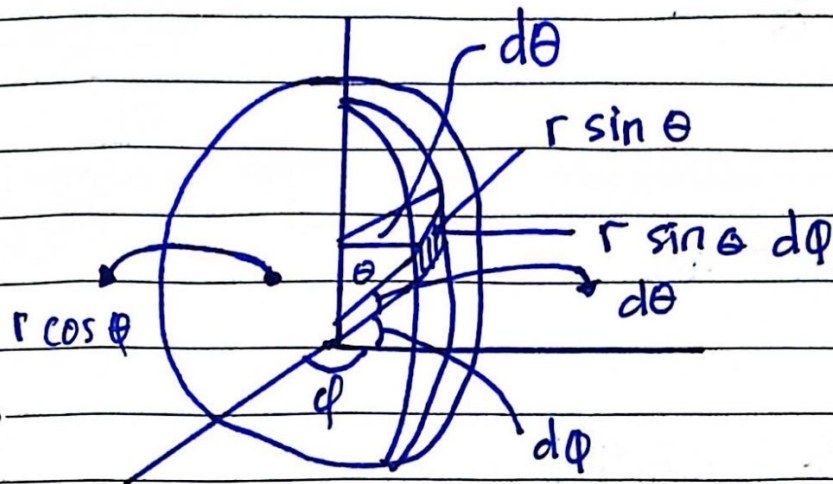
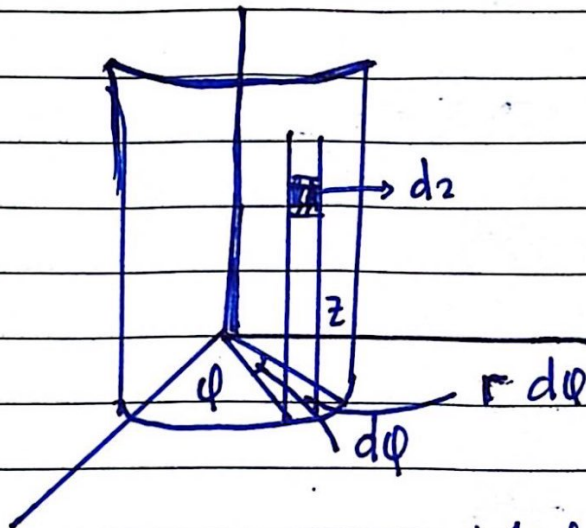


Elektrik



$$\begin{aligned} dV &= \text{panjang} \times \text{lebar} \times \text{tebal} \\ &= r d\theta \cdot r \sin \theta d\phi \cdot r \\ &= r^2 \sin \theta d\theta d\phi \\ dV &= r^2 \sin \theta d\theta d\phi dr \end{aligned}$$

cos : samping / samping
sin : depan / samping



$$\begin{aligned} A &= r d\phi dz \\ V &= r d\phi dz d\phi \end{aligned}$$

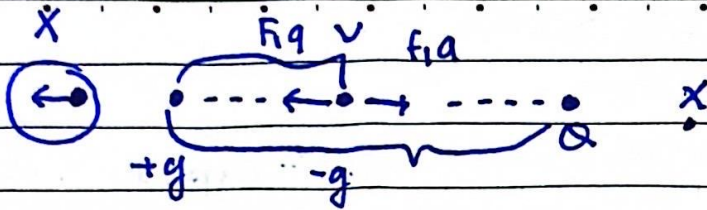
Medan listrik. Gaya listrik.

- Muatan listrik :

Atom $\rightarrow$ Kelebihan elektron / kekurangan e^-

$$q = \pm Ne \rightarrow +q \text{ --- } Q \text{ --- } F_a$$

$$\begin{aligned} \vec{F} &= \frac{1}{4\pi} \frac{qQ}{r^2} \hat{e}_r \\ \hat{e}_r &= \frac{\vec{r}}{|\vec{r}|} \end{aligned}$$



