No 18 Maret
Date

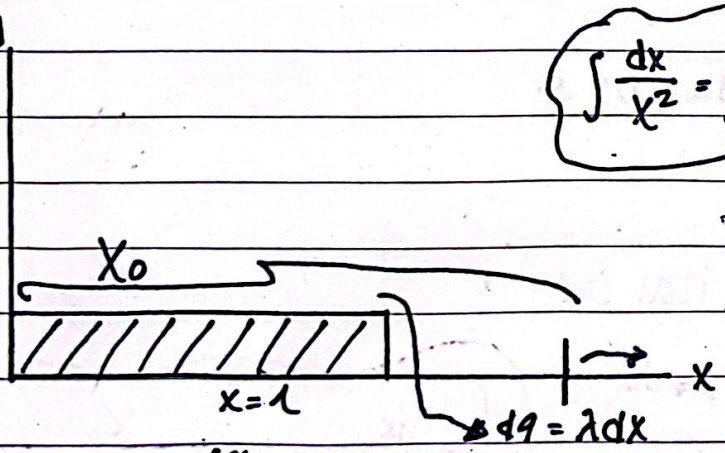
1). $\vec{E} = \frac{1}{4\pi\varepsilon_0} \frac{q}{r^2} \hat{r} = k \frac{q}{r^2} \hat{r}_0$ → oleh muatan listrik (terpisah)

2). $\vec{E} = \frac{1}{4\pi\varepsilon_0} \int \frac{\lambda \, dL}{r^2}$ $\quad q = \lambda L$ → Muatan berdistribusi pada penggaris

3). $\vec{E} = \frac{1}{4\pi\varepsilon_0} \iint \frac{\sigma da}{r^2} \hat{r}_0$ → Luas Permukaan

4). $\vec{E} = \frac{1}{4\pi\varepsilon_0} \iiint \frac{\rho dT}{r^2} \hat{r}_2$ → pada ruang muda kekiri pada volume

2 → Jawaban Soal hal 50



$$\int \frac{dx}{x^2} = \int x^{-2} dx = x^{-1} \Big|_0^2 = \frac{1}{x} \Big|_0^2$$

$$\vec{E} = \frac{1}{4\pi\varepsilon_0} \int_0^{\alpha} \frac{\lambda dx}{(x_0 - x)^2}$$

$$= \frac{1}{4\pi\varepsilon_0} \lambda \int_0^{\alpha} (x_0 - x)^{-2} dx$$

$$= \frac{\lambda}{4\pi\varepsilon_0} (x_0 - x)^{-1} \Big|_0^2$$

$$= \frac{\lambda}{4\pi\varepsilon_0} \left(\frac{1}{x_0 - x} \right) \Big|_0^2$$

$$= \frac{\lambda}{4\pi\varepsilon_0} \left(\frac{1}{x_0^{-2}} - \frac{1}{x_0^{-0}} \right)$$

$$= \frac{\lambda}{4\pi\varepsilon_0} \left(\frac{1}{x_0^{-2}} - \frac{1}{x^0} \right)$$

$$= \frac{\lambda}{4\pi\varepsilon_0} \left(\frac{L}{x_0 (x_0 - L)} \right)$$

No
Date

Jawaban Soal no 2 hal 51

$\therefore x = -\infty$ $\quad \therefore \cos\theta = \frac{z}{r}$ $\quad \therefore \tan = \frac{x}{z}$ $\quad \therefore dx = \cos^2\theta$

