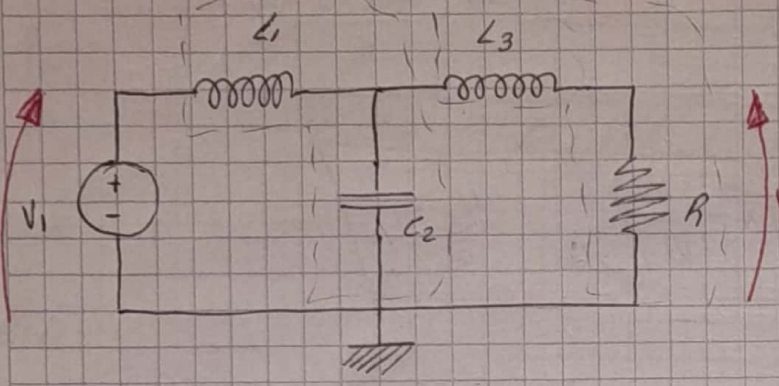
HOJA Nº

FECHA

Ejercicio #2

T_A T_B



$L_1 = 1,5$

$L_3 = 0,5$

$C_2 = \frac{4}{3} = 1,333$

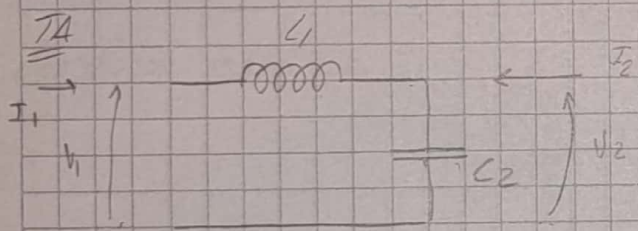
$R = 1$

a)

$V_1 = V_2 A_1 (-I_2) B$

$I_1 = V_2 C + (-I_2) D$

$T_{eq} = T_A \cdot T_B$



$$A = \left.\frac{V_1}{V_2}\right|_{(-I_2)=0} = \frac{\$L_1 + \frac{1}{\$C_2}}{\frac{1}{\$C_2}} \Rightarrow \boxed{A = \$^2 L_1 C_2 + 1}$$

$$B = \left.\frac{V_1}{-I_2}\right|_{V_2=0} ; \quad \frac{V_1 - (V_2)^{\to 0}}{\$L_1} = -I_2 ; \quad \frac{V_1}{\$L_1} = -I_2 ; \quad \boxed{B = \frac{V_1}{-I_2} = \$L_1}$$

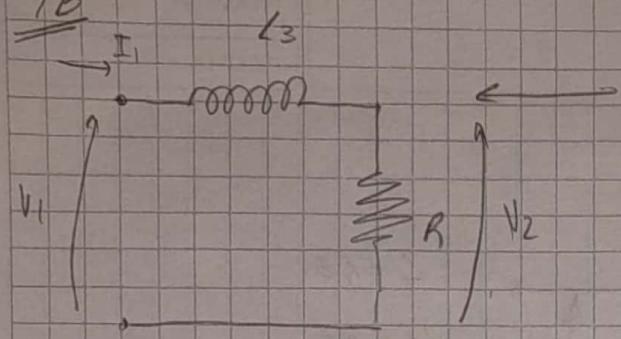
$$C = \left.\frac{I_1}{V_2}\right|_{-I_2=0} ; \quad I_1 = -I_2 ; \quad V_2 = \frac{1}{\$C_2} \cdot I_1 = \frac{-I_2}{\$C_2} ; \quad \boxed{C = \left.\frac{I_1}{V_2}\right|_{-I_2=0} = \$C_2}$$

$$D = \left.\frac{I_1}{-I_2}\right|_{V_2=0} ; \quad I_1 = -I_2 \Rightarrow \boxed{D = \left.\frac{I_1}{-I_2}\right|_{V_2=0} = 1}$$

$$\boxed{T_A = \begin{pmatrix} \$^2 L_1 C_2 + 1 & \$L_1 \\ \$C_2 & 1 \end{pmatrix}}$$

