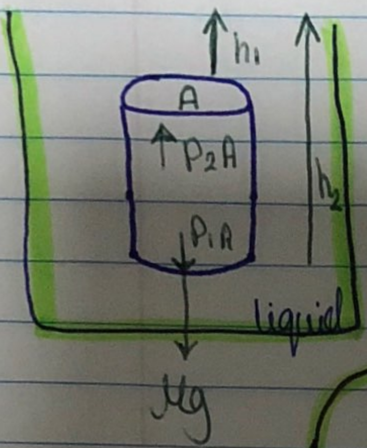
Experiment 3: Density of Liquids:

- fluids Means: → Gases / → Liquids : if they are at the rest The force they exert on The surface is: Perpendicular on The surface.



The pressure of The fluid on a surface is = $P = \frac{Force}{Area} = \frac{F}{A}$

$$P_2A - P_1A - Mg = Zero$$

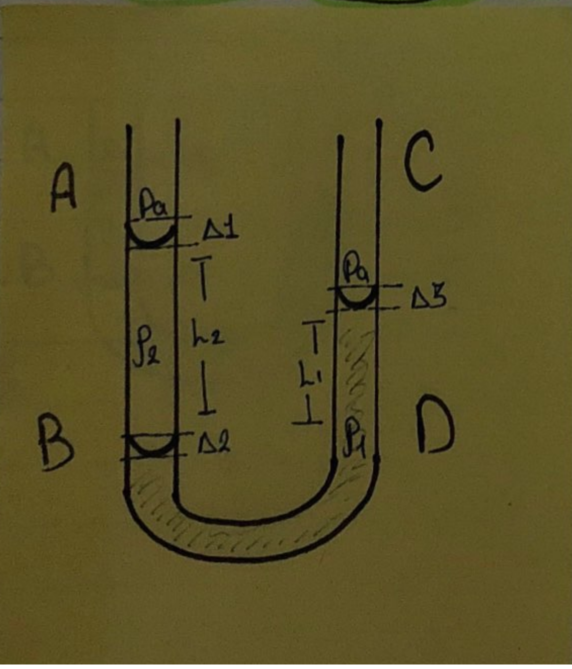
because of the cylinder is on static equilibrium $F_{net} = Zero$

- $M = \rho V$ = density x volum
- $V = A(h_2 - h_1)$
- $A(P_2 - P_1) = \rho A(h_2 - h_1)g$ (where $\rho A(h_2 - h_1) = M$)

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

The difference in pressure depends on:

1. vertical hight
2. liquid's Type



$P_B - P_A = \rho_2 L_2 g$ — [1]

$P_D - P_C = \rho_1 L_1 g$ — [2]

$P_A = P_C = P_a$ (atmospheric pressure)

$P_B = P_D$ = same vertical height

so: $\rho_2 L_2 = \rho_1 L_1$

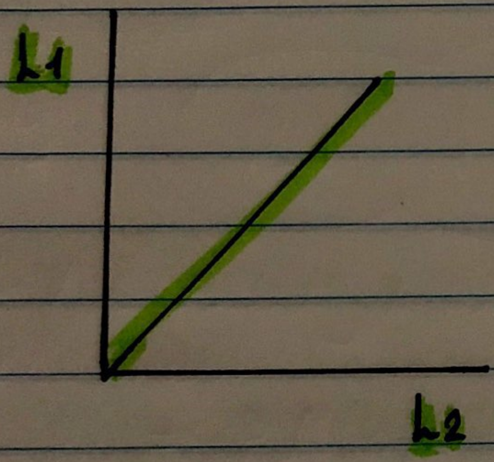
since ρ_1 is water's density $= 1$

$$\rho_2 = \frac{L_1}{L_2}$$

unc. ? $\frac{\Delta\rho_2}{\rho_2} = \frac{\Delta L_1}{L_1} + \frac{\Delta L_2}{L_2}$

$\Delta L_1 = \Delta_2 + \Delta_3$

$\Delta L_2 = \Delta_1 + \Delta_2$



Graph of:

L_1 vs L_2

so the slope:

$$\frac{\Delta L_1}{\Delta L_2} = \rho$$