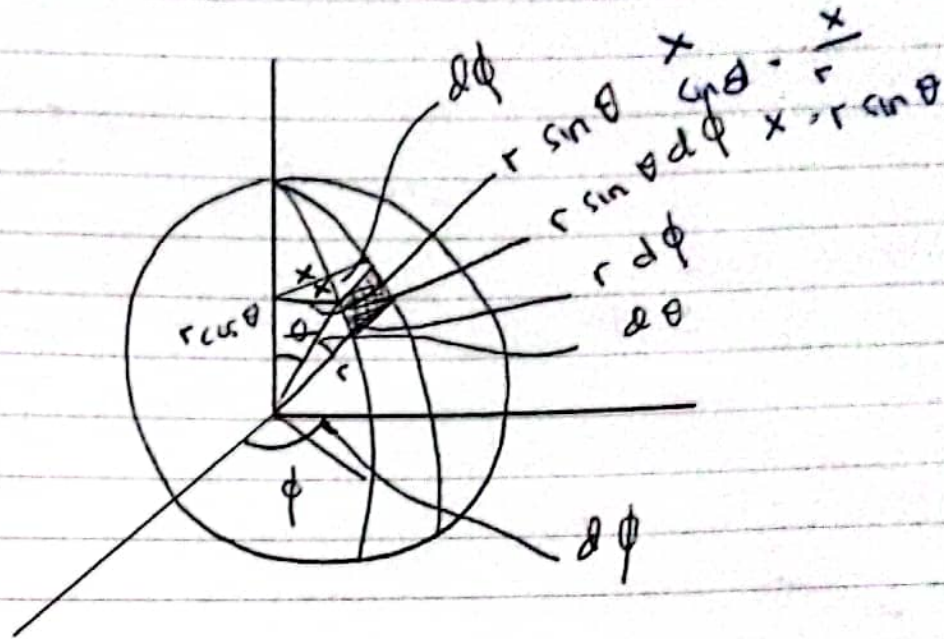
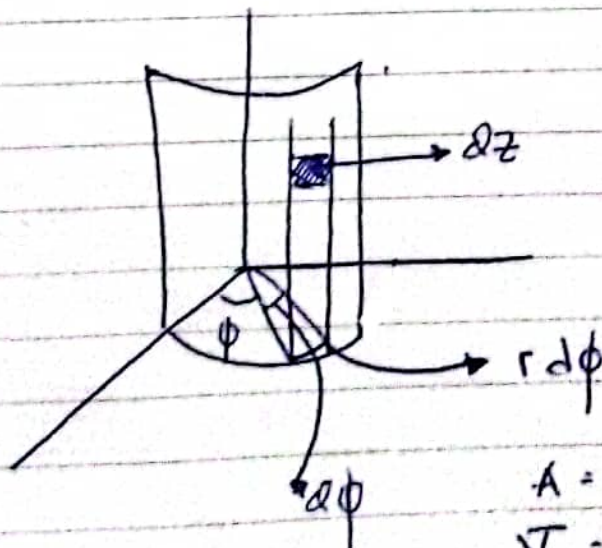


Koordinat Lingkaran



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

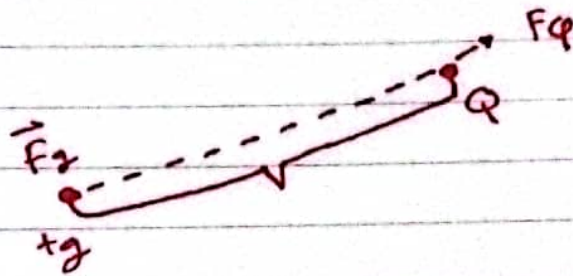


$$\begin{aligned}
 A &= r d\phi dz \\
 V &= r d\phi dz dr
 \end{aligned}$$

Medan Listrik

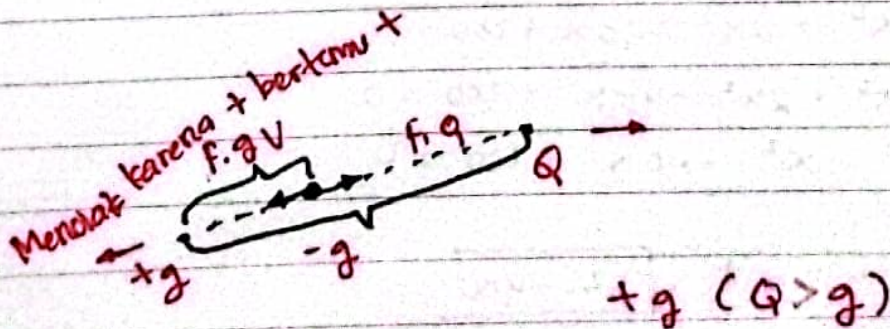
Gaya Listrik

Muatan Listrik



$$\vec{F}_g = \vec{F}_Q = \vec{F} = \frac{1}{4\pi\epsilon_0} \cdot \frac{qQ}{r^2} \hat{r}_0$$

