

Usaha & Energi



q

V = Potensial

$$W = \int_A^B \vec{F} \cdot d\vec{L}$$

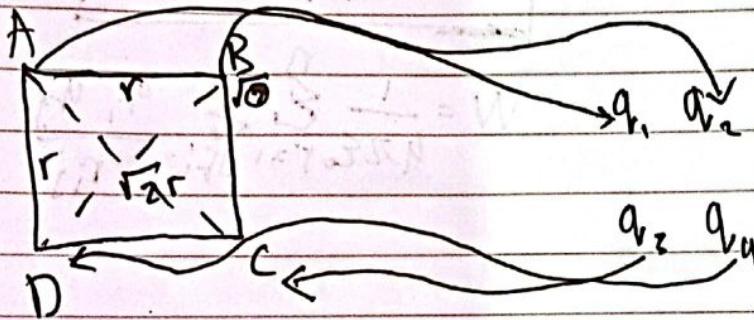
$$W = -q \left[\frac{q}{4\pi\epsilon_0 r} \right]$$

$$= -q \int \vec{E} \cdot d\vec{L}$$

$$= Q(V)$$

$$= -q \left[\int \frac{1}{4\pi\epsilon_0} \frac{q}{r^2} dr \right]$$

$$W = QV$$



$$- W_1 = q_1 V_1 = 0 \rightarrow \text{Potensialnya } 0$$

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

$$- W_4 = q_4 V_4 = q_4 \left[k \frac{q_1}{r} + k \frac{q_2}{\sqrt{2}r} + k \frac{q_3}{r} \right]$$

$$W_2 = q_2 V_2$$

$$- W_3 = q_3 V_3$$

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

$$W_4 = W_1 + W_2 + W_3 + W_4 = k \frac{q_1 q_2}{r}$$

$$= q_3 \cdot k \frac{q_1 q_2}{\sqrt{2}r}$$

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

$$W = \frac{1}{2} \int \lambda v dl \rightarrow \text{Volume}$$

$$W = \frac{1}{2} \int b v ds \rightarrow \text{Luas}$$

$$W = \frac{1}{2} \int P V d\theta \rightarrow \text{Torsi}$$

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

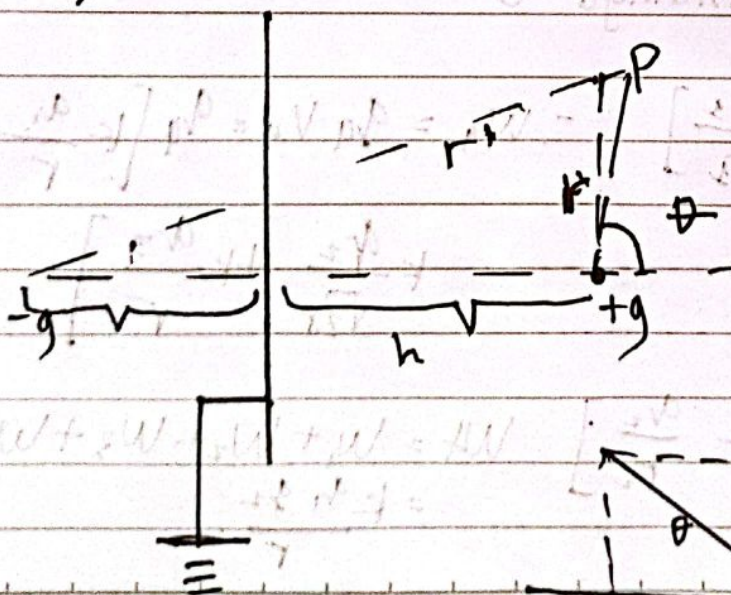
$$\nabla \cdot \vec{E} = \frac{\rho}{\epsilon_0}$$

$$W = \frac{\epsilon_0}{2} \int \vec{E} d\phi$$

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

$$W = \frac{1}{4\pi\epsilon_0} \sum_{i=1}^n \sum_{j=1}^m \frac{q_i q_j}{r_{ij}}$$

Metode Bayangan



$$P = \frac{1}{4\pi\epsilon_0} \frac{q}{r} + \frac{-q}{4\pi\epsilon_0 r'} = \frac{q}{4\pi\epsilon_0} \left[\frac{1}{r} - \frac{1}{r'} \right]$$

atau

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

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

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

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

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

$$(r^2 + 4h^2 + 4hr \cos \theta)$$

= 1

