

Exp 3: Density of liquids



• exert forces on the walls of their containers (perpendicular to the surface)

Pressure \rightarrow

$$P = \frac{F \rightarrow \text{force}}{A \rightarrow \text{area}}$$

• pressure is larger at lower points

• a portion of liquid:

$$P_2 A - mg - P_1 A = 0$$

$$A(P_2 - P_1) = mg$$

$$(P_2 - P_1) = \frac{mg}{A}$$

$$P = \frac{m}{V}$$

$$m = AV$$

$$P_2 - P_1 = \frac{\rho V g}{A}$$

$$P_2 - P_1 = \rho A (h_2 - h_1) g$$

$$P_2 - P_1 = (h_2 - h_1) \rho g$$

• U-Tube:

$$1 - P_B - P_A = h_2 \times \rho_2 \times g$$

$$2 - P_D - P_C = h_1 \times \rho_1 \times g \quad \left(\begin{matrix} \rho_2 = \rho_1 \\ A_2 = A_1 \end{matrix} \right)$$

$$h_2 \rho_2 g = h_1 \rho_1 g$$

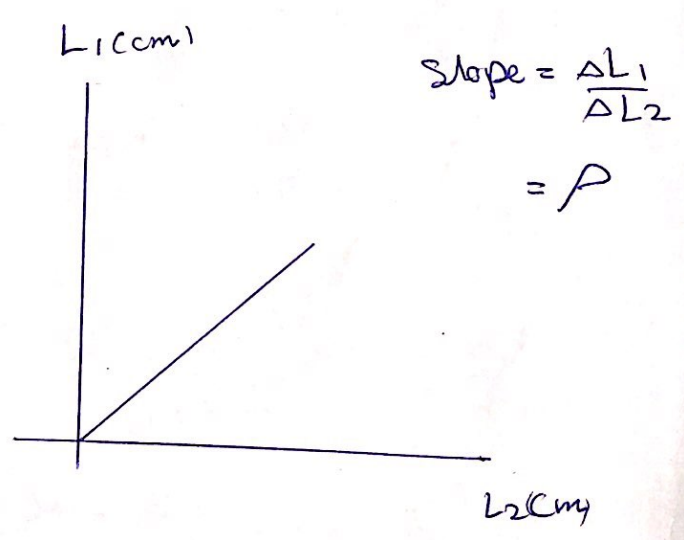
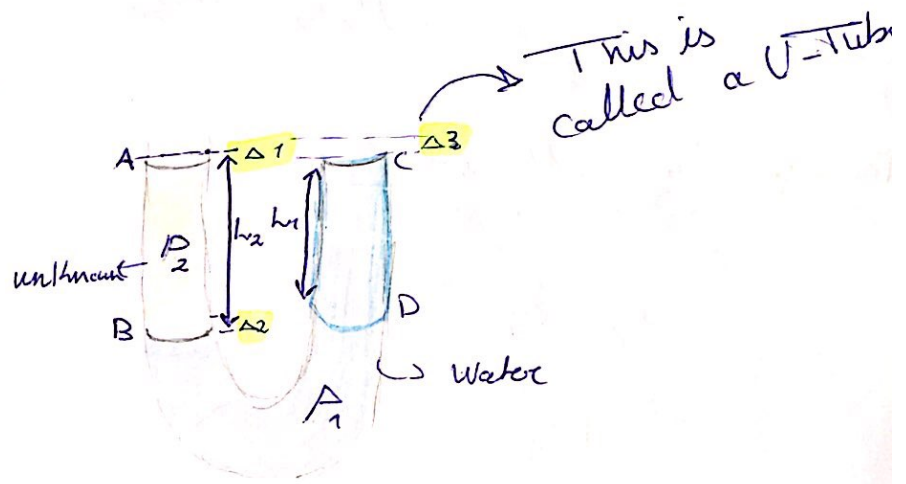
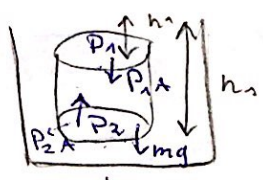
$$h_2 \rho_2 = h_1 \rho_1$$

$$\rho_2 = \frac{h_1}{h_2} \rho_1$$

$$\frac{\Delta P}{\rho} = \frac{\Delta h_1}{h_1} + \frac{\Delta h_2}{h_2}$$

$\Delta h_2 + \Delta h_3$

$\Delta h_1 + \Delta h_2$



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