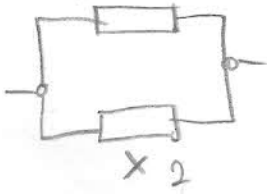


15.11

$$R = 10,07$$



$$R_2 = 10 [\Omega]$$

$$G_2 = \frac{1}{10} [S]$$

$$G_1 = \frac{100}{1007}$$

$$G_2 = G_1 + G_2$$

$$G_2 = X$$

$$X = G_2 - G_1$$

$$X = \frac{1}{10} - \frac{100}{1007} = \frac{1 \cdot 1007}{10 \cdot 1007} - \frac{100 \cdot 10}{1007 \cdot 10} =$$

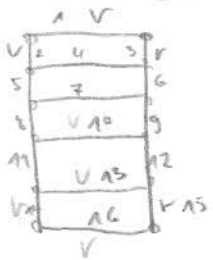
$$X = \frac{1007}{10070} - \frac{1000}{10070} = \frac{7}{10070} [S]$$

$$G_2 = \frac{7}{10070} [S]$$

$$R_2 = \frac{10070}{7} [\Omega]$$

$$R_2 = 1439 [\Omega] \checkmark$$

15.12



$$R_{123} = 3 \cdot r$$

$$G_{14} = \frac{1}{r} + \frac{1}{3r} = \frac{3}{3r} + \frac{1}{3r} = \frac{4}{3r}$$

$$R_{14} = \frac{3}{4} r$$

$$R_{456} = R_{14} + R_5 + R_6 = \frac{3}{4} r + 2r = \frac{11}{4} r$$

$$G_{456} = \frac{4}{11r}$$

$$G_{4567} = G_{46} + G_7 = \frac{4}{11r} + \frac{1}{r} = \frac{4}{11r} + \frac{11}{11r} = \frac{15}{11r}$$

$$R_{4567} = \frac{11}{15} r$$

$$R_{49} = R_{4567} + R_8 + R_9 = \frac{11}{15} r + 2r = \frac{11}{15} r + \frac{30}{15} r = \frac{41}{15} r$$

$$G_{49} = \frac{15}{41r} [S]$$

$$G_{410} = G_{49} + G_{10} = \frac{15}{41r} + \frac{1}{r} = \frac{15}{41r} + \frac{41}{41r} = \frac{56}{41r}$$

$$R_{410} = \frac{41}{56} r$$

$$R_{412} = R_{410} + R_{11} + R_{12} = \frac{41}{56} r + 2r = \frac{41 + 112}{56} r = \frac{153}{56} r$$

$$G_{413} = G_{412} + G_{13} = \frac{56}{153r} + \frac{1}{r} = \frac{56}{153r} + \frac{153}{153r}$$

$$G_{413} = \frac{209}{153r}$$

$$R_{413} = \frac{153}{209} \cdot r$$

$$R_{415} = R_{413} + R_{14} + R_{15} = \frac{153}{209} r + 2r = \frac{153 + 418}{209} r$$

$$R_{415} = \frac{571}{209} r \quad G_{415} = \frac{209}{571r}$$

$$G_{416} = G_{415} + G_{16} = \frac{209}{571r} + \frac{571}{571r} = \frac{780}{571r}$$

$$R_{416} = \frac{571}{780} \cdot r \quad \checkmark$$

15.7 Dane:

$$\rho = 38,8 \cdot 10^{-6} \Omega \cdot \text{cm}$$

$$d = 1 \text{ mm}$$

$$R = 1 \Omega$$

$$\rho = 38,8 \cdot 10^{-8} \Omega \cdot \text{m}$$

$$d = 1 \cdot 10^{-3} \text{ m}$$

$$R = 1 \Omega$$

$$R = \frac{\rho \cdot l}{S} \rightarrow l = \frac{R \cdot S}{\rho} \left[\frac{\Omega \cdot \text{m}^2}{\Omega \cdot \text{m}} \right] = [\text{m}]$$

$$l = \frac{1 \cdot \frac{\pi \cdot (1 \cdot 10^{-3})^2}{4}}{38,8 \cdot 10^{-8}} = \frac{1 \cdot \pi \cdot 10^{-6} \cdot 10^8}{4 \cdot 38,8} = \frac{\pi \cdot 10^2}{4 \cdot 38,8} = 2 \text{ m}$$

$$l = 2 \text{ m} \quad \checkmark$$

15.8

Dane:

$$R(t_0) = 193,2 \Omega$$

$$t_0 = 0^\circ \text{C}$$

$$t_p = 2200^\circ \text{C} \quad \alpha_t = 0,0045 \frac{1}{\text{K}}$$

$$R = R_0 \cdot (1 + \alpha_t \cdot \Delta t)$$

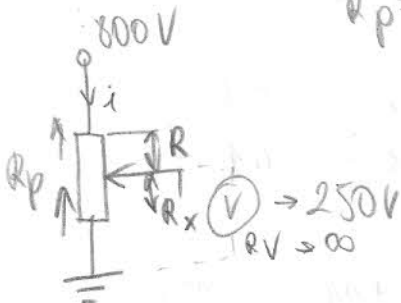
$$R = 193,2 \cdot (1 + 0,0045 \cdot 2200) = 2105,88 \Omega$$

$$R = 2105,88 \Omega \quad \checkmark$$

15.9

$$R_p = 10\,000 \Omega$$

$$i = \frac{U}{R} = \frac{800}{10\,000} = 8 \cdot 10^2 \cdot 10^{-4} = 0,08 \text{ A}$$



$$U_{800} - i \cdot R - U_{250} = 0$$

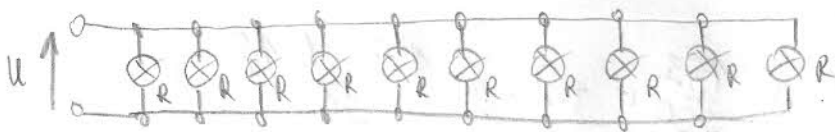
$$R = \frac{U - U_{250}}{i} = \frac{800 - 250}{0,08} = \frac{550}{0,08} = 6875 \Omega$$

$$R = 6875 \Omega \quad \text{lub} \quad R_x = 3125 \Omega \rightarrow \text{między "0" a suwakiem}$$

↳ między 800V a suwakiem

15.10

Dane: $R = 570 \Omega$
 $G = 1/570 \text{ [S]}$



$$G_z = \sum_{i=1}^{10} G_i = \frac{10}{570} \text{ [S]}$$

$$R_z = \frac{1}{G} = \frac{570}{10} = 57 \Omega$$

$$R_z = 57 \Omega \quad \checkmark$$