

Nama = Chairani Kartini S. Harry
NPM = 2013022028
Kelas B

$$\begin{aligned} 1. N &= (5 - 0,8) \cdot \frac{6,02 \times 10^{23}}{107,9} + 0,8 \cdot \frac{6,02 \times 10^{23}}{197} \\ &= 4,2 \cdot \frac{6,02 \times 10^{23}}{107,9} + 0,8 \cdot \frac{6,02 \times 10^{23}}{197} \\ &= 2,34 \times 10^{22} + 2,44 \times 10^{21} \\ &= 2,58 \times 10^{22} \end{aligned}$$

⇒ Atom Ag mempunyai 47 elektron atom Au mempunyai 79 elektron maka jumlah kedua atom tsbt adalah
 $47 + 79 = 126$ elektron, jadi jumlah medan total Q yaitu:

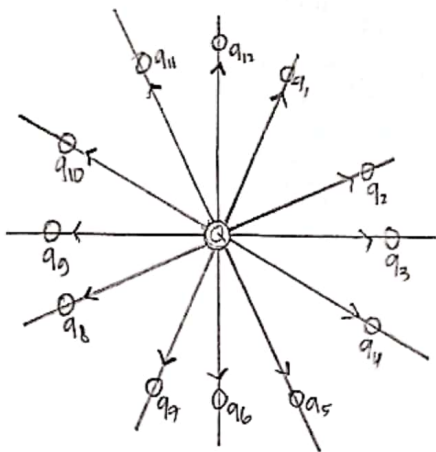
$$\begin{aligned} Q &= (2,58 \times 10^{22} \text{ atom}) (126 \text{ elektron / atom}) (1,60 \times 10^{-19} \text{ C / elektron}) \\ &= 5,2 \times 10^5 \text{ C} \end{aligned}$$

jadi untuk massa cincin sgr mempunyai muatan $5,2 \times 10^5 \text{ C}$
hal ini berarti dalam massa cincin sgr terdapat

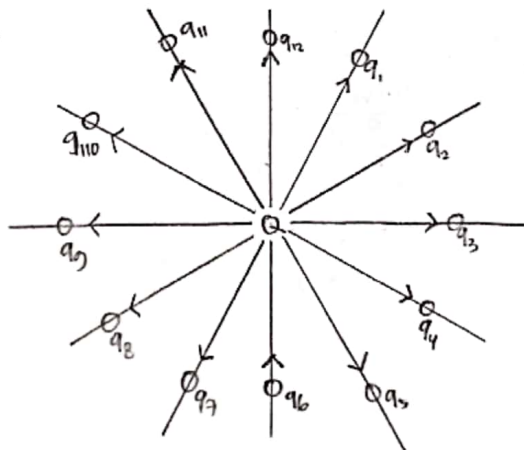
$$\frac{5,2 \times 10^5}{1,6 \times 10^{-19}} = 3,25 \times 10^{24} \text{ elektron}$$

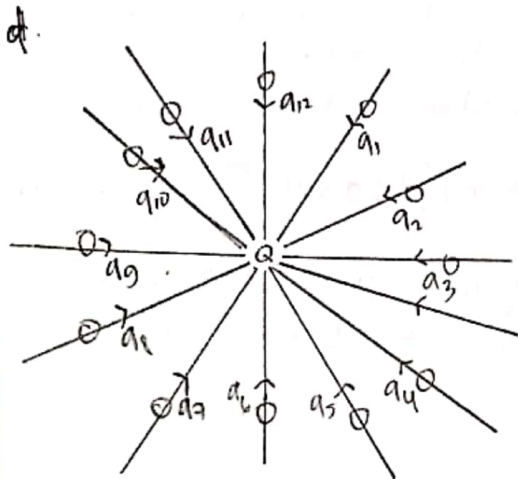
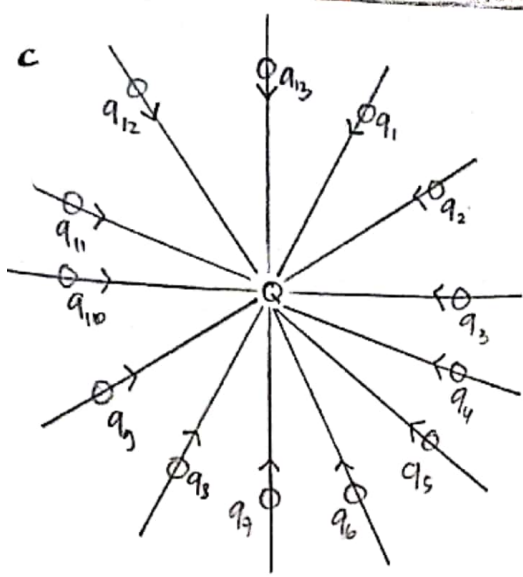
* Kasus Gaya listrik

a.

