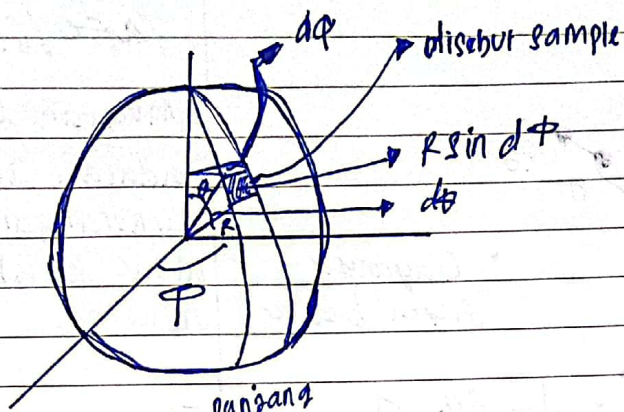


Elektrika dan Kemagnetan



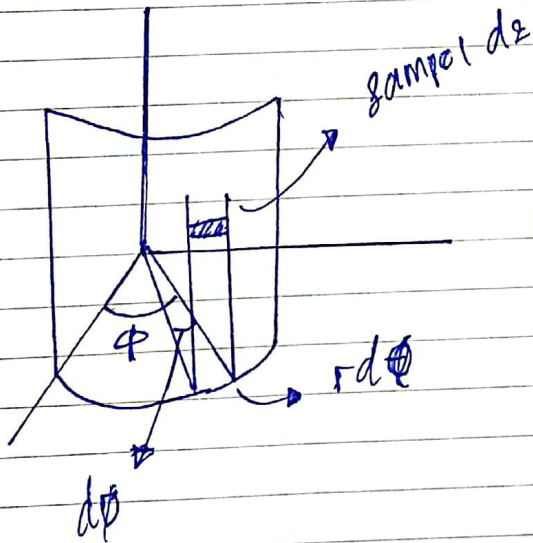
$$dA = d\theta \times d\phi \rightarrow \text{lebar}$$

$$= r d\theta \sin \theta d\phi$$

$$= r^2 \sin \theta d\theta d\phi$$

$$= r^2 \sin \theta d\theta d\phi$$

$$dV = r^2 \sin \theta d\theta d\phi dr$$



$$A (\text{luas}) = r d\phi dz$$

$$V (\text{volume}) = r d\phi dz dr$$

• menggunakan Integral karena hal yang dikaji adalah partikel yang kecil

• $\sin \rightarrow$ lebar
• $\cos \rightarrow$ tinggi

Medan Listrik

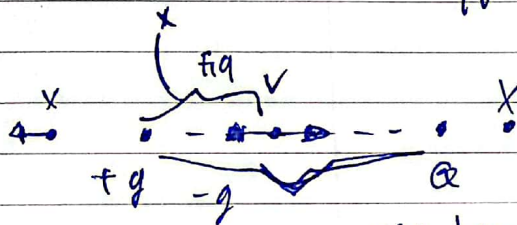
Gaya listrik

Muatan listrik
 $q = \pm (N \cdot e)$

• Gayaanya sama besar

$$\vec{F}_g = \vec{F}_Q = \vec{F} = \frac{1}{4\pi} \frac{qQ}{r^2} \frac{1}{\epsilon_0}$$

$$\frac{1}{\epsilon_0} = \frac{\vec{P}}{|\vec{P}|}$$



Jika begini gayanya
maka sama

$$F_g = F_Q$$

$$\frac{k q_1 Q}{(r-x)^2} = \frac{k q_1 q}{x^2}$$

$$\frac{Q}{(r^2 - 2rx + x^2)} = \frac{q}{x^2} \rightarrow x = ?$$

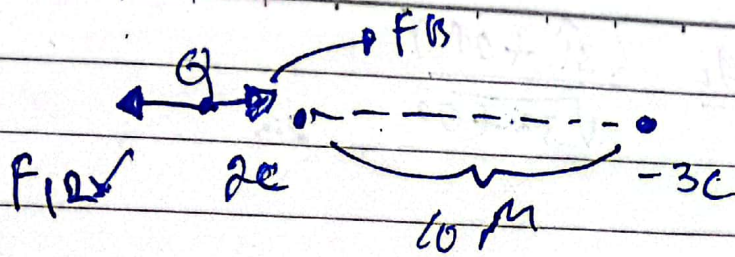
$$\frac{k q_1 Q}{(r-x)^2} = \frac{k q_1 q}{x^2}$$

~~Ruang~~ Medan
Ruang
coretan

$$\frac{4 \cdot 4 \cdot \sqrt{4ac}}{b}$$

Info 66

- muatan listrik
adalah ion yang
kehilangan elektron
atau kelebihan
elektron.



