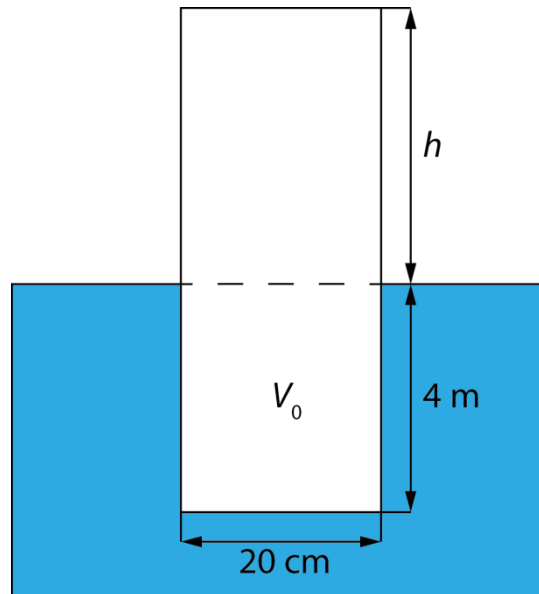


### Answer on Question #43052 – Math – Other

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  $700\text{kg/m}^3$  and of water is  $1000\text{kg/m}^3$

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