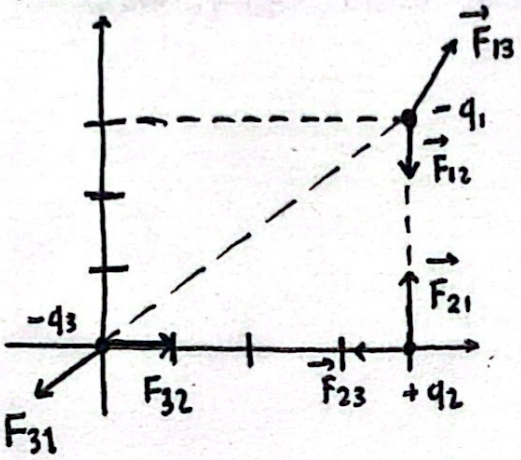
# Kalisma

18 Maret 2024
Senin




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

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

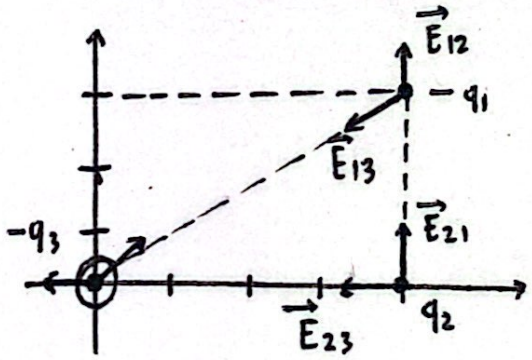
- $\vec{F}_{13} = K \frac{q_1 q_3}{5^2} \left( \frac{4\hat{i} + 3\hat{j}}{5} \right)$

$\vec{F}_{31} = \frac{1}{4\pi t_0} \frac{q_3 q_1}{5^2} \left( \frac{-4\hat{i} - 8\hat{j}}{5} \right)$

$\vec{F}_{32} = \frac{1}{4\pi t_0} \frac{q_3 q_2}{4^2} \hat{i}$

- $\vec{F}_{21} = K \frac{q_2 q_1}{3^2} (\hat{j})$
- $\vec{F}_{23} = K \frac{q_2 q_3}{4^2} (-\hat{i})$

- Mencari medan (arah medan)




- negatif : menuju kearah titik (mendekati)
- positif : menjauhi

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

$= K \frac{q_2}{r^2}$

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

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

Muatan Diskrit

1) $E = K \frac{q}{r^2} \hat{r}_0$

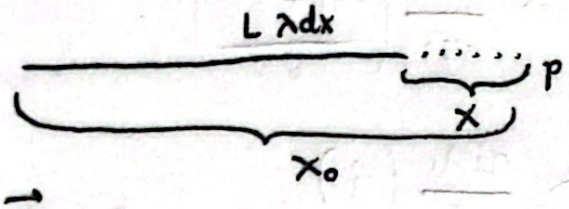
$= K \sum_{i=1}^{n} \frac{q_i}{r_i^2} \hat{r}_{0i}$

$= K \left[ \sum_{i=1}^{n} \frac{q_1}{r_1^2} \hat{r}_{01} + \frac{q_2}{r_2^2} \hat{r}_{02} + \dots + \frac{q_n}{r_n^2} \hat{r}_{0n} \right]$

2) $\vec{E} = K \int \frac{dq}{r^2} \hat{r}_o = K \int \frac{\lambda dx}{r^2} \hat{r}_o$ ⟶ medan pada kawat jalur

3)  $\vec{E} = K \iint \frac{\sigma dq}{r^2} \hat{r}_o$ ⟶ luasan

4)  $\vec{E} = K \iiint \frac{\rho dv}{r^2} \hat{r}_o$ → volume.




$\vec{E}_P = ?$

$$\vec{E} = K \int_0^L \frac{\lambda dx}{(x_o - x)^2} = K\lambda \int \frac{dx}{(x_o - x)^2}$$

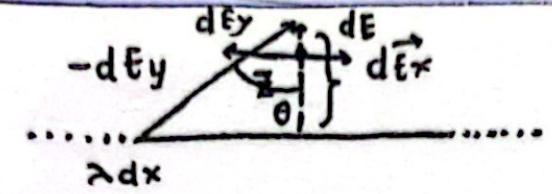
- $\int \frac{dx}{x^2} = \int_0^L x^{-2}\, dx$
  - $= x^{-1} \Big|_0^L$
  - $= \frac{1}{x} \Big|_0^L$

$$= K\lambda \int_0^L (x_o - x)^{-2} dx$$

$$= K\lambda \left[ \frac{1}{(x_o - x)} \Big|_0^L \right]$$

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

$$= K\lambda \left[ \frac{x_o - (x_o - L)}{x_o (x_o - L)} \right] = K\lambda \frac{L}{x_o (x_o - L)}$$




$$\vec{dE} = \vec{dE_y} + \vec{dE_x}$$

$$\vec{dE} = \vec{dE_y}$$

$$dE_y = dE\cos\theta$$

$$\vec{E} = K\int_{\infty}^{\infty} \frac{\lambda dx}{r^2}\cos\theta \qquad dq = \lambda dx$$

Misal :

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

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

$$\text{tangen } \theta = \frac{x}{z}$$

$$x = z\tan\theta$$

$$x = -\infty \qquad \theta = -\frac{\pi}{2}$$

$$x = \infty \qquad \theta = \frac{\pi}{2}.$$