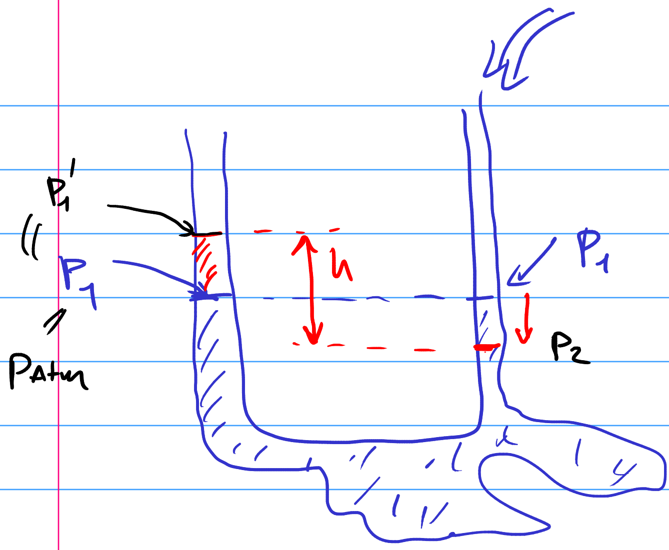
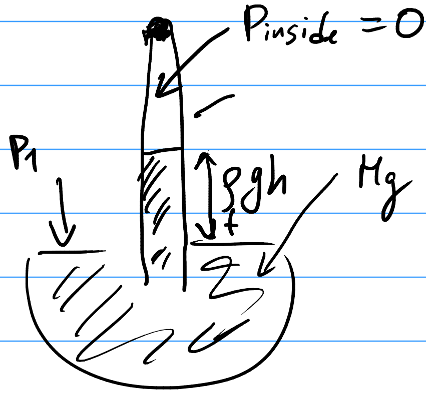


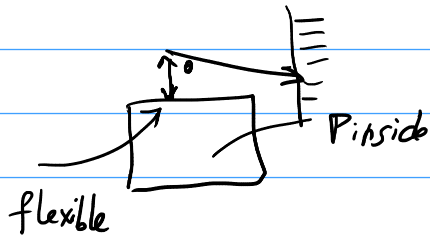
$$P_1 + \rho g h = P_2$$

$$P_2 - P_1 = \rho g h$$

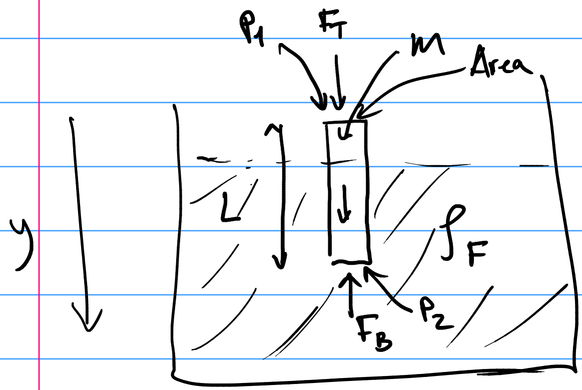
$$P_2 - P_{ambient} = \rho g h = \Delta P$$

gauge pressure





Floating force = buoyancy



$\Sigma F_i = 0$

y: $F_g + F_T - F_{Bot}$

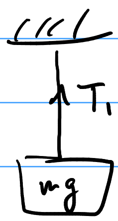
$\underbrace{mg}_{} + \underbrace{p_1 \cdot A - p_2 A}_{F_{buoyancy}} = 0$

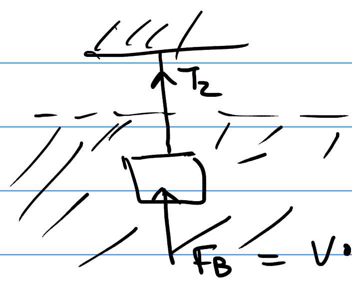
$\rho_0 V g + (p_1 - p_2) A = 0$

$\rho_0 L \cdot A g + (\cancel{p_1} - (\cancel{p_1} + \rho_F \cdot g h)) A = 0$

$\rho_0 L \cdot \cancel{A} g - \underbrace{\rho_F g h \cancel{A}}_{F_{Buoy..} = W_{F.\,displaced}} = 0$

$\dfrac{V_{inside\ fluid}}{V_{object}} = \dfrac{h}{L} = \dfrac{\rho_0}{\rho_F} \Longleftarrow \rho_0 \cdot L - \rho_F h = 0$





$F_B = V \cdot \rho_F g$

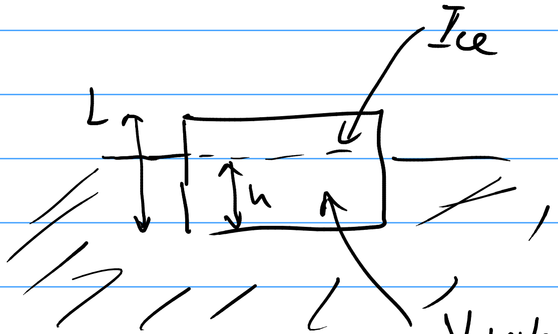
$T_1 = mg$

$T_2 = mg - F_B = mg - V\rho_F \cdot g$

$\dfrac{T_1}{T_1 - T_2} = \dfrac{mg}{F_B} = \dfrac{mg}{V \cdot \rho_F g} = \dfrac{\cancel{V} \cdot \cancel{g} \cdot \rho_0}{\cancel{V} \cdot \cancel{g} \cdot \rho_F} = \dfrac{\rho_0}{\rho_F}$

$W = mg - F_B = mg - \rho_{Air} \cdot g \cdot V$ (Air ↑ fluid)

$= mg - \rho_{fluid} \cdot g \dfrac{m}{\rho_{obj}}$



$$\frac{h}{L} = \frac{\rho_{ice}}{\rho_{water}} = \frac{917\ \frac{kg}{m^3}}{1000\ \frac{kg}{m^3}} \approx 92\%$$

$$V_{displaced} \cdot \rho_w \cdot g = m_{ice} \cdot g$$

melting ice does not change the water level.