

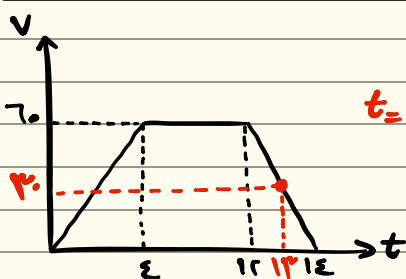
۴۶-۲ این کار را با یک تفنج شیب نرمی است و بدون تکان به جسم می‌دهد تا آن را اندازه‌گیری کند

۴۷-۲ $E = \frac{hc}{\lambda} \Rightarrow \frac{E_r}{E_i} = \frac{\lambda_i}{\lambda_r} =$

۴۸-۲ جنبه موج‌ها $\lambda \leftarrow$ ثابت دور بین نوبت $f \leftarrow$ کاتر

۴۹-۲ $K_1 \rightarrow 1 = \text{هو}$ $K_2 > K_1 \rightarrow C = \frac{KE \cdot A}{d} \Rightarrow \frac{C_r}{C_i} = \frac{K_r}{K_i} \rightarrow$ افزایش

$C = \frac{q}{V}$



۱۲-۱۳ $t = 13 \Rightarrow$ سرعت در $t = 13 \Rightarrow \frac{25}{15} \mid \frac{70 \downarrow}{57} \Rightarrow \Delta v = 30$

۱۳-۱۴ $L = \int = \frac{2}{70} \times \frac{70}{1} + \frac{1}{70} \times 70 + \frac{1}{70} \times 28$
 $= 2 + 1 + \frac{2}{7} = 3 + \frac{2}{7} = 3.28 \text{ km}$

۵۱-۳ $t=0 \rightarrow v_0=0$ $v_{avr} = \frac{v+v_0}{2} \Rightarrow \frac{\Delta x}{\Delta t} = \frac{v}{2} \Rightarrow \frac{217}{15} = \frac{12a}{2} \Rightarrow a = 3$

$v = at + v_0 \Rightarrow v = at$

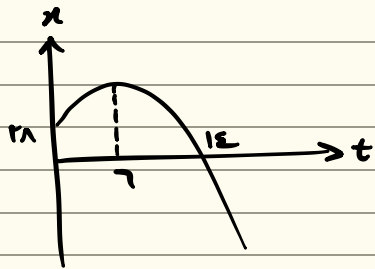
$t=7 \rightarrow v=21 \Rightarrow \Delta x = 21 \text{ m} \times$
 $t=9 \rightarrow v=27$

$t=7 \rightarrow v=21$
 $\Rightarrow \Delta x = 21 \text{ m} \times$

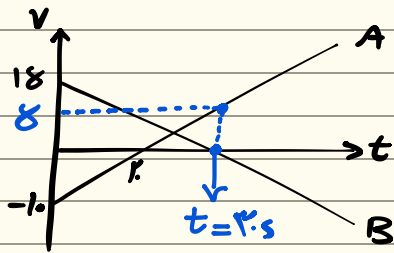
$t=1 \rightarrow v=22$

$t=8 \rightarrow v=28 \Rightarrow \Delta x = 28 \text{ m} \checkmark$

$t=7 \rightarrow v=21$



$$V_{avg} = \frac{\Delta x}{\Delta t} = \frac{21}{14} = 1.5 \frac{m}{s}$$

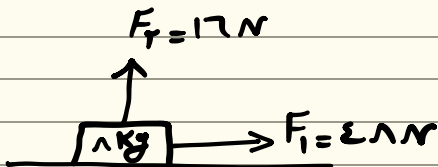


$$A \rightarrow v - v_0 = at \Rightarrow v - 100 = 2 \times \frac{1}{7} - 18 \Rightarrow v = 8 \frac{m}{s}$$

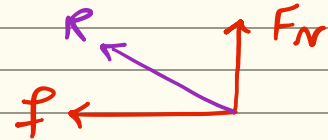
$$B \Rightarrow 0 \rightarrow 3.5 \Rightarrow \Delta x = \frac{18 \times 3.5}{2} = 31.5 m$$

$$\Delta x = x - x_0 \Rightarrow 31.5 = x - 100 \rightarrow x_B = 131.5 m$$

$$x_B - x_A = 131.5 - (-178) = 309.5 m$$



$$R = \sqrt{F_N^2 + f^2}$$



$$2-52$$

۱- ثابت است نیروی F_N و F_f اثر نداشته و تغییر آن باعث تغییر R می‌شود

۲- ثابت است به افزایش F_f باعث کاهش F_N و کمتر R می‌شود

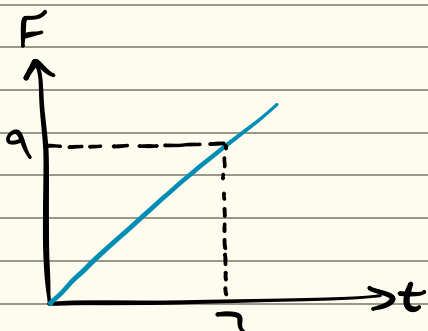
۳- ثابت است F_f نیروی پرتاب آن بوده و هیچ تاثیری بر نیروی سطح ندارد و نیرو وارد عمل حرکت است.

