4   A sphere floats in equilibrium on the surface of sea water of density 1050 kg m^{-3}, as shown in Fig. 4.1.
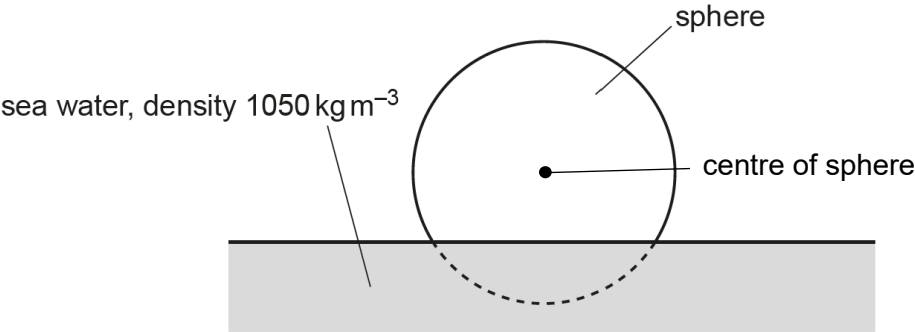

Fig. 4.1

(a) On Fig 4.1, draw an arrow to represent the force exerted on the sphere due to the seawater. [2]

(b) Explain the origin of the force in **(a)**.

……………………………………………………………………………………………..

……………………………………………………………………………………...........[1]

(c) Explain how the force in **(a)** helps the sphere to stay in equilibrium.

……………………………………………………………………………………………..

……………………………………………………………………………………………..

……………………………………………………………………………………...........[2]

(d) 21% of the volume of the sphere is below the surface of the water.
    Calculate the density of the sphere.

density = …………………………kg m^{-3} [2]

(e) The sphere is now held stationary by a force of 2000 N so that its entire volume is below the surface of the water.

    Calculate the diameter of the sphere.

diameter = ……………………………..m [2]