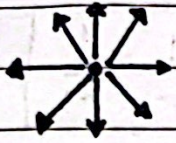
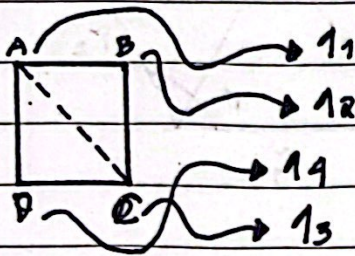


Usaha dan Energi



$$W = \int_A^B \vec{F} \cdot d\vec{L} = -q \int_A^B \vec{E} \cdot d\vec{L} = -q \int_{\frac{1}{4\pi\epsilon_0 r^2}} \frac{1}{r^2} dr$$

$$W = -q \left[\frac{1}{4\pi\epsilon_0 r} \right] = q \left[\frac{1}{4\pi\epsilon_0 r} \right] = qV$$



$$\therefore W_1 = q_1 V_1 = 0$$

$$\therefore W_2 = q_2 V_2 = q_2 \left[k \frac{q_1}{r_1} \right]$$

$$\therefore W_3 = q_3 V_3 = q_3 \left[k \frac{q_1}{r_1} + k \frac{q_2}{r_2} \right]$$

$$\therefore W_4 = q_4 V_4 = q_4 \left[k \frac{q_1}{r_1} + k \frac{q_2}{r_2} + k \frac{q_3}{r_3} \right]$$

$$W = \frac{1}{2} \sum_{i=1}^n q_i V_i$$

$$P = \epsilon_0 (\nabla \cdot \vec{E})$$

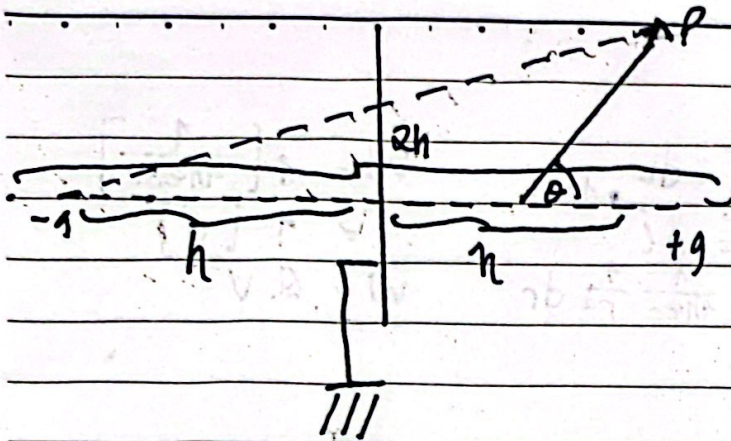
$$\nabla \cdot \vec{E} = \frac{\rho}{\epsilon_0}$$

$$W = \frac{1}{2} \int \rho V dV$$

$$W = \frac{1}{2} \int \sigma V dS$$

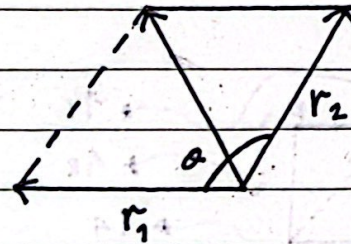
$$W = \frac{\epsilon_0}{2} \int \vec{E}^2 dV$$

$$W = \frac{1}{2} \int \rho V dV$$



$$P = \frac{1}{4\pi\epsilon_0 r} + \frac{-1}{4\pi\epsilon_0 r^1}$$

$$= \frac{1}{4\pi\epsilon_0} \left[\frac{1}{r} - \frac{1}{r^1} \right]$$



$$r^1 = (r^2 + 4h^2 + 4hr \cos \theta)^{1/2}$$

$$\frac{dv}{dr} = k \left[\frac{1}{r} - \frac{1}{(r^2 + 4h^2 + 4hr \cos \theta)^{1/2}} \right]$$

$$= k \left[\frac{1}{r^2} - \frac{\frac{1}{2} (r^2 + 4h^2 + 4hr \cos \theta)^{-1/2} (2r + 4h \cos \theta)}{(r^2 + 4h^2 + 4hr \cos \theta)} \right]$$

