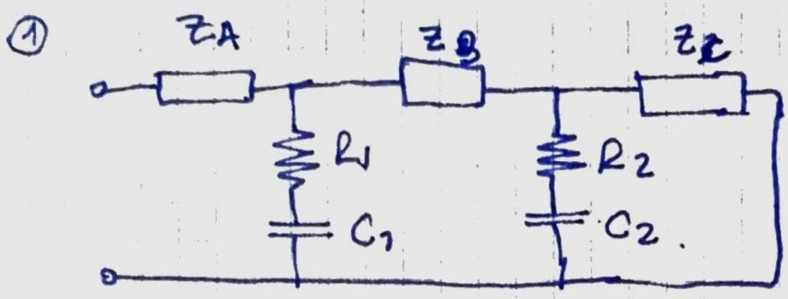
①




Sabiendo:

$R_1 C_1 = 1/6 \rightarrow \omega_1 = 6$

$R_2 C_2 = \frac{2}{7} \rightarrow \omega_2 = 7/2$

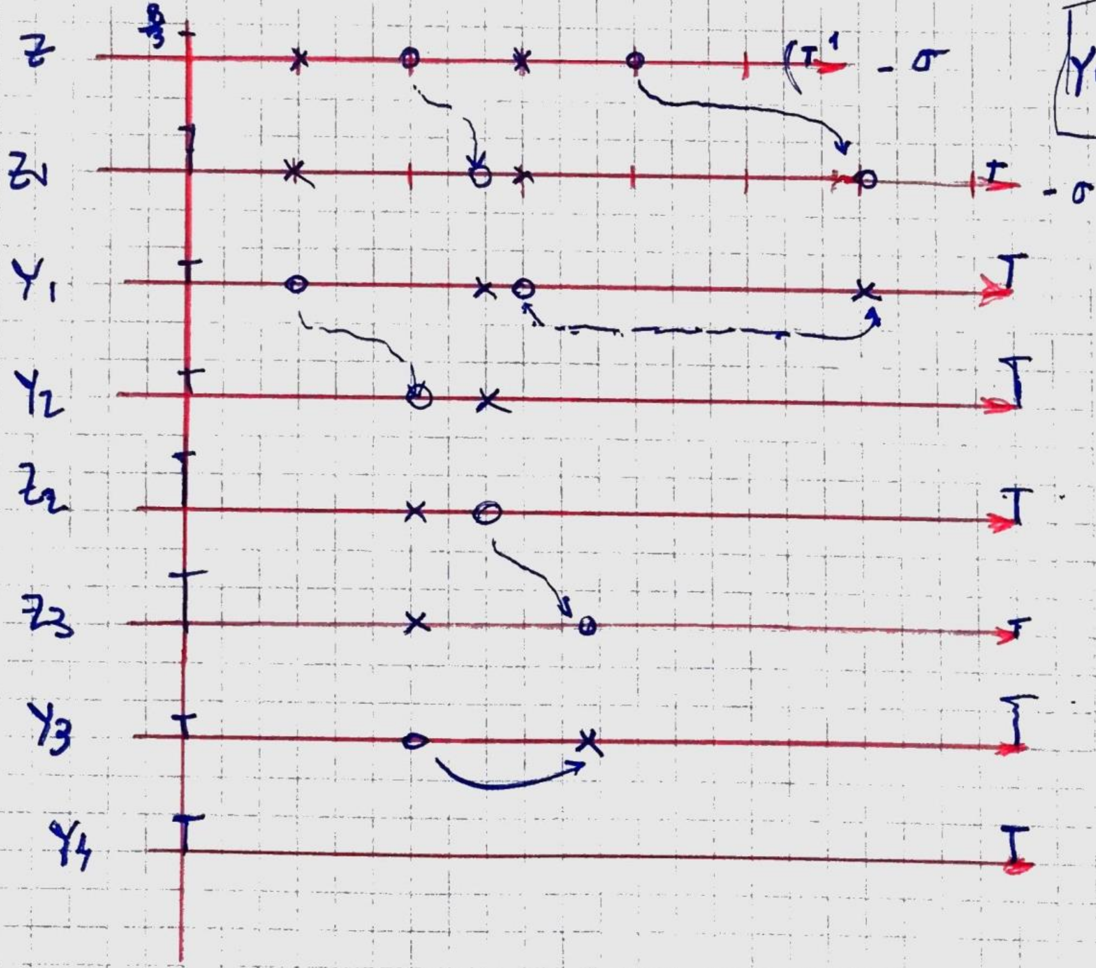
$Y_{RC} = \frac{Y_R Y_C}{Y_R + Y_C}$

$Y_{RC} = \frac{\frac{sC}{R}}{\frac{1}{R} + sC}$

$Z(s) = \frac{(s^2+6s+8)}{(s^2+4s+3)} = \frac{(s+2)(s+4)}{(s+1)(s+3)}$

$Y_{RC} = \frac{sC}{1+RsC}$

$\boxed{Y_{RC} = \frac{s/R}{\frac{1}{RC}+s}}$



Luego: Necesito:

