1 První příklad zadání C

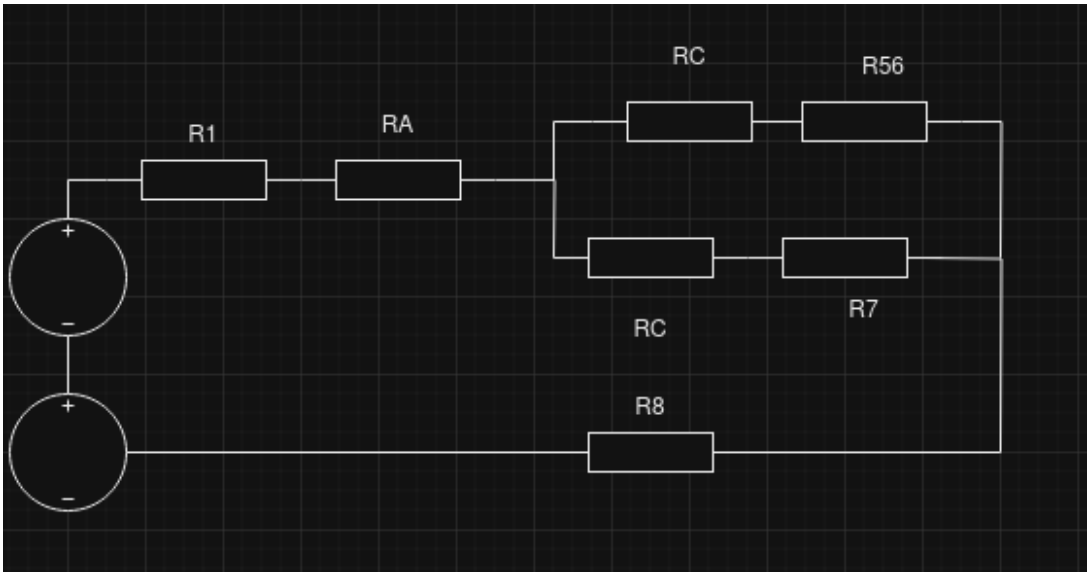

Figure 1: Úprava pomocí hvězdy

$$R_{56} = \frac{R_6 \times R_5}{R_6 + R_5}$$

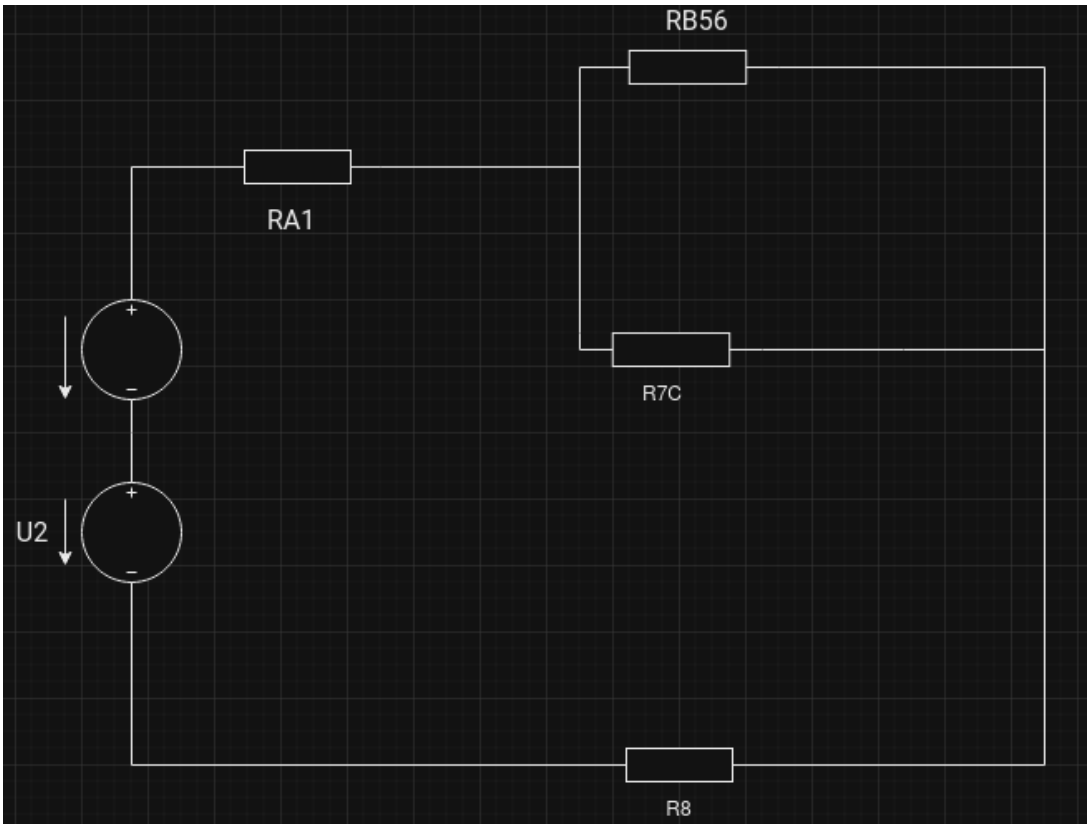

Figure 2: Další úprava

$$R_{A1} = \frac{R_2 \times R_3}{R_2 + R_3 + R_4} + R_1$$

$$R_{A1} = \frac{810 \times 220}{810 + 220 + 190} + 450 \quad \Rightarrow \quad R_{41} = 596.066$$

