

تیر ماہ ۱۴۲

$$\vec{v} = \dot{x}\hat{i} + \dot{y}\hat{j} + \dot{z}\hat{k} \rightarrow \dot{x}\hat{i} + \dot{y}\hat{j} + \dot{z}\hat{k} \quad \begin{matrix} \dot{x} = 2z - 2 \\ \dot{y} = 2z - 2 \\ \dot{z} = 2z - 2 \end{matrix}$$

۴ (۴۶)

$$V_B - V_A = \frac{-W_E}{q} \Rightarrow V_B - V_A = \frac{-k \times 1 \cdot 4}{-\delta \times 1 \cdot 4} \Rightarrow V_B = 1.0 \text{ V}$$

۲ (۴۷)

$$\Delta x = \frac{1}{2} a (t_f^2 - t_i^2)$$

$$\Delta x = \frac{1}{2} a (v_f^2 - v_i^2)$$

$$v_0 = \frac{1}{2} a (9 - 1) \Rightarrow a = 0.5 \text{ m/s}^2$$

$$\Delta x = \frac{1}{2} \times 0.5 \times 9 = 2.25 \text{ m}$$

۳ (۴۸)

۱ (۴۹)

$$\Delta x = x_f - x_i = -\frac{1}{2} a x \delta^2 \quad \left. \begin{matrix} (0 - 85) \\ \Delta x = -85 \end{matrix} \right\} \rightarrow a = -2$$

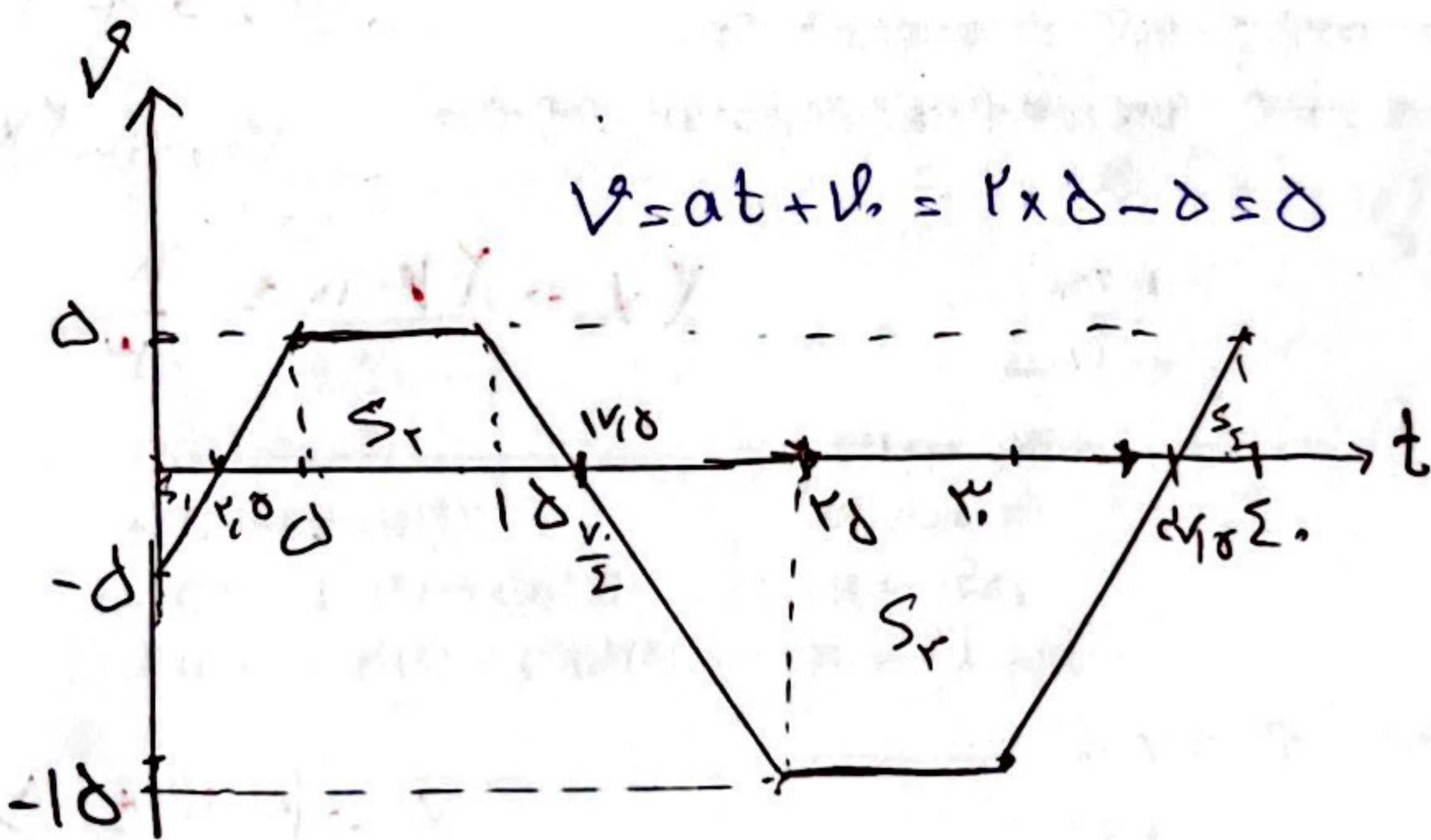
$$\Delta x = -85 \Rightarrow -x_f = \frac{1}{2} a x \Sigma^2$$

