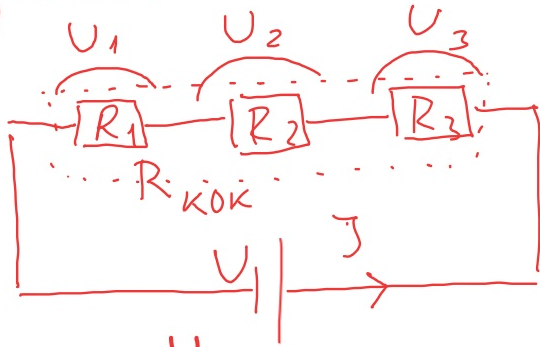
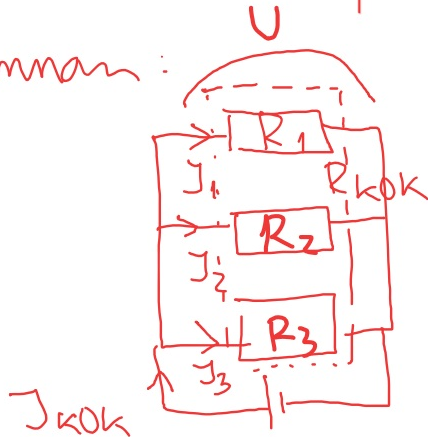


Vastusten kytkennät

Sarjassa:



Rinnan:



$$KII: U = U_1 + U_2 + U_3$$

$$R_{kok} J = R_1 J + R_2 J + R_3 J \quad || : J$$

$$R_{kok} = R_1 + R_2 + R_3$$

$$KI: J_{kok} = J_1 + J_2 + J_3$$

$$\frac{U}{R_{kok}} = \frac{U}{R_1} + \frac{U}{R_2} + \frac{U}{R_3} \quad || : U$$

$$\frac{1}{R_{kok}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

Esim. 3 resistoria 10Ω , 20Ω ja 30Ω

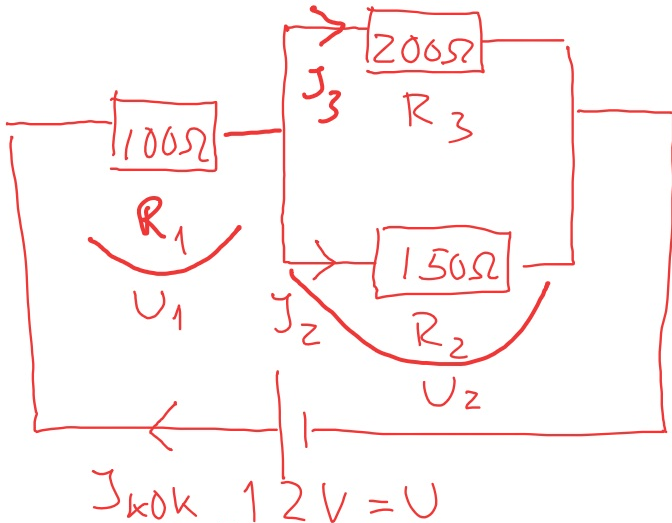
a) sarjassa: $R_{\text{kok}} = 10\Omega + 20\Omega + 30\Omega = 60\Omega$

b) rinnan: $\frac{1}{R_{\text{kok}}} = \frac{1}{10\Omega} + \frac{1}{20\Omega} + \frac{1}{30\Omega} = \frac{11}{60\Omega}$

$$R_{\text{kok}} = \frac{60\Omega}{11} = \underline{\underline{5,5\Omega}}$$

HUOM! Rinin kokonaisresistanssi määräää pinissä
kulturan kokonaisvirran (jännitelähtestä)

Esim. Määritä vastusten läpi kulkevat virrat.



Kokonaisresistanssi:

$$R_{kok} = R_1 + R_{23} \quad \left| \quad \frac{1}{R_{23}} = \frac{1}{R_2} + \frac{1}{R_3} \right.$$

$$R_{kok} = 185,7\Omega \quad R_{23} = \frac{1}{\frac{1}{150} + \frac{1}{200}} = 85,7\Omega$$

$$J_{kok} = \frac{U}{R_{kok}} = \frac{12V}{185,7\Omega} = \underline{0,065A}$$

$$U_1 = R_1 \cdot J_{kok} = 100\Omega \cdot 0,065A = 6,5V$$

$$\Rightarrow U_2 = 12V - 6,5V = 5,5V$$

$$J_2 = \frac{U_2}{R_2} = \frac{5,5V}{150\Omega} = \underline{0,037A}$$

$$J_3 = \frac{U_2}{R_3} = \frac{5,5V}{200\Omega} = \underline{0,028A}$$

KI: $J_{kok} = J_2 + J_3$

KII: $12V = U_1 + U_2$

$$J_{kok} \cdot 12V = U$$