$$\hat{r}_0 = \frac{\vec{r}}{|\vec{r}|}$$



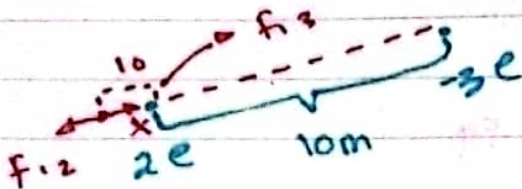
$$F.g = F.Q$$

$$k \frac{q.g}{(r-x)^2} = k \frac{q.g}{(x^2)}$$

x?

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

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



$$F_1 q = F_2 Q$$

$$k \frac{1.2}{x^2} = k \frac{1.3}{(10+x)^2}$$

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

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

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

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

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

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

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

$$= -40 + \sqrt{400}$$

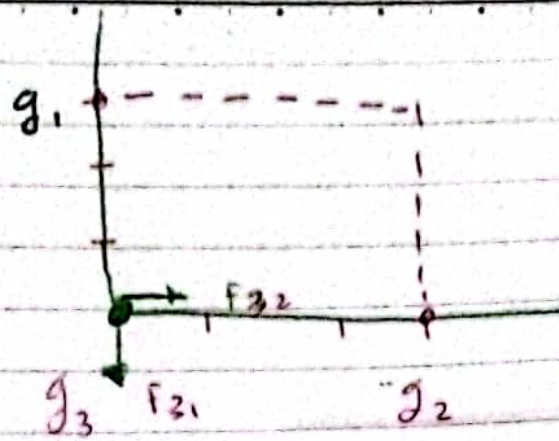
$$= -40 + 20$$

$$= -40 - 20$$

$$= -20$$

$$= -60$$

$$\text{Jadi } (x - 20)(x - 60)$$



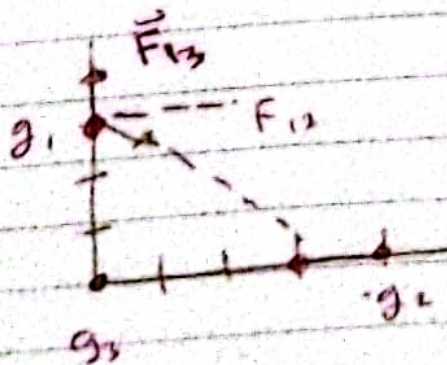
$$\vec{F}_{g3} =$$

$$\begin{aligned}\vec{F}_{32} &= k \frac{g_3 \cdot g_2}{r^2} \frac{(3\hat{i} + 0\hat{j})}{\sqrt{3^2 + 0^2}} \\ &= \frac{g_3 \cdot g_2}{16} \hat{i}\end{aligned}$$

$$\vec{F}_{31} = \frac{g_3 \cdot g_1}{3^2} \cdot \hat{j} = -k \frac{g_3 \cdot g_1}{9} \hat{j}$$

$$\vec{F} = k g_3 \left[\frac{g_2}{16} \hat{i} - \frac{g_1}{9} \hat{j} \right]$$

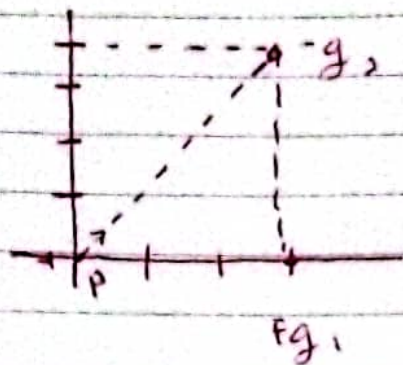
$$|\vec{F}| = k g_3 \sqrt{\left(\frac{g_2}{16}\right)^2 + \left(\frac{g_1}{9}\right)^2}$$



$$\vec{F}_{13} = \frac{g_1 \cdot g_3}{3^2} \hat{j}$$

$$\begin{aligned}\vec{F}_{12} &= k \frac{g_1 \cdot g_2}{5^2} \left(\frac{4\hat{i} - 3\hat{j}}{5} \right) \\ &= k \frac{g_1 \cdot g_2}{125} \hat{i} - 3k \frac{g_1 \cdot g_2}{125} \hat{j}\end{aligned}$$

$$\vec{F} = k g_1 \left[\left(\frac{4g_2}{125} \right) \hat{i} + \left(\frac{g_3}{9} - \frac{3g_2}{125} \right) \hat{j} \right]$$



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

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

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

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

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