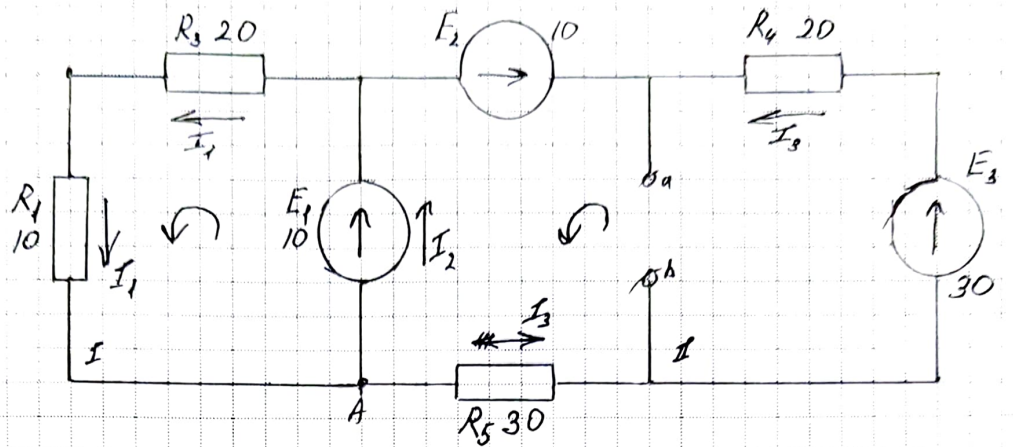


Дано:

$R_1 = 10$ Ом ; $R_5 = 30$ Ом

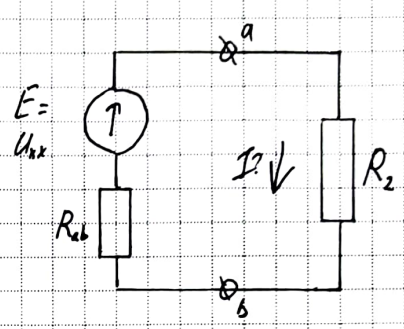
$R_2 = 10$ Ом ; $E_1 = 10$ В

$R_3 = 20$ Ом ; $E_2 = 10$ В

$R_4 = 20$ Ом ; $E_3 = 30$ В

Найти: I, U_{xx}, R_{ab}

I_{kz}.



По I з. Кирхгофа:

A: $I_1 - I_2 - I_3 = 0$

По II з. Кирхгофа:

$R_3 I_1 + R_1 I_1 = E_1$

$R_5 I_3 + R_4 I_3 = E_3 - E_2 - E_1$

$$\begin{cases} R_3 I_1 + R_1 I_1 = E_1 \\ R_5 I_3 + R_4 I_3 = E_3 - E_2 - E_1 \\ I_1 - I_3 = I_2 \end{cases}$$

$$\begin{cases} 30 I_1 = 10 \\ 50 I_3 = 10 \\ I_2 = I_1 - I_3 \end{cases} \Rightarrow \begin{cases} I_1 = \frac{1}{3}\ A \\ I_3 = \frac{1}{5}\ A \\ I_2 = \frac{2}{15}\ A \end{cases}$$

$$R_{ab} = \frac{R_5 \cdot R_4}{R_5 + R_4} = \frac{20 \cdot 30}{20+30} = 12\ \text{Ом};$$

$$U_{xx} = E_3 - I_3 R_4 = 30 - \frac{1}{5} 20 = 26\ \text{В}.$$

$$I_{kz} = \frac{E_1 + E_2}{R_5} + \frac{E_3}{R_4} = \frac{20}{30} + \frac{30}{20} = \frac{13}{6} \approx 2{,}167\ \text{А}.$$

Итого:

$$I(\text{по } k_3) = I_{kz} \cdot \frac{R_{ab}}{R_{ab} + R_2} = \frac{13}{6} \cdot \frac{12}{22} = 1{,}18\ \text{А}.$$

$$I(\text{по } U_{xx}) = \frac{E(U_{xx})}{R_{ab} + R_2} = \frac{26}{22} = 1{,}18\ \text{А}.$$

Ответ: $I = 1{,}18$ А. Данные сошлись.