

- 2 A sphere floats in equilibrium on the surface of sea water of density 1050 kg m^{-3} , as shown in Fig. 2.1.

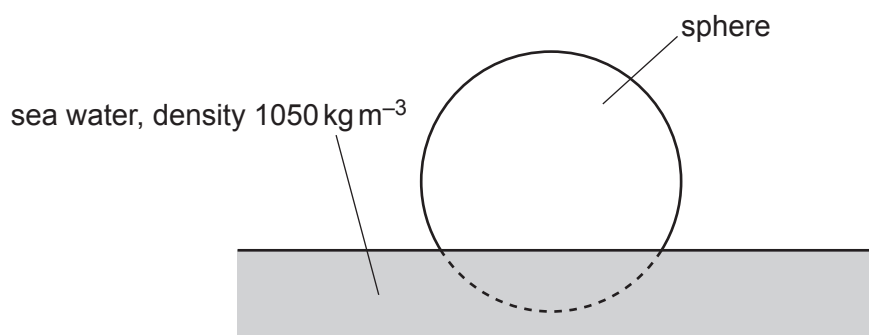


Fig. 2.1

- (a) 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]

- (b) The sphere is now held so that its entire volume is below the surface of the water. The sphere is then released.

- (i) Calculate the initial acceleration of the sphere.

acceleration = ms^{-2} [3]

- (ii) The sphere accelerates upwards but remains entirely below the surface of the water.

State and explain what happens to the acceleration of the sphere as its velocity begins to increase.

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[Total: 8]