surface of the sea, as shown.



The sphere has a weight of 5.00 N. The probe and string have a combined weight of 2.00 N.

The density of the seawater is $1.03 \times 10^3\,\text{kg}\,\text{m}^{-3}$. The upthrust acting on the probe and thread is negligible.

What is the volume of the sphere below the surface of the sea?

A $1.98 \times 10^{-4}\,\text{m}^3$

B $2.97 \times 10^{-4}\,\text{m}^3$

C $4.95 \times 10^{-4}\,\text{m}^3$

D $6.93 \times 10^{-4}\,\text{m}^3$

15 What is the centre of gravity of an object?

A the geometrical centre of the object

B the point at which the weight of the object may be considered to act

C the point on the object about which there is a zero net torque

D the point where gravity acts on the object

16 A system with an efficiency of 74% wastes 230 W of power.

What is the useful output power of the system?

A 170 W **B** 310 W **C** 650 W **D** 880 W

17 A projectile of mass 0.25 kg is at a height of 30 m above horizontal ground and travelling at a speed of $15\,\text{m}\,\text{s}^{-1}$. A short time later, it is at a height of 35 m above the horizontal ground and travelling at a speed of $5.0\,\text{m}\,\text{s}^{-1}$.

How much work is done against air resistance during this time?

A 0 J **B** 13 J **C** 25 J **D** 37 J