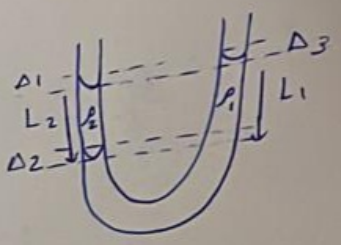
R(3) :- $P = \frac{F}{A}$ ضغط — قوة / مساحة

$M = \rho V$



في حالة الماء $\frac{\rho_2}{\rho_1} = \text{slope} = \frac{L_1}{L_2}$

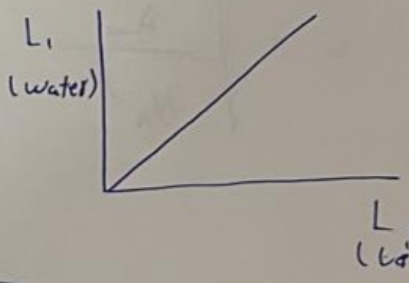
gm/cm³

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

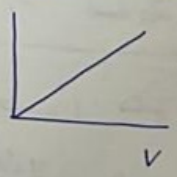
$\Rightarrow \Delta L_1 = \Delta_1 + \Delta_2$

$\Rightarrow \Delta L_2 = \Delta_2 + \Delta_3$

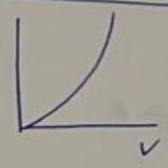
$$\rho_1 L_1 = \rho_2 L_2$$



R(4) :- $R = \frac{V}{I}$, $R = \frac{I}{V}$

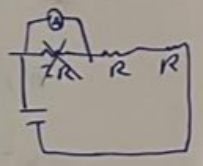


Ohmic



Non-

أميتر على توازي يعتبر سلك فارغ



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

$A B \times C \pm D$

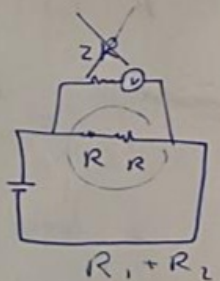
$\overline{A B \times C \times \%}$

(توالي) series

$R_1 + R_2$

Parallel

$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} = \frac{R_1 R_2}{R_1 + R_2}$



ومقاومته عالية مقارنة مع الدارة .

الفولتميتر على توازي ويقيس جهد

الاميتر على توالي ويقيس التيار .

* Ammeter → connected in series and has smallest resistance

* voltmeter → connected in parallel and has biggest resistance

STUDENTS-HUB.com Uploaded By: Malak Obaid

$R(1): \quad V = \bar{L} \times \bar{W} \times \bar{T}$

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

(Density) كثافة $\rho = \frac{M}{V}$ كتلة

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

مسافة بين ذرات $a = \sqrt[3]{\frac{A_w}{N_A \rho}} = \sqrt[3]{\frac{\text{عدد الذرات (من جدول)}}{\text{عدد الجزيئات} \times \text{الكثافة}}}$

$(6.023 \times 10^{23}) \quad (\frac{M}{\rho})$

الحجم :- مساحة × ارتفاع

* مكعب : $ضلع^3$

* متوازي مستطيلات : $h \times عرض \times طول$

* كرة : $\frac{4}{3} \pi r^3$

* هرم : $\frac{h \times عرض \times طول}{3}$

* أسطوانة : $\pi r^2 h$

* مخروط : $\frac{\pi r^2 h}{3}$

$R(2): \quad \vec{P} = m\vec{V}$

زخم محفوظ $R = \frac{\text{true value}}{\text{measured value}} = \frac{P_a}{P_b}$

* time of flight $(t) = \sqrt{\frac{2y}{g}}$

$V = \frac{X}{t}$

$$\Delta R = \frac{m_1 V_{1f} + m_2 V_{2f}}{m_1 V_{1i}} = \frac{A}{B}$$

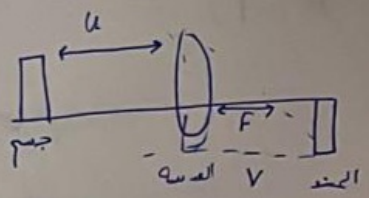
$$\frac{\Delta R}{R} = \frac{\Delta A}{A} + \frac{\Delta B}{B}$$

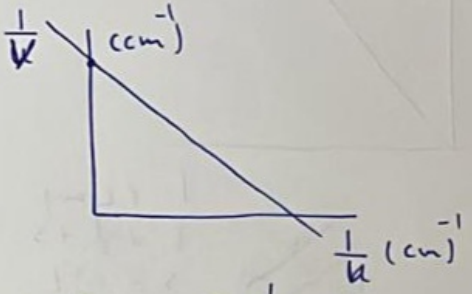
* $m_1 x_{1i} + m_2 x_{2i} = m_1 x_{1f} + m_2 x_{2f}$

$\Delta m_1 x_{1i} + m_1 \Delta x_{1i} + \Delta m_2 x_{2i} + m_2 \Delta x_{2i} =$ ـــــ

STUDENTS-HUB.com Uploaded By: Malak Obaid

R (5) :- $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$





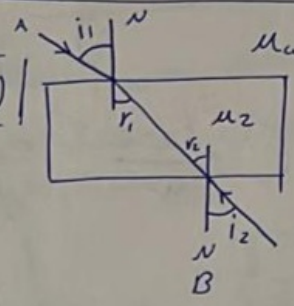
$f_1 = x_{intercept} = \frac{1}{\text{المقدار}} = cm$

