

1 První příklad zadání C

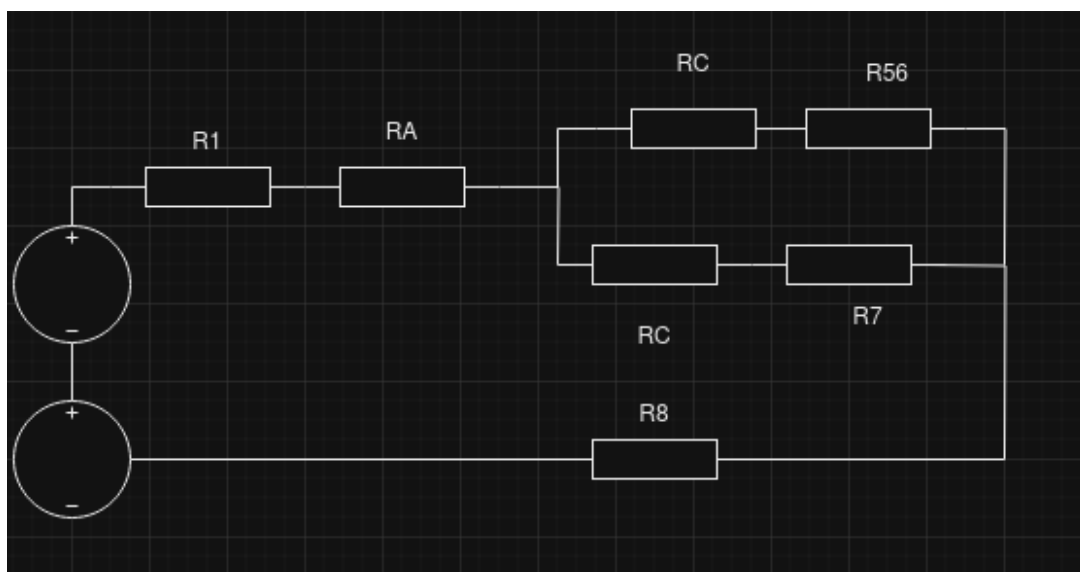


Figure 1: Úprava pomocí hvězdy

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

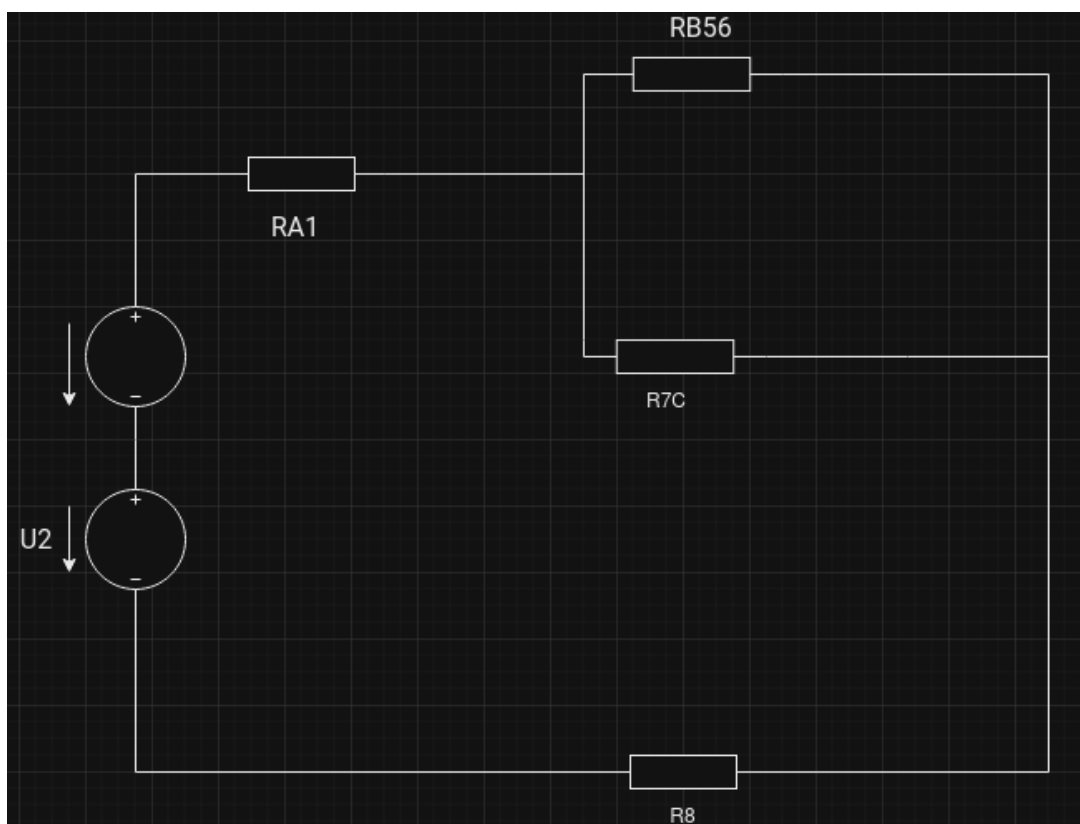


Figure 2: Další úprava

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

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

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

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

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

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

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

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

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

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

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

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

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

$$U_{R3} = 180 - 51.114 - 88.515 = 40.371 \text{ V}$$

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

$$I_{R3} = \frac{40.371}{190} = 0.212 \text{ A}$$

2 Resení druhého príkladu

