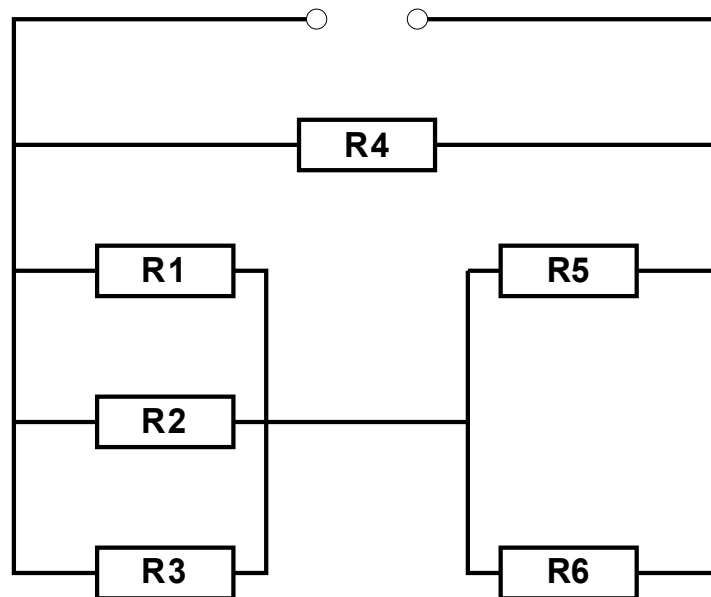


Aufgabe 1: Berechne den Ersatzwiderstand der folgenden Schaltung:



$R_1 = 20 \Omega$, $R_2 = 20 \text{ k}\Omega$, $R_3 = 40 \Omega$, $R_4 = 0,5 \text{ k}\Omega$, $R_5 = 800 \Omega$, $R_6 = 1000 \Omega$

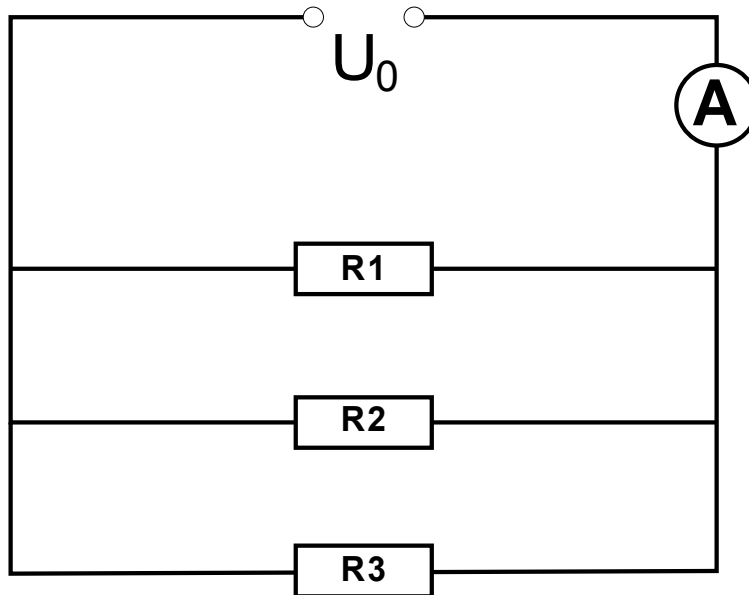
$$\frac{1}{R_{123}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} = \frac{1}{20 \Omega} + \frac{1}{20.000 \Omega} + \frac{1}{40 \Omega} = \frac{1501}{20000 \Omega} \quad \Leftrightarrow R_{123} = \frac{20.000 \Omega}{1501} \approx 13,32 \Omega$$

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

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

$$\frac{1}{R_{Ges}} = \frac{1}{R_{12356}} + \frac{1}{R_4} = \frac{1}{457,76 \Omega} + \frac{1}{500 \Omega} = 0,004185 \frac{1}{\Omega} \quad \Leftrightarrow R_{Ges} = 238,97 \Omega$$

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



$U_0 = 40 \text{ V}$, $I_0 = 0,2 \text{ A}$, $R_3 = 400 \Omega$, R_1 ist doppelt so groß wie R_2 ,

$$R_{Ges} = \frac{U_0}{I_0} = \frac{40 \text{ V}}{0,2 \text{ A}} = 200 \Omega \quad R_1 = 2 R_2$$

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

$$\Leftrightarrow \frac{3}{2R_2} = \frac{1}{R_{Ges}} - \frac{1}{R_3} = \frac{1}{200 \Omega} - \frac{1}{400 \Omega} = \frac{1}{400 \Omega} \quad \Leftrightarrow \frac{1}{R_2} = \frac{2}{3 \cdot 400 \Omega} = \frac{1}{600 \Omega}$$

$$\Leftrightarrow R_2 = 600 \Omega \quad \Rightarrow R_1 = 1200 \Omega$$