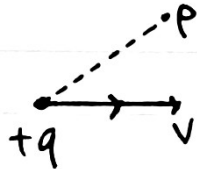


→ Medan Magnet.

1. Medan oleh muatan bergerak.

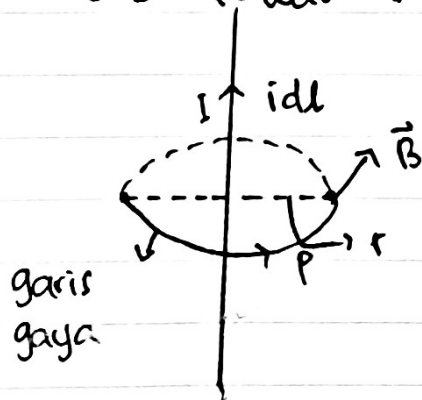


$\vec{B}$ = Medan magnet.

$$\begin{aligned}\vec{B} &= \frac{\mu_0}{4\pi} \frac{q \vec{v} \times \hat{r}_0}{r^2} \\ &= \frac{\mu_0 q v}{4\pi r^2} \sin \theta\end{aligned}$$

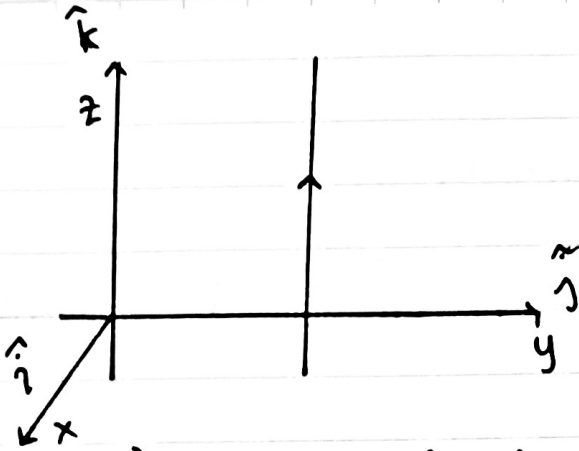
2. $\vec{B}$ oleh arus listrik

» Pada kawat 1



$$\vec{B} = \frac{\mu_0}{4\pi} \frac{\vec{idl} \times \hat{r}_0}{r^2}$$

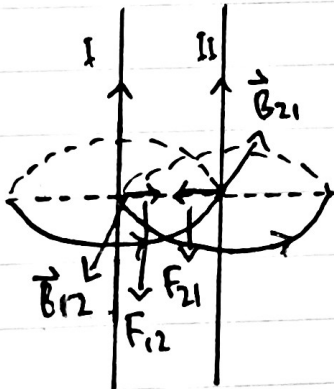
Contoh:



$$\vec{B} = \frac{\mu_0}{4\pi} \frac{idl \hat{k} \times \hat{j}}{r^2}$$

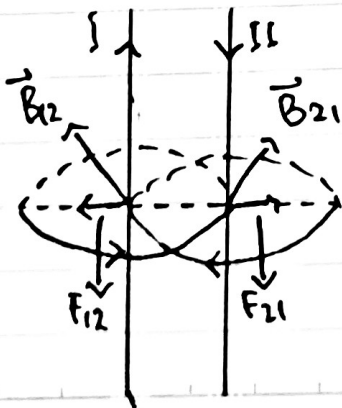
$$\vec{B} = \frac{\mu_0}{4\pi} \frac{idl}{r^2} \sin \theta (-\hat{i})$$

→ Pada Kawat 2.

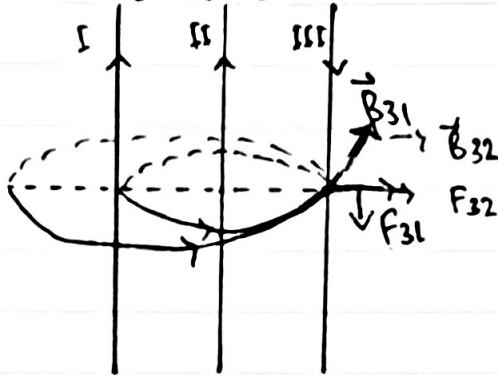


$$\vec{F} = i d\vec{l} \times \vec{B}$$

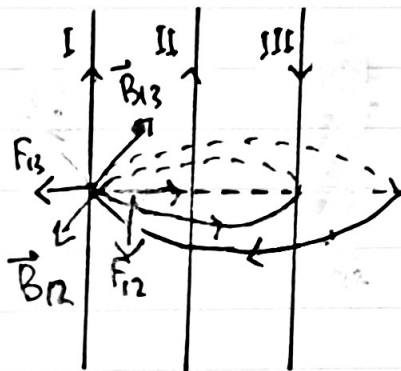
Contoh :



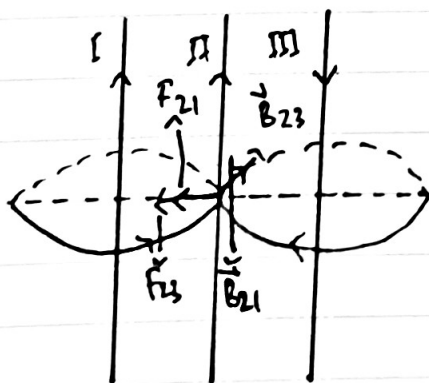
→ Pada kawat 3



→ kawat 1 dan 2 terhadap kawat 3.