$$\Delta x = -\frac{1}{2} a x (v)^2 = 9$$

$$S_{av} = \frac{v \delta + 9}{1.0 - 2} = \frac{1v}{\Sigma} \cdot \frac{7}{5}$$

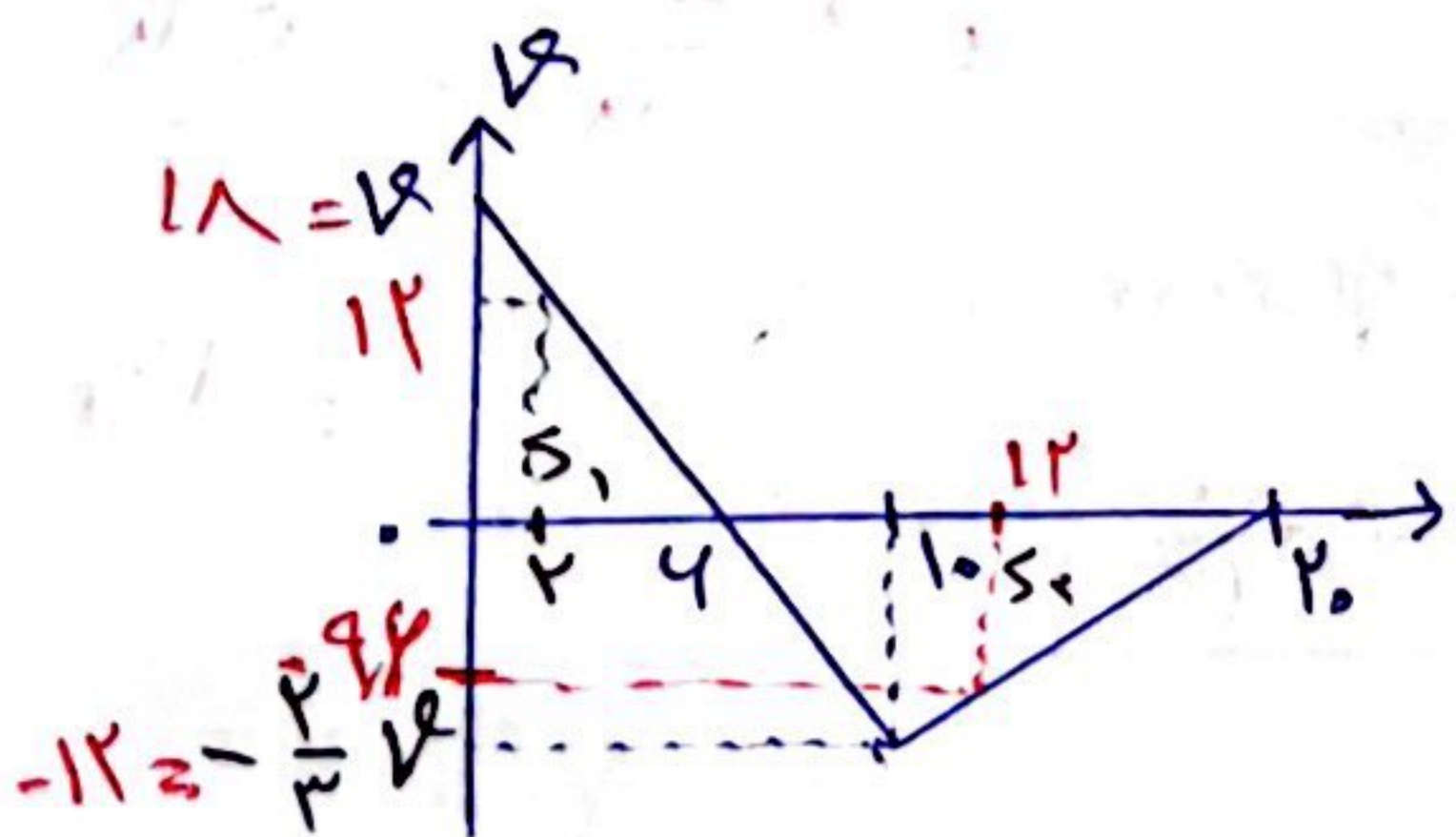
$$\Delta x = \frac{1}{2} a x (\delta)^2 = 2\delta \quad (0 - 1.0)$$

