

U [V]	I_1 [A]	I_2 [A]	R_1 [Ω]	R_2 [Ω]	R_3 [Ω]	R_4 [Ω]	R_5 [Ω]
130	0.95	0.50	47	39	58	28	25

$$G_1 = \frac{1}{R_1} = \frac{1}{47} S$$

$$G_2 = \frac{1}{R_2} = \frac{1}{39} S$$

$$G_3 = \frac{1}{R_3} = \frac{1}{58} S$$

$$G_4 = \frac{1}{R_4} = \frac{1}{28} S$$

$$G_5 = \frac{1}{R_5} = \frac{1}{25} S$$

$$I_3 = \frac{U}{R_4 + R_5} = \frac{130}{28 + 25} = \frac{130}{53} A = 2.452830188679245 A$$

Nyní sestavíme rovnici pro jednotlivé uzly

$$A) G_1 U_A + G_2 (U_A - U_B) = -I_1$$

Nyní si vytvoříme matici za jejíž pomocí vypočteme U

$$\begin{pmatrix} -G_1 - G_2 & G_2 & 0 \\ G_2 & -G_2 - G_3 & G_3 \\ 0 & G_3 & -G_3 - G_4 - G_5 \end{pmatrix}^{-1} \times \begin{pmatrix} -I_1 \\ -I_2 \\ I_2 - \frac{U}{R_5} \end{pmatrix}$$

Dosadíme hodnoty a vypočteme U

$$\begin{pmatrix} -\frac{1}{47} - \frac{1}{39} & \frac{1}{39} & 0 \\ \frac{1}{39} & -\frac{1}{39} - \frac{1}{58} & \frac{1}{58} \\ 0 & \frac{1}{58} & -\frac{1}{58} - \frac{1}{28} - \frac{1}{25} \end{pmatrix}^{-1} \times \begin{pmatrix} -0.95 \\ -0.50 \\ 0.50 - \frac{130}{25} \end{pmatrix} =$$

$$= \begin{pmatrix} -32.94851176 & -21.2887662 & -3.94863178 \\ -21.2887662 & -38.95391263 & -7.22515602 \\ -3.94863178 & -7.22515602 & -12.09793567 \end{pmatrix} \times \begin{pmatrix} -0.95 \\ -0.5 \\ -4.7 \end{pmatrix} = \begin{pmatrix} 60.50403865 \\ 73.65951752 \\ 64.22407585 \end{pmatrix}$$

$$U_A = 60.50403865V$$

$$U_B = 73.65951752V$$

$$U_C = U_{R4} = \mathbf{64.22407585V}$$

$$I_{R4} = \frac{U_{R4}}{R_4} = \frac{64.22407585}{28} = \mathbf{2.2937169946428573A}$$