۴- ثابت

84- $\vec{r}$ = بردار از مرکز به سمت مرکز دور

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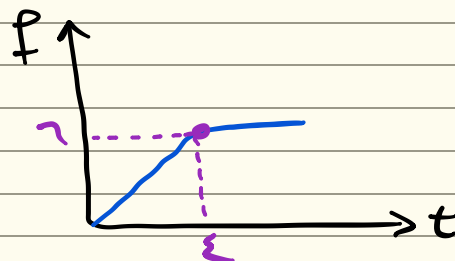
فاصله بین محور $f-t$ معبره مقابل است



$$F_{smax} = \mu_s F_N = \frac{7}{1} \times 9 = 7N$$

9N	7s
7N	t

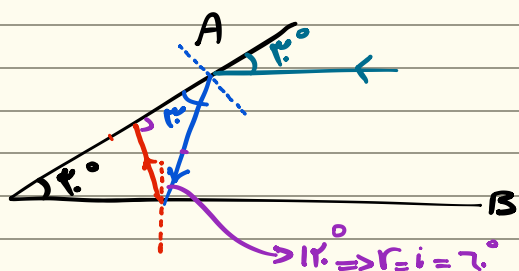
$$t = 2s$$



86- $R = 2R_e$ $m = 2m_e$ $w = \frac{GmM}{R^2}$

میدان: $\frac{Gm_2m_e}{\epsilon R_e^2}$

نیس: $\frac{Gmme}{R_e^2} \Rightarrow \frac{2}{\epsilon} = \frac{1}{1}$



87- زاویه بین دو بردار با هم 90 درجه است
برای زاویه 90 درجه

$$E = K + U \Rightarrow K = \frac{1}{2}mv^2 = \frac{1}{2} \times 2 \times 1.6 = 1.6J$$

$$E = \frac{1}{2}kA^2 = \frac{1}{2} \times 20 \times 74 \times 10^{-2} = 74J$$

$$U = 74 - 1.6 = 72.4$$

$$V_{max} = A\omega \Rightarrow 2,5 = 74 \times 10^{-2} \omega \Rightarrow \omega = \frac{25}{74}$$

$$\omega = \frac{2\pi}{T} \Rightarrow T = \frac{2\pi}{\omega} = \frac{2\pi}{\frac{25}{74}} = 18.8s$$

افزایش تنش به افزایش طول موج به افزایش انرژی به T° نسبت

$$P = \frac{E}{t} = \frac{nhc}{\lambda} = \frac{nhc}{\lambda \cdot t} \Rightarrow \frac{10^{-3}}{2 \times 10^{-3}} = \frac{n \cdot 6.626 \times 10^{-34} \times 3 \times 10^8}{\lambda \times 10^{-6}} \times 1$$

$$\Rightarrow 3 \times 10^{-6} = 2 \times 10^{-27} n \Rightarrow n = 1.5 \times 10^{21} = 1.5 \times 10^{21}$$

$$\frac{\lambda_1}{\lambda_2} = \frac{\frac{1}{\lambda_2}}{\frac{1}{\lambda_1}} = \frac{\frac{1}{\lambda_{\min}}}{\frac{1}{\lambda_{\max}}} = \frac{\frac{1}{50} - \frac{1}{\infty}}{\frac{1}{50} - \frac{1}{40}} = \frac{\frac{1}{50}}{\frac{1}{200} - \frac{1}{40}} = \frac{40}{11}$$

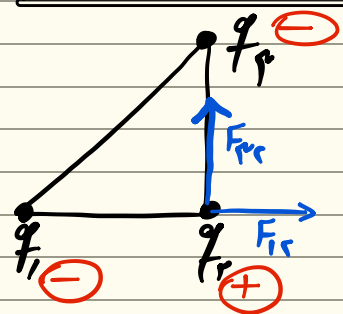


$$F = mg \Rightarrow \frac{k q_1 q_2}{r^2} = mg \Rightarrow \frac{9 \times 10^9 \times q^2}{r^2} = 10 \times 4.8 \times 10^{-3} \times 10^{-2}$$

