LISMA

No. Pert. 09

Date 18/04/2022

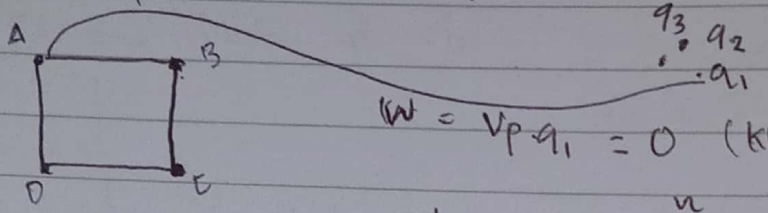
74.

Rumuskan usaha untuk benda yg terdistribusi

⇒ $W = q_n (V_i \pm V_a)$

$= V_p \cdot q_n$

kemampuan memindahkan muatan dg kecepatan tertentu.



$W = V_p q_1 = 0$ (krn tidak ada potensial yg diberikan)

$$W = \frac{1}{4\pi\varepsilon_0} \sum_{i=1}^{n} q_i \sum_{i \neq j} \frac{q_j}{r}$$

$$W = \frac{1}{2} \frac{1}{4\pi\varepsilon_0} \sum_{i=1}^{n} q_i \sum_{i \neq j} \frac{q_i}{r}$$

$$W = \frac{1}{2} \sum_{i=n}^{n} q_i \sum_{\substack{i \neq j \\ j > i}} V_i$$

$$W = \frac{1}{2} V_p \cdot q_n$$

muatan diskrit ⇒

$$W = \frac{1}{2} \sum_{i=1}^{n} q_i \left[\sum_{\substack{i=1 \\ j \neq i}} \frac{1}{4\pi\varepsilon_0} \frac{q_j}{r_{ij}} \right]$$

Muatan Terdistribusi Kontinu

→ $W = \frac{\varepsilon_0}{2} \int_v E^2 \, dv$ ⇒ $\int dq = \int_0^R \int_0^{\pi} \int_0^{\pi} r^2 \sin\theta \, d\theta \, d\phi \, dq$

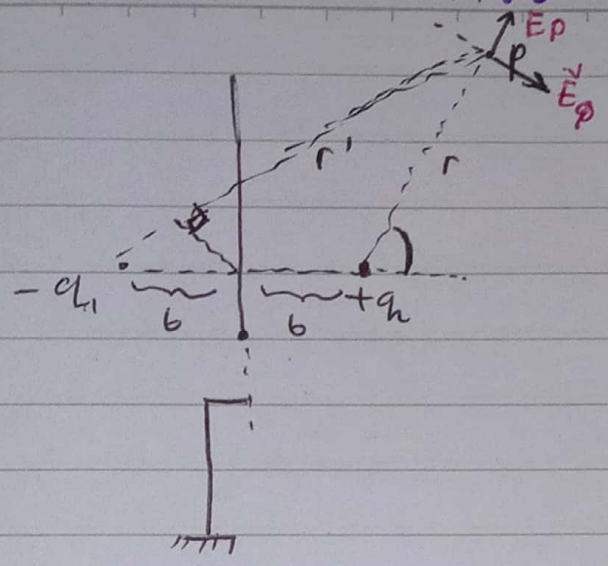
→ $W = \frac{1}{2} \int \sigma V da^{-1}$ $= 4\pi \int_0^R b^2 \, dr$

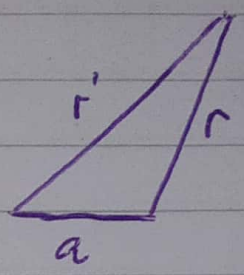
$W = \frac{1}{2} \iint \sigma V da$

No.

Date hal 86

Bab 3. Metoda Penentuan Potensial





$r' = [r^2 + a^2 + 2ar\cos\theta]^{1/2}$

$\partial V/\partial r$ → fungsi 2-3 dimensi

dV/dr → fungsi 1 dimensi

•) $V_p = \frac{1}{4\pi\varepsilon_0}\left[\frac{q_2}{r} - \frac{q_2}{r'}\right]$

$V_p = \frac{1}{4\pi\varepsilon_0}\left[\frac{q_2}{r} - \frac{q_2}{[r^2 + a^2 + 2ar\cos\theta]^{1/2}}\right]$

•) $\vec{E} = -\frac{\partial V}{\partial r}$

$\vec{E} = -\frac{q_2}{4\pi\varepsilon_0}\frac{\partial}{\partial r}\left[\frac{1}{r} - (r^2 + q_1^2 + 4hr\cos\theta)^{-1/2}\right] = -\frac{q_2}{4\pi\varepsilon_0}\left[\frac{1}{r^2} - \frac{2r + 4h\cos\theta}{(r^2 + 4h^2 + 4hr\cos\theta)^{3/2}}\right]$

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

$= +\frac{1}{2}\left(\frac{2r + 4h\cos\theta}{r^2 + 4h^2 + 4hr\cos\theta}\right)^{3/2}$

•) $\vec{E}_\theta = -\frac{1}{r}\frac{\partial V}{\partial \theta}$

•) $\vec{E}_\theta = -\frac{1}{r}\frac{\partial V}{\partial \theta}$ =

$= -\frac{1}{r}\frac{q_2}{4\pi\varepsilon_0}\frac{d}{\partial\theta}\left(\frac{1}{P} + \frac{1}{(r^2 + 4h + 4hr\cos\theta)^{1/2}}\right)$

$= -\frac{q_2}{4\pi\varepsilon_0 r}\left[-\frac{1}{2}\frac{4hr\sin\theta}{(r^2 + 4h + 4hr\cos\theta)^{3/2}}\right]$

$= \frac{q_2}{4\pi\cos}\left[\frac{2hr\sin\theta}{(r)^{3/2}}\right]$