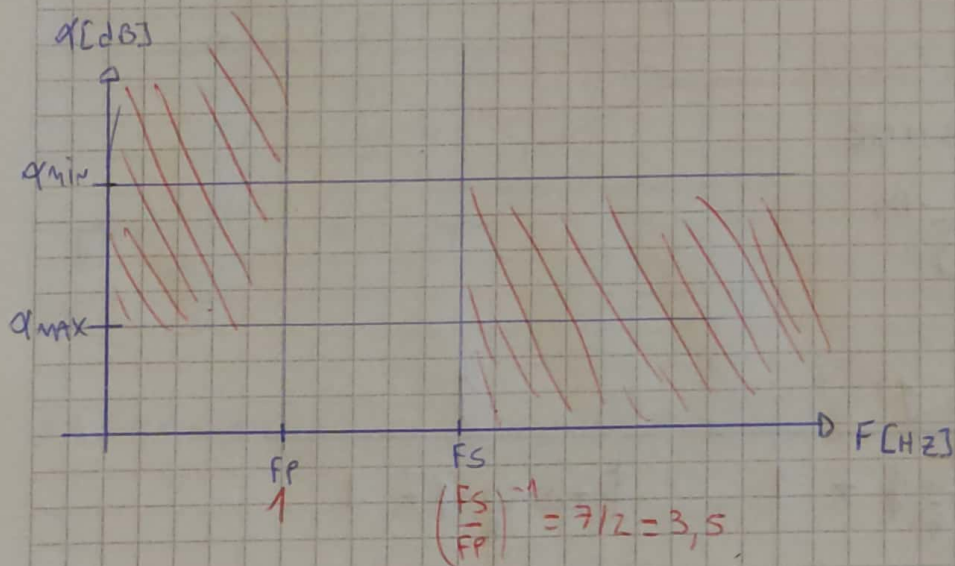


2) PARTIMOS DE UNA PUNTILLA DE UN FILTRO PASABAJOS



$$\xi = 10^{\frac{1}{10}} - 1 \approx 7 \quad \xi^2 = 0,2589 \rightarrow \xi = 0,5088$$

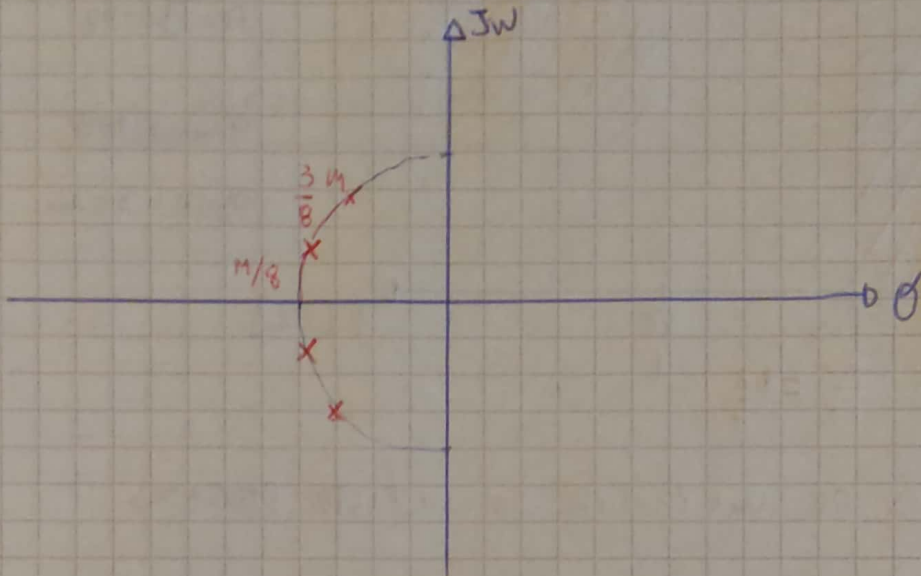
$$\alpha_{\text{min}}(n) = 10 \log \left(1 + \xi^2 \cdot \frac{2n}{3,5} \right)$$

