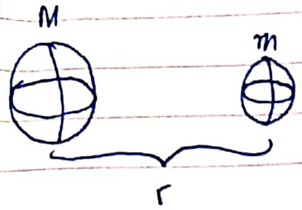
No.

Date 01 . 04 . 2024

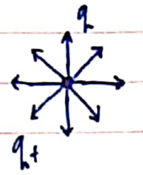
Potensial listrik



$$W = k \frac{M \cdot m}{r}$$

$$V = \frac{W}{m} = k \frac{M}{r}$$

$$V_{ab} = \frac{W}{Q} = k \frac{q \cdot Q}{r}$$



$$W = \vec{F} \cdot \vec{r}$$

$$= k \frac{q \cdot Q}{r^2} r$$

$$= k \frac{q \cdot Q}{r}$$

Energi potensial dari a - b

$$\int_a^b dv = - \int_{ra}^{rb} \vec{E} \, dr$$

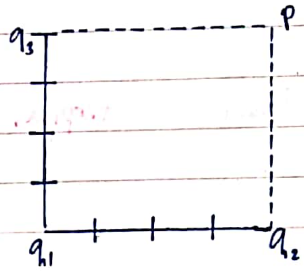
$$v \Big|_a^b = - \int_{ra}^{rb} k \frac{q}{r^2} dr$$

$$= - kq \int_{ra}^{rb} r^{-2} dr$$

$$= - kq \left(-r^{-1} \Big|_{ra}^{rb} \right)$$

$$= kq \left[\frac{1}{rb} - \frac{1}{ra} \right]$$

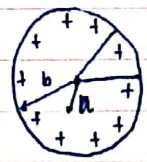
$$V_b - V_a = kq \left[\frac{1}{rb} - \frac{1}{ra} \right]$$



$$V_p = k \left[\frac{q_1}{\sqrt{32}} + \frac{q_2}{4} + \frac{q_3}{4} \right]$$

$$\hookrightarrow r = \sqrt{4^2 + 4^2}$$

Tidak ada muatan



$$V_b - V_a = kq \left[\frac{1}{rb} - \overset{\approx 0}{\frac{1}{ra}} \right]$$

$$V_b = V_a = k \frac{Q}{R}$$

$$V_a = k \frac{Q}{R} \qquad V = k \frac{Q}{r}$$

$r > R$

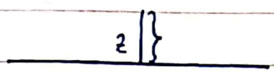
Pers Poisson dan Lapalace.

$$\nabla \cdot \nabla V = \nabla^2 V$$

$$\vec{E} = -\nabla V$$

$$V = -\int \vec{E} \cdot d\vec{r} = -\int_{-\infty}^{\infty} \frac{\lambda}{2\pi\varepsilon_0 r}\, dr = -\frac{\lambda}{2\pi\varepsilon_0} \int_{-\infty}^{\infty} \frac{1}{r}\, dr$$

$$= -\int \vec{E} \cdot d\vec{l}$$



$$\vec{E} = \frac{\lambda}{2\pi\varepsilon_0} \qquad \oint \vec{E}\, da = \frac{Q}{\varepsilon_0}$$

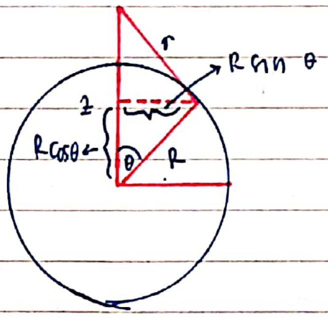
$$E(2\pi r l) =$$

$V = k \frac{q}{r}$ → diskrit (terpisah - pisah)

$$V = k \int \frac{\sigma\, da}{r}$$

$$= k \int \frac{dq}{r} \rightarrow \sigma a$$

→ tidak diskrit (terdistribusi)



$$r = \sqrt{(R \sin\theta)^2 + (z - R\cos\theta)^2}$$

$$= \sqrt{R^2 + z^2 - 2Rz\cos\theta}$$

$$V = \frac{1}{4\pi\varepsilon_0} \int_0^{2\pi}\int_0^{\pi} \frac{\sigma\, da}{r}$$

$$= \frac{\sigma}{4\pi\varepsilon_0} \iint \frac{r^2 \sin\theta \; d\theta\, d\phi}{(R^2 + z^2 - 2Rz\cos\theta)^{\frac{1}{2}}}$$

$$= \frac{2\pi\sigma}{4\pi\varepsilon_0} \int_0^{\pi} \frac{\sin\theta\, d\theta}{(R^2 + z^2 - 2Rz\cos\theta)^{\frac{1}{2}}}$$

$$= \frac{2\pi\sigma}{4\pi\varepsilon_0} \int \frac{d(\cos\theta)}{(R^2 + z^2 - 2Rz\cos\theta)^{\frac{1}{2}}}$$

$$= \square \int (R^2 + z^2 - 2Rz\cos\theta)^{-\frac{1}{2}}\, d(\cos\theta)$$