

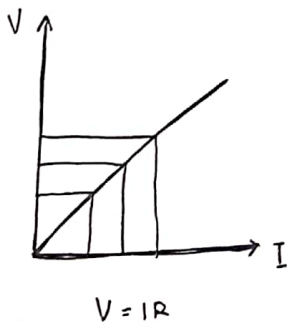
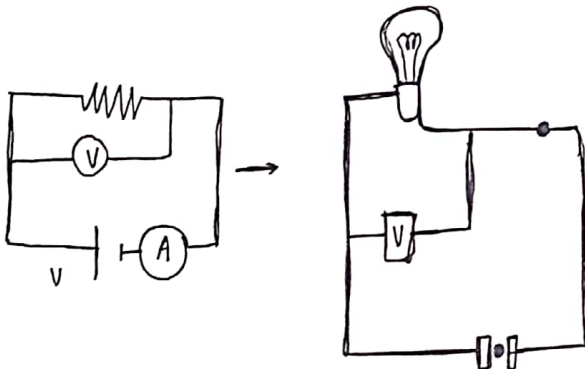
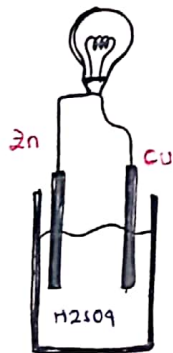
Elektrodinamika

1. Hukum Ohm
2. Rangkaian Listrik

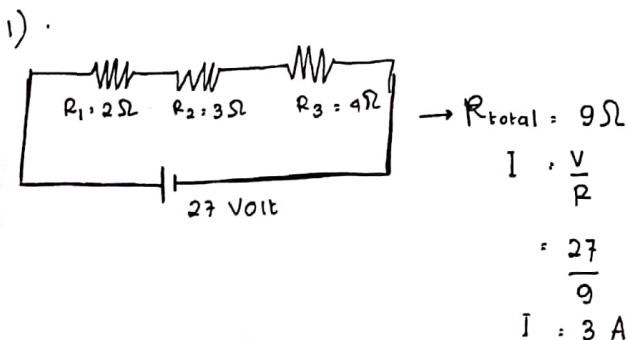
Pembahasan:

$$J = \sigma E \leftarrow \text{DC}$$

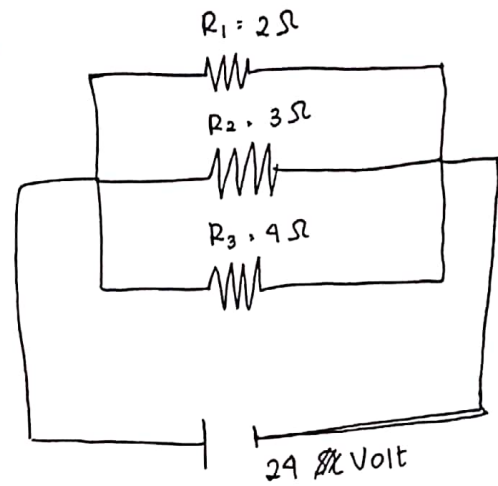
$$V = IR \leftarrow \text{AC}$$



example:



2).



$$R_t = \frac{1}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}} = \frac{1}{\frac{1}{2} + \frac{1}{3} + \frac{1}{4}} = \frac{12}{6 + 4 + 3} = \frac{12}{13} = 0,9\Omega$$

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

• Daya pada R_1

$$P = V \cdot I_1 = 24 \cdot 12 = 288 \text{ watt}$$

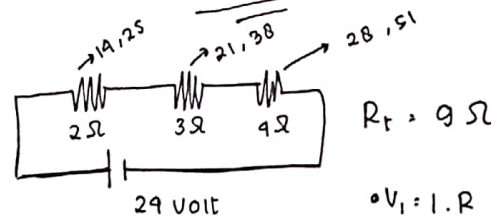
• Daya pada R_2

$$P = V \cdot I_2 = 24 \cdot 8 = 192 \text{ watt}$$

• Daya pada R_3

$$P = V \cdot I_3 = 24 \cdot 6 = 144 \text{ watt}$$

3).