$$Q > q$$

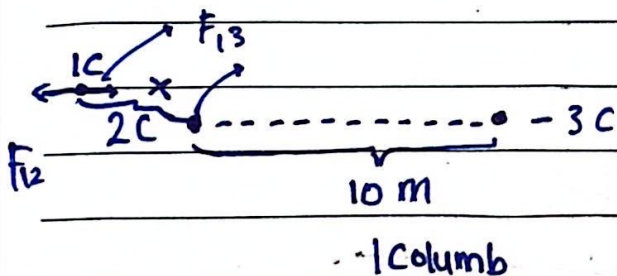
$$-q, +q, \bar{F}_{1q} = F_{1a}$$

$$q$$

$$\frac{kq_1q_2}{(r-x)^2} = k \frac{q_1q_2}{x^2}$$

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

$$Qx^2 = q(r^2 - 2rx + x^2)$$



$$F_1 = F_a$$

$$\frac{kq_1q_2}{(f+x)^2} = k \frac{q_1q_2}{x^2}$$

$$F_{12} = F_{13}$$

$$k \frac{1 \cdot 2}{x} = k \frac{1 \cdot 3}{(10+x)^2}$$

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

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

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

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

$$(x-20)(x-20)$$

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

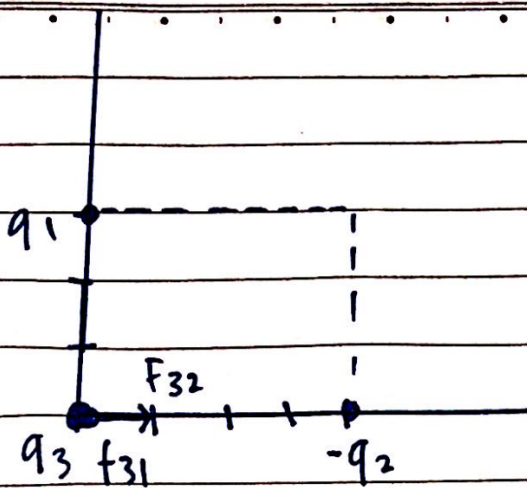
$$= \frac{-(-40) \pm \sqrt{(-40)^2 - 4 \cdot 1 \cdot (-200)}}{2 \cdot 1}$$

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

$$= \frac{-(-40) \pm \sqrt{400}}{2}$$

$$= \frac{-(-40) + 20}{2} = \frac{-40 - 20}{2}$$

$$= \frac{-20}{2} = -10$$



$$\vec{F}_{32} = k \frac{q_3 \cdot q_2}{r^2} \frac{(3\hat{i} + 0\hat{j})}{\sqrt{3^2 + 0^2}}$$

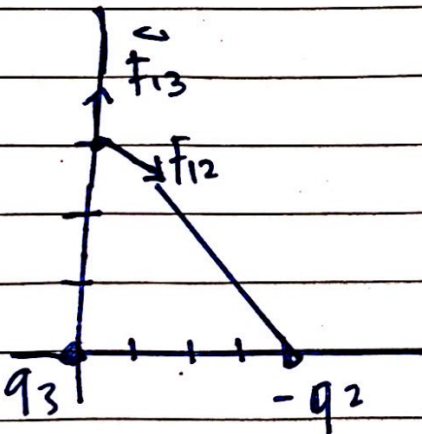
$$= k \frac{q_3 q_2}{16} \hat{i}$$

$$\vec{F}_{31} = k \frac{q_3 q_1}{3^2} (-\hat{j}) = k \frac{q_3 q_1}{9} \hat{j}$$

$$\vec{V}_0 = \frac{P}{|r|}$$

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

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

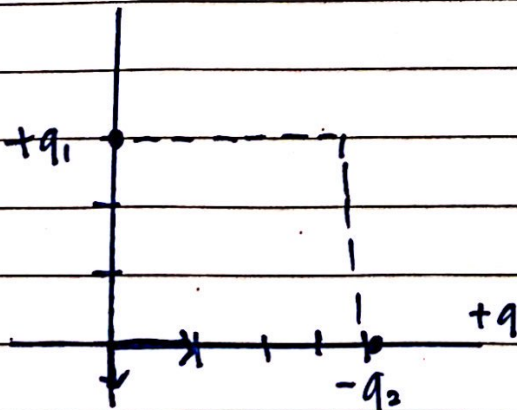


$$\vec{F}_{13} = k \frac{q_1 q_3}{3^2} \hat{j}$$

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

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

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



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

$$F = k \frac{q}{r^2} r$$