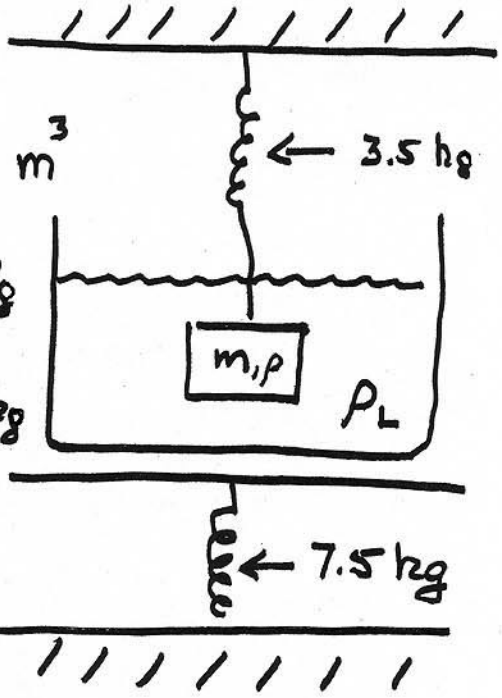
Day 1 - Problem 1

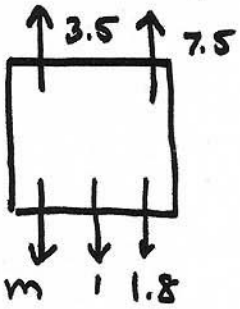


V_m = Volume of mass = $3.8 \times 10^{-3}\ m^3$

What is ρ_{Liquid}?

unknowns: ρ, m, ρ_L, but $m = \rho V_m$
$\Rightarrow$ two unknowns

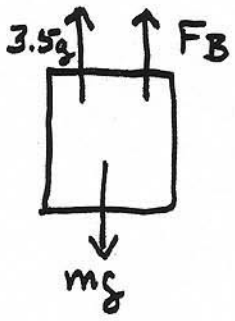
1) Consider forces on mass / liquid / beaker in kg



$7.5 + 3.5 = 1 + 1.8 + m$

$\Rightarrow m = 8.2\ kg$

2) Now consider forces on m in N



$F_B = (m - 3.5)g = (8.2 - 3.5)g = 4.7g$

$= m_L^{Displaced} g = \rho_L V g$

$\Rightarrow \rho_L = \frac{4.7\ kg}{3.8 \times 10^{-3} m^3} = 1.23 \times 10^3\ kg/m^3$