۴ (۵۰)



$$\left. \begin{matrix} S_1 = \frac{-2 \times 0 \times \delta}{2} \\ S_2 = \frac{\delta \times 0}{2} \\ S_3 = \frac{10 \times 2 \delta}{2} \\ S_4 = \frac{2 \times 10 \times \delta}{2} \end{matrix} \right\} L = 24 \times 10^3 \text{ m}$$

۱ (۵۱)



$$\frac{v}{4} = \frac{u}{\Sigma} \quad u = \frac{v}{4}$$

$$S_1 + S_2 = 12 \text{ m} \quad \frac{4 \times v}{2} + \frac{12 \times (\frac{v}{4})}{2} = 12 \text{ m}$$

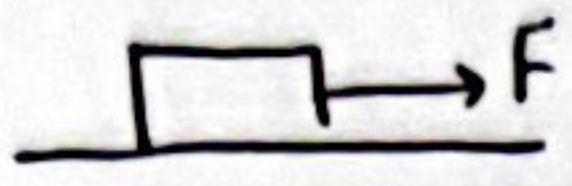
$$v = 11 \text{ m/s}$$

$$a_{av} = \frac{\Delta v}{\Delta t} = \frac{-9.4 - 12}{12 - 2} = \frac{2.16 \text{ m/s}^2}{5}$$

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$$mg = kx$$

3 (Δr)



$$F - f_k = ma$$

$$kx - \mu_k \times mg = ma \Rightarrow 1.2 \times 10^3 \times 0.2 - 0.1 \times 10 \times 1.2 = 1.2 \times a \Rightarrow a = 17 \text{ m/s}^2$$

$$p = at^r + bt + c$$

$$r = -\frac{b}{2a}$$

$$b = -2a$$

$$p = 2t^r - 12t + 17$$

2 (Δr)

$$0 = Fa - 2ax^2 + 17$$

$$1a = 17 \quad a = 2 \quad b = -12$$

$$t = 1 \rightarrow p_1 = -2$$

$$t = 2 \rightarrow p_2 = 7$$

$$F = \frac{\Delta p}{\Delta t} = \frac{7 - (-2)}{1} = 9 \text{ N}$$

$$v^2 - v_0^2 = 2a\Delta x$$

$$F - f_k = ma$$

$$F_N = f_y + mg$$

4 (Δr)

$$12\Delta x = 2a \times 12$$

$$12 - f_k = 2 \times 12$$

$$F_N = v \cdot N$$

$$R = \sqrt{f_k^2 + f_N^2}$$

$$a = 4 \text{ m/s}^2$$

$$f_k = 24$$

$$R = \sqrt{24^2 + 12^2} = 26.8 \text{ N}$$

$$h = \frac{t}{T} \Rightarrow T = \frac{hT}{1} = 1.1 \text{ s}$$

$$\frac{T_2}{T_1} = \sqrt{\frac{L_2}{L_1}}$$

$$\frac{T_2}{1.1} = \sqrt{\frac{L_2 - 10}{L_1}} \Rightarrow \frac{T_2}{1.1} = \sqrt{\frac{40}{L_1}}$$