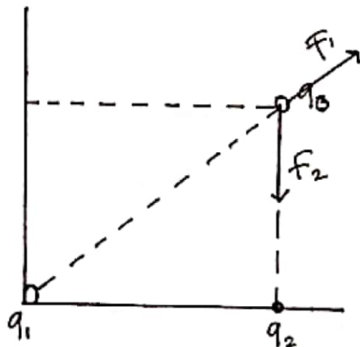


b.



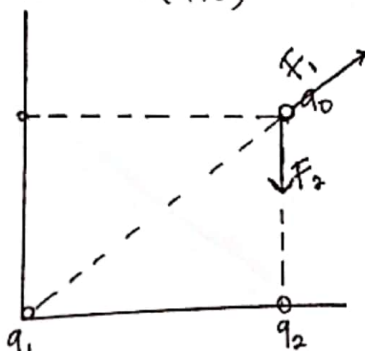


- e. $q_1 = 25 \mu\text{C} \rightarrow (0,0) \text{ m}$
 $q_2 = -10 \mu\text{C} \rightarrow (4,0) \text{ m}$
 $q_0 = 10 \mu\text{C} \rightarrow (4,3) \text{ m}$



$$\begin{aligned}\vec{F} &= k q_0 \left\{ \frac{q_1}{r_{10}^2} \hat{r}_{10} + \frac{q_2}{r_{20}^2} \hat{r}_{20} \right\} \\ &= 10 \cdot 9 \times 10^9 \left\{ \left(\frac{25}{25^2} \right) \left(\frac{4\hat{i} + 3\hat{j}}{5} \right) + \frac{10}{16} (\hat{i}) \right\} \\ &= 10 \cdot 9 \times 10^9 \left\{ \frac{100}{125} + \frac{10}{16} \hat{i} + \frac{75}{125} \hat{j} \right\} \\ &= 9 \times 10^{10} (1.42\hat{i} + 0.6\hat{j}) \\ \vec{F} &= 9 \times 10^{10} \sqrt{(1.42)^2 + (0.6)^2}\end{aligned}$$

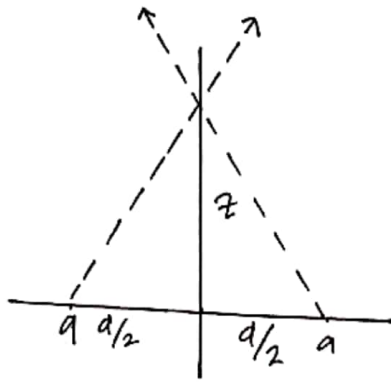
- f. $q_1 = 25 \mu\text{C} \rightarrow (0,0)$
 $q_2 = -15 \mu\text{C} \rightarrow (4,0)$
 $q_0 = 20 \mu\text{C} \rightarrow (4,3)$



$$\begin{aligned}\vec{F} &= k q_0 \left\{ \frac{q_1}{r_{10}^2} \hat{r}_{10} + \frac{q_2}{r_{20}^2} \hat{r}_{20} \right\} \\ \vec{F} &= 20 \cdot 9 \times 10^9 \left\{ \left(\frac{25}{25^2} \right) \left(\frac{4\hat{i} + 3\hat{j}}{5} \right) + \frac{10}{16} (\hat{i}) \right\} \\ \vec{F} &= 20 \cdot 9 \times 10^9 \left\{ \frac{100}{125} + \frac{10}{16} (\hat{i}) + \frac{75}{125} \hat{j} \right\} \\ &= (18 \times 10^{10}) (1.42\hat{i} + 0.6\hat{j}) \\ \vec{F} &= 18 \times 10^{10} \sqrt{(1.42)^2 + (0.6)^2}^{1/2}\end{aligned}$$

* Kasus Medan Listrik

a.