NOTA

TB



$$V_1 = V_2 A + (-I_2) B$$

$$I_1 = V_2 C + (-I_2) D$$

$$A = \left.\frac{V_1}{V_2}\right|_{-I_2=0} = \frac{\$L_3 + R}{R} \quad ; \quad \left.A = \frac{V_1}{V_2}\right|_{-I_2=0} = \frac{\$L_3 + 1}{R}$$

$$B = \left.\frac{V_1}{-I_2}\right|_{V_2=0} = \$L_3$$

$$C = \left.\frac{I_1}{V_2}\right|_{-I_2=0} = \frac{1}{R}$$

$$D = \left.\frac{I_1}{-I_2}\right|_{V_2=0} = 1$$

$$T_B = \begin{pmatrix} \$L_3 + 1 & \$L_3 \\ 1/R & 1 \end{pmatrix}$$

$$T_{eq} = T_A \cdot T_B = \begin{pmatrix} \$^2 L_1 C_2 + 1 & \$L_1 \\ \$C_2 & 1 \end{pmatrix} \begin{pmatrix} \frac{\$L_3 + 1}{R} & \$L_3 \\ 1/R & 1 \end{pmatrix}$$

Me interesa $H(\$) = \frac{V_2}{V_1} = \frac{1}{A}$

$$A = \left(\$^2 L_1 C_2 + 1\right)\left(\frac{\$L_3 + 1}{R}\right) + \$L_1 \cdot \frac{1}{R} =$$

$$A = \frac{\$^3 L_1 L_3 C_2}{R} + \$^2 L_1 C_2 + \frac{\$L_3}{R} + 1 + \frac{\$L_1}{R} = \frac{\$^3 L_1 L_3 C_2}{R} + \$^2 L_1 C_2 + \$\frac{L_1 + L_3}{R} + 1$$

NOTA

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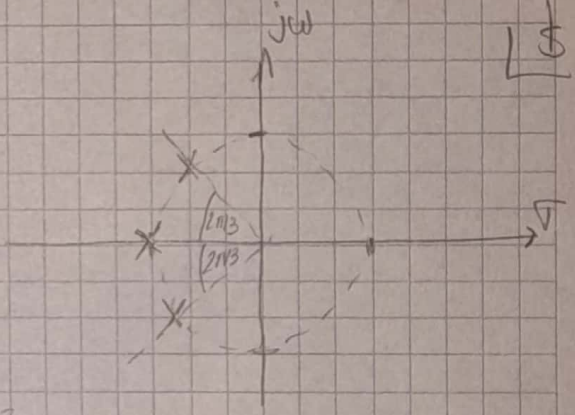
$$A = \frac{L_1 L_3 C_2}{R}\left(\$^3 + \$^2\frac{R}{L_3} + \$\frac{L_1+L_3}{L_1 L_3 C_2} + \frac{R}{L_1 L_3 C_2}\right)$$

$$\therefore \boxed{H(\$) = \frac{1}{A} = \frac{R}{L_1 L_3 C_2} \cdot \frac{1}{\$^3 + \$^2\frac{R}{L_3} + \$\frac{L_1+L_3}{L_1 L_3 C_2} + \frac{R}{L_1 L_3 C_2}}}$$

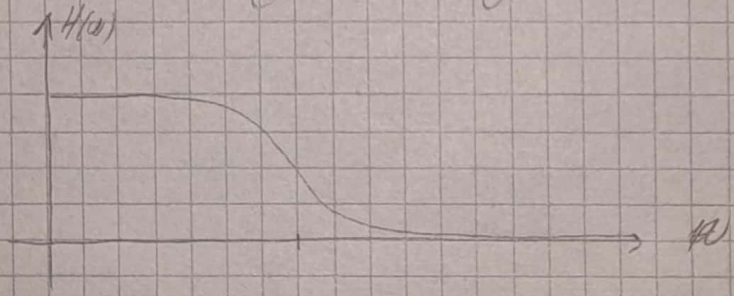
$$H(\$) = \frac{1}{1,5 \cdot 0,5 \cdot \frac{4}{3}} \cdot \frac{1}{\$^3 + \$^2 \cdot \frac{1}{0,5} + \$\frac{1,5+0,5}{1,5 \cdot 0,5 \cdot \frac{4}{3}} + \frac{1}{1,5 \cdot 0,5 \cdot \frac{4}{3}}}$$

$$\boxed{H(\$) = 1 \cdot \frac{1}{\$^3 + 2\$^2 + 2\$ + 1}}$$

Los Polos están en $\begin{cases} -1 \\ e^{j\frac{2\pi}{3}} \\ e^{j\frac{2\pi}{3}} \end{cases}$



La transferencia debe ser algo así: pasa bajos



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