$$R_{B56} = \frac{R_2 \times R_4}{R_2 + R_3 + R_4} + \frac{R_6 \times R_5}{R_6 + R_5}$$

$$R_{B56} = \frac{810 \times 220}{810 + 190 + 720} + \frac{220 \times 720}{220 + 720} = 272.115$$

$$R_{C7} = \frac{R_3 \times R_4}{R_2 + R_3 + R_4} + R_7$$

$$R_{C7} = \frac{190 \times 220}{810 + 190 + 720} + 260 = 284.302$$

$$R = \frac{272.115 \times 284.320}{272.115 + 284.320} + 596.066 + 180 \quad \Rightarrow \quad R = 915.107$$

$$I = \frac{U}{R} = \frac{180}{894.770} \quad \Rightarrow \quad I = 0.1967$$

$$U_{R3} = U - U_{R7} - U_{R1} - U_{R8}$$

$$U_{R7} = R_7 \times I$$

$$U_{R1} = R_1 \times I$$

$$U_{R7} = 260 \times 0.1967 = 51.114\,\mathrm{V}$$

$$U_{R1} = 450 \times 0.1967 = 88.515\,\mathrm{V}$$

$$U_{R3} = 180 - 51.114 - 88.515 - 35.406 = 4.965\,\mathrm{V}$$

$$I_{R3} = \frac{U_{R3}}{R_3}$$

$$I_{R3} = \frac{4.965}{190} = 0.026\,\mathrm{A}$$

2 Reseni druheho prikladu

$$\text{Uzel A:} \quad \frac{130-U_A}{47}+\frac{U_A-U_B}{28}-\frac{90-(U_A-U_B)}{58}-\frac{U_A}{39}=0$$

$$\text{Uzel B:} \quad \frac{5}{10}+\frac{90-(U_A-U_B)}{58}-\frac{U_A-U_B}{28}-\frac{U_C-U_B}{35}=0$$

$$\text{Uzel C:} \quad \frac{U_C-U_B}{35}-\frac{5}{10}-\frac{U_C}{25}=0$$

$$\begin{aligned} 8987U_A - 78819U_B &= -1807260 \\ -215U_A + 331U_B - 116U_C &= -8330 \\ -10U_B - 4U_C &= 175 \end{aligned}$$

Pomoci Cramerovy metody vyresime U_A

$$\begin{gathered} U_A = 191.716\,\mathrm{V} \\ U_{R2} = U_A \quad \Rightarrow \quad U_{R2} = 191.716\,\mathrm{V} \\ I_{R2} = \frac{U_{R2}}{39} \quad \Rightarrow \quad I_{R2} = 4.915\,\mathrm{A} \end{gathered}$$

3 Řešení třetího příkladu

Úprava:

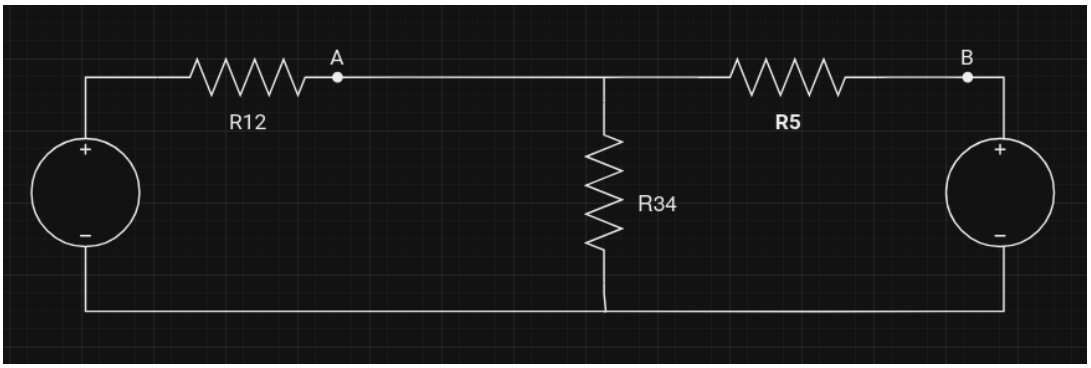

Figure 3: Další úprava

$$\begin{gathered} R_i = \frac{R_{12}\times R_5}{R_{12}+R_5} \\ R_i = \frac{950\times 80}{950+80} \quad \Rightarrow \quad R_i = 73.786 \\ I_x = \frac{U_2-U_1}{R_{12}+R_5} \\ I_x = \frac{180-130}{950+80} \quad \Rightarrow \quad I_x = 0.049 \\ U_i = U_1 + R_i \times I_x \\ U_i = 130 + 950 \times 0.049 \\ I_{R34} = \frac{U_i}{R_i + R_{34}} \\ \frac{176.55}{73.786+150} \quad \Rightarrow \quad I_{R34} = 0.789 \\ U_{R34} = 0.789 \times 150 \quad \Rightarrow \quad U_{R34} = 118.35\,\mathrm{V} \\ U_{R3} = 118.35\,\mathrm{V} \\ I_{R3} = \frac{118.35}{195} \quad \Rightarrow \quad I_{R3} = 0.606\,\mathrm{A} \end{gathered}$$