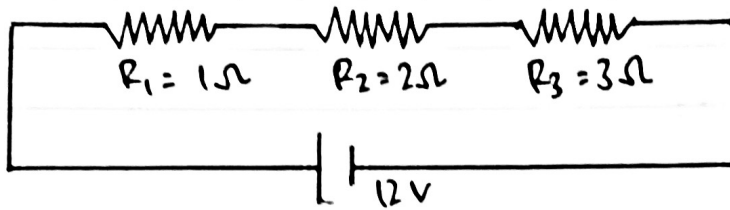
→ kawat 2 dan 3 terhadap kawat 1



→ kawat 1 dan 3 terhadap kawat 2.

Kuis!

1.



- a.) Hitung arus pada R_3
b.) Hitung tegangan pada R_2 .

Jawab :

- a.) Arus pada R_3 .

$$\begin{aligned} R_t &= R_1 + R_2 + R_3 \\ &= 1 + 2 + 3 \\ &= 6\Omega \end{aligned}$$

$$I = \frac{V}{R}$$

$$= \frac{12}{6}$$

$$= 2 \text{ A.}$$

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Jadi, arus pada R_3 adalah 2 Amper.

- b. Tegangan pada R_2 .

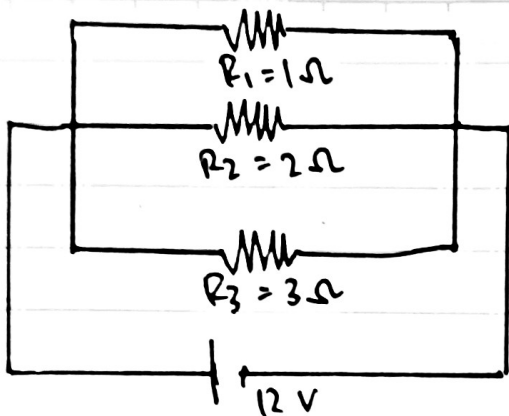
$$V_2 = R_2 \cdot I$$

$$= 2 \cdot 2$$

$$= 4 \text{ V}$$

Jadi, tegangan pada R_2 adalah 4 volt.

2.



- a.) Hitung arus pada R_3
b.) Hitung tegangan pada R_2

Jawab:

- a). Arus pada R_3 .

$$\begin{aligned} I_3 &= \frac{V}{R_3} \\ &= \frac{12}{3} \\ &= 4 \text{ A} \end{aligned}$$

Jadi, arus pada R_3 adalah 4 Ampere.

- b) Tegangan pada R_2

$$\begin{aligned} \frac{1}{R} &= \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \\ \frac{1}{R} &= \frac{1}{1} + \frac{1}{2} + \frac{1}{3} \\ \frac{1}{R} &= \frac{3}{6} \\ R &= \frac{6}{3} \\ R &= 2 \Omega \end{aligned}$$

$$V_2 = I \cdot R$$

$$I_t = \frac{V}{R_t}$$

$$= \frac{12}{2}$$

$$= 6 \text{ Ampere}$$

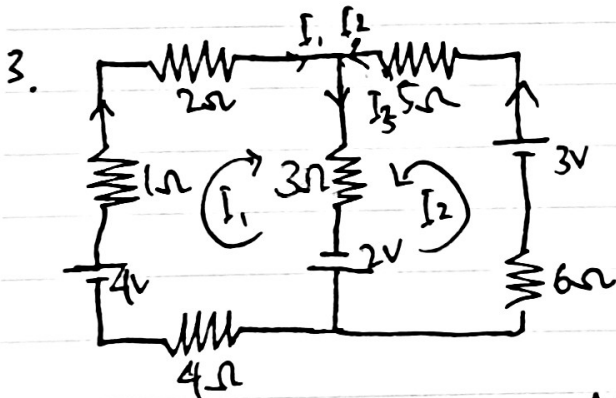
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$$V_2 = I \cdot R$$

$$= 6 \cdot 2$$

$$= 12 \text{ Volt.}$$

Jadi, tegangan pada R_2 adalah 12 Volt.



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Hitung arus tiap loop (I_1, I_2, I_3)

=> Jawab :

Loop I_1 :

$$\sum \mathcal{E} + \sum IR = 0$$

$$-4V - 2V + I_1 (1\Omega + 2\Omega + 4\Omega) + I_3 (3\Omega) = 0$$

$$-6V + I_1 (7\Omega) + I_3 (3\Omega) = 0$$

$$7I_1 + 3I_3 = 6V$$

Loop I_2 :

$$\sum \mathcal{E} + \sum IR = 0$$

$$-3V - 2V + I_2 (5\Omega + 6\Omega) + I_3 (3\Omega) = 0$$

$$-5V + I_2 (11\Omega) + I_3 (3\Omega) = 0$$

$$11 I_2 + 3 I_3 = 5V$$

$$* 7 I_1 = 6 - 3 I_3$$

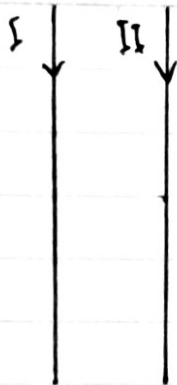
$$I_1 = 6 - 3 (1 - 5 I_2)$$

$$I_1 = 6 - 3 + 15 I_2$$

$$* 3 I_3 = 5 - 11 I_2$$

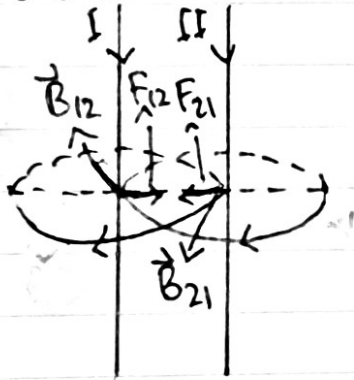
$$I_3 = \frac{5 - 11 I_2}{3}$$

4.



Gambarkan medan magnet, garis gaya dan arah arus!

→ Jawab :



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