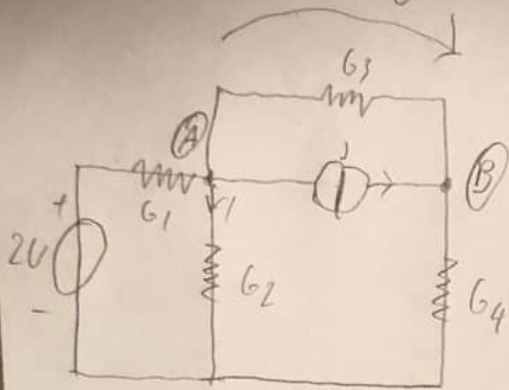


Kotitehtävä 5 V



$$G_1 = 1S \quad G_2 = \frac{2}{3}S$$

$$G_3 = 1S \quad G_4 = 2S$$

$$I = \frac{2}{3}A$$

Lasketaan V_A

$$\Delta_1 = 2 - 3 = -1$$

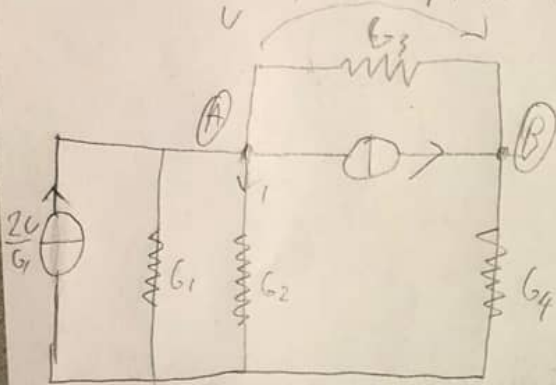
$$\Delta_2 = \frac{2}{3} \cdot \frac{2}{3} - (-1) \cdot (-\frac{2}{3}) = -\frac{2}{9}$$

$$V_A = \frac{\Delta_1}{\Delta_2} = \frac{-1}{-\frac{2}{9}} = \frac{9}{2}$$

$$I = V_A G_2 = \frac{9}{2} \cdot \frac{2}{3}S$$

$$= \frac{18}{6}A = \underline{\underline{3A}}$$

muunnetaan piiriä:



muodostetaan matriisiyhtälö:

$$\begin{pmatrix} G_1 + G_2 + G_3 & -G_3 \\ -G_3 & G_3 + G_4 \end{pmatrix} \begin{pmatrix} V_A \\ V_B \end{pmatrix} = \begin{pmatrix} 2UG_1 \\ -I \end{pmatrix}$$

$$\begin{pmatrix} G_1 + G_2 + G_3 & -G_3 G_1 \\ -G_3 & G_3 + G_4 \end{pmatrix} \begin{pmatrix} V_A \\ V_B \end{pmatrix} = \begin{pmatrix} 2(V_A - V_B)G_1 \\ -I \end{pmatrix}$$

$$\begin{pmatrix} G_1 + G_2 + G_3 - 2G_1 & -G_3 - 2G_1 \\ -G_3 & G_3 + G_4 \end{pmatrix} \begin{pmatrix} V_A \\ V_B \end{pmatrix} = \begin{pmatrix} -I \\ -I \end{pmatrix}$$

$$\begin{pmatrix} \frac{2}{3} & -3 \\ -1 & 3 \end{pmatrix} \begin{pmatrix} V_A \\ V_B \end{pmatrix} = \begin{pmatrix} -\frac{2}{3} \\ \frac{2}{3} \end{pmatrix}$$