

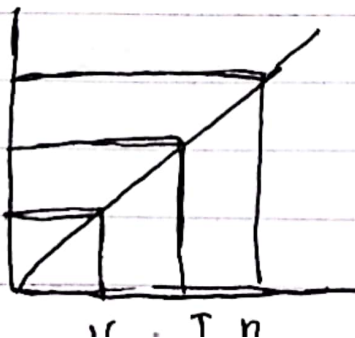
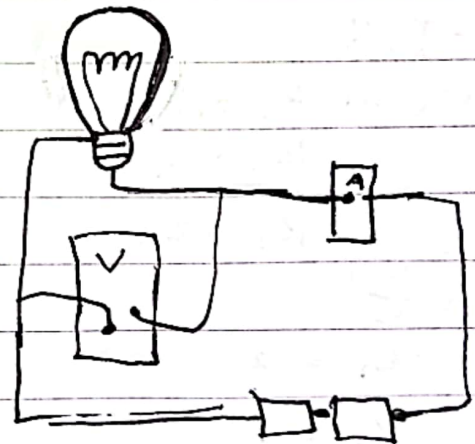
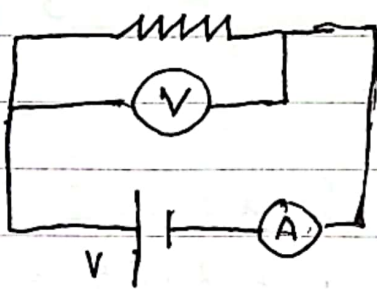
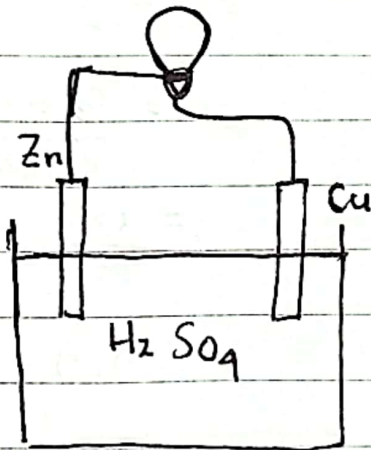
## Elektrodinamika

1. Hukum Ohm
2. Rangkaian Listrik

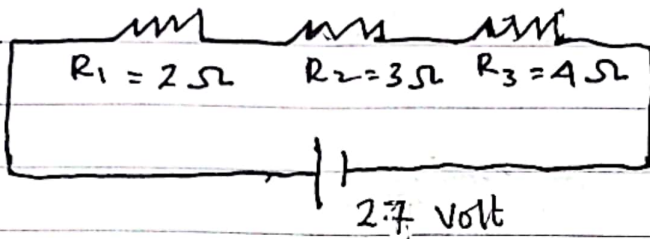
### Pembahasan

$$J = \sigma E \leftarrow \begin{matrix} DC \\ AC \end{matrix}$$

$$V = iR$$



# Rangkaian Listrik



$$R_{total} = 9$$

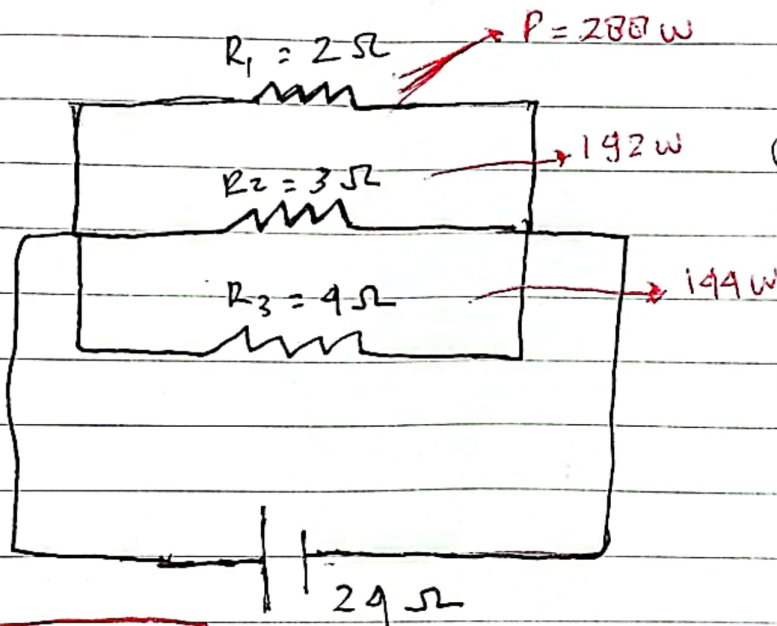
$$I = \frac{27}{9} = 3A \rightarrow \frac{V}{R}$$

