

Exemplo Análise nodal

Calcular as correntes do circuito dado utilizando o método de análise nodal.

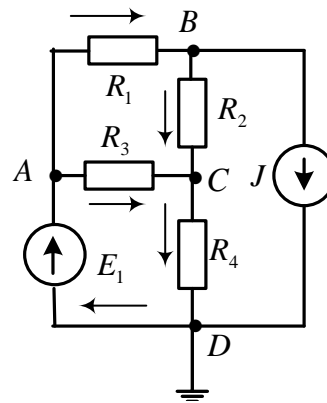
$$E_1 = 100 \text{ V}; J = 6 \text{ A}; R_1 = 2,5 \Omega$$

$$R_2 = 10 \Omega; R_3 = 40 \Omega; R_4 = 20 \Omega$$

$$N = 4; T = 1$$

$$N_{eq} = N - 1 - T = 2$$

$$\varphi_D = 0 \rightarrow \varphi_A - \varphi_D = E_1 \rightarrow \varphi_A = E_1 = 100 \text{ V}$$



$$\begin{cases} \varphi_B(G_1 + G_2) - \varphi_C G_2 - \varphi_A G_1 = -J \\ \varphi_C(G_3 + G_2 + G_4) - \varphi_B G_2 - \varphi_A G_3 = 0 \end{cases} \begin{cases} 0,5 \varphi_B - 0,1 \varphi_C = 34 \\ -0,1 \varphi_B + 0,175 \varphi_C = 2,5 \end{cases} \begin{cases} \varphi_B = 80 \text{ V} \\ \varphi_C = 60 \text{ V} \end{cases}$$

$$I_1 = (\varphi_A - \varphi_B)G_1 = 8 \text{ A}; I_2 = (\varphi_B - \varphi_C)G_2 = 2 \text{ A}; I_3 = (\varphi_A - \varphi_C)G_3 = 1 \text{ A};$$

$$I_4 = \varphi_C G_4 = 3 \text{ A}; I = I_1 + I_3 = 9 \text{ A}$$