TP 6

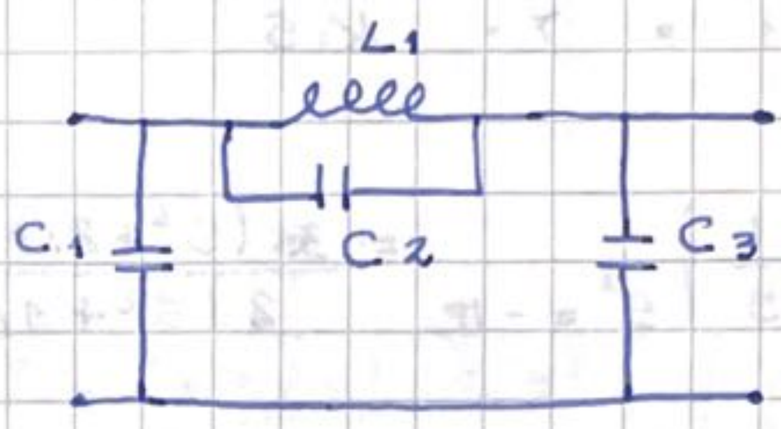


FECHA

③ Dado la función de excitación $Z(s)$ se pide hallar los valores de los componentes sabiendo que $L_1 C_2 = 1/\pi$.

$$Z(s) = \frac{2s^2+1}{s(3s^2+2)} \Longrightarrow$$

$3s^3 + 2s = 3s(s^2 + 2/3)$

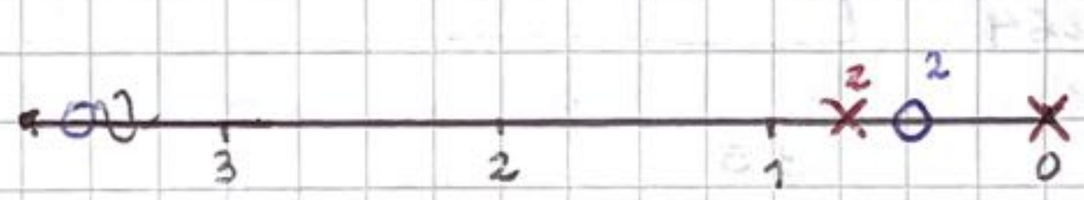


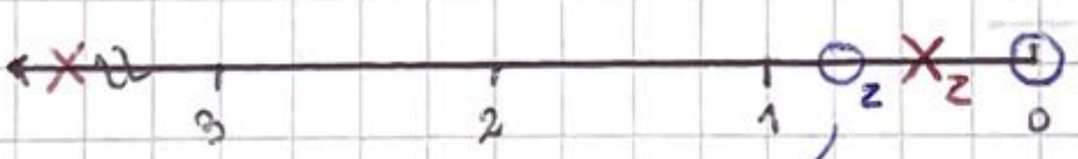

¿Desde el punto de vista de transmición: tiene polo, cero o un nivel constante en cc?

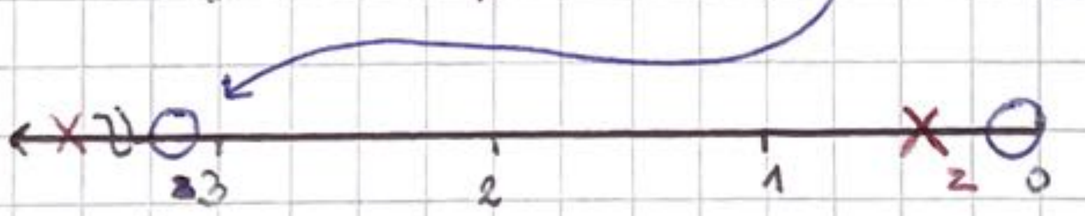
Resolución: tiene polo en cc.