1 (Δδ)

$$T_1 = 2\pi\sqrt{\frac{L}{g}} \Rightarrow 1.1 = 2\pi\sqrt{\frac{L}{9.8}} \Rightarrow L = 11 \text{ cm}$$

$$h = \frac{t}{T} \Rightarrow \frac{1}{1.1} = 0.9$$

$$T_2 = 1.7$$

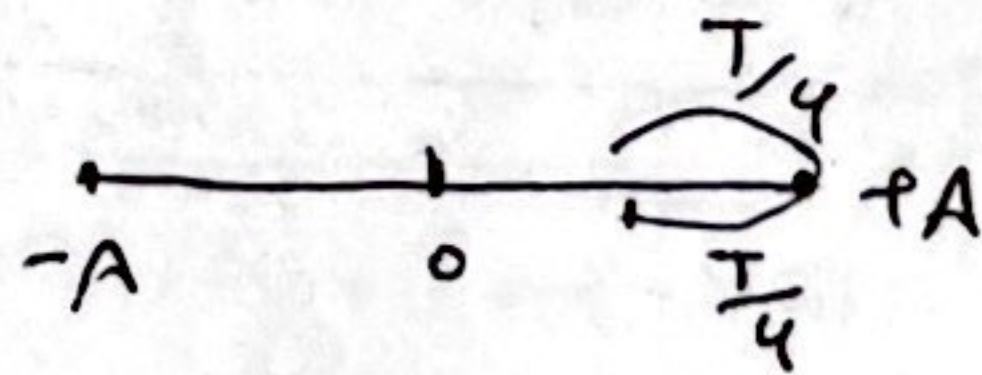
$$v = \frac{v}{D} \sqrt{\frac{F}{\rho \pi}} \Rightarrow \lambda F = \frac{v}{D} \sqrt{\frac{F}{\rho \pi}} \Rightarrow \lambda \times 2 = \sqrt{\frac{2 \times 10^3}{1.2 \times 10^3 \times \pi}} \times \frac{v}{2 \times 10^{-2}}$$

3 (Δγ)

$$\frac{\lambda}{2} = (10 \text{ cm})$$

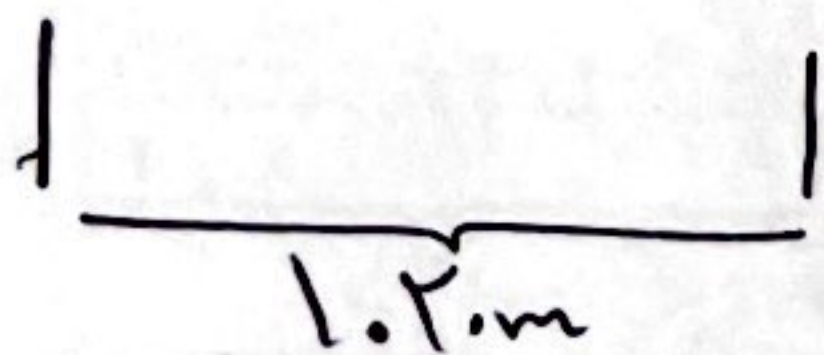
$$\lambda = 0.8 \text{ m}$$

$$\frac{F_1}{v} = \frac{F_2}{v} \Rightarrow T_1 = \frac{4}{v} = \frac{4}{10}$$



$$v \frac{T}{4} = \frac{T}{v} = \frac{4}{v}$$

1 (Δv)



