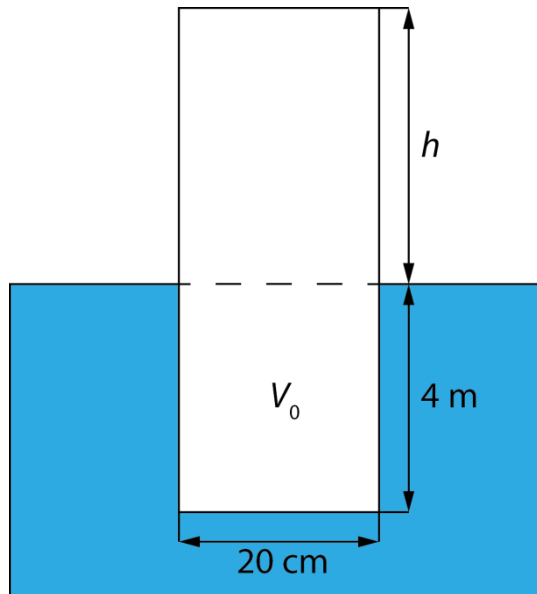


Answer on Question #43052 – Math – Other

A wooden block cross section diameter 20cm, and 4m long floats in water what part of volume is above water. If density of wooden block is 700kg/m^3 and of water is 1000kg/m^3

Solution.



Let h be the altitude of the block over the water. The volume of the under the water part of the block is $V_0 = \frac{\pi \cdot 0.2^2}{4} \cdot 4 = 0.04\pi \text{ m}^3$. The volume of all block is $V = \frac{\pi \cdot 0.2^2}{4} \cdot (4 + h)$. By Archimedes' principle

$$\rho_{\text{water}} V_0 g = \rho_{\text{wood}} V g \text{ (buoyancy = gravity).}$$

Hence, $\frac{V}{V_0} = \frac{\rho_{\text{water}}}{\rho_{\text{wood}}}$ or $\frac{4+h}{4} = \frac{10}{7}$, so $h = \frac{12}{7} \approx 1.714 \text{ m}$.

Answer: $h = \frac{12}{7} \approx 1.714 \text{ m}$.