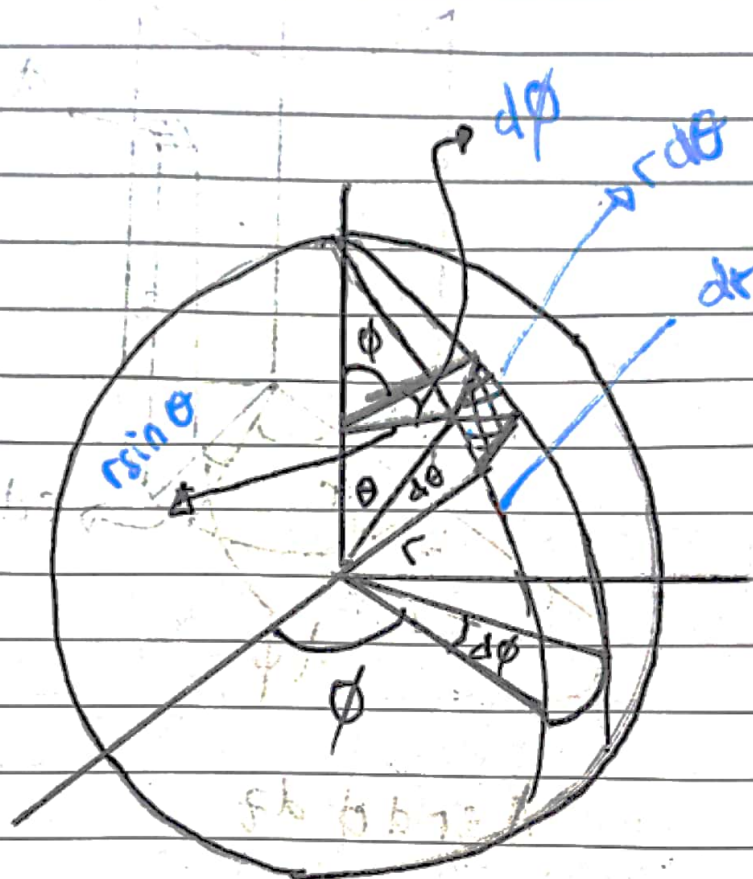


Kelistrikan dan Kemagnetan

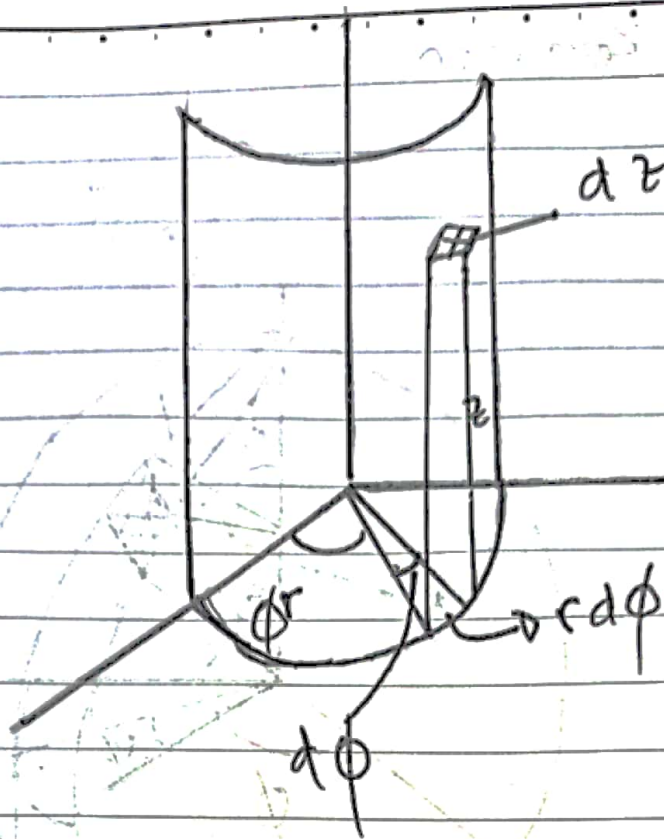


$$A = P \times l$$

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

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

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

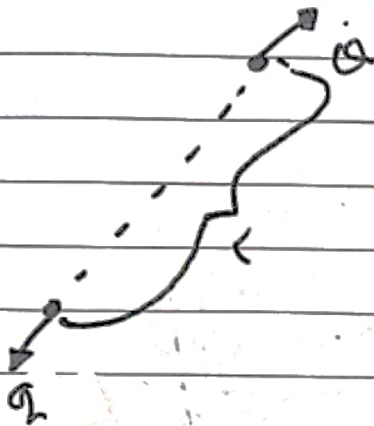


$$A = r d\phi dz$$

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

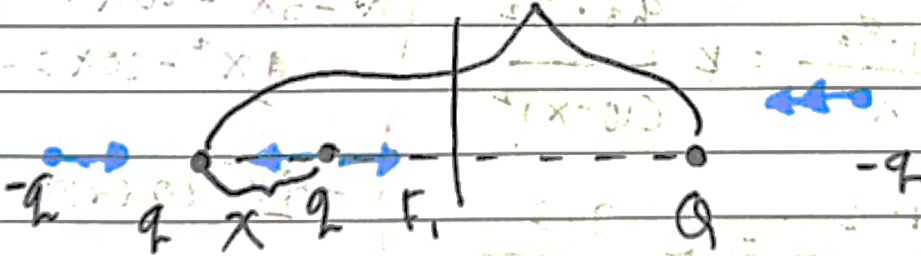
Lorentz States

$$q = \pm Ne$$



$$F = \frac{1}{4\pi\epsilon_0}$$

$$\mu_0 = \frac{2q}{r^2} \hat{r}_0$$

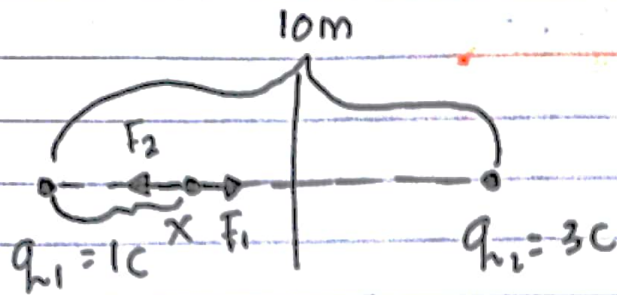


$$q > q$$

$$F = T_2$$

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

Contoh Soal



$$q_3 = -2C$$

Diketahui : $q_1 = 1C$

$$q_2 = 3C$$

$$q_3 = -2C$$

Penyelesaian :

$$F_1 = F_2$$

$$K \frac{q_1 \cdot q_3}{x^2} = K \frac{q_3 \cdot q_2}{(10-x)^2}$$

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

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

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

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

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

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

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

$$-x^2 - 10x + 50 = 0$$

$$x_{(1,2)} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-(-10) \pm \sqrt{(-10)^2 - 4(-1)(50)}}{2 \cdot (-1)}$$