$$r^2 q^2 = 4.8 \times 10^{-4} \Rightarrow q^2 = 4.8 \times 10^{-4} \Rightarrow q = 2.19 \times 10^{-2} \text{ C}$$

$$q = 2.19 \times 10^{-2} \text{ C} \Rightarrow q = ne \Rightarrow n = \frac{q}{e} = \frac{2.19 \times 10^{-2}}{1.6 \times 10^{-19}} = 1.37 \times 10^{17}$$

$$r q = 9.158 \times 10^{-1}$$

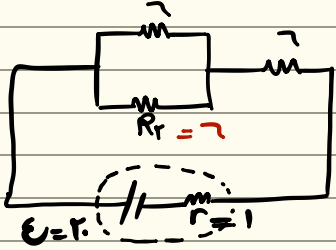


$$F_T = 1 \times 10^{-2} \hat{i} + 2 \times 10^{-2} \hat{j}$$

$$\frac{F_{pr}}{F_{ir}} = \frac{q_r}{q_i} \Rightarrow \frac{2 \times 10^{-2}}{1 \times 10^{-2}} = \frac{r}{\lambda} = \frac{r}{\lambda} \rightarrow -\frac{r}{\lambda}$$

$R = \rho \frac{L}{A} \Rightarrow \frac{R_A}{R_B} = \frac{\rho_A}{\rho_B} \cdot \frac{L_A}{L_B} \cdot \frac{A_B}{A_A}$
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 $1 = 1 \times 1 \cdot \frac{A_B}{A_A}$
 $\frac{A_B}{A_A} = 1$

$m = \rho' A L \Rightarrow \frac{m_A}{m_B} = \frac{\rho'_A}{\rho'_B} \cdot \frac{L_A}{L_B} \cdot \frac{A_B}{A_A}$
 $\frac{m_A}{m_B} = 1 \times 1 \times \frac{A_A}{A_B} \Rightarrow 1 \times 1 = 1$

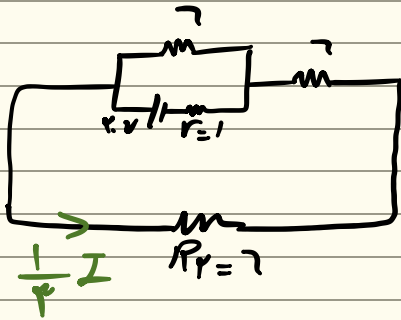


$R_{eq} = R_{1,2} + R_T \Rightarrow 9 = R_{1,2} + 7 \Rightarrow R_{1,2} = 2\Omega$

$\frac{2R_T}{7 + R_T} = 1 \Rightarrow 11 + 7R_T = 7R_C \Rightarrow 7R_C = 11 \rightarrow R_C = 2\Omega$

$I = \frac{\mathcal{E}}{R_{eq} + r} \Rightarrow I = \frac{1}{9 + 1} = 1A$

$I_{R_T} = \frac{1}{7} = 1A \Rightarrow P = RI^2 \Rightarrow P = 7W$



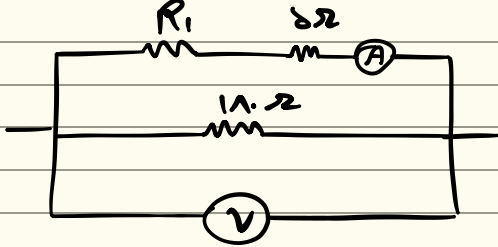
$R_{eq} = \frac{15 \times 7}{11} = 9.5\Omega$

$I = \frac{\mathcal{E}}{R + r} = \frac{1}{8} = 1A$

$I_{R_T} = \frac{1}{7} I = \frac{1}{7} A$

$P = R_T I_T^2 = 7 \times \frac{1}{9} = \frac{7}{9} W$

$P - P_1 = \frac{7}{9} - 1 = -\frac{2}{9} W$

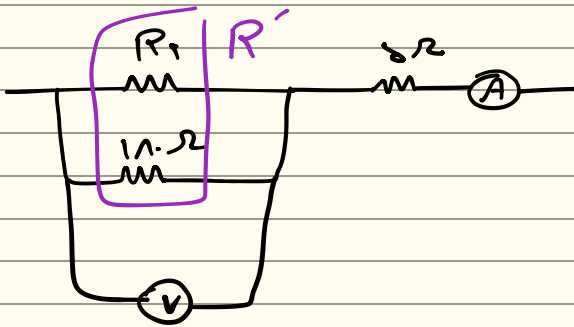


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$$R_1 + 8 = \frac{V}{I} \Rightarrow V = (R_1 + 8)I$$