$$\vec{F}_{12} = \vec{F}_{13}$$

$$k_{1.2} = k_{1.3}$$

$$\frac{2}{x^2} = \frac{3}{x^2 + 20x + 100}$$

$$3x^2 = 2x^2 + 40x + 200$$

$$3x^2 - 2x^2 + 40x + 200 = 0$$

$$x^2 + 40x + 200 = 0 \rightarrow$$

$$(x - 20)(x - 60) = 0$$

Gunakan rumus ABC

Rumus ABC

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

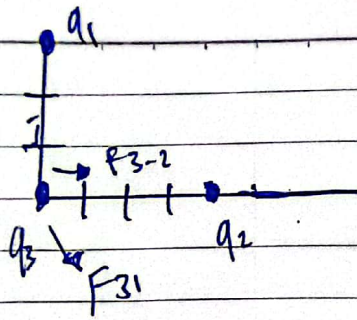
$$= \frac{-40 \pm \sqrt{(-40)^2 - 4 \cdot 1 \cdot 200}}{2}$$

$$= -40 \pm \sqrt{\frac{1600 - 800}{2}}$$

$$x_1 = -40 + 20 = -20$$

$$x_2 = -40 - 20 = -60$$

→ dari garis q_3 & d_1



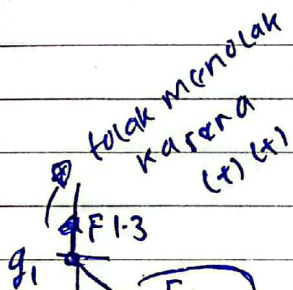
$$\rightarrow f_{32} = k \frac{q_3 q_2}{4^2} \frac{(3\hat{i} + 0\hat{j})}{\sqrt{3^2 + 0^2}}$$

$$= k \frac{q_3 q_2}{16}$$

$$\rightarrow f_{g3} =$$

$$\rightarrow f_{31} = k \frac{q_3 q_1}{3^2} - \hat{j}$$

$$= -k \frac{q_3 q_1}{9} \hat{j}$$



$$\rightarrow \vec{F} = k q_3 \left[\frac{q_2}{16} \hat{i} - \frac{q_1}{9} \hat{j} \right]$$

$$|\vec{F}| = k q_3 \sqrt{\left(\frac{q_2}{16}\right)^2 + \left(\frac{q_1}{9}\right)^2}$$

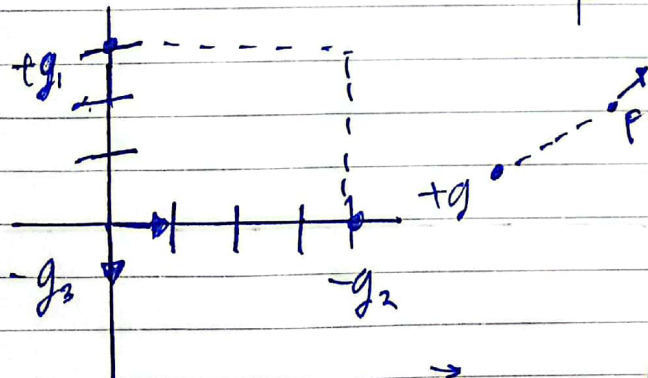
tarik menarik karena (+)(-)

$$\rightarrow \vec{F}_{1-3} = k \frac{q_1 q_3}{3^2} \hat{j}$$

$$\rightarrow \vec{F}_{12} = k \frac{q_1 q_2}{5^2} \frac{-(4\hat{i} - 3\hat{j})}{5}$$

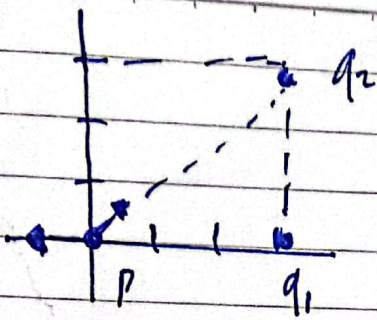
$$= 4k \frac{q_1 q_2}{125} - 3k \frac{q_1 q_2}{125} \hat{j}$$

$$\vec{F} = k q_1 \left[\left(\frac{4q_2}{125}\right) \hat{i} + \left(-\frac{q_3}{9} - \frac{3q_2}{125}\right) \hat{j} \right]$$



$$F_{g3} = E_{g3} = \frac{F_{32}}{-q_3} = k \frac{q_3 q_2}{g_3} / r_2$$

$$F = k \frac{q}{16}$$



$$\vec{E}_1 = k \frac{q_1}{r^2} (-\hat{i})$$

$$= -k \frac{q_1}{9} \hat{i}$$

$$\vec{E}_2 = k \frac{q_2}{r^2} (3\hat{i} + 4\hat{j})$$

$$= 3k \frac{q_2}{125} \hat{i} + 4k \frac{q_2}{125} \hat{j}$$

$$\vec{E} = k \left[\left(\frac{3q_2}{125} - \frac{q_1}{9} \right) \hat{i} + \frac{4q_2}{125} \hat{j} \right]$$

