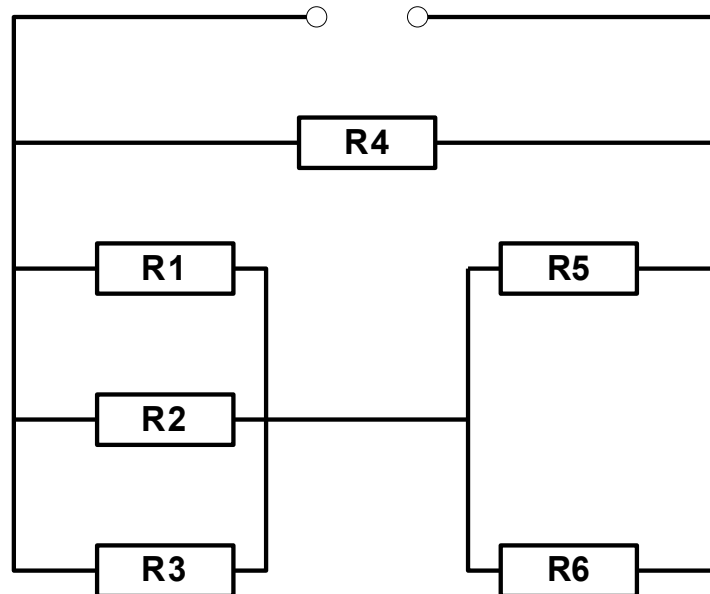


Aufgabe 1: Berechne R_4 !



$$R_0 = 0,3 \text{ k}\Omega, R_1 = 20 \Omega, R_2 = 20 \text{ k}\Omega, R_3 = 40 \Omega, R_5 = 800 \Omega, R_6 = 1000 \Omega$$

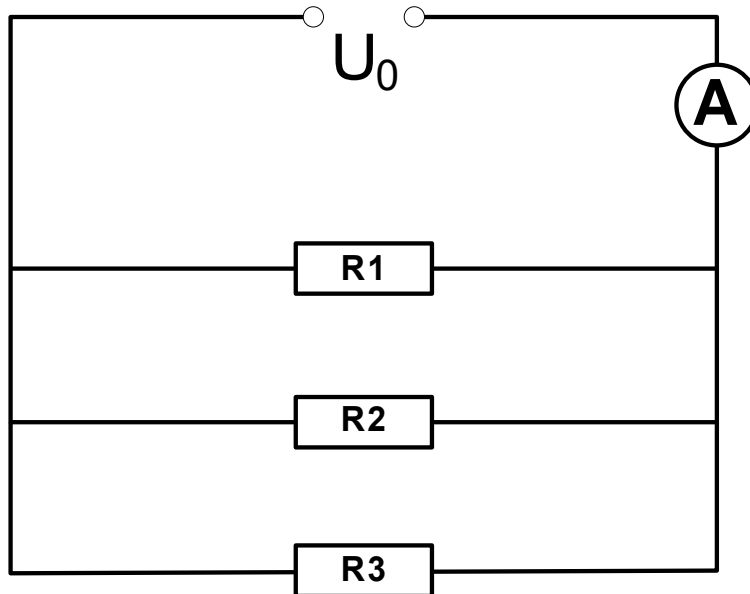
$$\frac{1}{R_{123}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} = \frac{1}{20 \Omega} + \frac{1}{20.000 \Omega} + \frac{1}{40 \Omega} = \frac{1501}{20000 \Omega} \Leftrightarrow R_{123} = \frac{20.000 \Omega}{1501} \approx 13,32 \Omega$$

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

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

$$\frac{1}{R_{Ges}} = \frac{1}{R_{12356}} + \frac{1}{R_4} \Leftrightarrow \frac{1}{R_4} = \frac{1}{R_{Ges}} - \frac{1}{R_{12356}} = \frac{1}{300 \Omega} - \frac{1}{457,76 \Omega} = \frac{1}{870,49 \Omega} \Leftrightarrow R_{Ges} = 870,49 \Omega$$

Aufgabe 2: Berechne R_2 und R_3 ! (Der Innenwiderstand des Messgerätes wird vernachlässigt.)



$U_0 = 20\text{ V}$, $I_0 = 0,4\text{ A}$, $R_1 = 300\ \Omega$, R_2 ist doppelt so groß wie R_3

$$R_{Ges} = \frac{U_0}{I_0} = \frac{20\text{ V}}{0,4\text{ A}} = 50\ \Omega \quad R_2 = 2 R_3$$

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

$$\Leftrightarrow \frac{3}{2} R_3 = \frac{1}{R_{Ges}} - \frac{1}{R_1} = \frac{1}{50\ \Omega} - \frac{1}{300\ \Omega} = \frac{1}{60\ \Omega} \quad \Leftrightarrow \frac{1}{R_3} = \frac{2}{3 \cdot 60\ \Omega} = \frac{2}{180\ \Omega} = \frac{1}{90\ \Omega}$$

$$\Leftrightarrow R_3 = 90\ \Omega \quad \Rightarrow R_2 = 180\ \Omega$$