$$v \lambda_1 = v \times 2$$

$$v \lambda_2 = v \times \lambda$$

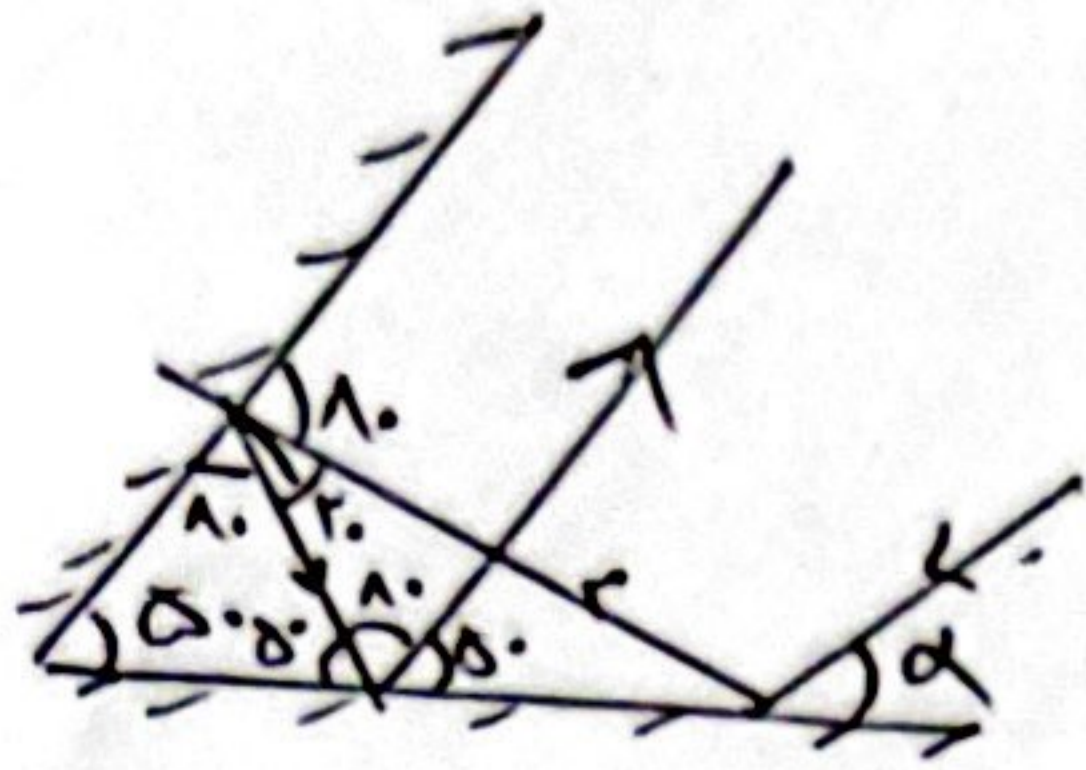
$$\frac{\lambda_2}{\lambda_1} = 2 \rightarrow \lambda_2 = 2\lambda_1$$

2 (Δλ)

$$\lambda_1 + \lambda_2 = 1.2 \rightarrow \lambda_2 = 0.8 \text{ m} \text{ and } \lambda_1 = 0.4 \text{ m}$$

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$\alpha + \gamma + \delta + \alpha = 180^\circ$
 $\alpha = \gamma$

I (۴)

II (۴)

$\begin{cases} n = \delta \\ n' = \epsilon \end{cases} \quad \begin{cases} n = \epsilon \\ n' = \gamma \end{cases} \quad \begin{cases} n = \gamma \\ n' = \gamma \end{cases} \quad \begin{cases} n = \gamma \\ n' = 1 \end{cases}$

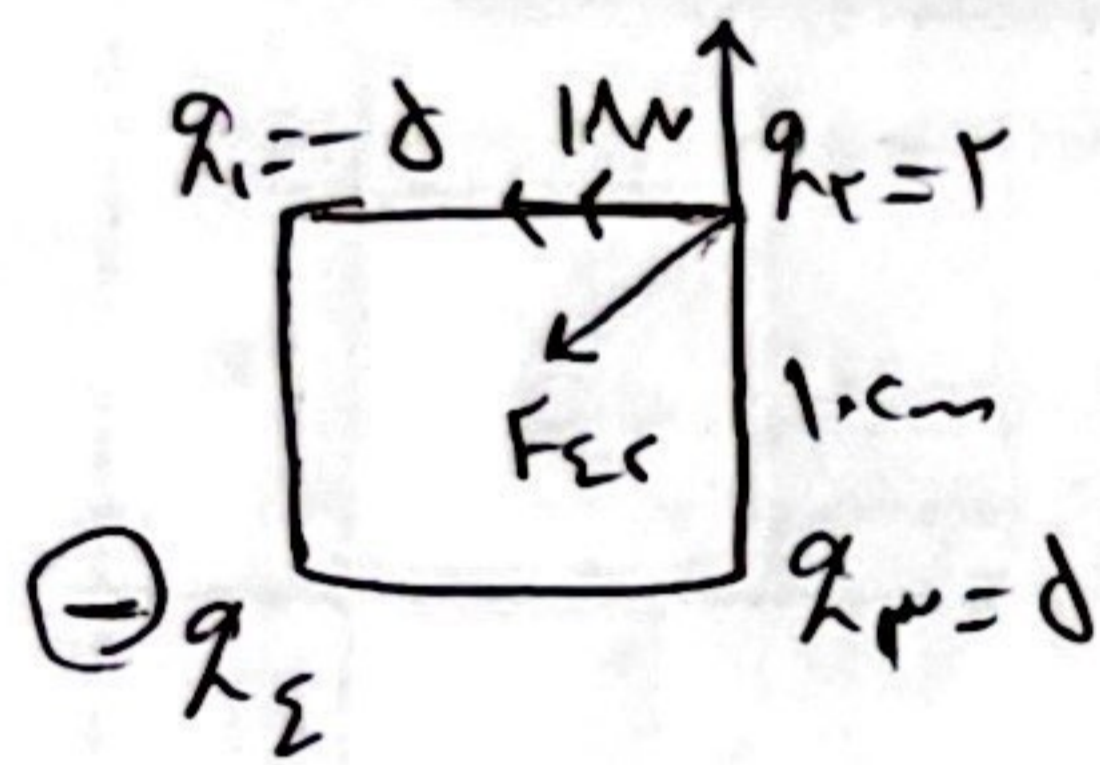
$E_\delta - E_\epsilon = hf \rightarrow 12,4 \left(-\frac{1}{r\delta} + \frac{1}{1r} \right) = \frac{12,4}{\lambda_1} \rightarrow \lambda_1 = \epsilon, \delta, \gamma, r \text{ nm}$

