

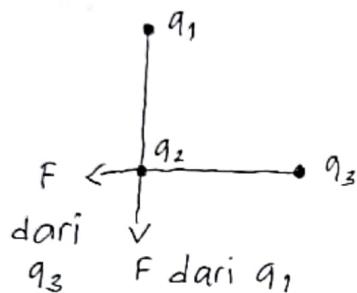
# Tugas fisika - listrik statis

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Kelas: XI MIPA 6

$$1.) F = \frac{k \cdot q_1 \cdot q_2}{r^2}$$

Karena muatannya sama, saling menolak gayanya



karena ada 2 arah, hitungnya memakai vektor:

$$\begin{aligned} \Sigma F &= \sqrt{F_1^2 + F_2^2 + 2 \cdot F_1 \cdot F_2 \cdot \cos \theta} \\ &= \sqrt{F^2 + F^2 + 2F_2 \cdot \cos 90^\circ} \\ &= \sqrt{F^2 + F^2 + 2F_2 \cdot (0)} \\ &= \sqrt{2F^2} \\ &= F\sqrt{2} \end{aligned}$$

→ Fnya sama karena muatan dan jaraknya sama

2.) Dik:

$$q_1 = +4 \mu C$$

$$q_2 = -2 \mu C$$

$$r_1 = 10 \text{ cm} = 10 \times 10^{-2} \text{ m}$$

$$r_2 = 5 \text{ cm} = 5 \times 10^{-2} \text{ m}$$

Dit: besar kuat medan listrik di titik A adalah?

Pembahasan:

\* kuat medan di A disebabkan muatan  $q_1$  dan muatan  $q_2$

$$\begin{aligned} E_1 &= kq \cdot \frac{q_1}{r_1^2} \\ &= \frac{9 \times 10^9 \times 4 \times 10^{-6}}{100 \times 10^{-4}} \\ &= 36 \times 10^7 \\ &= 0,36 \times 10^7 \end{aligned}$$

$$\begin{aligned} E_2 &= kq \cdot \frac{q_2}{r_2^2} \\ &= \frac{9 \times 10^9 \times 2 \times 10^{-6}}{25 \times 10^{-4}} \\ &= 18 \times 10^7 \\ &= 0,72 \times 10^7 \end{aligned}$$

\* kuat medan total di A

$$\begin{aligned} E_A &= E_1 + E_2 = 0,36 \times 10^7 + 0,72 \times 10^7 \\ &= 1,08 \times 10^7 \end{aligned}$$

3.) Dik:

$$q_A = 5 \times 10^{-8} \text{ C}$$

$$r_A = 10 \text{ cm} = 10 \times 10^{-2} \text{ m}$$

$$q_B = -40 \times 10^{-8} \text{ C}$$

$$r_B = 20 \text{ cm} = 20 \times 10^{-2} \text{ m}$$

$$q_C = 8 \times 10^{-8} \text{ C}$$

$$r_C = 10 \text{ cm} = 10 \times 10^{-2} \text{ m}$$

Dit: V dititik B?

Pembahasan:

$$V = k \cdot \frac{q}{r}$$

$$V_{\text{tot}} = V_A - V_B + V_C$$

$$= k \cdot \frac{q_A}{r_A} - k \cdot \frac{q_B}{r_B} + k \cdot \frac{q_C}{r_C}$$

$$= 9 \times 10^9 \left( \frac{5 \times 10^{-8}}{10 \times 10^{-2}} - \frac{40 \times 10^{-8}}{20 \times 10^{-2}} + \frac{8 \times 10^{-8}}{10 \times 10^{-2}} \right)$$

$$= 9 \times 10^9 (0,5 \times 10^{-6} - 2 \times 10^{-6} + 0,8 \times 10^{-6})$$

$$= 9 \times 10^9 (-0,7 \times 10^{-6})$$

$$= -6,3 \times 10^{-3}$$

$$V_{\text{tot}} = -6,300 \text{ volt}$$

4.) Dik:

$$\text{(kiri)} = 12 \mu\text{F} (5+7)$$

$$\text{(kanan)} = 6 \mu\text{F} (2+4)$$

Dit: Besar energi listrik pada kapasitor gabungan?

Pembahasan:

$$\frac{1}{\text{total}} = \frac{1}{12} + \frac{1}{9} + \frac{1}{6}$$

$$= \frac{1+3+2}{12}$$

$$\frac{1}{\text{total}} = \frac{6}{12} \text{ dibalik menjadi } \frac{12}{6}$$

$$\begin{aligned} &> 2 \mu\text{F} \\ &= 2 \times 10^{-6} \\ E &= \frac{1}{2} \times (2 \times 10^{-6}) (24)^2 \\ &= 5,76 \times 10^{-4} \text{ Joule} \end{aligned}$$