

Archimedes' Principle Exercise

Before you solve the problem, draw a diagram in each case.

Question 1

Case 1: A beaker is set on a scale, which reads 150 g. 1000 ml of water is poured into the beaker.

(a) What does the scale read now?

Case 2: A 1-kg cylindrical object suspended by a spring scale is submerged completely in the water, and the new water level is 400 ml higher than before.

(b) What is the volume of the object?

(c) What is the density of the object?

(d) What does the spring scale read?

(e) What does the scale below the beaker read?

Case 3: Instead of the cylinder submerged completely in water, the only half of the cylinder is submerged.

(f) What is the new water level?

(g) What is the density of the object?

(h) What does the spring scale read?

(i) What does the scale below the beaker read?

Case 4: Lastly, the cylinder is resting on the bottom of the scale.

(j) What is the water level?

(k) What does the spring scale read?

(l) What does the scale below the beaker read?

Question 2

A beaker is set on a scale, which reads 1000 g. 1000 ml of liquid ($\rho = 2 \text{ g/cm}^3$) is poured into the beaker. When a 1-kg object is submerged completely, the scale below the beaker read 3250 g.

(a) What does the spring scale which supports the object read now?

(b) What is the new water level?

(c) What is the density of the object?