$$\text{Tegangan} : R_1 = 6\Omega$$

$$R_2 = 9\Omega$$

$$R_3 = 12\Omega$$

$$\text{Total Tegangan} = 27$$



$$\begin{aligned} \frac{1}{R_t} &= \frac{1}{2} + \frac{1}{3} + \frac{1}{4} \\ &= \frac{6 + 4 + 3}{12} \\ &= \frac{13}{12} \\ &= 0,9 \end{aligned}$$

$$V = I \cdot R$$

$$\text{Tegangan } R_1 = 24$$

$$R_2 = 24$$

$$R_3 = 24$$

$$I = \frac{V}{R} = \frac{24}{0,9} = 26,6A$$

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

$$\text{Arus } R_1 = 12$$

$$R_2 = 8$$

$$R_3 = 16$$

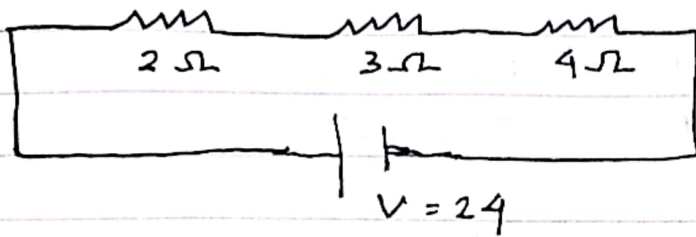
$$\text{Total arus} = 26$$

$$\text{Daya} : V \times I$$

$$P_1 = 12 \cdot 24 = 288W$$

$$P_2 = 8 \cdot 24 = 192W$$

$$P_3 = 16 \cdot 24 = 384W$$



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

$$= \frac{24}{9} = 2,67 \text{ A}$$

$$V_{R_1} = I \times R$$

$$= 2,67 \times 2$$

$$= 5,34$$

$$V_{R_2} = I \times R$$

$$= 2,67 \times 3$$

$$= 8,01$$

$$P_1 = V \times I$$

$$= 5,34 \times 2,67$$

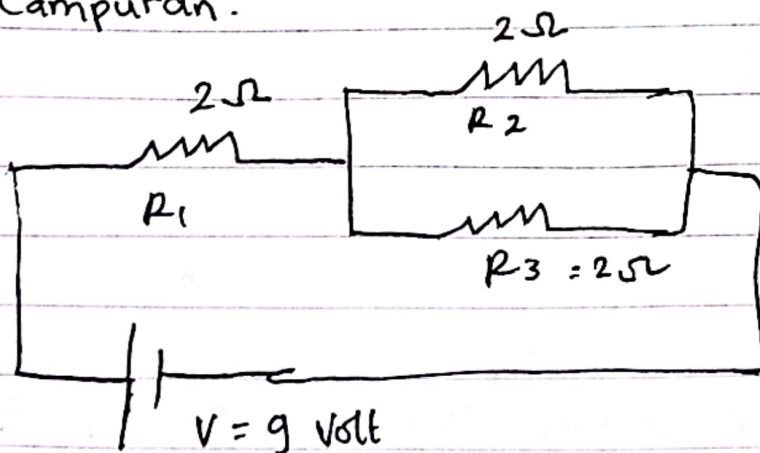
$$= 14,25 \text{ W}$$

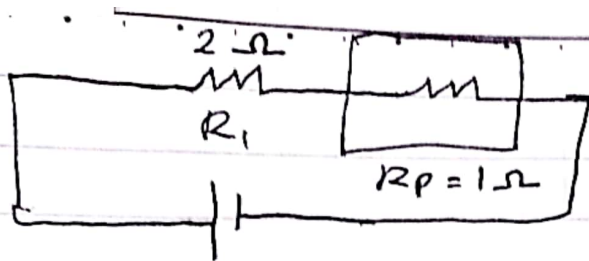
$$P_2 = V \times I$$

$$= 8,01 \times 2,67$$

$$= 21,38 \text{ W}$$

Campuran.