$\therefore \theta = -\frac{\pi}{2}$ $\quad \therefore r = \frac{z}{\cos\theta}$

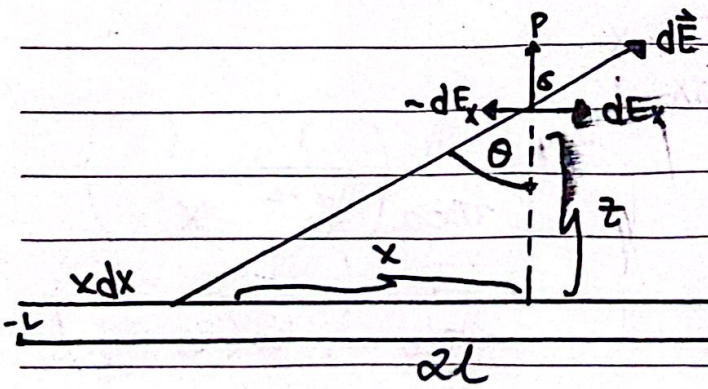
$\therefore \infty = \frac{\pi}{2}$ $\quad \therefore x = z\tan\theta$

$$\vec{E} = \frac{1}{4\pi\varepsilon_0}\int_{-\infty}^{\infty} \frac{\lambda dx}{r^2}\cos\theta$$

$$\vec{E} = \frac{1}{4\pi\varepsilon_0}\int_{-\infty}^{\infty} \lambda dx\cos\theta$$

$$= \frac{\lambda}{4\pi\varepsilon_0}\int_{-\infty}^{\infty} r^2\, dx\cos\theta$$

Jawaban Soal no. 3 hal 52



$$\int \frac{dx}{(x^2+z^2)^{3/2}} = \frac{x}{z^2\sqrt{x^2+z^2}}$$

$d\vec{E} = dE_y + d\vec{E}_x$ → saling meniadakan

$= dE_y$

$d\vec{E}_y = d\vec{E}\cos\theta$

$$\vec{E} = \frac{1}{4\pi\varepsilon_0}\int_{-L}^{L} \frac{\lambda dl}{r^2}\cos\theta$$

Date

$$= \frac{Q}{4\pi\varepsilon_0} \int_0^L \frac{\lambda dx}{(r^2+z^2)} \cos\theta$$

$$\vec{E} = \frac{Q\pi z}{4\pi\varepsilon_0} \int_0^L \frac{dx}{(x^2+z^2)^{3/2}}$$

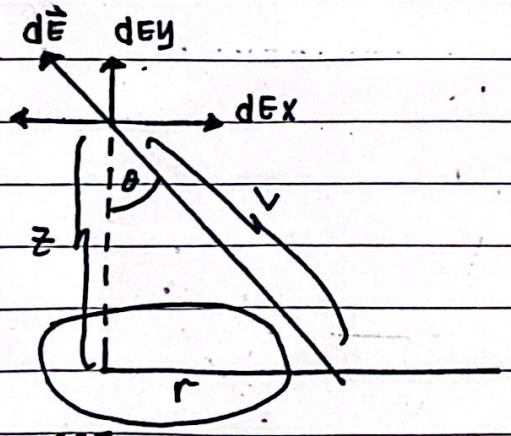
$$= \square \int \frac{dx}{(x^2+z^2)^{3/2}}$$

$$= \square \left(\frac{x}{z^2\sqrt{x^2+z^2}} \right) \Big|_0^L$$

$$= \square \left[\frac{L}{z\sqrt{L^2+z^2}} - \frac{0}{z\sqrt{0+z^2}} \right]$$

$$= \square \left[\frac{L}{z\sqrt{L^2+z^2}} \right]$$

→ Jawaban Soal no 30 hal 53



$$E = \frac{1}{4\pi\varepsilon_0} \int_0^{2\pi} \frac{z\lambda dl}{(z^2+r^2)^{3/2}}$$

$$= \frac{z\lambda}{4\pi\varepsilon_0 (z^2+r^2)^{3/2}} \int_0^{2\pi r} dl$$

$$= \frac{z\lambda}{4\pi\varepsilon_0 (z^2+r^2)^{3/2}} \cdot l \Big|_0^{2\pi r}$$

$$= \frac{z\lambda}{4\pi\varepsilon_0 (z^2+r^2)^{3/2}} (2\pi r - r^2)$$

$$= \frac{z\lambda}{4\pi\varepsilon_0 (z^2+r^2)^{3/2}} 2\pi r$$