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

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

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

$$8987U_A - 78819U_B = -1807260$$

$$-215U_A + 331U_B - 116U_C = -8330$$

$$-10U_B - 4U_C = 175$$

Pomoci Cramerovy metody vyresime U_A

$$U_A = 191.716 \text{ V}$$

$$U_{R2} = U_A \Rightarrow U_{R2} = 191.716 \text{ V}$$

$$I_{R2} = \frac{U_{R2}}{39} \Rightarrow I_{R2} = 4.915 \text{ A}$$

3 Řešení třetího příkladu

Úprava:

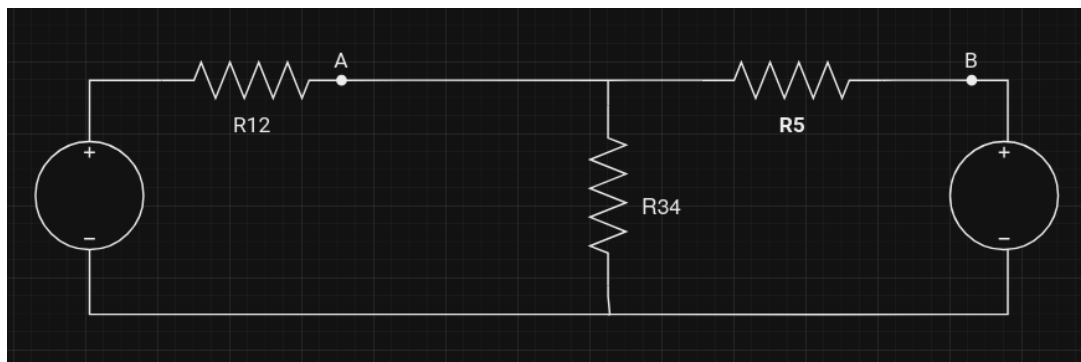


Figure 3: Další úprava

$$R_i = \frac{R_{12} \times R_5}{R_{12} + R_5}$$

$$R_i = \frac{950 \times 80}{950 + 80} \Rightarrow R_i = 73.786$$

$$I_x = \frac{U_2 - U_1}{R_{12} + R_5}$$

$$I_x = \frac{180 - 130}{950 + 80} \Rightarrow I_x = 0.049$$

$$U_i = U_1 + R_i \times I_x$$

$$U_i = 130 + 950 \times 0.049$$

$$I_{R34} = \frac{U_i}{R_i + R_{34}}$$

$$\frac{176.55}{73.786 + 150} \Rightarrow I_{R34} = 0.789$$

$$U_{R34} = 0.789 \times 150 \Rightarrow U_{R34} = 118.35 \text{ V}$$

$$U_{R3} = 118.35 \text{ V}$$

$$I_{R3} = \frac{118.35}{195} \Rightarrow I_{R3} = 0.606 \text{ A}$$