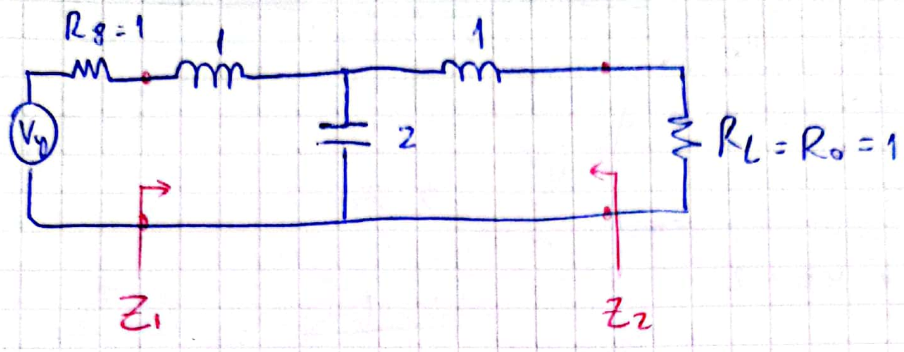
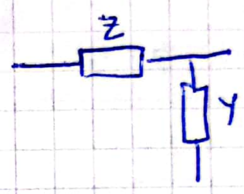
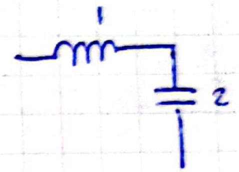


$$T_L = \begin{pmatrix} 1+ZY & Z \\ Y & 1 \end{pmatrix} \longrightarrow$$



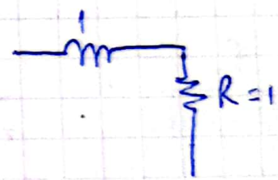
$=$



$Z = s$

$Y = 2s$

$$T_{L_1} = \begin{pmatrix} 1+2s^2 & s \\ 2s & 1 \end{pmatrix}$$



$$T_{L_2} = \begin{pmatrix} 1+s & s \\ 1 & 1 \end{pmatrix}$$

$Z = s$

$Y = 1$

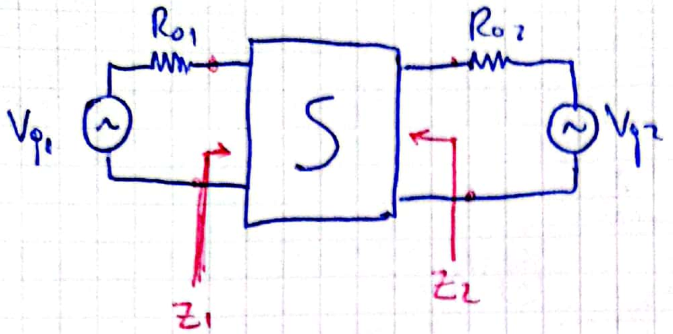
$$T_T = T_{L_1} \cdot T_{L_2} = \begin{pmatrix} 2s^3+2s^2+s+1+s & \cdots \\ 2s^2+2s+1 & \cdots \end{pmatrix}$$

$$Z_{11} = \frac{A}{C} = \frac{2s^3+2s^2+2s+1}{2s^2+2s+1} = Z_1 \qquad S_{11} = \frac{Z_1 - R_0}{Z_1 + R_0}$$

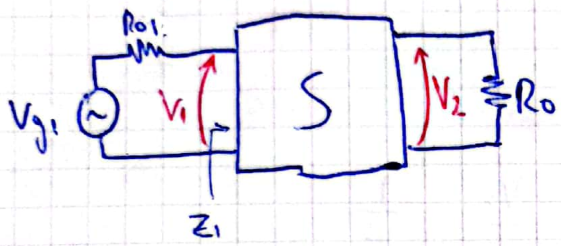
NOTA

$$S_{11} = \frac{2s^3 + 2s^2 + 2s + 1 - 2s^2 - 2s - 1}{2(s^3 + 2s^2 + 2s + 1)} = \frac{s^3}{s^3 + 2s^2 + 2s + 1}$$

$$S_{22} = S_{11}$$



$$S_{12} = \frac{2V_1}{V_{g2}} \frac{\sqrt{R_{02}}}{\sqrt{R_{01}}}$$



$$\frac{V_2}{V_1} = \frac{1}{A} = \frac{1}{2s^3+2s^2+2s+1}$$

$$\frac{V_1}{V_{g1}} = \frac{Z_1}{Z_1+R_0} = \frac{2s^3+2s^2+2s+1}{2(s^3+2s^2+2s+1)}$$

$$\frac{V_2}{V_{g1}} = \frac{V_2}{V_1} \cdot \frac{V_1}{V_{g1}} \rightarrow \frac{1}{2s^3+2s^2+2s+1} \cdot \frac{2s^3+2s^2+2s+1}{2(s^3+2s^2+2s+1)}$$

$$\Longrightarrow \frac{2V_2}{V_{g1}} = \frac{1}{s^3+2s^2+2s+1} = S_{21} = S_{12}$$ Por simetría

$$S = \frac{1}{s^3+2s^2+2s+1} \begin{pmatrix} s^3 & 1 \\ 1 & s^3 \end{pmatrix}$$