$f_2 = y_{intercept} = \frac{1}{\text{المقدار}} = cm$

$\Rightarrow f = \frac{f_1 + f_2}{2}$ ، أي $\frac{1}{f} = \frac{x_{int} + y_{int}}{2}$

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

R (6) :- $\mu_A \sin(i) = \mu_B \sin(r)$



$$\frac{\mu_2}{\mu_1} = \frac{\sin(i)}{\sin(r)}$$

$$\frac{\Delta \mu}{\mu} = \left|\frac{\cos(i)}{\sin(i)}\right| \cdot \Delta i + \left|\frac{\cos(r)}{\sin(r)}\right| \cdot \Delta r$$

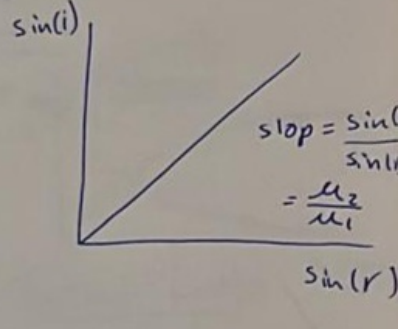
$1^\circ = 1^\circ \cdot \frac{\pi}{180} = r_{rad}$

i → زاوية دخول وخروج الضوء مع العمودي

r → زاوية خروج ودخول الضوء مع العمودي

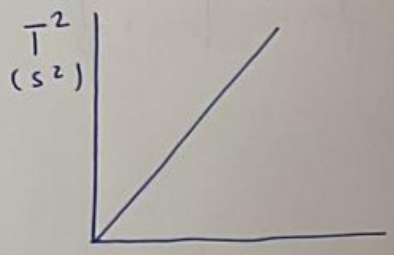
μ_1 → معامل انعكاس الوسط الأول

μ_2 → معامل انعكاس الوسط الثاني



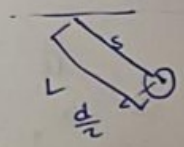
STUDENTS-HUB.com Uploaded By: Malak Obaid

R(7) :-



slope =

$$g = \frac{4\pi^2}{\text{slope}} = \frac{4\pi}{m}$$



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

$s = \Theta L$

$$\frac{\Delta g}{g} = \frac{\Delta m}{m}$$

Period = $T = \frac{2\pi}{\omega} = \frac{2\pi}{\sqrt{g/L}} = 2\pi\sqrt{\frac{L}{g}}$

$$T^2 = \frac{4\pi^2}{g} L$$

* Period = $T = \frac{2\pi}{\omega} = \frac{2\pi}{\sqrt{g/L}} = \left(2\pi\sqrt{\frac{L}{g}}\right)^2 = \frac{4\pi^2 L}{g}$

$= T^2$ $\Rightarrow g = \frac{4\pi^2 L}{T^2} \Rightarrow m = \boxed{\frac{4\pi^2}{m} = g}$

$$\boxed{\Delta g = \frac{4\pi^2}{m^2} \Delta m}$$

$y = m x + b$ * في معادلة

m = الميل

STUDENTS-HUB.com Uploaded By: Malak Obaid

R(8):

$$t_{\frac{1}{2}} = \frac{Ln\,2}{\lambda}$$

$\lambda = K$

* when landoda (λ) is large the decay is faster. ←
* كلما زادت قيمة الثابت (λ) تزداد سرعة النقصان.

$$h = h_o e^{-\lambda t}$$

$$slope = -\lambda = \frac{-Ln\,2}{t_{\frac{1}{2}}}$$

$$t = \frac{Ln(h_o) - Ln(h)}{\lambda}$$

Ln(h) Vs t

* Ln(2)

slope = $-\lambda$

T (s)

* لإيجاد الزمن النصفي من رسم h Vs t:
1- نأخذ الزمن عند أي ارتفاع في الرسمة.
2- نأخذ الزمن عند نصف هذا الارتفاع.
3- نطرح الزمنين

h

h Vs t

t

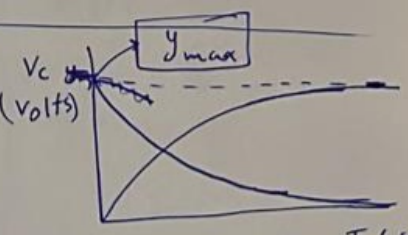
* when "λ" is bigger the half life dime is shorter

=> the decay is fasster.

R(9):- in graph ← Vc Vs T

τ_c = y_{max} (على قيمة) × 0.63 => sec

τ_D = y_{max} × 0.37 => sec



in graph Ln(h) Vs t ← $\tau_s = \frac{-1}{m}$, m = slope = $\frac{\Delta y}{\Delta x} = \frac{Ln(h_o) - Ln(h)}{t_o - t}$

$\bar{\tau} = \frac{\tau_D + \tau_s + \tau_c}{3}$

$\Delta\tau = \frac{\sigma_s}{\sqrt{3}}$

$\tau_{true} = R.C$

=> to find C: $C = \frac{\tau}{R}$, $\frac{\Delta C}{C} = \frac{\Delta\tau}{\tau} + \frac{\Delta R}{R}$

Ln V_D (volt)

t (s) (ثانية)

STUDENTS-HUB.com Uploaded By: Malak Obaid