1/4 24

No.

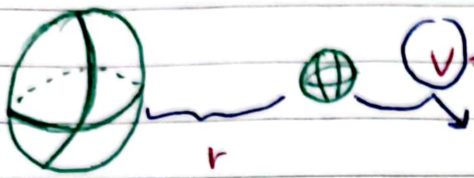
Date . .

Potensial Listrik

(Elektric Potensial)

$W = G \frac{Mm}{r}$

$V = \frac{W}{q} = \frac{F \cdot r}{q}$



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

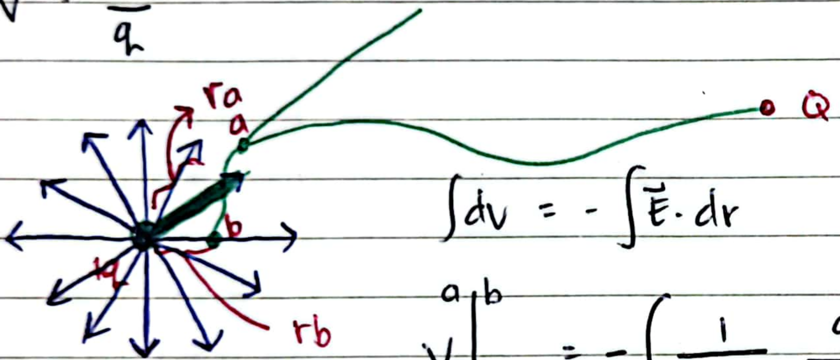
$V = G \frac{M}{r}$

$= \frac{W}{m}$

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

$$\boxed{V = k \frac{q}{r}}$$

$V = \frac{W}{q}$



$\int dV = -\int \vec{E} \cdot dr$

$V \Big|_a^{a\,b} = -\int \frac{1}{4\pi\varepsilon_0} \frac{q}{r^2} dr$

$= -\frac{q}{4\pi\varepsilon_0} \int_{ra}^{rb} \frac{1}{r^2} dr$

$= -\frac{q}{4\pi\varepsilon_0} \left(-\frac{1}{r} \Big|_{ra}^{rb} \right)$

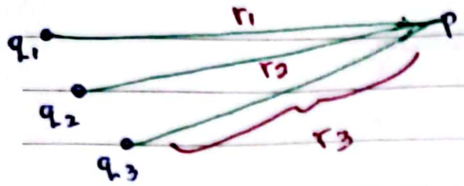
$=$ $\boxed{V_b - V_a = \frac{q}{4\pi\varepsilon_0} \left(\frac{1}{r_0} - \frac{1}{r_a} \right)}$

$\int \Delta V$ $\quad k \frac{qQ}{r}$

$\boxed{V = k \frac{q}{r}}$

$V = \frac{W}{Q}$

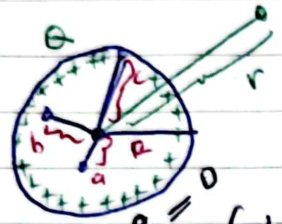
$q \quad P = k \frac{q}{r}$



$$V = \frac{W}{q} = \frac{\vec{F}\cdot\vec{s}}{q} = k\frac{q}{r}$$

$$V_P = k\left[\frac{q_1}{r_1} + \frac{q_2}{r_2} + \frac{q_3}{r_3}\right]$$

$$= k\sum_{i=1}^{n}\frac{q_i}{r_i}$$

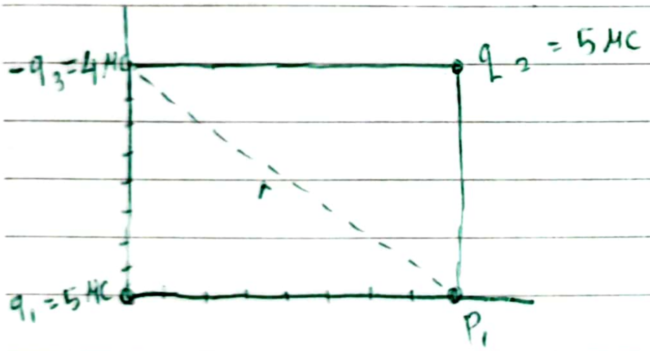


$$V = k\frac{Q}{r},\ r > R$$

$$V_b - V_a = \frac{q}{4\pi\mu_0}\left(\frac{1}{r_b} - \frac{1}{r_a}\right)$$

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

Gambarkan k



$$V = \frac{kq_1}{r_1} + \frac{kq_2}{r_2} + \frac{k(-q_3)}{r_3}$$

$$= k\left(\frac{5}{8} + \frac{5}{8} + \frac{(-4)}{\sqrt{8^2+8^2}}\right)$$

$$= k\left(\frac{5}{8} + \frac{5}{8} + \frac{(-4)}{\sqrt{128}}\right)$$

$$\oint_S \vec{E}\cdot d\vec{a} = \int_V (\nabla\cdot\vec{E})\, d\tau$$

perubahan

Medan = Gradien di suatu V (skala)

