



Dane

- $R_1 := 1 \cdot \Omega$
- $R_2 := 0.5 \cdot \Omega$
- $R_3 := 1 \cdot \Omega$
- $R_4 := 2 \cdot \Omega$
- $R_5 := 2 \cdot \Omega$
- $R_7 := 1 \cdot \Omega$
- $E_6 := 5 \cdot V$
- $J_6 := 2 \cdot A$

$$I_1 := 0 \quad I_2 := 0 \quad I_3 := 0$$

Given **Metoda prądów oczkowych:**

$$I_1 \cdot (R_1 + R_2 + R_4) - I_2 \cdot R_2 - I_3 \cdot R_4 = 0$$

$$-I_1 \cdot R_2 + I_2 \cdot (R_2 + R_3 + R_5) - J_6 \cdot R_5 = 0$$

$$-I_1 \cdot R_4 + I_3 \cdot (R_4 + R_7) - J_6 \cdot R_7 = -E_6$$

$$I := \text{Find}(I) \quad I^T = (-0.682 \quad 1.045 \quad -1.455) \text{ A}$$

$$I_{I1} := I_1 = -0.682 \text{ A} \quad I_2 := I_2 - I_1 = 1.727 \text{ A} \quad I_3 := -I_2 = -1.045 \text{ A}$$

$$I_4 := I_1 - I_3 = 0.773 \text{ A} \quad I_5 := I_2 - J_6 = -0.955 \text{ A} \quad I_7 := J_6 - I_3 = 3.455 \text{ A}$$

$$V_1 := 0 \quad V_2 := 0 \quad V_3 := 0$$

Given **Metoda potencjałów węzłowych:**

$$V_1 \cdot \left(\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \right) - \frac{V_2}{R_2} - \frac{V_3}{R_3} - \frac{E_6}{R_1} = 0$$

$$\frac{-V_1}{R_2} + V_2 \cdot \left(\frac{1}{R_2} + \frac{1}{R_4} + \frac{1}{R_5} + \frac{1}{R_7} \right) - \frac{V_3}{R_5} - \frac{E_6}{R_4} = 0$$

$$\frac{-V_1}{R_3} - \frac{V_2}{R_5} + V_3 \cdot \left(\frac{1}{R_3} + \frac{1}{R_5} \right) = J_6$$

$$V := \text{Find}(V) \quad V^T = (4.318 \quad 3.455 \quad 5.364) \text{ V}$$

$$I_{I1} := \frac{V_1 - E_6}{R_1} = -0.682 \text{ A} \quad I_2 := \frac{(V_1 - V_2)}{R_2} = 1.727 \text{ A} \quad I_3 := \frac{(V_1 - V_3)}{R_3} = -1.045 \text{ A}$$

$$I_4 := \frac{(E_6 - V_2)}{R_4} = 0.773 \text{ A} \quad I_5 := \frac{(V_2 - V_3)}{R_5} = -0.955 \text{ A} \quad I_7 := \frac{V_2}{R_7} = 3.455 \text{ A}$$