$$X_{(1,2)} = \frac{-10 \pm \sqrt{10^2 - 4(-1)(50)}}{2 \cdot (-1)}$$

$$X_{(1,2)} = \frac{-10 \pm \sqrt{100 + 200}}{-2}$$

$$X_{(1,2)} = \frac{-10 \pm \sqrt{\frac{300}{-2}}}{-2}$$

$$= \frac{-10 \pm \sqrt{\frac{300}{-2}}}{-2}$$

$$= \frac{-10 \pm \frac{10\sqrt{3}}{2}}{2}$$

$$X_1 = \frac{10 + 17}{2}$$

$$= \frac{27}{2}$$

$$= 13,5$$

$$X_2 = \frac{10 - 17}{2}$$

$$= \frac{-7}{2}$$

$$= -3,5$$

2.

10 m

 $q_3 \times q_1 = 1C$ $Q_2 = 2C$ $q_3 = 1C$ Diketahui : $q_1 = 1C$ $Q_2 = 2C$ $q_3 = 1C$

Penyelesaian :

$$F_1 = F_2$$

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

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

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

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

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

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

$$x_{(1,2)} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-20 \pm \sqrt{(-20)^2 - (4 \cdot 1) \cdot (-100)}}{2 \cdot 1}$$

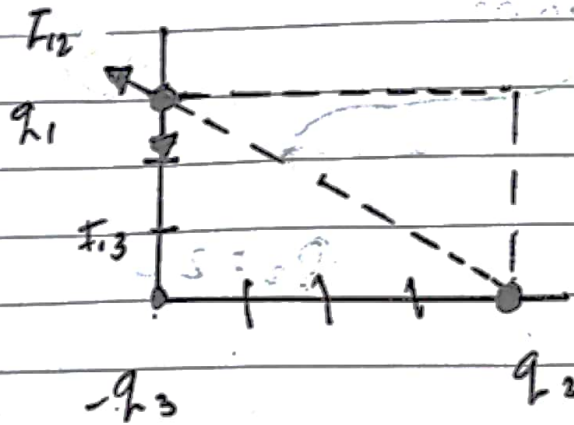
$$= \frac{-20 \pm \sqrt{400 + 400}}{2}$$

$$= \frac{-20 \pm \sqrt{800}}{2}$$

$$= \frac{-20 \pm 20\sqrt{2}}{2}$$

$$= \frac{-20 \pm 20\sqrt{2}}{2}$$

3..



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

$$F_{13} = k \frac{q_1 \cdot q_3}{3^2} (-\hat{j})$$

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

$$= -\hat{j}$$