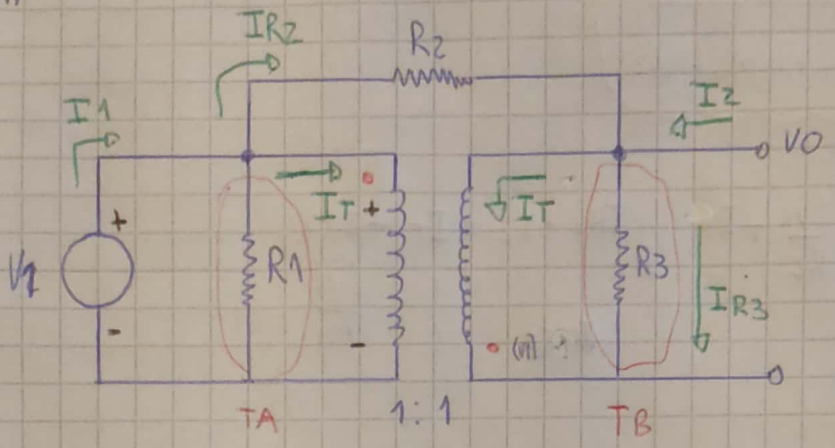
TAREA SEMANAL 6

1)



$R_1 = 1 \cdot R_2 = 2$

$R_3 = 3$

$$\begin{cases} V1 = V2A + (-I2)B \\ I1 = V2C + (-I2)D \end{cases}$$

$$\hookrightarrow \begin{cases} V1 = -2\,V2 \rightarrow V1 = -V2 \\ I1 = I2 \cdot 1/2 \rightarrow I1 = I2 \end{cases}$$

FORMA Nº 1

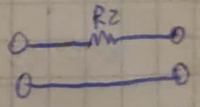
$$T_{TRAFO} = \begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix} \; ; \; T_A = \begin{pmatrix} 1 & 0 \\ 1 & 1 \end{pmatrix} \; ; \; T_B = \begin{pmatrix} 1 & 0 \\ 1/3 & 1 \end{pmatrix}$$

$$T = T_{TRAFO} \cdot T_A \cdot T_B = \begin{pmatrix} -1 & 0 \\ 0 & -1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ 1 & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ 1/3 & 1 \end{pmatrix} = \begin{pmatrix} -1 & 0 \\ -1 & -1 \end{pmatrix} \begin{pmatrix} 1 & 0 \\ 1/3 & 1 \end{pmatrix}$$

$$T = \begin{pmatrix} -1 & 0 \\ -4/3 & -1 \end{pmatrix} \; ; \; DT = 1 \; ; \; Z = \begin{pmatrix} 3/4 & 3/4 \\ 3/4 & 3/4 \end{pmatrix}$$

→ NO SE PUEDE PASAR A Y

PROBLEMA: NO PUEDO PARAMETRIZAR



CON PARAMETROS Z. SI / CON Y

AHORA SI QUERE HA CALCULAR LOS PARAMETROS DE FORMA DIRECTA:

$$I1 = IR2 + IT + IR1 = \frac{V1}{R1} + IT + \frac{V1 - V0}{R2} \; (-V1) = \frac{V1}{R1} + \frac{2V1}{R2} + IT \; ; \; I1 = \frac{V1}{R1} + \frac{2V1}{R2} + \frac{2V1}{R2} + \frac{V1}{R3}$$

$$IR2 = IT + IR3 \Rightarrow \frac{2V1}{R2} = IT + \frac{V0}{R3} \Rightarrow \frac{2V1}{R2} = IT - \frac{V01}{R3} \; ; \; IT = \frac{2V1}{R2} + \frac{V1}{R3} \; ; \; I1 = \frac{V1}{R1} + \frac{4V1}{R2} + \frac{V1}{R3}$$

NOTA

$$z_{11} = \left.\frac{V_1}{I_1}\right|_{I_2=0} \; ; \; I_1 = V_1\left(\frac{1}{R_1} + \frac{4}{R_2} + \frac{1}{R_3}\right) = V_1\left(\frac{R_2R_3 + 4R_1R_3 + R_1R_2}{R_1R_2R_3}\right)$$

$$z_{11} = \frac{R_1R_2R_3}{R_2R_3 + 4R_1R_3 + R_1R_2}$$

$$z_{12} = \left.\frac{V_1}{I_2}\right|_{I_1=0} \; ; \; I_1 = \underbrace{\frac{V_1}{R_1} + \frac{2V_1}{R_2}}_{0} + I_T \; ; \; I_{R_2} + I_2 = I_T + \underbrace{I_{R_3}}_{\frac{-V_1}{R_3}}$$

$$I_T = \frac{2V_1}{R_2} + I_2 + \frac{V_1}{R_3} \; ; \; \frac{V_1}{R_1} + \frac{2V_1}{R_2} + \frac{2V_1}{R_2} + I_2 + \frac{V_1}{R_3} = 0 \; ; \; \frac{V_1}{I_2} = -\frac{R_1R_2R_3}{R_2R_3 + 4R_1R_3 + R_1R_2}$$

$$\left.\frac{V_1}{I_2}\right|_{I_1=0} = -\frac{R_1R_3R_2}{R_2R_3 + 4R_1R_3 + R_1R_2}$$

$$z_{21} = z_{12} \; ; \; z_{22} = \left.\frac{V_2}{I_2}\right|_{I_1=0} \Rightarrow z_{22} = ? \; ; \; I_1 = 0 = \underbrace{\frac{V_1}{R_1}}_{-V_0} + \frac{2V_1}{R_2} + I_T = \frac{-(R_2+2R_1)}{R_1R_2}V_0 + I_T$$

↳ PASIVO

$$I_{R_2} + I_2 = I_T + \frac{V_0}{R_3} \rightarrow \frac{-V_0}{R_2} + I_2 = \frac{(R_2+2R_1)V_0}{R_1R_2} + \frac{V_0}{R_3}$$

$$I_2 = \frac{R_2R_3 + 4R_1R_3 + R_1R_2}{R_1R_2R_3} V_0$$

$$z_{22} = \frac{R_1R_2R_3}{R_2R_3 + 4R_1R_3 + R_1R_2} \; ; \; z = \begin{pmatrix} z_{11} & z_{12} \\ z_{21} & z_{22} \end{pmatrix} \Rightarrow z = \begin{pmatrix} z_{11} & -z_{11} \\ -z_{11} & z_{11} \end{pmatrix}$$