$\lambda_1 - \lambda_2 = 492,4 \text{ nm}$

$E_\gamma - E_1 = 12,4 \left(-\frac{1}{\epsilon} + \frac{1}{1} \right) = \frac{12,4}{\lambda_2} \rightarrow \lambda_2 = 121,04$

III (۴)

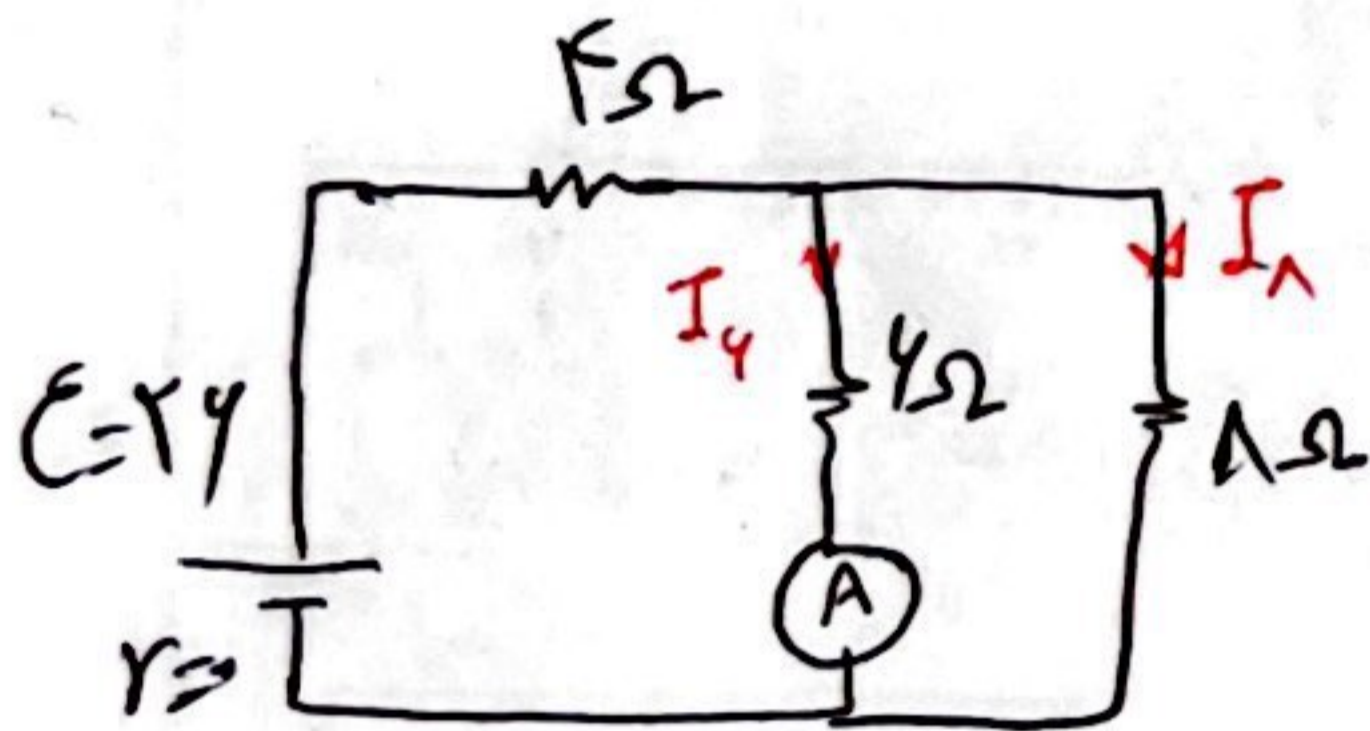
$U_2 - U_1 = \gamma\delta \rightarrow \frac{q_2 r}{rc} - \frac{q_1 r}{rc} = \gamma\delta \rightarrow \frac{q_2 r - q_1 r}{r \cdot \alpha c} = \gamma\delta \rightarrow q_1 = 5 \text{ nC}$



