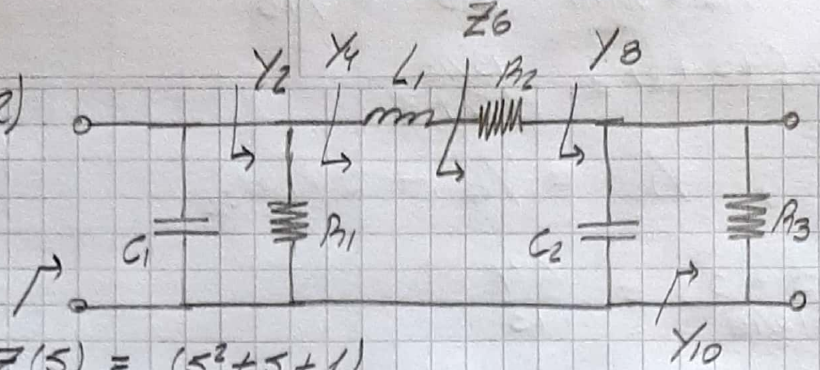
2)



$$Z(s) = \frac{(s^2+s+1)}{(s^2+2s+5)(s+1)}$$

La clave está en, el siempre eliminar el componente reactivo antes del resistivo, ya que, de otra manera se podría remover un valor finito más grande de lo necesario y hacer que la inmitancia deje de ser FRP.

$Y_2 = \frac{1}{Z} - sK_\infty$ El cap representa el polo en infinito

$$K_\infty = \lim_{s\to\infty} \frac{1}{Z(s)\, s} = \frac{(s^2+2s+5)(s+1)}{(s^2+s+1)\, s} = 1$$

$$\Rightarrow K_{\infty_{C_1}} = 1$$

$$Y_2 = \frac{\cancel{s^3}+3s^2+7s+5 - (\cancel{s^3}+s^2+s)}{s^2+s+1}$$

$$Y_2 = \frac{2s^2+6s+5}{s^2+s+1}$$

$Y_4 = Y_2 - 1/R_1$ $\qquad \lim_{s\to\infty} Y_2 = 2$

$$Y_4 = \frac{2s^2+6s+5 - 2(s^2+s+1)}{s^2+s+1} = \frac{4s+3}{s^2+s+1}$$

$$Z_4 = 1/Y_4 = \frac{s^2+s+1}{4s+3}$$

$Z_6 = Z_4 - sK_{\infty_{L_1}}$ $\qquad K_{\infty_{L_1}} = \lim_{s\to\infty} \frac{Z_4}{s} = \frac{s^2+s+1}{4s^2+3s}$

$Z_6 = Z_4 - 1/4\, s$ $\qquad K_{\infty_{L_1}} = 1/4$

$$Z_6 = \frac{s^2+s+1 - 1/4\, s(4s+3)}{4s+3} = \frac{1/4\, s + 1}{4s+3}$$

NOTA

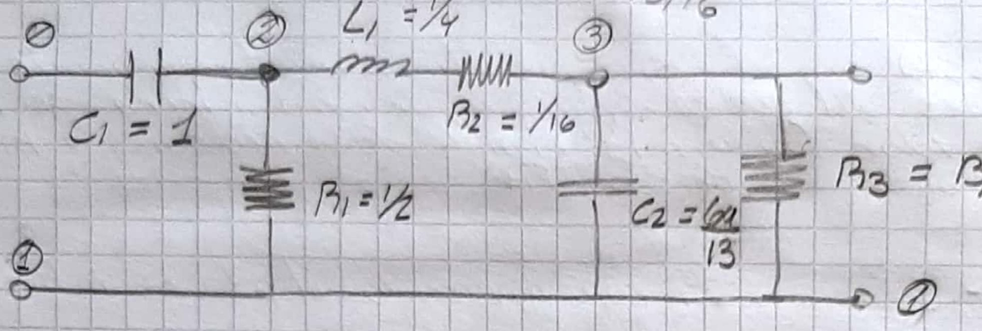
$Z_8 = Z_6 - R_2 \qquad R_2 = \lim_{s \to \infty} Z_6 = 1/16$

$$Z_8 = \frac{1/4\, s + 1 - 1/16\,(4s+3)}{4s+3} = \frac{13/16}{4s+3}$$

$$Y_8 = \frac{4s+3}{13/16} \quad ; \quad Y_{10} = Y_8 - s\, k_{\infty_{C_2}}$$

$$k_{\infty_{C_2}} = \lim_{s \to \infty} \frac{4s+3}{s\, 13/16} = \frac{64}{13}$$

$$\Rightarrow Y_{10} = 1/R_3 = \frac{4s+3 - 13/16 \cdot 64/13\, s}{13/16} = \frac{3}{13/16} = \frac{48}{13}$$



Verifico con MAI en python

$$Y_{MAI} = \begin{pmatrix} -sC_1 & 0 & -sC_1 & 0 \\ 0 & G_1 + sC_2 + G_3 & -G_1 & -(sC_2 + G_3) \\ -sC_1 & -G_1 & sC_1 + G_1 + \frac{1}{sL_1 + R_2} & -\frac{1}{sL_1 + R_2} \\ 0 & -(sC_2 + G_3) & -\frac{1}{sL + R_2} & \frac{1}{sL + R_2} + sC_2 + G_3 \end{pmatrix}$$

NOTA