The fraction of a floating object of volume V and density d above the surface of a liquid of density D will be: a) d/D; b) $Dd/(D+d)$; c) $(D-d)/D$; d) $Dd/(D-d)$.

Answer: When object floats, according to the Newton's third law, buoyant force of the liquid has an opposite direction and the same magnitude as the weight force of the floating object.

From this condition we obtain equation of force equilibrium: $D \cdot g \cdot V_{im} = m \cdot g$, where g = 9.81 m/s^2 – standard gravity; V_{im} – volume of the object which is immersed in the liquid, m^3; $m = d \cdot V$ – mass of the object, kg. Then, $D \cdot g \cdot V_{im} = d \cdot V \cdot g$; $D \cdot V_{im} = d \cdot V$; $\frac{V_{im}}{V} = \frac{d}{D}$; $1 - \frac{V_{im}}{V} = 1 - \frac{d}{D}$; $\frac{V - V_{im}}{V} = \frac{D - d}{D}$, where $V - V_{im} = V_{fl}$ – volume of a floating object above the surface of the liquid.

Then, $\frac{V_{fl}}{V} = \frac{D - d}{D}$; it's the answer c)