A piece of lead has the shape of a hockey puck, with a diameter of 7.5 cm and a height of 2.5 cm. If the puck is placed in a mercury bath it floats. How deep below the surface of the mercury is the bottom of the lead puck?

\[ P_{\text{lead}} = 11.3 \times 10^3 \text{ Kg/m}^3 \]
\[ P_{\text{Hg}} = 13.6 \times 10^3 \text{ Kg/m}^3 \]

If an object floats \( \rightarrow F_B = mg \)

\[ F_B = P_f V_{\text{sub}} g \]

\[ P_f V_{\text{sub}} g = mg \quad \rho = \frac{m}{V} \rightarrow m = \rho_{\text{lead}} V_{\text{obj}} \]

\[ P_f V_{\text{sub}} g = (\rho_{\text{lead}} V_{\text{obj}}) g \]

\[ V_{\text{sub}} = (\frac{\rho_{\text{lead}}}{P_{\text{lead}}}) V_{\text{obj}} \rightarrow \text{for an object that floats} \]

\[ V_{\text{sub}} = \left[ \frac{11.3 \times 10^3 \text{ Kg/m}^3}{13.6 \times 10^3 \text{ Kg/m}^3} \right] V_{\text{obj}} \]

\[ \approx 0.83 \]
\[ V_{\text{sub}} = (0.83) V_{\text{obj}} \]

83% of lead puck is submerged

\[ h = (0.83)(2.5\text{ cm}) \rightarrow h = 2.1\text{ cm} \]