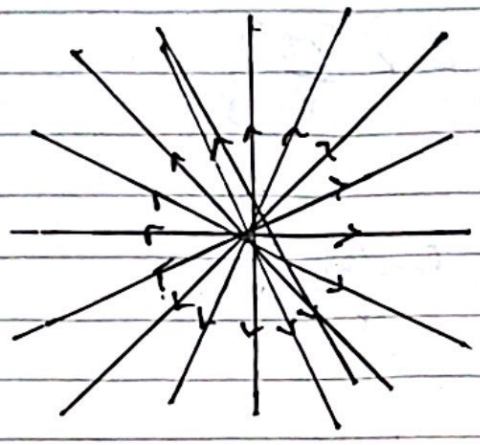
No. Senin

Date 22 . 09 . 2079

KALUSMA

Usaha dan Energi



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

$$= -q \int \vec{E}\, dl \quad \rightarrow dr$$

$$= -q \left[\int \frac{1}{4\pi\varepsilon_0} \frac{q}{r^2} dr \right]$$

$$W = -q \left[-\frac{q}{4\pi\varepsilon_0 r} \right]$$

$$= Q\,[V]$$

$$W_1 = q_1 V_1 = 0$$

$$W_2 = q_2 V_2 = q \left[k \frac{q_1}{r} \right]$$

$$W_2 = q_2 V_2$$

$$W_3 = q_3 V_3$$

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

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$= q_3 \left[\right.$

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

$W_b = W_1 + W_2 + W_3 + W_4$

$= k\frac{q_1 q_2}{r} + k\frac{q_1 q_3}{r} + k\frac{q_2 q_3}{r} + \dots$

$W = \frac{1}{4\pi\varepsilon_0} \sum_{i=} \sum_{j\neq} \frac{q_i q_j}{r_{ij}}$

Dari semua persamaan tersebut dapat disimpulkan bahwa:

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

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

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

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

$W = \frac{1}{2} \int \rho V \, d\tau$

$\rho = \varepsilon_0 (\nabla \cdot \vec{E})$ Hkm-gauss dlm bentuk diferensial

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

$W = \frac{\varepsilon_0}{2} \int \vec{E} \, d\tau$

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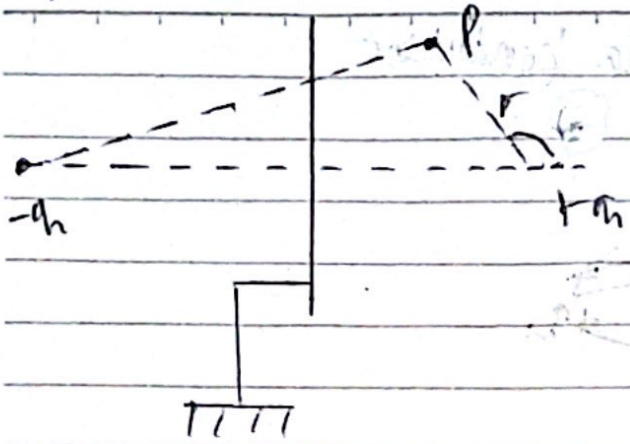
~~FISIKA~~ BAB 3 Metode Penentuan Potensial



1. Muatan listrik dan babang konduktor

$$V = \frac{1}{4\pi\varepsilon_0}\frac{q}{r} + \frac{-q}{4\pi\varepsilon_0 r'}$$

$$= \frac{q}{4\pi\varepsilon_0}\left[\frac{1}{r} - \frac{1}{r'}\right]$$

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

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

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

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

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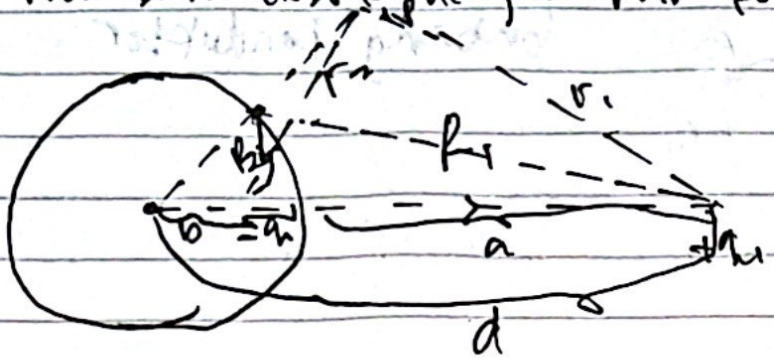
2- Muatan listrik dengan bola konduktor



$$V = \frac{1}{4\pi\varepsilon_0}\left(\frac{q_1}{R_1} - \frac{q_2}{R_2}\right) = 0$$

$$R_1^2 = a^2 + d^2 - 2ad\cos\theta$$
$$R_1^2 = a^2 + b^2 - 2ba\cos\theta$$

Untuk $V = 0$, maka:

$$\frac{q_1}{R_1} = \frac{q_2}{R_2} \Rightarrow \frac{q_1^2}{q_2^2} = \frac{R_1^2}{R_2^2} = \frac{a^2 + d^2 - 2ab\cos\theta}{a^2 + b^2 - 2ab\cos\theta}$$

$$\left(\frac{q_1}{q_2}\right)^2 = \left(\frac{R_1}{R_2}\right)^2 = \frac{d}{b}\left(\frac{a^2/d + q_2 - 2a\cos\theta}{a^2/b + b - 2a\cos\theta}\right)$$