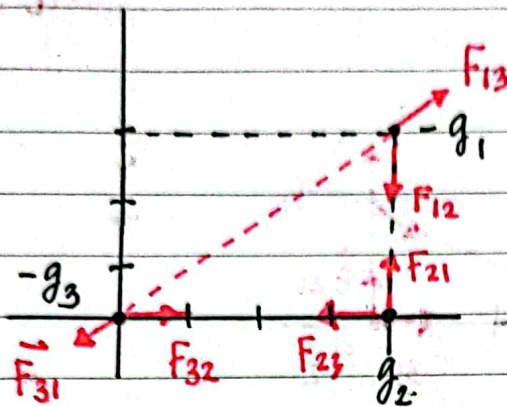


KALISMA



$$q = q$$

$$\vec{F}_{31} = \frac{1}{4\pi\epsilon_0} \frac{q_3 q_1}{5^2} \left(\frac{-4\hat{i} - 3\hat{j}}{5} \right)$$

$$\vec{F}_{32} = \frac{1}{4\pi\epsilon_0} \frac{q_3 q_2}{4^2} \hat{i}$$

$$\vec{F}_{12} = k \frac{q_1 \cdot q_2}{3^2} \left(\frac{0\hat{i} - 3\hat{j}}{3} \right)$$

$$\vec{F}_{12} = -k \frac{q_1 \cdot q_2}{3^2} \hat{j}$$

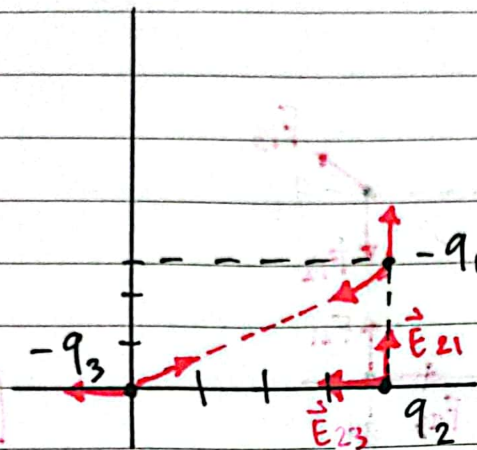
$$\vec{F}_{13} = k \frac{q_1 \cdot q_3}{5^2} \left(\frac{4\hat{i} + 3\hat{j}}{5} \right)$$

$$\vec{F}_{21} = k \frac{q_2 \cdot q_1}{3^2} \hat{j}$$

$$\vec{F}_{23} = k \frac{q_2 q_3}{4^2} (-\hat{i})$$

Medan

Sifat muatan :
Menuju



$$\vec{E}_{32} = \frac{F}{q_3} = k \frac{q_3 \cdot q_2 / r^2}{q_3} = k \frac{q_2}{r^2}$$

$$\vec{E}_{31} = k \frac{q}{5^2} \left(\frac{4\hat{i} + 3\hat{j}}{5} \right)$$

$$\vec{E}_{32} = k \frac{q_2}{4^2} (-\hat{i})$$

* Muatan non

$$①. E = k \frac{q}{r^2} \hat{r}$$

$$= k \sum_{i=1}^n \frac{q_i}{r_i^2} \hat{r}_i$$

$$= k \left[\frac{q_1}{r_1^2} \hat{r}_{01} + \frac{q_2}{r_2^2} \hat{r}_{02} + \dots + \frac{q_n}{r_n^2} \hat{r}_{0n} \right]$$

②.

⋮
z

$$\vec{E} = k \int \frac{dq}{r^2} \hat{r}_0 = k \int \frac{\lambda dx}{r^2} \hat{r}_0 \rightarrow \text{Medan pada kawat lurus}$$

③.



$$\vec{E} = k \iint \frac{\sigma dq}{r^2} \hat{r}_0 \rightarrow \text{luas}$$

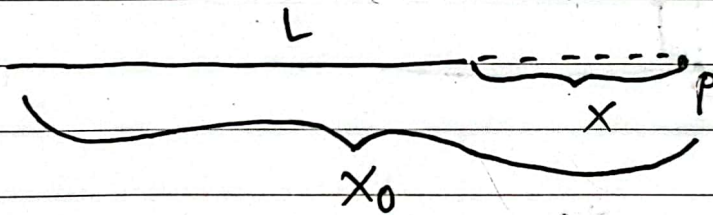
④.



$$\vec{E} = k \iiint \frac{\rho d\tau}{r^2} \hat{r}_0 \rightarrow \text{Volume}$$

Latihan

①.



$\vec{E}_P = ?$

$$\vec{E} = k \int_0^L \frac{\lambda dx}{(x_0 - x)^2} = k \lambda \int_0^L \frac{dx}{(x_0 - x)^2}$$

$$\begin{aligned} \int \frac{dx}{x^2} &= \int_0^L x^{-2} dx \\ &= x^{-1} \Big|_0^L \\ &= \frac{1}{x} \Big|_0^L \end{aligned}$$

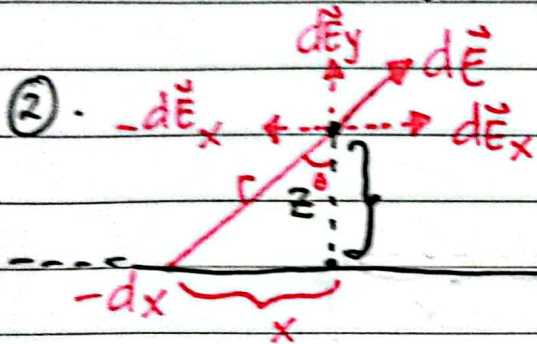
$$= k \lambda \int_0^L (x_0 - x)^{-2} dx$$

$$= k\lambda \left[\frac{1}{(x_0 - x)} \right]_0^L$$

$$= k\lambda \left[\frac{1}{(x_0 - x)} \right]_0^L$$

$$= k\lambda \left[\frac{1}{(x_0 - L)} - \frac{1}{(x_0 - 0)} \right]$$

$$= \cancel{k\lambda} \left[\frac{x_0 - (x_0 - L)}{x_0 (x_0 - L)} \right] = \cancel{0} \frac{L}{x_0 (x_0 - L)}$$



$$d\vec{E} = d\vec{E}_y + d\vec{E}_x$$

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

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

$$\vec{E} = k \int_{-\infty}^{\infty} \frac{\lambda \cancel{dx} \cos \theta}{r^2} \quad dq = x dx$$

Misal : $\cos \theta = \frac{z}{r}$

$$r = \frac{z}{\cos \theta}$$

$$\tan \theta = \frac{x}{z}$$

$$x = z \cdot \operatorname{tg} \theta$$

$$\rightarrow dx = \frac{z}{\cos^2 \theta}$$

$$x = -\infty$$

$$\theta = -\frac{\pi}{2}$$

$$x = \infty$$

$$\theta = \frac{\pi}{2}$$