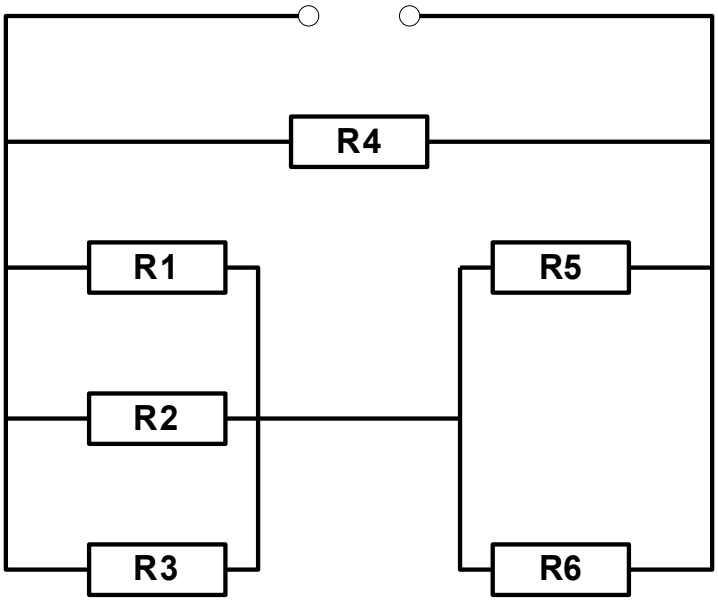
Aufgabe 1: Berechne R_4!



$R_0 = 0{,}25\,k\Omega,\ R_1 = 20\,\Omega,\ R_2 = 20\,k\Omega,\ R_3 = 40\,\Omega,\ R_5 = 800\,\Omega,\ R_6 = 1000\,\Omega$

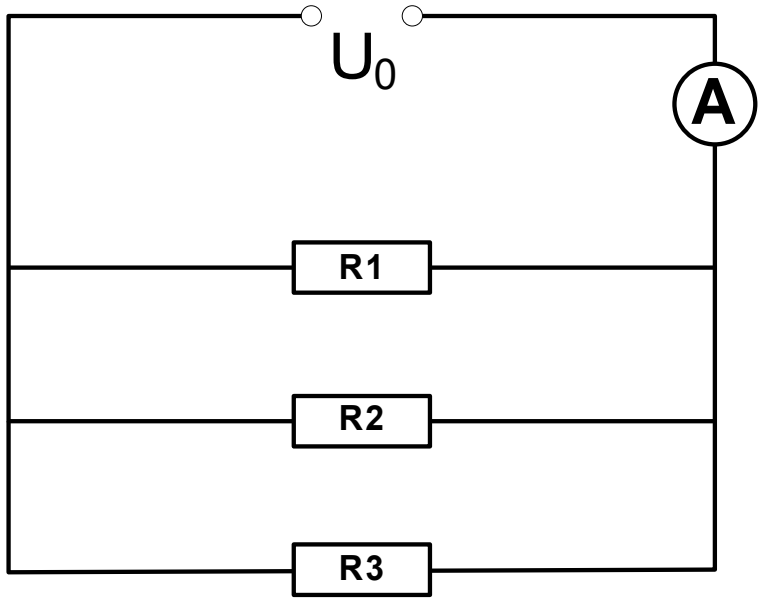
$$\frac{1}{R_{123}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} = \frac{1}{20\,\Omega} + \frac{1}{20.000\,\Omega} + \frac{1}{40\,\Omega} = \frac{1501}{20000\,\Omega} \quad \Leftrightarrow R_{123} = \frac{20.000\,\Omega}{1501} \approx 13{,}32\,\Omega$$

$$\frac{1}{R_{56}} = \frac{1}{R_5} + \frac{1}{R_6} = \frac{1}{800\,\Omega} + \frac{1}{1.000\,\Omega} = \frac{9}{4000\,\Omega} \quad \Leftrightarrow R_{56} = \frac{4.000\,\Omega}{9} \approx 444{,}44\,\Omega$$

$$R_{12356} = R_{123} + R_{56} = 457{,}76\,\Omega$$

$$\frac{1}{R_{Ges}} = \frac{1}{R_{12356}} + \frac{1}{R_4} \ \Leftrightarrow\ \frac{1}{R_4} = \frac{1}{R_{Ges}} - \frac{1}{R_{12356}} = \frac{1}{250\,\Omega} - \frac{1}{457{,}76\,\Omega} = \frac{1}{550{,}83\,\Omega} \quad \Leftrightarrow \boldsymbol{R_{Ges} = 550{,}83\,\Omega}$$

Aufgabe 2: Berechne R_1 und R_2! (Der Innenwiderstand des Messgerätes wird vernachlässigt.)



$U_0 = 60\,V$, $I_0 = 0{,}2\,A$, $R_3 = 0{,}6\,k\Omega$, R_1 *ist doppelt so groß wie* R_2

$$R_{Ges} = \frac{U_0}{I_0} = \frac{60\,V}{0{,}2\,A} = 300\,\Omega \qquad R_1 = 2\,R_2$$

$$\frac{1}{R_{Ges}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} = \frac{1}{2R_2} + \frac{1}{R_2} + \frac{1}{R_3} = \frac{3}{2R_2} + \frac{1}{R_3}$$

$$\Leftrightarrow \frac{3}{2} R_2 = \frac{1}{R_{Ges}} - \frac{1}{R_3} = \frac{1}{300\,\Omega} - \frac{1}{600\,\Omega} = \frac{1}{600\,\Omega} \qquad \Leftrightarrow \frac{1}{R_2} = \frac{2}{3 \cdot 600\,\Omega} = \frac{2}{1800\,\Omega}$$

$$\Leftrightarrow \boldsymbol{R_2 = 900\,\Omega} \qquad \Rightarrow \boldsymbol{R_1 = 1800\,\Omega}$$