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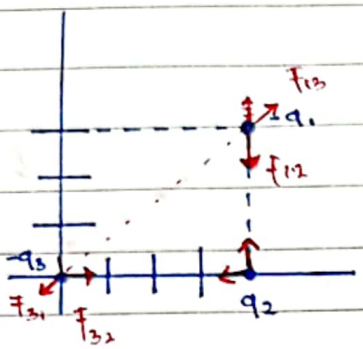
# KALISMA




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

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

$$\vec{F}_{12} = \left( \frac{1}{4\pi\epsilon_0} \right) \frac{q_1 q_2}{3^2} \left( \frac{0\hat{i} + 3\hat{j}}{3} \right)$$

K.

Note: $\sqrt{0^2 + 3^2} = \sqrt{9} = 3.$

$$F_{12} = -k \frac{q_1 q_2}{3^2} \hat{j}$$

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

$$F_{21} = \frac{1}{4\pi\epsilon_0} \frac{q_2 q_1}{3^2} \left( \frac{0\hat{i} + 3\hat{j}}{3} \right)$$

$$= \frac{1}{4\pi\epsilon_0} \frac{q_2 q_1}{3^2} \hat{j}$$

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

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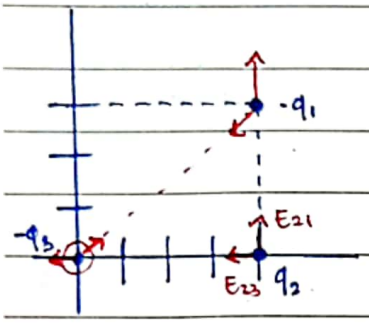
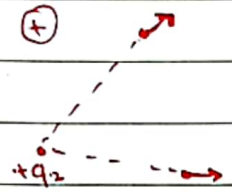
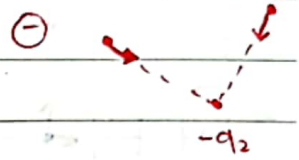
# MEDAN




$$E_{32} = \frac{F}{q_3} = k\frac{q_3 q_2 / r^2}{q_3}$$

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

$$E_{32} = k\frac{q_2}{r^2}$$

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

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

Gaya

Medan

Potensial.

$$E_{21} = \frac{F}{q_3} = \frac{q_2 q_1}{3^2}\hat{j} = k\frac{q}{3^2}\left(\frac{0\hat{i}+3\hat{j}}{3}\right) = k\frac{q}{3^2}(\hat{j})$$

$$E_{23} = \frac{F}{q_3} = k\frac{q}{4^2}\{4\hat{i}+3\hat{j}\} = k\frac{q}{4^2}(\hat{j})$$

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# MUATAN NON DISKRIK

Hanya berlaku untuk medan

1. $E = k\frac{q}{r^2}\hat{i}$

$= k\sum_{i=1}^{n}\frac{q\hat{i}}{r_i^2}\hat{r}_{oi}$

$= k\sum_{i=1}^{n}\frac{q_1}{r_1^2}\hat{r}_{o1} + \frac{q_2}{r_2^2}\hat{r}_{o2} + \frac{q_3}{r_3^2}\hat{r}_{o3} + \ldots \frac{q_n}{r_n^2} r_{oa}$

2. $\vec{E} = k\int \frac{dq}{r^2}\hat{r}_o = k\int \frac{\rho\, dx}{r^2}\hat{r}_o$ → medan pada kawat lurusan

3.  $\vec{E} = k\iint \frac{\sigma dq}{r^2}\hat{r}_o$ → luas

4.  $\vec{E} = k\iiint \frac{\rho d\tau}{r^2}\hat{r}_o$ → Volume

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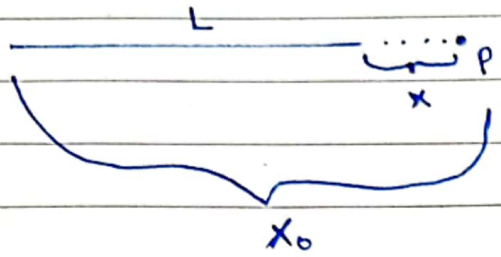
Soal!




$\vec{E}_p = ?$

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

$$= k\lambda \int \frac{dx}{(x_0-x)^2} = k\lambda \int_0^L (x_0 - x)^{-2} dx = k\lambda \left[ \frac{1}{(x_0-x)} \Big|_0^L \right]$$

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

$$= \int \frac{dx}{x^2} = \int_0^L x^{-2} dx$$

$$= x^{-1} \Big|_0^L$$

$$= \frac{1}{x} \Big|_0^L$$

Dasar Teori

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

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

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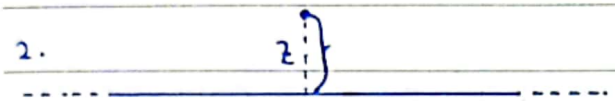
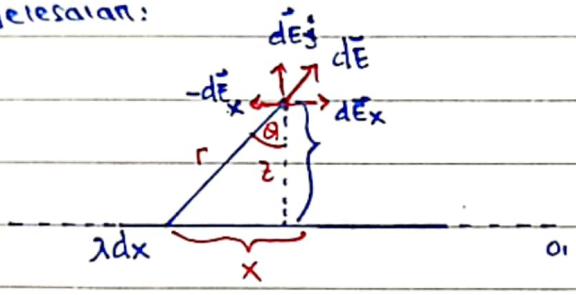
Soal!

2. 


Medan diatas kawat ?

Penyelesaian:




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

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

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

$dq = \lambda dx$.

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

misal :

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

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

$$tg\,\theta = \frac{x}{z}$$

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

$$x = z\,tg\,\theta$$

$x = \infty$

$\theta = -\pi/2$

$x = \infty$

$\theta = \pi/2$