- potensial

PERSAMAAN POISSON & LAPLACE

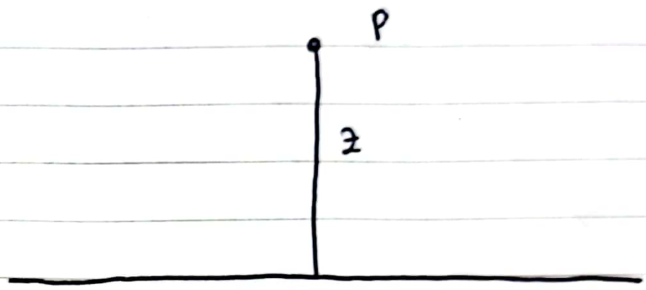
$$E = -\nabla V$$

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

$$\nabla\cdot\vec{E} = \frac{\rho}{\mu_0}$$

$$\nabla^2 V = -\frac{\rho}{\mu_0} \quad \text{(poison)}$$

$$\nabla^2 V = 0 \quad \text{(Laplace)}$$



$$\vec{E} = \frac{\lambda}{2\pi\mu_0 r}$$

$$\oint \vec{E}\cdot da = \frac{\lambda\cdot l}{\mu_0}$$

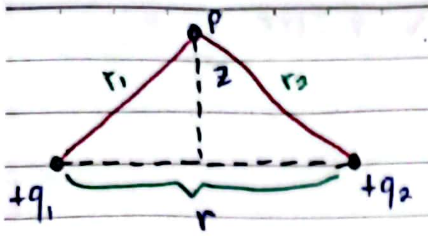
$$\vec{E}(2\pi r \cancel{l}) = \frac{\lambda\cdot\cancel{l}}{\mu_0}$$

$$\vec{E} = \frac{\lambda}{2\pi\mu_0 r}$$

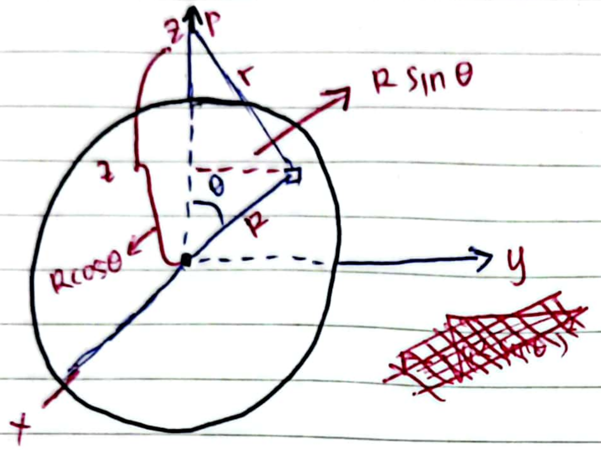
$$V = -\int \vec{E}\cdot dr$$

$$= -\int \frac{\lambda}{2\pi\mu_0}\frac{1}{r}\,dr$$

$$= -\frac{\lambda}{2\pi\mu_0}\int \frac{1}{r}\,dr$$



$$V_p = k\left[\frac{q_1}{\sqrt{(\frac{1}{2}r)^2+z^2}} + \frac{q_2}{\sqrt{(\frac{1}{2}r)^2+z^2}}\right]$$



$$V_{(p)} = \frac{1}{4\pi\mu_0}\int \frac{\sigma}{r}\, da$$

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

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

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

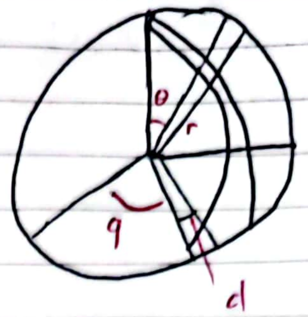
$$= \sqrt{R^2+z^2-2zR\cos\theta}$$

$$dq = \sigma da$$

$$V = \frac{1}{4\pi\mu_0}\int\frac{\sigma da}{r}$$

$$= \frac{1}{4\pi\mu_0}\iint \frac{\sigma da}{(R^2+z^2-2Rz\cos\theta)^{\frac{1}{2}}}$$

$$= \frac{\sigma}{4\pi\mu_0}\int_0^{\pi}\int_0^{2\pi}\frac{r^2\sin\theta\, d\theta\, d\phi}{(R^2+z^2-2Rz\cos\theta)^{\frac{1}{2}}}$$



$$\boxed{\square \rightarrow \frac{\sigma R 2\pi}{4\pi\mu_0}} \int_0^{\pi} \frac{\sin\theta\, d\theta}{(R^2+z^2-2Rz\cos\theta)^{\frac{1}{2}}}$$

$$V_p = \square\int_0^{\pi} \frac{d(\cos\theta)}{(R^2+z^2-2Rz\cos\theta)^{\frac{1}{2}}}$$

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

$$= \square\ 2\ (R^2+z^2-2Rz\cos\theta)^{\frac{1}{2}}\Big|_0^{\pi}$$

dari ½

$r = R,\quad R = r$

$\pi\ \pi\ \pi.\quad (-R\cos(\theta))+z)^2 + |R|\,|\sin(\theta)|$ $\quad 1\cdot 2,\ 2$