$F_{12} = \frac{q_1 \cdot q_2}{r^2} = q_2$

$\cos \epsilon\delta = \frac{q}{F_{21}} \rightarrow F_{21} = \frac{q \cdot r}{\sqrt{r}} = \frac{q \cdot \sqrt{2} \cdot r}{1 \cdot \sqrt{2}} \quad |q_2| = 6\sqrt{2}$

IV (۴)

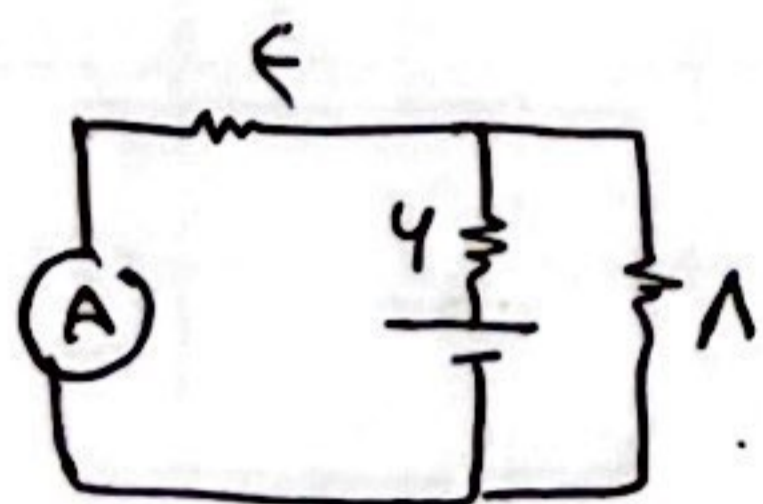


① $R_{4,1} = \frac{4 \times 1}{4+1} = \frac{4}{5}$

$I = \frac{E}{R+r} = \frac{24}{\frac{4}{5} + 1} = 2,4$

$I_1 = 1,6$
 $I_4 = 2$

V (۴)



② $\frac{1 \times \epsilon}{1+\epsilon} = \frac{1}{\epsilon}$

$I = \frac{24}{\frac{4}{5} + \frac{1}{\epsilon}} = 2$

$I_{(1)} = 4/5 \text{ A}$

VI (۴)