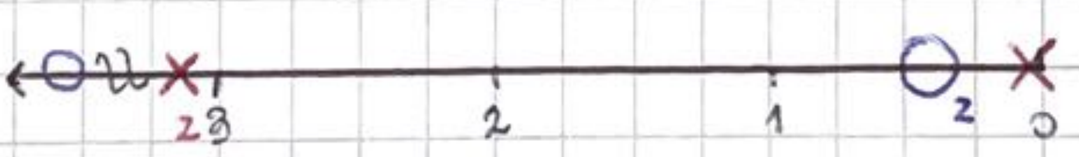
Remociones gráficas:

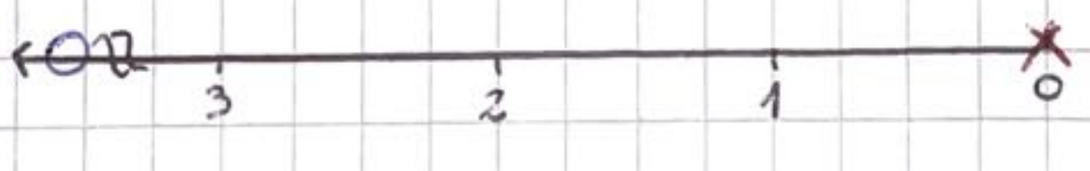
$$Z(s) = \frac{K}{3}\frac{2(s^2+1/2)}{s(s^2+2/3)}$$




* Bloque LC paralelo en Z.

$$Y = Cs + \frac{1}{Ls} = \frac{CLs^2+1}{Ls} = \frac{(s^2+1/LC)LC}{Ls} = C\frac{(s^2+1/LC)}{s}$$

↓

$$Z = \frac{1/C \quad s}{(s^2+1/LC)}$$

NOTA

Analíticamente:

$$Y(s) = \frac{3s(s^2 + 2/3)}{2(s^2 + 1/2)}$$

* $Y_2 = Y - Y_1 = Y - K_1 s$

• $K_1 = Y(s)\ \frac{1}{s}\Big|_{s^2=-\pi} = -157/50 = \frac{3s(s^2+2/3)}{2(s^2+1/2)\cdot s}\Big|_{s^2=-\pi} = \frac{371}{264}$

↓

$$Y_2 = \frac{3s^3 + 2s}{2s^2 + 1} - \underbrace{\frac{371}{264}\, s}_{Y_1} = \frac{3s^3 + 2s - (2s^2+1)\,371/264\, s}{2s^2 + 1}$$

$$Y_2 = \frac{3s^3 + 2s - 371/132\, s^3 + 371/264\, s}{2s^2 + 1} = \frac{25/132\, s^3 + 157/264\, s}{2s^2 + 1}$$

$$Y_2 = \frac{(s^2 + 157/50)\, 25/132 \cdot s}{2s^2 + 1} \rightarrow Z = \frac{2s^2 + 1}{(s^2 + 157/50)\, 25/132 \cdot s}$$

* $Z_4 = Z_2 - Z_3 = Z_2 - K_2 \frac{s}{s^2 + 157/50}$

• $K_2 = Z_2(s) \cdot \frac{(s^2 + 157/50)}{s}\Big|_{s^2=-157/50} = \frac{2s^2+1}{25/132\, s^2} = \frac{132/25}{157/264}$

↓

$$Z_4 = \frac{2s^2 + 1}{(s^2 + 157/50)\, 25/132 \cdot s} - \underbrace{\frac{132/25}{157/264}\ \frac{s}{s^2 + 157/50}}_{Z_2}$$

$$Z_4 = \frac{2s^2 + 1 - \frac{264}{157} s^2}{(s^2 + 157/50)\, 25/132 \cdot s} = \frac{50/157\ s^2 + 1}{(s^2 + 157/50)\, 25/132 \cdot s}$$

$$Z_4 = \frac{50/157\ (s^2 + 157/50)}{25/132 \cdot s (s^2 + 157/50)} = \frac{264}{157 \cdot s} \rightarrow \underbrace{Y_4 = \frac{157}{264} \cdot s}_{Y_3}$$

En tonces:

• $C_1 = 371/264$ F.

• $C_3 = 157/264$ F.

y

$$\begin{cases} L_2 = 2{,}82 \text{ H} \\ C_2 = 0{,}113 \text{ F} \end{cases}$$

NOTA