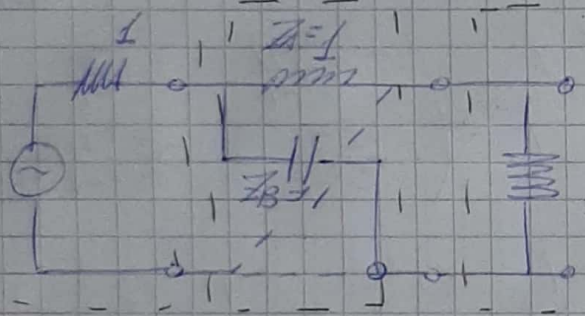
Red de resistencias cte



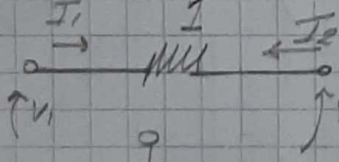
$$\begin{cases} L_1 = L_2 \\ \Rightarrow L_1 + L_2 = 1 \Rightarrow L_1 = L_2 = 1/2 \end{cases}$$

$$K = 1$$

$$\frac{V_2}{V_1}\Big|_{I_2=0} = \frac{1}{A} = \frac{Z_{e1}}{L_{11}} = \frac{-s^2+1}{s^2-1}$$

$$T \begin{cases} V_1 = AV_2 + B(-I_2) \\ I_1 = CV_2 + D(-I_2) \end{cases}$$

1º)



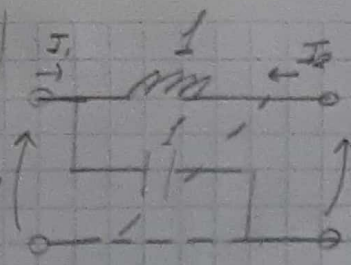
$$T \begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix}$$

$$A_1 = \frac{V_1}{V_2}\Big|_{-I_2=0} = 1 \; ; \quad B_1 = \frac{V_1}{-I_2}\Big|_{V_2=0} = R = 1 \; ; \quad C_1 = \frac{I_1}{V_2}\Big|_{-I_2=0} = \frac{0}{V_2} = 0$$

NOTA

$$D_1 = \frac{I_1}{-I_2}\Big|_{V_2=0} = 1$$

2°)



$$Z = \begin{pmatrix} \frac{1}{2}\frac{s^2+1}{s} & \left(\frac{-1}{2}\right)\frac{s^2-1}{s} \\ \left(\frac{-1}{2}\right)\frac{s^2-1}{s} & \frac{1}{2}\frac{s^2+1}{s} \end{pmatrix}$$

$$T_{ABCD} = \frac{1}{Z_{21}} \begin{pmatrix} Z_{11} & \Delta Z \\ 1 & -Z_{22} \end{pmatrix} \qquad \begin{cases} V_1 = Z_{11} I_1 + Z_{12} I_2 \\ V_2 = Z_{21} I_2 + Z_{22} I_2 \end{cases}$$

$$A_2 = \frac{V_1}{V_2}\Big|_{-I_2=0} \Rightarrow \frac{V_1}{Z_{11}} = \frac{V_2}{Z_{21}} \Rightarrow \frac{V_1}{V_2} = \frac{Z_{11}}{Z_{21}} \Rightarrow A_2 = \frac{Z_{11}}{Z_{21}} = -\frac{(s^2+1)}{s^2-1}$$

$$B_2 = \frac{V_1}{-I_2}\Big|_{V_2=0} \Rightarrow 0 = Z_{21} I_1 + Z_{22} I_2 \Rightarrow I_1 = \frac{Z_{22} I_2}{-Z_{21}}$$

$$\hookrightarrow V_1 = \frac{Z_{11} Z_{22}}{-Z_{21}} I_2 + Z_{12} I_2$$

$$\frac{V_1}{I_2} = \frac{Z_{11} Z_{22}}{-Z_{21}} + Z_{12} = \frac{Z_{11} Z_{22} - Z_{12} Z_{21}}{-Z_{21}}$$

$$\Rightarrow B_2 = \frac{\Delta Z}{Z_{21}} \; ; \; \Delta Z = \frac{1}{4}\frac{(s^2+1)^2}{s^2} - \frac{1}{4}\frac{(s^2-1)^2}{s^2} = \frac{4s^2}{4s^2} = 1$$

$$B_2 = \frac{-s}{s^2-1}$$

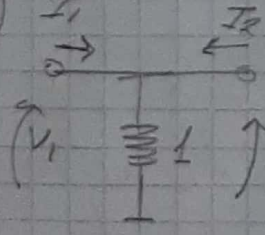
$$C_2 = \frac{I_1}{V_2}\Big|_{-I_2=0} = \frac{1}{Z_{21}} \; ; \; D_2 = \frac{I_1}{-I_2}\Big|_{V_2=0} \Rightarrow -Z_{21} I_1 = Z_{22} I_2$$

$$\Rightarrow D_2 = -\frac{Z_{22}}{Z_{21}}$$

$$C_2 = \frac{-s}{s^2-1} \quad y \quad D_2 = -\frac{(s^2+1)}{s^2-1}$$

$$T = \begin{pmatrix} -\frac{(s^2+1)}{s^2-1} & \frac{-s}{s^2-1} \\ \frac{-s}{s^2-1} & -\frac{s^2+1}{s^2-1} \end{pmatrix}$$

3°)



$$T = \begin{pmatrix} 1 & 0 \\ Y & 1 \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ \frac{1}{1} & 1 \end{pmatrix}$$

$$T = \begin{pmatrix} 1 & 1 \\ 0 & 1 \end{pmatrix} \cdot \begin{pmatrix} A_2 & B_2 \\ C_2 & D_2 \end{pmatrix} \cdot \begin{pmatrix} 1 & 0 \\ 1 & 1 \end{pmatrix}$$

$$T = \begin{pmatrix} A_2 + C_2 & B_2 + D_2 \\ C_2 & D_2 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ 1 & 1 \end{pmatrix} = \begin{pmatrix} A_2 + B_2 + C_2 + D_2 & B_2 + D_2 \\ C_2 + D_2 & D_2 \end{pmatrix}$$

HOJA Nº

FECHA

$$A = Az + Bz + Cz + Dz = 2 \cdot \frac{-(5^2+1)}{5^2-1} + 2 \cdot \frac{-25}{5^2-1}$$

$$A = \frac{-2(5^2+1) - 45}{5^2-1}$$

$$A = \frac{-2(5^2 - 25 - 1)}{5^2-1} = \frac{-2(5+1)^2}{(5+1)(5-1)} = \frac{-2(5+1)}{(5-1)}$$

$$A = -2\frac{(5+1)}{5-1} \qquad T = \frac{1}{A} = -\frac{1}{2}\frac{5-1}{5+1}$$

NOTA