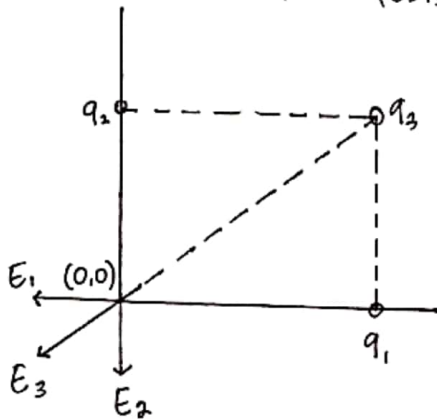


b. $q_1(4,0) = 2C$

$q_2(0,3) = 5C$

$q_3(4,3) = 10C$

Medan listrik pada posisi $(0,0)$



Medan oleh $q_1, \vec{E}_1 = \frac{1}{4\pi\epsilon_0} \frac{2}{16} (\vec{j})$

Medan oleh $q_2, \vec{E}_2 = \frac{1}{4\pi\epsilon_0} \frac{5}{9} (\vec{i})$

Medan oleh $q_3, \vec{E}_3 = \frac{1}{4\pi\epsilon_0} \frac{10}{25} \left(\frac{4\vec{i} + 3\vec{j}}{5} \right)$

Medan total $\vec{E} = \frac{1}{4\pi\epsilon_0} \left[\left(\frac{5}{9} + \frac{40}{125} \right) (\vec{i}) + \left(\frac{2}{16} + \frac{30}{125} \right) (\vec{j}) \right]$

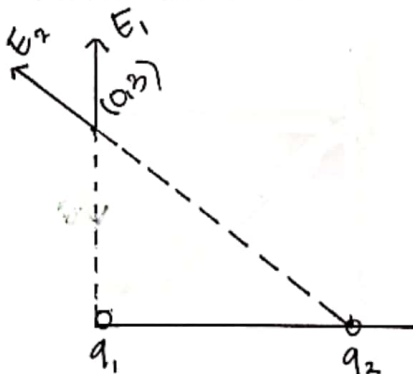
$= \frac{1}{4\pi\epsilon_0} \sqrt{(0,49)^2 + (0,8)^2}$

$= 8,35 \times 10^2 \text{ N/C}$

c. $q_1(0,0) = -5 \mu C$

$q_2(4,0) = 10 \mu C$

Medan listrik pada posisi $(0,3)$



Medan listrik oleh $q_1, \vec{E}_1 = k \cdot \frac{q_1}{r_1^2}$

$= 9 \cdot 10^9 \frac{5}{25} \left(\frac{-4\vec{i} - 3\vec{j}}{5} \right)$

$= 9 \cdot 10^9 \left(\frac{-20}{125} \vec{i} - \frac{15}{125} \vec{j} \right)$

Medan oleh $q_2, \vec{E}_2 = 9 \cdot 10^9 \frac{10}{16} \left(\frac{3\vec{j}}{3} \right)$

$= 9 \cdot 10^9 \left(\frac{30\vec{j}}{48} \right)$

Medan total $\vec{E} = -9 \cdot 10^9 \frac{20}{125} \vec{i} + 9 \cdot 10^9 \left(\frac{30}{48} - \frac{5}{125} \right) \vec{j}$

$= 9 \cdot 10^9 \sqrt{(0,16)^2 + (0,58)^2}$

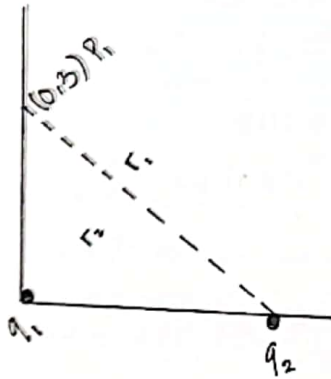
* Potensial Listrik

11.

2. $q_1(0,0) = -5 \mu C$

$q_2(4,0) = 10 \mu C$

Hitung Medan listrik titik $(0,3)$



$$\begin{aligned} V &= \frac{kq_1}{r_1} + \frac{kq_2}{r_2} \\ &= 9 \times 10^9 \left(\frac{5}{3} + \frac{10}{4} \right) \\ &= 3,75 \times 10^7 \frac{\text{dyne cm}}{\mu C} \end{aligned}$$

3. $q_1(0,0) = 25 \mu C$

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

$q_0(4,3) = 20 \mu C$

Carilah pada titik $(0,3)$

