Kalisma

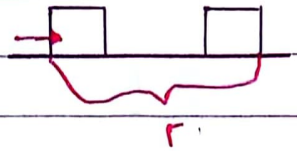
No. Senin, 22/04/2024

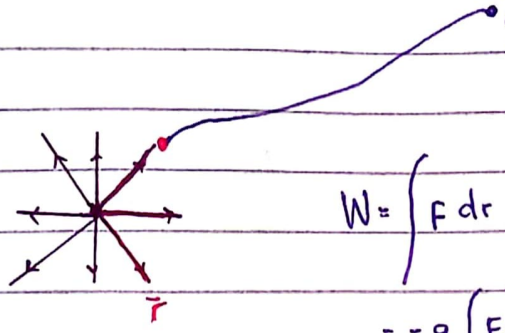
Date

# Usaha dan Energi

$$W = \int F \, df \rightarrow d\vec{r}$$

$$W = qV$$




$$W = \int F \, dr$$

$$= -q \int E \, dr$$

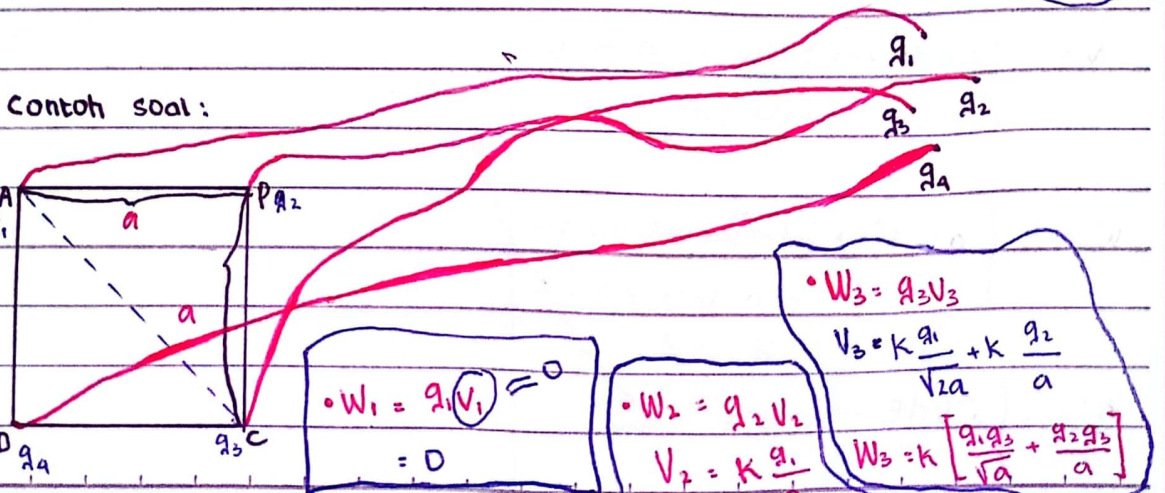
$$= -q \left[ -k \frac{Q}{r} \right] = qV$$

- $W_A = q_a V_a$

$$V_A = k \left[ \frac{q_1}{a} + \frac{q_2}{\sqrt{2}a} + \frac{q_3}{a} \right]$$

$$= k \left[ \frac{q_1 q_a}{a} + \frac{q_2 q_a}{\sqrt{2}a} + \frac{q_3 q_a}{a} \right]$$

Contoh soal:




- $W_1 = q_1 V_1 = 0$

$= 0$

- $W_2 = q_2 V_2$

$$V_2 = k \frac{q_1}{a}$$

$$W_2 = k q_2 \frac{q_1}{a} = k \frac{q_1 q_2}{a}$$

- $W_3 = q_3 V_3$

$$V_3 = k \frac{q_1}{\sqrt{2}a} + k \frac{q_2}{a}$$

$$W_3 = k \left[ \frac{q_1 q_3}{\sqrt{a}} + \frac{q_2 q_3}{a} \right]$$

$$a^2 = \sqrt{a^2 + a^2} = a\sqrt{2}$$

No.

Date . .

$W_{tot} = W_1 + W_2 + W_3 + W_4$

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

$= \frac{1}{8\pi\varepsilon_0} \sum_{i=1}^{n} q_i \sum_{j \neq i}^{m} \frac{j q_j}{r_{ij}}$

$= \frac{1}{2} \sum_{i=1}^{n} q_i \sum \frac{1}{4\pi\varepsilon_0 r_{ij}} q_j$

$W = \frac{1}{2} \sum_{i=1}^{n} q_i \sum_{j \neq i}^{m} V_j$

$= \frac{1}{2} \sum_{i=1}^{n} q_i \sum_{j \neq i}^{n} V_j$

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

$W = \frac{1}{2} \int a v d\vec{t}$ → Potensial oleh muatan pada garis

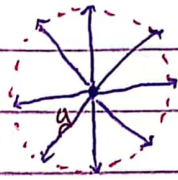
$W = \frac{1}{2} \int \sigma V d\vec{s}$ → potensial oleh muatan pada permukaan.

$W = \frac{1}{2} \int \rho V dG$ → Volume

$\rho = \varepsilon_0 \nabla \cdot \vec{E} \longrightarrow \nabla \vec{E} = \frac{\rho}{\varepsilon_0}$

$W = \frac{\varepsilon_0}{2} \int (\nabla E)^2 V dG$

$W = \frac{\varepsilon_0}{2} \int E^2 dG$



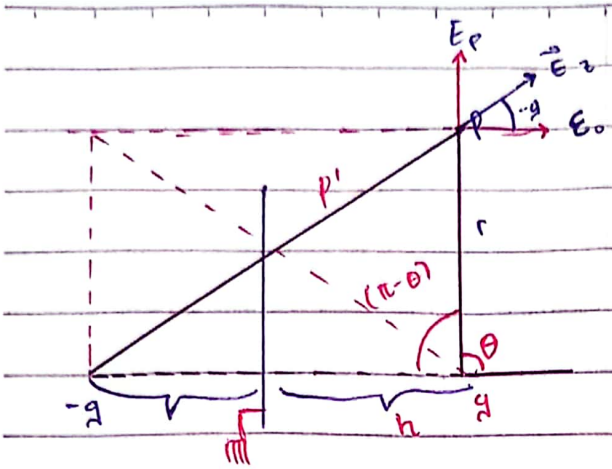
$\oint \varepsilon d\vec{a} = \frac{Q}{\varepsilon_0}$

No. Senin, 22/2024/09

Date . .

Fisika

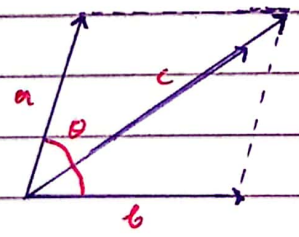
# METODE BAYANGAN




$$V_p = K\left[\frac{q}{r} + \frac{-q}{r'}\right]$$

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

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




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

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

No.

Date

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

$$\vec{E_\theta} = \frac{\partial V}{\partial \theta}$$

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

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