

7.1. $I = 2 \text{ A}$, $R_3 = 2 \Omega$

7.2. $E = \frac{I\rho}{S}$, $E = 2 \cdot 10^{-2} \frac{\text{V}}{\text{m}}$

7.3. $I_2 = 4 \text{ A}$, $I_3 = 1 \text{ A}$, $R_3 = 400 \Omega$, $R_1 = R_2 = 100 \Omega$

7.4. $I_1 = I_2 = \frac{4U}{11r}$, $I_3 = 3I_4$, $I_4 = I_5 = I_6 = \frac{I_1}{4}$,

$I_1 = I_2 = 10,91 \text{ A}$, $I_4 = I_5 = I_6 = 2,73 \text{ A}$, $I_3 = 8,18 \text{ A}$

7.5. $r_x = \frac{R}{4}$

7.6. a) $I = 0$, b) $I = 1,2 \text{ A}$

7.7. $r_x = \frac{3}{5}R$, $r_x = 3 \Omega$

7.8. Równoległe $R = r_a$

7.9. $\mathcal{E} = \sqrt{\frac{P}{R_1} \left(1 + \frac{R_1}{R_2}\right) \left(\frac{R_1 R_2}{R_1 + R_2} + r_w\right)}$

7.10. $I_A = 4,89 \text{ A}$, $r_A = 0,4 \Omega$

7.11. $r_w = \frac{(U_1 - U_2)r}{U_2 \frac{(r+R)}{R} - U_1}$

$$R \sqrt{\frac{Q}{Rt}}$$

7.12. $n = \frac{R \sqrt{\frac{Q}{Rt}}}{\mathcal{E} - 2r_w \sqrt{\frac{Q}{Rt}}}$, $n = 10$

7.13. $F = \eta \frac{UI}{v}$

7.14. $r_w = \sqrt{R_1 R_2}$, $r_w = 1 \Omega$,

$$\mathcal{E} = \sqrt{\frac{P}{R_1} (R_1 + \sqrt{R_1 R_2})}$$
, $\mathcal{E} = 3\sqrt{2} \text{ V}$

7.15. $P'_1 = \frac{P_1 P_2^2}{(P_1 + P_2)^2}$, $P'_1 = 23,44 \text{ W}$,

$$P'_2 = \frac{P_2 P_1^2}{(P_1 + P_2)^2}$$
, $P'_2 = 14,06 \text{ W}$

7.16. $\eta = \frac{mgh}{UIt}$, $\eta = 0,49$

7.17. $l = 69 \text{ m}$

7.20. $U_1 = \frac{R \mathcal{E} \varepsilon_r}{\left(R + \frac{r_w}{2}\right) (\varepsilon_r + 1)}$, $U_1 = 2 \text{ V}$,

$$U_2 = \frac{R \mathcal{E}}{\left(R + \frac{r_w}{2}\right) (\varepsilon_r + 1)}$$
, $U_2 = 1 \text{ V}$,

$$E_1 = \frac{C_1 U_1^2}{2}$$
, $E_1 = 2 \cdot 10^{-12} \text{ J}$,

$$E_2 = \frac{C_1 \varepsilon_r U_2^2}{2}$$
, $E_2 = 10^{-12} \text{ J}$

7.22. $Q = \frac{\mathcal{E} R_2 C}{R_1 + R_2 + r_w}$

7.23. $I_1 = \frac{75}{23} \text{ A}$, $I_2 = \frac{25}{23} \text{ A}$, $I_3 = \frac{15}{23} \text{ A}$