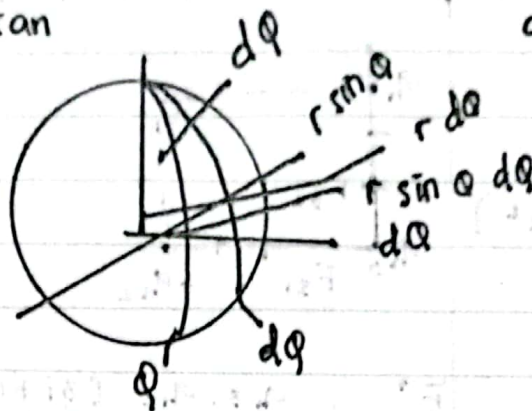


Sk. Lingkaran



$$da = dp \cdot r \cdot dr$$

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

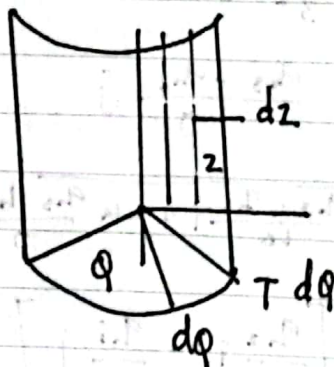
$$= r^2 \sin \theta d\theta d\phi$$

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

$$A = \int_0^\pi \int_0^{2\pi} r^2 \sin \theta d\theta d\phi$$

$$V = \iiint r^2 \sin \theta d\theta d\phi dr$$

Sk. Tabung



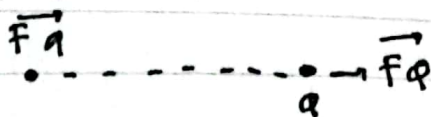
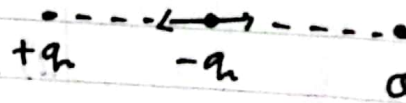
$$A = r d\theta dz$$

$$V = r d\theta dz dr$$

Gaya Listrik

7 Muatan Listrik

$$q = \pm ne$$



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

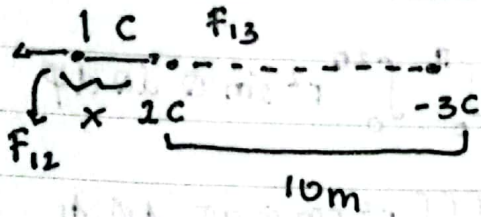
$$= \vec{r}_0 = \frac{\vec{F}}{(r)}$$

$$F_{12} = F_{21}$$

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

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

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



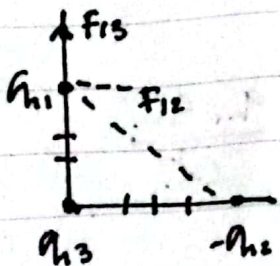
$$\vec{F}_{12} = \vec{F}_{13}$$

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

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

$$3x^2 = 2x^2 + 20x + 100$$

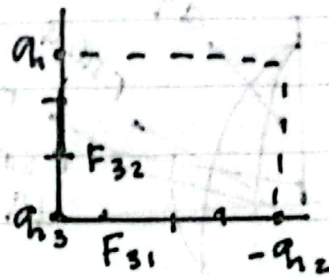
$$x^2 - 20x - 100 = 0$$



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

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

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



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

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

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

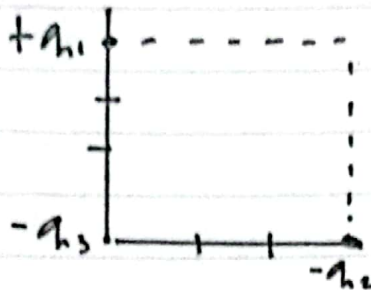
$$= -k \frac{q_3 q_1}{9} \hat{j}$$

$$1) |\vec{F}| = \sqrt{k \frac{q_3 q_2}{16} \hat{i} + -k \frac{q_3 q_1}{9} \hat{j}}$$

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

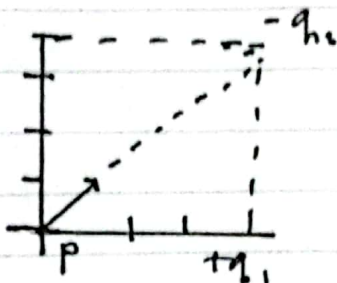
$$2) |\vec{F}| = k q_3 \sqrt{\left(\frac{q_2}{16}\right)^2 + \left(\frac{q_1}{9}\right)^2}$$

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



$$\vec{F}_{p3} = \frac{F_{32}}{q_3} = k \frac{q_3 q_2}{r^2}$$

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



$$\vec{E}_1 = k \frac{q_1}{3^2} (-\hat{i})$$

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

$$\vec{E}_2 = k \frac{q_2}{5^2} \left(\frac{3\hat{i} + 4\hat{j}}{5} \right)$$

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

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