① Remover parcialmente en infinito para generar un cero en $-\sigma = 6$.

$$\lim_{s\to -6} Z(s) = \lim_{s\to -6} (Z_A + \cancel{Z_1}) \to 0$$

$$\lim_{s\to -6} Z(s) = \lim_{s\to -6} K_{\infty} \ldots \longrightarrow K_{\infty} = \frac{8}{15} < 1$$

residuo en infinito.

$$\therefore \quad Z_1 = Z(s) - Z_A(s) = \frac{s^2+6s+8}{s^2+4s+3} - \frac{8}{15}$$

$$Z_1 = \frac{s^2+6s+8 - \frac{8}{15}(s^2+4s+3)}{s^2+4s+3}$$

$$Z_1 = \frac{\frac{7}{15}s^2 + \frac{58}{15}s + \frac{32}{5}}{s^2+4s+3} = \frac{7}{15}\,\frac{\left(s+\frac{16}{7}\right)(s+6)}{s^2+4s+3}$$

② Invierto para obtener $Y_1$.

$$Y_1 = \frac{s^2+4s+3}{\frac{7}{15}\left(s^2+\frac{58}{7}s+\frac{102}{7}\right)}$$

③ Remuevo tanque en $-6 = \sigma$.

$$\lim_{s\to -6} Y_1(s) = \lim_{s\to -6} \frac{s K_{-6}}{s+6}$$

$$\lim_{s\to -6} \frac{15}{7}\,\frac{(s+1)(s+3)}{\left(s+\frac{16}{7}\right)s} = K_{-6}.$$

$$K_{-6} = \frac{75}{52}$$

$$Y_2(s) = Y_1(s) - \frac{\frac{75}{52}s}{s+6}$$

$$Y_2(s) = \frac{15}{7}\,\frac{s^2+4s+3 - \frac{75}{52}s\left(s+\frac{16}{7}\right)}{\left(s+\frac{16}{7}\right)(s+6)}$$

$$Y_2(s) = \frac{\frac{255}{364}s^2 + \frac{430}{91}s + \frac{45}{7}}{\left(s+\frac{16}{7}\right)(s+6)}$$

④ Invierto:

$$Z_2(s) = \frac{\left(s+\frac{16}{7}\right)(s+6)}{\frac{255}{364}\cancel{\left(s^2+\frac{129}{7}s+\frac{364}{85}\right)}}$$

$$(s+6)\left(s+\frac{26}{17}\right)$$

⑤ Remoción de nuevo en infinito para mover el cero a 7/2. Luego:

$$\lim_{s\to -7/2} Z_2(s) = \lim_{s\to -\frac{7}{2}} Z_3(s) + \lim_{s\to 7/2} Z_3 \to 0$$

$$k_\infty' = \lim_{s\to -\frac{7}{2}} \frac{364}{255}\,\frac{\left(s+\frac{16}{7}\right)\cancel{(s+6)}}{\cancel{\left(s^2+\frac{129}{7}s+\frac{364}{85}\right)}} = 3$$

$$\left(s+\frac{26}{17}\right)$$

$$K'_\infty = \frac{884}{1005}$$

Busco $Z_3$:

$$Z_3 = Z_2 - \frac{884}{1005} = \frac{364}{255} \cdot \frac{\left(s+\frac{16}{7}\right)}{\left(s+\frac{26}{17}\right)} - \frac{884}{1005}$$

$$Z_3 = \frac{624\,(s+7/2)}{1139\,\left(s+\frac{26}{17}\right)}$$

$$Y_3 = \frac{1139\,(s+26/17)}{624\,(s+7/2)}.$$

Saco el polo en $\sigma = -7/2$

$$\lim_{s\to -7/2} Y_3 = \lim_{s\to -7/2} \frac{K_3 \cdot s}{s+7/2}$$

$$\lim_{s\to -7/2} \frac{Y_3}{s}(s+7/2) = \frac{1139}{624} \cdot \frac{(s+26/17)}{s} = K_3.$$

$$\therefore K_3 = \frac{4489}{4368}.$$

$1/K_3$

$$\left(\frac{7/2}{K_3}\right)^{-1} = \frac{2}{7} K_3.$$

$$Y_4 = Y_3 - \frac{4489}{4368} \cdot \frac{s}{s+7/2} = \frac{67}{84} \checkmark$$

$\therefore \quad Z_A =$