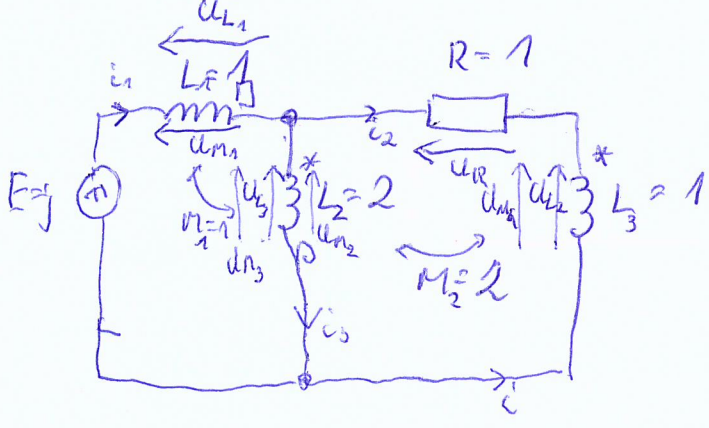


Zadanie 1



$\omega = 1$

19

$$u_{L1} = I_1 \cdot j\omega L_{11}$$

$$u_{M1} = I_3 \cdot j\omega M_{13}$$

$$u_{L2} = I_3 \cdot j\omega L_{22}$$

$$u_{M2} = I_1 \cdot j\omega M_{12}$$

$$u_{L3} = I_2 \cdot j\omega L_{33}$$

$$u_{M3} = I_2 \cdot j\omega M_{23}$$

$$u_{M1} = I_3 \cdot j\omega M_{21}$$

$$u_R = I_2 \cdot R$$

$$I_1 = I_2 + I_3$$

$$u_{L1} = I_1 j$$

$$u_{L2} = I_3 2j$$

$$u_{L3} = I_2 j$$

$$u_{M1} = I_3 j$$

$$u_{M2} = I_1 j$$

$$u_{M3} = I_2 \cdot 2j$$

$$u_{M1} = I_3 \cdot 2j$$

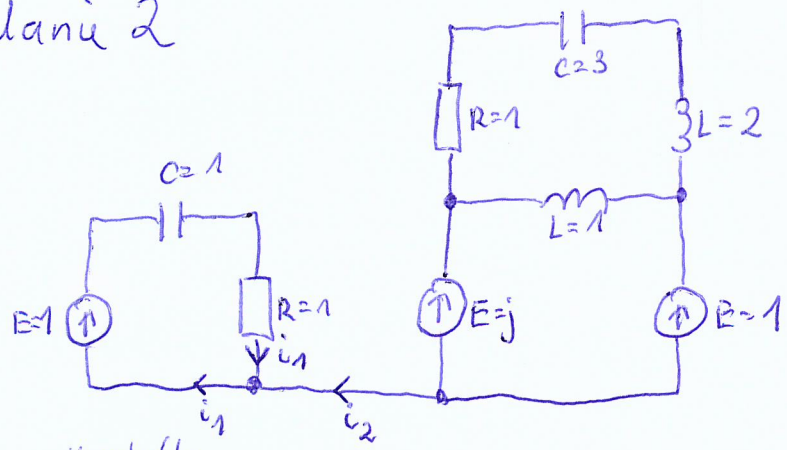
$$u_R = I_2$$

$$0 = E - u_{M1} - u_{L1} - u_{L3} - u_{M2} - u_{M3}$$

$$0 = u_{L3} + u_{M3} + u_{M2} - u_R - u_{M1} - u_{L2}$$

$$I_2 = \frac{9}{82} - \frac{j}{82} \quad 3$$

Zadanie 2



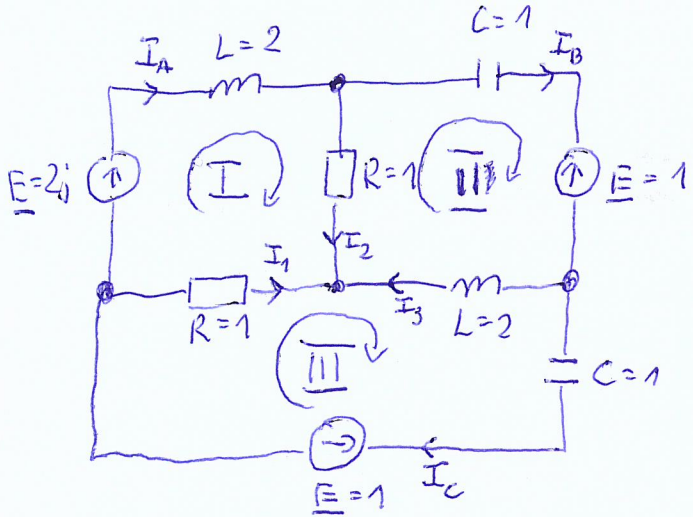
Prawo Kirchhoffa

$$i_1 + i_2 = i_1 \Rightarrow i_2 = 0$$

Zadanie 3

12

$\omega = 1$



$$\begin{bmatrix} j\omega L + R + R & -R & -R \\ -R & R + \frac{1}{j\omega C} + j\omega L & -j\omega L \\ -R & -j\omega L & R + j\omega L + \frac{1}{j\omega C} \end{bmatrix} \begin{bmatrix} I_A \\ I_B \\ I_C \end{bmatrix} = \begin{bmatrix} 2j \\ -1 \\ -1 \end{bmatrix}$$

$$\begin{bmatrix} 2i + 2 & -1 & -1 \\ -1 & 1 + i & -2i \\ -1 & -2i & 1 + i \end{bmatrix} \begin{bmatrix} I_A \\ I_B \\ I_C \end{bmatrix} = \begin{bmatrix} 2i \\ -1 \\ -1 \end{bmatrix}$$

$$W = (2i + 2) \cdot (1 + i)^2 + (-1) \cdot (-2i) \cdot (-1) + (-1) \cdot (-1) \cdot (-2i) - (-1) \cdot (-1) \cdot (1 + i) - (-2i) \cdot (-2i) \cdot (2i + 2) - (-1) \cdot (-1) \cdot (1 + i) = 2 + 6i$$

$$W_A = -6 + 2i \quad I_A = \frac{W_A}{W} = \frac{-6 + 2i}{2 + 6i} = i$$

$$W_B = -2 - 6i \quad I_B = \frac{W_B}{W} = \frac{-2 - 6i}{2 + 6i} = -1$$

$$W_C = -2 - 6i \quad I_C = \frac{W_C}{W} = \frac{-2 - 6i}{2 + 6i} = -1$$

$$I_1 = I_C - I_A = -1 - i$$

$$I_2 = I_A - I_B = i + 1$$

$$I_3 = I_B - I_C = -1 + 1 = 0$$