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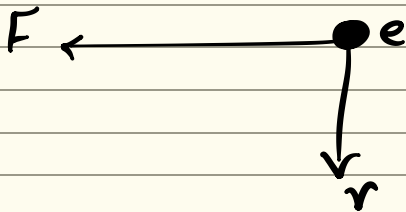
$$V \cdot 2 = 1.7 R_1 + 1 \Rightarrow R_1 = 8 \Omega$$



$$V = R I \Rightarrow V \cdot 1.7 = R' \cdot 1.7 \Rightarrow R' = 9 \Omega$$

$$\frac{R_p \times 1.7}{R_p + 1.7} = 9 \Rightarrow 2R_p = R_c + 1.7$$

$$R_c = 1.7 \Omega$$

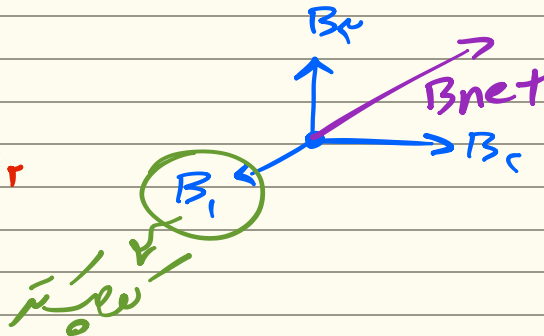
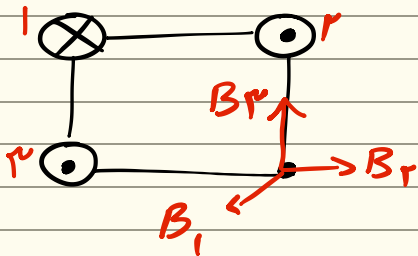


فاصله در راستای افقی و عمودی
و با استفاده از
نسبت نیو

78

رابطه جیب - دایره

B: دایره و $\otimes$



79

$$I = \frac{\mathcal{E}}{R} = -\frac{N}{R} \frac{\Delta \phi}{\Delta t} = -\frac{N}{R} \frac{\Delta B A \cos \theta}{\Delta t}$$

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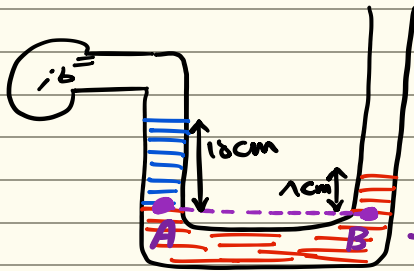
$$= \frac{r \cdot}{r} = \frac{8 \times 10^{-5} \times 8 \times 10^{-5}}{8 \times 10^{-5}} = 1.58 A$$

$$V = \frac{\epsilon}{\rho} \pi r^2 = \frac{\epsilon}{\rho} \pi (r_1^2 - r_2^2) = \frac{\epsilon}{\rho} \pi (b^2 - a^2)$$

$$= \frac{\epsilon}{\rho} \pi (1a^2 - a^2) = \frac{\epsilon}{\rho} \pi V a^2$$

$$\rho = \frac{m}{V} \Rightarrow m = \rho \cdot V \Rightarrow \epsilon \times 1. = \frac{\rho}{V} \times \frac{\epsilon}{\rho} V a^2$$

$$1. = 1. a^2 \Rightarrow a^2 = 1. \Rightarrow a = 1.$$



$$P_A = P_B$$

$$P_{ib} + P_1 = P_0 + P_2$$

$$P_{ib} = P_2 - P_1$$

$$= 18 \text{ cm} \times 1. \times \frac{1}{1.} - 1 \text{ cm} \times 1. \times \frac{1}{1.}$$

$$P_{ib} = 18 - 1 = 17 \text{ cm Hg}$$

$$h = \frac{-88}{17} = -5.176 \text{ cm Hg} = -51.76 \text{ mm Hg}$$

$$W_T = \Delta K = \frac{1}{2} m (v^2 - v_0^2) = \frac{1}{2} \times 1. \times (17^2 - 1^2)$$

$$= 1. \times (17^2 - 1^2) = 17 \text{ J} = 17 \text{ J}$$

$$E_1 = E_2 \Rightarrow K_1 + U_1 = K_2 + U_2$$

$$\frac{1}{2} m v_1^2 = \frac{1}{2} m v_2^2 + m g h_2$$

$$\frac{1}{2} \times 1. = \frac{1}{2} \times 17^2 + 1 \cdot h_2$$

$$1. = 17^2 + 2h_2 \Rightarrow h_2 = 15.176 \text{ m}$$

$$Q = P \cdot t \xrightarrow[\text{تغییر}]{\text{تغییر حالت}} mL_v = P \cdot t$$

$$\Sigma X \text{ کد } 7 = 2 \dots \times t$$

$$t = 28125 = 78,5 \text{ min}$$