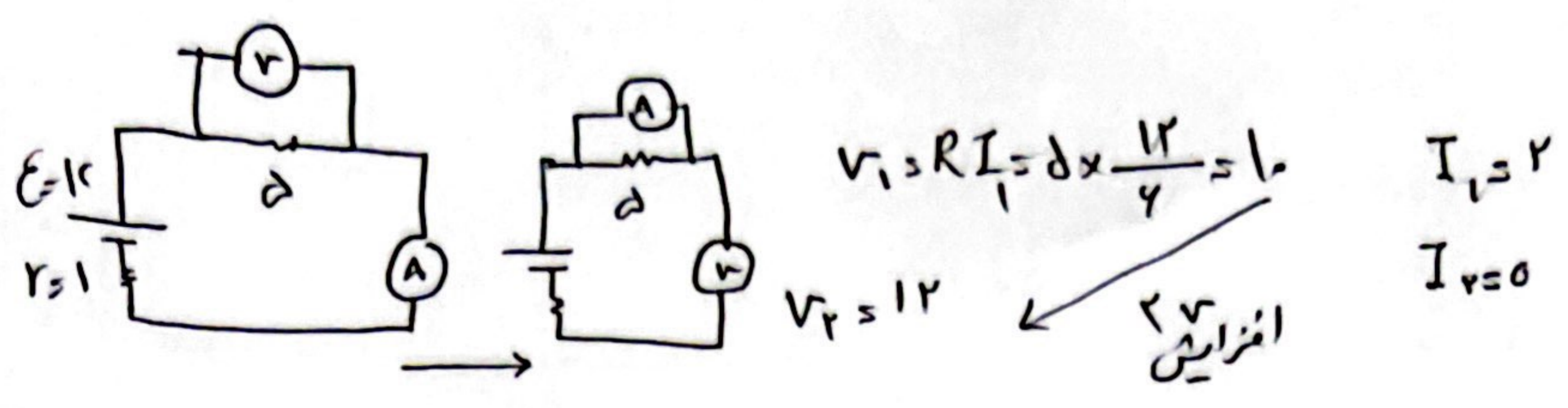
متولی $P_1 = RI^2 = (R_1 + \epsilon) \left(\frac{2\epsilon}{4 + R_1} \right)^2$

مولزی $P_2 = \frac{\epsilon R_1}{\epsilon + R_1} \left(\frac{2\epsilon}{\frac{\epsilon R_1}{\epsilon + R_1} + 2} \right)^2$

$P_1 = \frac{4\epsilon}{1-\epsilon} P_2$
 بیش مقدار ریزش در سیم که با انتقال انرژی
 به سمت سیم است. $R = \epsilon$

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1 (44)



F (47)

$$\mathcal{E} = -N \frac{\Delta \Phi}{\Delta t} = -1 \times \frac{(0 - 2 \times 1 \cdot \delta) \times \delta \times 1 \cdot \delta}{1 \cdot \delta} = 0.1 \text{ V}$$

F (48)

F (49)

$$P = P_1 + \rho g h_1 + \rho g h_2 + \rho g h_3 + \rho g h_4 + \rho g h_5$$

$$m = \rho V \Rightarrow 2 \times 2 = 1 \times 2 \times h \rightarrow h = 1 \text{ cm}$$

$$\delta \Sigma \Sigma = 1 \times 2 \times h \rightarrow h = 2 \text{ cm}$$

$$P_T = 1.4 \times 10^4 \text{ Pa}$$

F (50)

$$W_{HK} = E_2 - E_1 = \left(\frac{1}{2} \times 0.2 \times 12^2 \right) - \left(\frac{1}{2} \times 0.2 \times 10^2 + 0.2 \times 10 \times 10 \right)$$

$$= 3.2 \text{ J} - (10 + 2) = -1.4 \text{ J}$$

F (51)

$$Q_1 + Q_2 + Q_3 = 0$$

$$0.2 \times \Sigma \Sigma \times (20 - 10) + 0.1 \times C \times (20 - 10) + C \times (20 - 10) = 0$$

$$C = 2.4 \text{ J/}^\circ\text{C}$$

F (52)

$$k = \frac{1}{2} m v^2 = \frac{1}{2} \times 2 \times (2 \delta)^2 = 4 \delta^2 \text{ mJ}$$

F (53)

$$F = \delta \theta \rightarrow 1.8 \theta + 32 = \delta \theta \rightarrow \theta = 1.6 \text{ }^\circ\text{C}$$

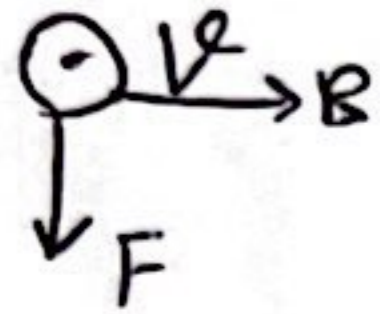
$$T = 1. + 27^\circ\text{C} = 28.6$$

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$$19 \times 10^{-10} \times 10^{-4} = 1.9 \times 10^{-14}$$

4 (74)

1 (75)



$$F = |R| \sin \theta$$

$$R = \frac{F \times 10^{-14}}{0.5 \times 4.7 \times 10^{-19} \times 1}$$

$$R = 0.5$$

به شرق

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