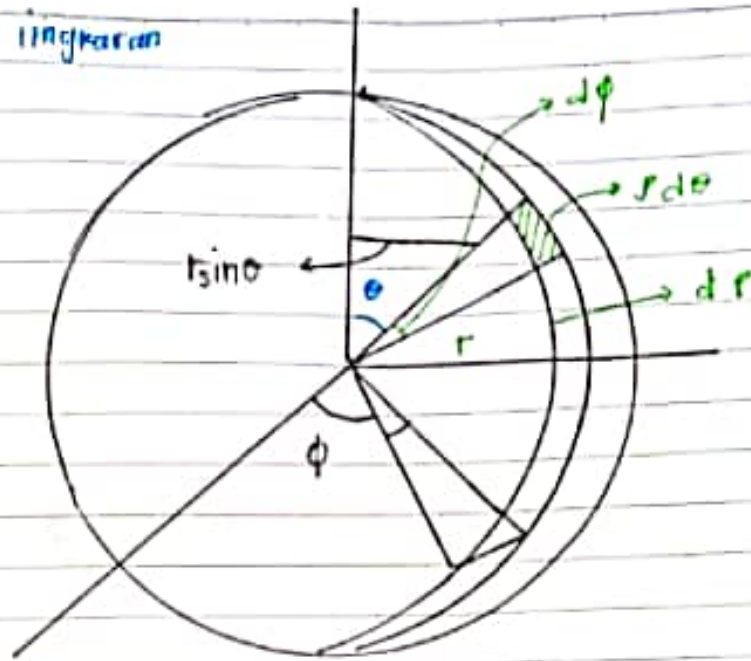


Kelompok dan kemagnetan (kalisma)

• koordinat lingkaran



$$\begin{aligned} A &= p \times l \\ &= r d\theta \cdot r \sin\theta \cdot d\phi \\ &= r^2 \sin\theta d\theta d\phi \end{aligned}$$

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

$$A = \int_0^{2\pi} \int_0^{\pi} r^2 \sin\theta d\theta d\phi = 4\pi r$$

$$A = r^2 \int_0^{2\pi} d\phi \int_0^{\pi} \sin\theta d\theta = 4\pi r^2$$

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

$$= \frac{4}{3} \pi r$$

$$(10-x)^2 = 3x^2$$

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

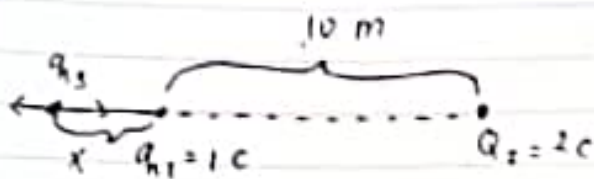
$$2x^2 + 20x - 100 = 0$$

$$x^2 + 20x - 50 = 0$$

$$(x+15)(x-5) = 0$$

$$x = 5$$

(2)



$$q_3 = 1C$$

$$\vec{F}_1 = \vec{F}_2$$

$$k \frac{q_1 q_3}{x^2} = k \frac{q_3 q_2}{(10+x)^2}$$

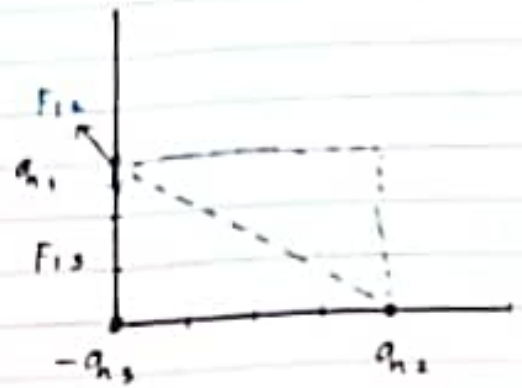
$$\frac{1}{x^2} = \frac{2}{(10+x)^2}$$

$$2x^2 = (10+x)^2$$

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

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

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



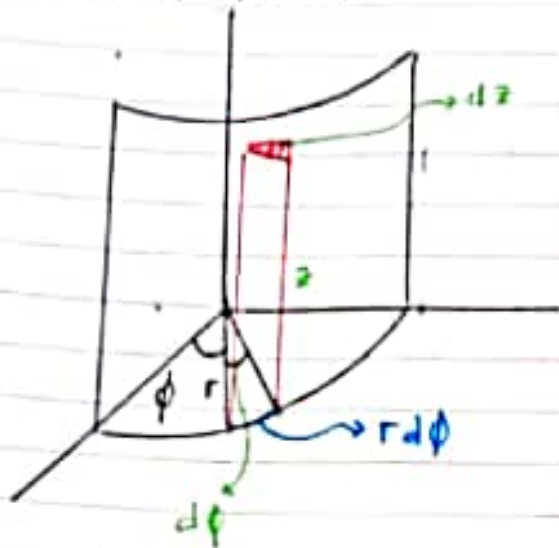
$$F_{12} = k \frac{q_1 q_2}{r^2} (-\hat{j})$$

$$\frac{(0\hat{i} - 3\hat{j})}{\sqrt{0^2 + 3^2}}$$

$$F_{12} = k \frac{q_1 q_2}{r^2} \left(-\frac{4\hat{i} + 3\hat{j}}{5} \right)$$

5 dari $\sqrt{3^2 + 4^2}$

• Koordinat cylinder



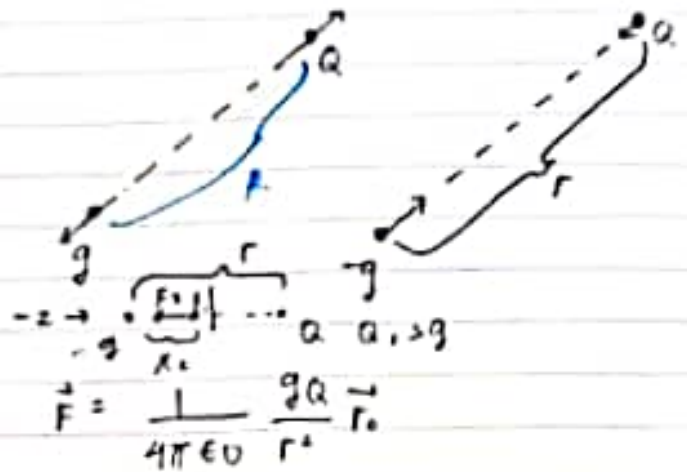
$$dV = r d\phi dz$$

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

$$\frac{1}{2} + \frac{1}{3} = \frac{3+2}{6}$$

$$= \frac{5}{6}$$

Little's statics



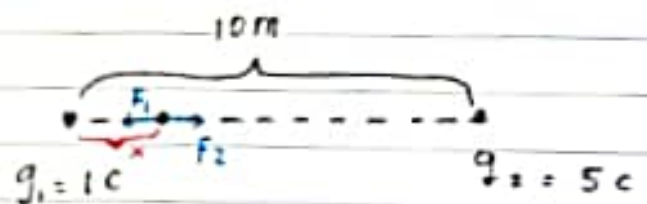
$$\vec{F} = \frac{1}{4\pi\epsilon_0} \frac{qQ}{r^2} \vec{r}_0$$

$$\vec{F}_1 = \vec{F}_2$$

$$k = \frac{qQ}{(l-x)^2} = k \frac{qQ}{x^2}$$

Contoh:

①



$$q_3 = -2C$$

$$\vec{F}_1 = \vec{F}_2$$

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

$$\frac{1}{x^2} = \frac{3}{(10-x)^2}$$