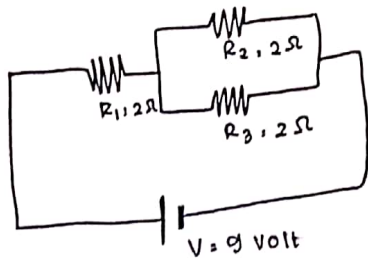
$$I = \frac{V}{R} = \frac{29}{9} = 3,22 \text{ A}$$

$$P_1 = V_1 \cdot I = 6,44 \cdot 3,22 = 20,74 \text{ watt}$$

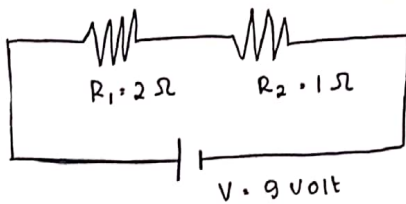
$$P_2 = V_2 \cdot I = 9,66 \cdot 3,22 = 31,11 \text{ watt}$$

$$P_3 = V_3 \cdot I = 12,88 \cdot 3,22 = 41,48 \text{ watt}$$

Rangkaian seri-paralel



$$R_{p \text{ total}} = \frac{1}{R_p} = \frac{1}{2} + \frac{1}{2} = \frac{2}{2} = 1 \Omega$$



$$R_{\text{total}} = 2 + 1 = 3 \Omega$$

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

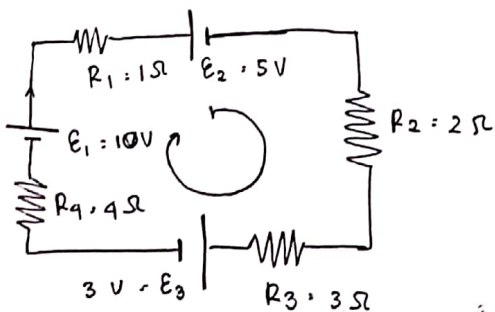
$$V_p = I \cdot R_p = 3 \text{ A} \cdot 1 \Omega = 3 \text{ Volt}$$

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

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

$$P = V \cdot I = 9 \cdot 3 = 27 \text{ watt}$$

Hukum Kirchoof (satu loop)



$$E_1 > E_2 > E_3$$

1. Gambar arah arus sesuai dengan besarnya $\mathcal{E}$
2. Gambar loop sesuai hatimu
3. Jika arah arus searah dengan, arah loop maka +

$$\rightarrow \sum \mathcal{E} + \sum I \cdot R = 0$$

$$E_1 + E_2 + E_3 + I(R_1 + R_2 + R_3 + R_4) = 0$$

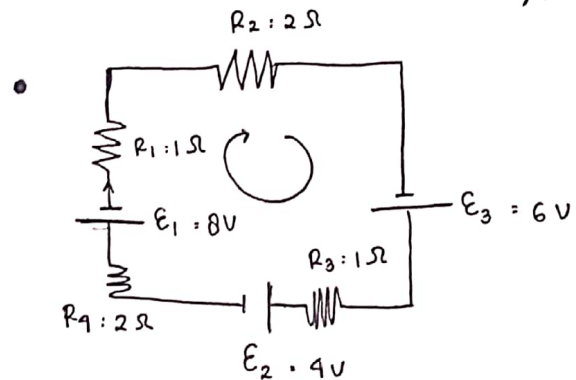
$$-10 + 5 + 3 + I(1 + 2 + 3 + 4) = 0$$

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

$$I(10) = 2$$

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

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



$$\cdot \sum \mathcal{E} + \sum I \cdot R = 0$$

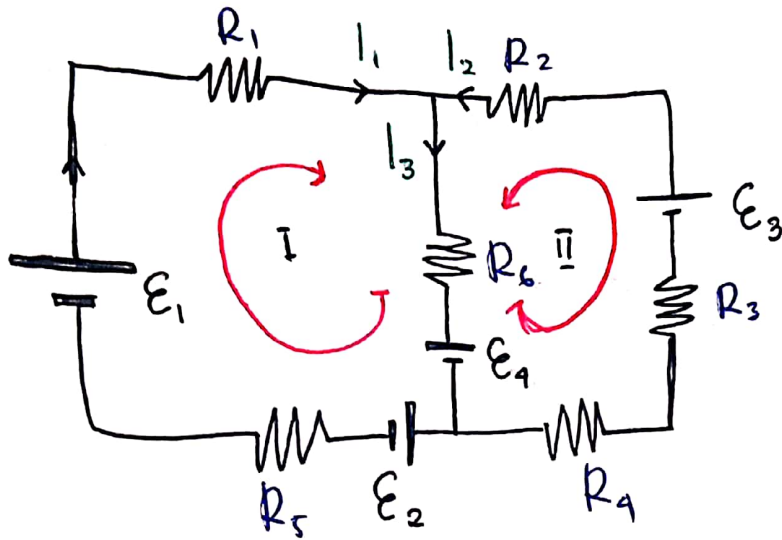
$$-E_1 + E_2 + E_3 + I(R_1 + R_2 + R_3 + R_4) = 0$$

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

$$6 + I(6) = 0$$

$$I = \frac{6}{6} = 1 \text{ A}$$

(Dua loop)



• Loop I

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

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

• Loop II

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

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