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Pemecahan Kasus

* kasus muatan listrik

$$\begin{aligned} 1) N &= (5 - 0,8) \cdot \frac{(6,02 \times 10^{23})}{107,9} + 0,8 \cdot \frac{(6,02 \times 10^{23})}{107} \\ &= 2,34 \times 10^{22} + 2,44 \times 10^{21} \\ &= \underline{\underline{2,58 \times 10^{22}}} \end{aligned}$$

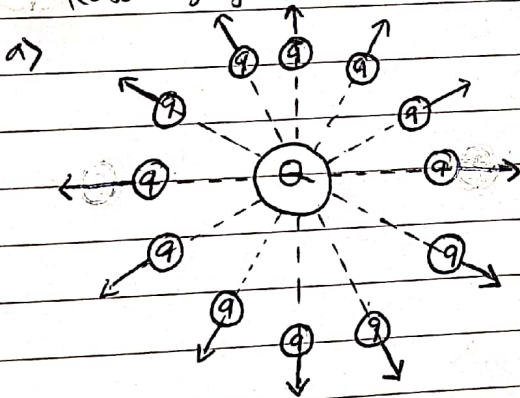
karena atom Ag mempunyai 47 elektron dan Au mempunyai 49 elektron maka jumlah kedua atom adalah 126 elektron.

Jumlah medan total Q adalah =

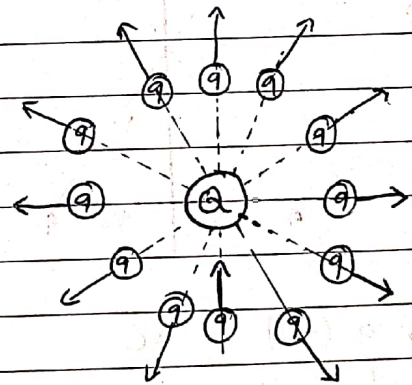
$$\begin{aligned} Q &= (2,58 \times 10^{22} \text{ atom}) (126 \text{ elektron}) (1,6 \times 10^{-19} \text{ C/elektron}) \\ &= \underline{\underline{5,2 \times 10^5 \text{ C}}} \end{aligned}$$

Jadi pada cincin 5 gr terdapat muatan $5,2 \times 10^5 \text{ C}$,
dimana ~~massa~~ pada cincin 5 gr terdapat $\frac{5,2 \times 10^5 \text{ C}}{1,6 \times 10^{-19}} = \underline{\underline{3,25 \times 10^{24} \text{ elektron}}}$

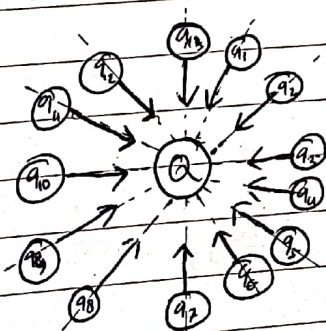
* Kasus gaya listrik.



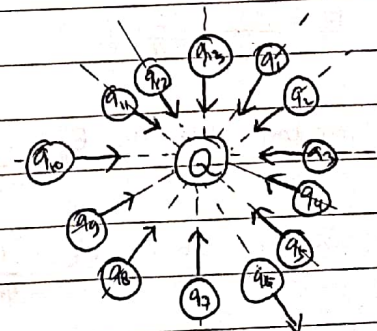
b)



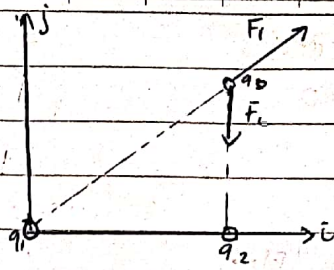
c)



d)



e) $q_1 = 25 \text{ MC} \rightarrow (0,0) \text{ m}$
 $q_2 = -10 \text{ MC} \rightarrow (4,0) \text{ m}$
 $q_3 = 10 \text{ MC} \rightarrow (4,3) \text{ m}$



$$\vec{F} = q_0 k \left\{ \frac{q_1}{r_{13}^2} \hat{r}_1 + \frac{q_2}{r_{23}^2} \hat{r}_2 \right\}$$

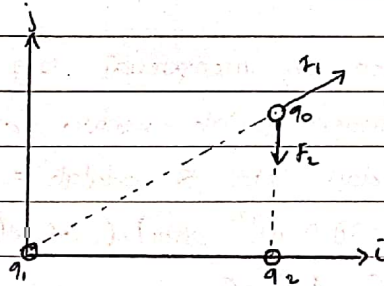
$$= 10 \cdot 9 \times 10^9 \left\{ \frac{25}{25^2} \left(\frac{4\hat{i} + 3\hat{j}}{5} \right) + \frac{10}{16} \hat{i} \right\}$$

$$= 10 \cdot 9 \times 10^9 \left\{ \frac{100}{125} + \frac{10}{16} \hat{i} + \frac{75}{125} \hat{j} \right\}$$

$$= 9 \times 10^9 (1,42\hat{i} + 0,6\hat{j})$$

$$F = 9 \times 10^9 \sqrt{(1,42)^2 + (0,6)^2}$$

f) $q_1 = 25 \text{ MC} \rightarrow (0,0)$
 $q_2 = -15 \text{ MC} \rightarrow (4,0)$
 $q_3 = 20 \text{ MC} \rightarrow (4,3)$



$$\vec{F} = q_0 k \left\{ \frac{q_1}{r_{13}^2} \hat{r}_1 + \frac{q_2}{r_{23}^2} \hat{r}_2 \right\}$$

