"Physics Lab 1"

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* تلخيص القوانين

→ exp 1:-

$$\rho = \frac{\text{Mass}}{\text{Volume}} = \frac{M}{V} \qquad V = L \times W \times T$$

$$\frac{\Delta V}{V} = \frac{\Delta L}{L} + \frac{\Delta W}{W} + \frac{\Delta T}{T}$$

$$\frac{\Delta \rho}{\rho} = \frac{\Delta M}{M} + \frac{\Delta V}{V}$$

$$a = \sqrt[3]{\frac{A_w}{\rho N_a}} \rightarrow \frac{\Delta a}{a} = \frac{1}{3}\frac{\Delta \rho}{\rho}$$

→ exp 2 :-

$$\vec{P} = m\vec{v}$$

$$R = \frac{P_a}{P_b} = \frac{m_1 \bar{x}_{1a} + m_2 \bar{x}_{2a}}{m_1 \bar{x}_{1b}}$$

→ let $R = \frac{A}{B}$, $\frac{\Delta R}{R} = \frac{\Delta A}{A} + \frac{\Delta B}{B}$

→ exp 3 :-

$\rho_1 L_1 = \rho_2 L_2$, $\rho_1 \rightarrow 1 g/cm^3$ كثافة السائل

$$\rho_2 = \frac{L_1}{L_2} \qquad \Delta L_1 = \Delta_2 + \Delta_3$$

$$\Delta L_2 = \Delta_1 + \Delta_3$$

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

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→ exp 4 :

$$R_{exp} = \frac{V}{I}$$

$$\frac{\Delta R}{R} = \frac{\Delta V}{V} + \frac{\Delta I}{I}$$

$$R_{True} = AB \times 10^{C}$$

$$\Delta R = (AB \times 10^{C})\, D$$

> From color code.

R in series, توالي

$$R_s = R_1 + R_2$$

$$\Delta R_s = \Delta R_1 + \Delta R_2$$

R in series : توالي

$$R_p = \frac{R_1 R_2}{R_1 + R_2}$$

$$\Delta R = R_p^2 \left(\frac{\Delta R_1}{R_1^2} + \frac{\Delta R_2}{R_2^2} \right)$$

exp 5 :-

$$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

u: distance between the object and lens

v: distance between the lens and image.

$$\frac{\Delta f}{f^2} = \frac{\Delta u}{u^2} + \frac{\Delta v}{v^2}$$

exp 6 :

$$\mu = \frac{c}{v}$$

$$\mu \geq 1$$

$$\mu_a \sin(i) = \mu_b \sin(\bar{r})$$

$1 = \mu_a$

$$\mu_b = \frac{\sin(i)}{\sin(\bar{r})}$$

$$\frac{\Delta \mu}{\mu} = \frac{\cos(i)}{\sin(i)} \Delta i + \frac{\cos(\bar{r})}{\sin(\bar{r})} \Delta r$$

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→ exp 7:

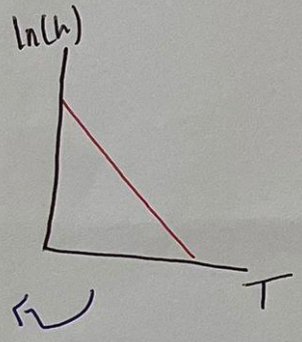
$L = s + \frac{d}{2}$

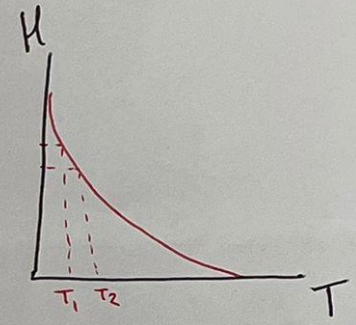
$T^2 = \frac{4\pi^2 L}{g}$ → $T = 2\pi\sqrt{\frac{L}{g}}$ → $g = \frac{4\pi^2 L}{T^2}$ → $\frac{\Delta g}{g} = \frac{\Delta L}{L} + \frac{2\Delta T}{T}$

→ exp 8:

$t_{\frac{1}{2}} = \frac{\ln(2)}{\lambda}$

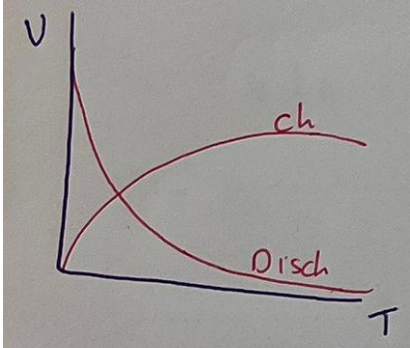
slope $= -\lambda$

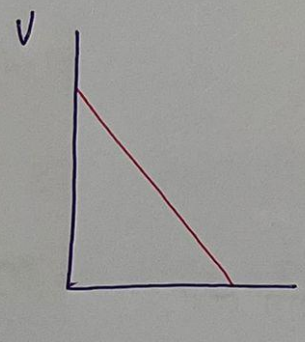




$t_{\frac{1}{2}} = T_1 - T_2$

exp 9:





slope $= \frac{\ln(v_2) - \ln(v_1)}{t_2 - t_1}$

$T_s = -\frac{1}{\text{slope}}$

T_c , T_D

1.63 1.37

* $C = \frac{\tau}{R}$, $\Delta C = C\left(\frac{\Delta t}{t} + \frac{\Delta R}{R}\right)$