$$R_t = 3 \Omega$$

Tegangan  $R_p$

$$R_p = I \cdot R_p$$

$$= 3 \cdot 1 = 3 \text{ Volt}$$

$$R_p = \frac{1}{2} + \frac{1}{2} = 1 \Omega$$

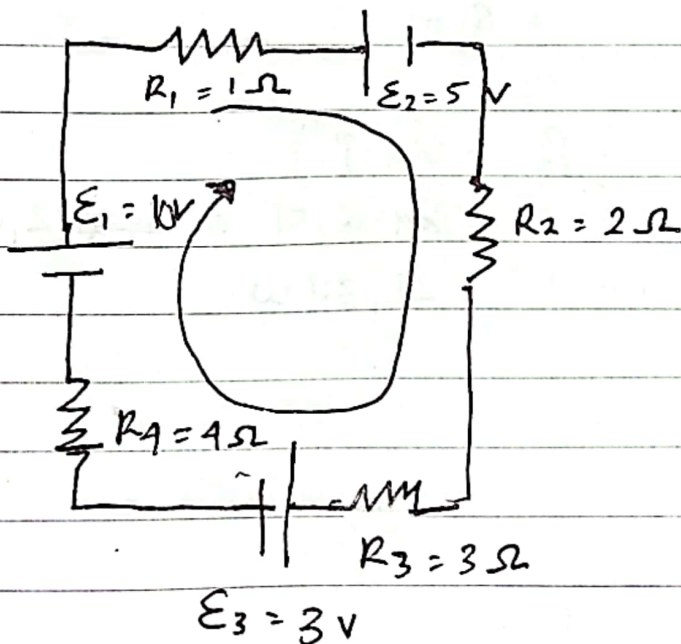
$$I = \frac{9}{3} = 3 \text{ A}$$

$$R_1 = 2 \cdot 3 = 6 \text{ Volt}$$

$$R_2 = 3 \text{ Volt}$$

$$R_3 = 3 \text{ Volt}$$

Hukum Kirchhoff



$$E_1 > E_2 > E_3$$

1. Gambarlah arah arus sesuai dengan besarnya  $E$
2. Gambar loop sesuka hati
3. Jika ~~arah~~ arah ~~sesuka~~ arus searah dengan arah loop maka Positif (+)

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

$$-\mathcal{E}_1 + \mathcal{E}_2 + \mathcal{E}_3 + I(R_1 + R_2 + R_3) = 0$$

$$-10V + 5V + 3V + I(1 + 2 + 3 + 4) = 0$$

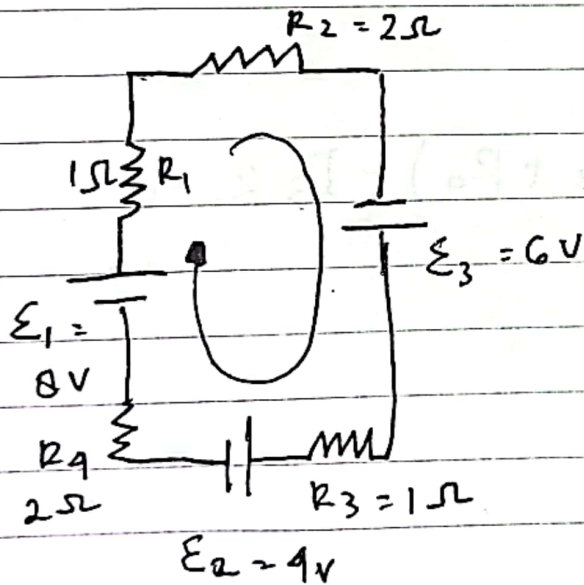
$$-2V + I(10) = 0$$

$$I = \frac{2}{10}$$

$$I = \frac{1}{5}$$

$$= 0,2 \text{ A}$$

Jadi Arus yang mengalir 0,2 A.



arah arus :

(Besar beda potensialnya)

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

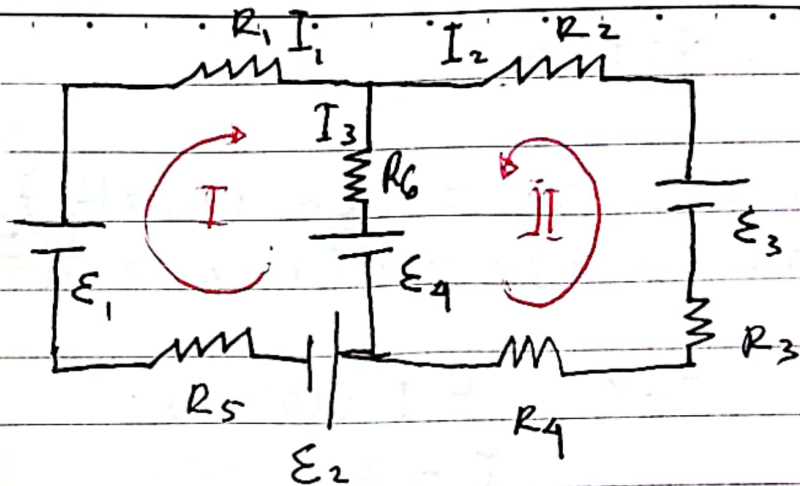
$$\mathcal{E}_1 + \mathcal{E}_2 - \mathcal{E}_3 - I(R_1 + R_3 + R_4) = 0$$

$$8V + 4V - 6V - I(1 + 2 + 1 + 2) = 0$$

$$6 - I(6) = 0$$

$$I = \frac{6}{6}$$

$$I = 1 \text{ A}$$



Loop I

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

$$-\mathcal{E}_1 + \mathcal{E}_4 + \mathcal{E}_2 + I_1(R_1 + R_5) + I_3 R_6 = 0$$

Loop II

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

$$-\mathcal{E}_3 + \mathcal{E}_4 + I_2(R_2 + R_3 + R_4) + I_3 R_6 = 0$$