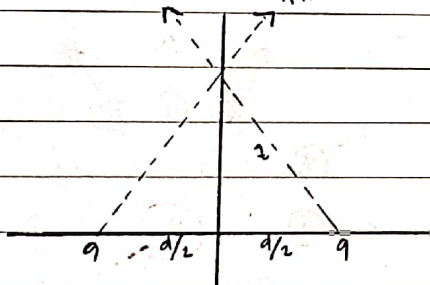
$$= 20 \cdot 9 \times 10^9 \left\{ \left(\frac{25}{25^2} \right) \left(\frac{4\hat{i} + 3\hat{j}}{5} \right) + \frac{10}{16} (1,1) \right\}$$

$$\vec{F} = 20 \cdot 9 \times 10^9 \left\{ \frac{100}{125} + \frac{10}{16} \hat{i} + \frac{75}{125} \hat{j} \right\}$$

$$= 18 \times 10^9 \sqrt{(1,42)^2 + (0,6)^2}$$

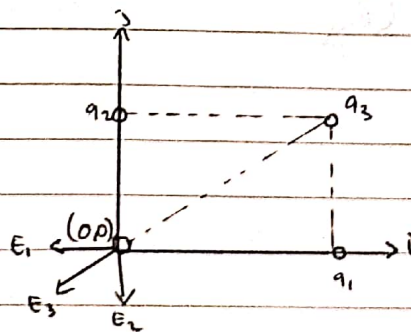
* Kasus - Medan Listrik

a)



b) $q_1 (4,0) = 2 \text{ C}$
 $q_2 (0,3) = 5 \text{ C}$
 $q_3 (4,3) = 10 \text{ C}$

$$E_1 = \frac{1}{4\pi\epsilon_0} \frac{2}{16} \hat{j}$$

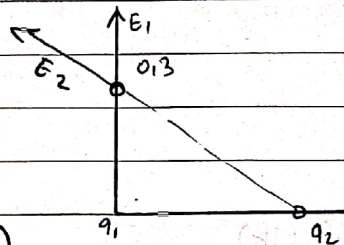


medan oleh q_2 $E_2 = \frac{1}{4\pi\epsilon_0} \frac{5}{9} (1,1)$

medan oleh q_3 $E_3 = \frac{1}{4\pi\epsilon_0} \frac{10}{25} \left(\frac{4\hat{i} + 3\hat{j}}{5} \right) = \frac{1}{4\pi\epsilon_0} \left(\frac{40}{125} \hat{i} + \frac{30}{125} \hat{j} \right)$

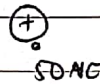
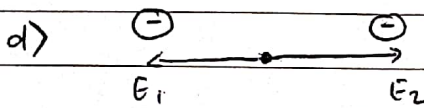
medan total $-\vec{E} = \frac{1}{4\pi\epsilon_0} \left[\left(\frac{5}{9} + \frac{40}{125} \right) \hat{i} + \left(\frac{2}{16} + \frac{30}{125} \right) \hat{j} \right] = 8,35 \times 10^2 \text{ N/C}$

c) $q_1 = -5 \mu\text{C} \rightarrow (0,0)$
 $q_2 = 10 \mu\text{C} \rightarrow (4,0)$



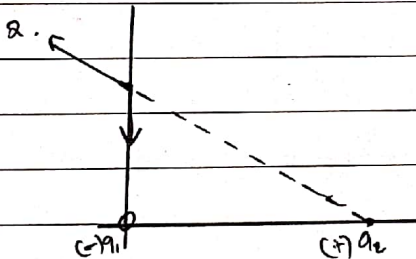
Medan oleh q_1 $E_1 = \frac{1}{4\pi\epsilon_0} \frac{5}{25} \left(\frac{4i + 3j}{5} \right)$
 $= \frac{1}{4\pi\epsilon_0} \left(\frac{20}{125} i + \frac{15}{125} j \right)$

Medan oleh q_2 $E_2 = \frac{1}{4\pi\epsilon_0} \frac{10}{16} \hat{j}$
~~Medan~~ Total $\vec{E} = \frac{1}{4\pi\epsilon_0} \left[\frac{20}{125} i + \left(\frac{10}{16} + \frac{15}{125} \right) j \right]$
 $= \frac{1}{4\pi\epsilon_0} \sqrt{(0,16)^2 + (0,74)^2} = \frac{1}{4\pi\epsilon_0} \sqrt{0,5732}$

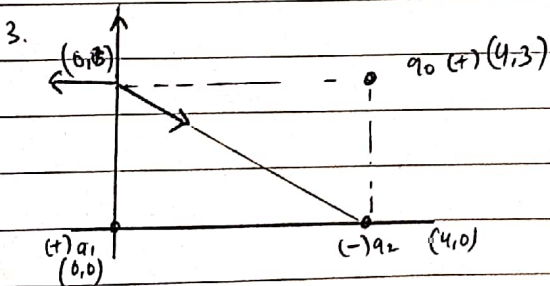


Potensial Listrik

1.



$V = k \frac{q_1}{r_1} + k \frac{q_2}{r_2}$
 $= 9 \cdot 10^9 \left(\frac{5}{3} + \frac{10}{4} \right)$
 $= 3,75 \times 10^4 \frac{\text{dyne cm}}{\text{MC}}$



$q_1 (0,0) = 25 \mu\text{C}$

$q_2 (4,0) = -15 \mu\text{C}$

$q_3 (4,3) = 20 \mu\text{C}$