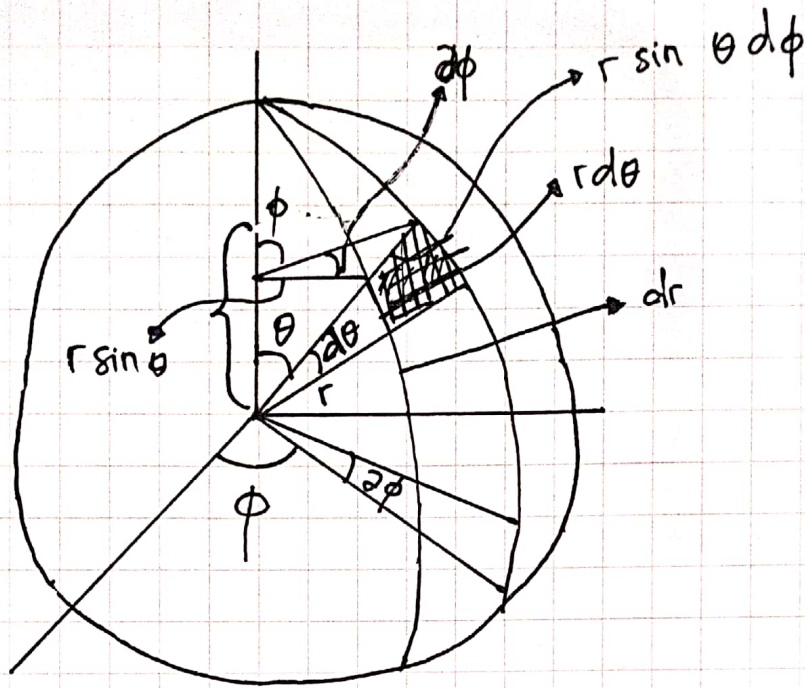




$$A = p \times l \rightarrow = r d\theta \cdot r \sin \theta d\phi$$

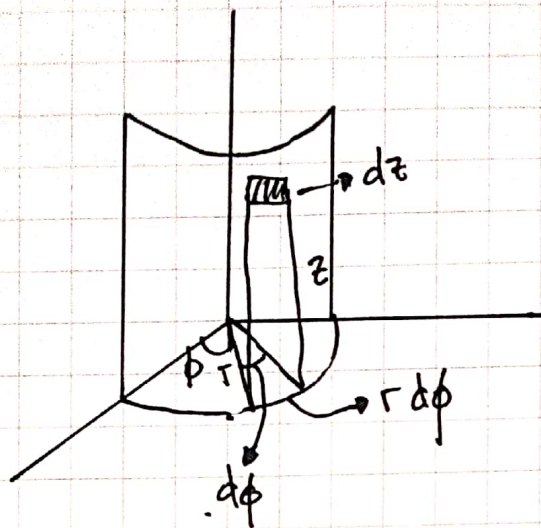
$$~~= r p d\theta \cdot r~~ = r^2 \sin \theta d\theta d\phi$$

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

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

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

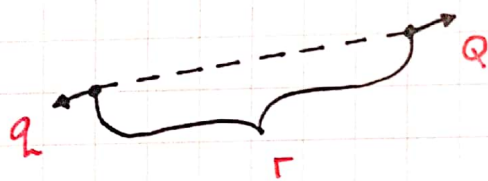
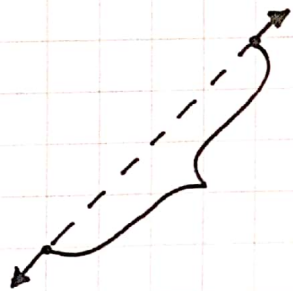
$$V = \int_0^r \int_0^{\pi} \int_0^{2\pi} r^2 \sin \theta d\theta d\phi = \frac{4}{3} \pi r$$



$$A = r d\phi dz$$

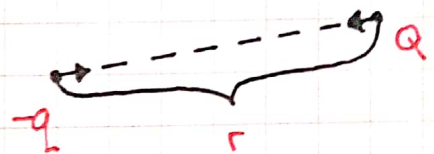
$$V = r d\phi dz dr$$

$$q = \pm Ne$$



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

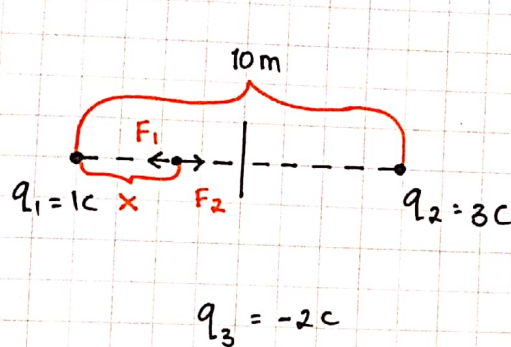
$$\frac{qQ}{r^2} \hat{r}_0$$





# " LISTRIK STATIS "

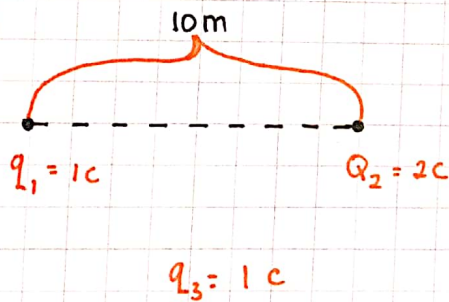
Muatan listrik adalah sifat dasar dari partikel elementer tertentu (proton dan neutron) yang menyebabkan terjadinya gaya tarik - menarik atau tolak menolak antar benda.



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

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

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



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

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

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

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

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

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

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

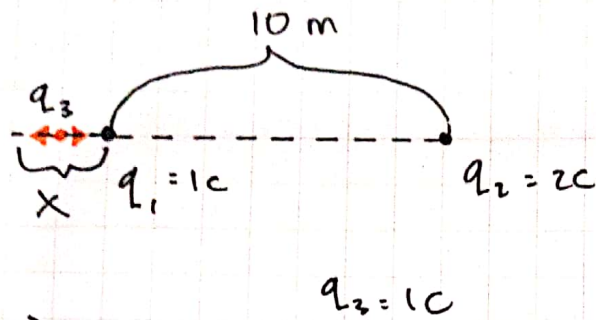
$$\frac{-10 \pm \sqrt{100 + 200}}{2}$$

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

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

$$\pm \frac{-10 + 10 \cdot 1,7}{2} = 3,5$$

$$\pm \frac{(-10) - 10 \cdot 1,7}{2} = 13,5$$



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

$$q_3 = 1C$$

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

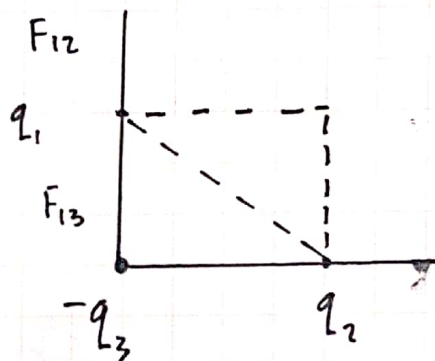
$$\frac{1}{x^2} = \frac{2}{(10+x)^2}$$

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

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

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

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



$$F_{12} = k \frac{q_1 q_2}{r^2}$$

$$\left( \frac{4\hat{i} + 3\hat{j}}{5} \right)$$

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

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