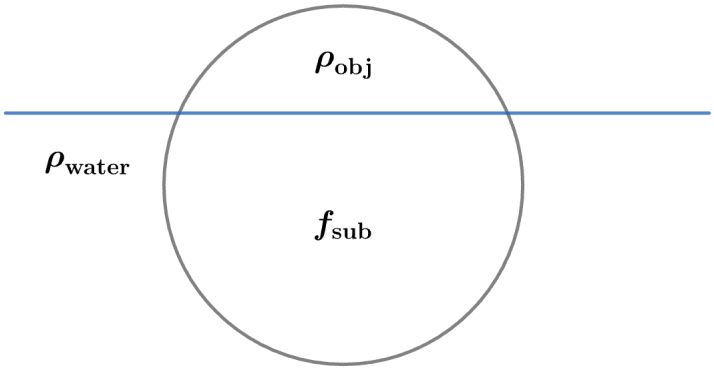
2015 F=ma Exam: Problem 11

Kevin S. Huang



Recall the fraction of an object that is submerged in a fluid is given by

$$f_{\text{sub}} = \frac{\rho_{\text{obj}}}{\rho_{\text{fluid}}}$$

In our case, we have

$$\frac{2}{3} = \frac{\rho_{\text{obj}}}{\rho_{\text{water}}}$$

The fraction of the object that would be submerged in oil is

$$f_{\text{sub}} = \frac{\rho_{\text{obj}}}{\rho_{\text{oil}}} = \frac{\rho_{\text{obj}}}{(3/4)\rho_{\text{water}}} = \frac{2}{(3/4)3} = \frac{8}{9}$$

using the fact that $\rho_{\text{oil}} = \frac{3}{4}\rho_{\text{water}}$. Thus, the answer is $\boxed{\text{C}}$.