$\alpha_{\text{min}} 1 = 10 \log (1 + 0,2589 \cdot 3,5^2) = 6,20 \text{ dB}$
 $\alpha_{\text{min}} 4 = 37,66 \text{ dB} \rightarrow n = 4$

NOTA

F. PB. DE ORDEN 4

Diagrama de polos y ceros:



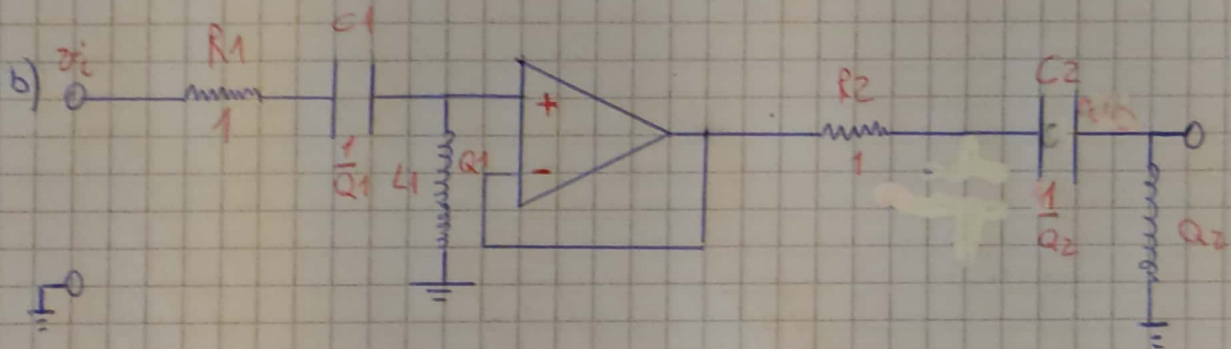
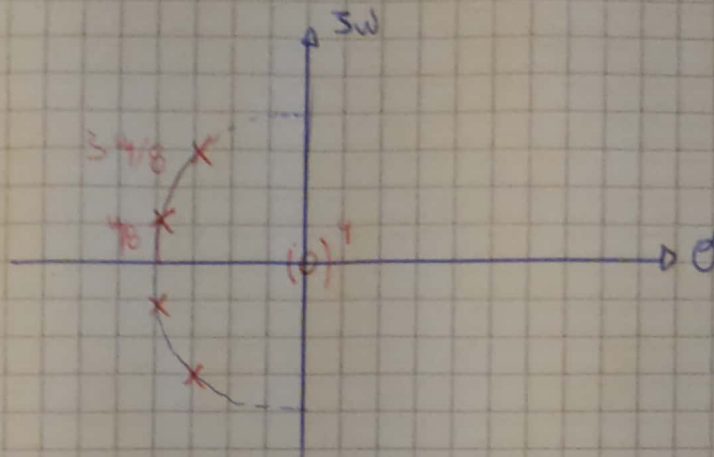
FILTRO P. BAJOS BUTTER

$$H_{\text{BUTTER}} = z^M \cdot F.P. \cdot \sum^{-1/n}$$

$$T_{PB}(z) = \frac{1}{z^2 + 2\cos\frac{\pi}{8}z + 1} \cdot \frac{1}{z^2 + 2\cos\frac{3\pi}{8}z + 1}$$

$$T_{PA}(s) = T_{PB}(z) \Big|_{z=s^{-1}} = \frac{s'^2}{s'^2 + 2\cos\frac{\pi}{8}s' + 1} \cdot \frac{s'^2}{s'^2 + 2\cos\frac{3\pi}{8}s' + 1}$$

Diagrama de Polos/Ceros de Pasa Alto



c)

$$R1 = R2 = 1K\Omega = R2 \quad ; \quad \omega_{WB} = 2\pi \cdot 1000 \text{ Hz} \cdot \xi^{+1/4} = 5,3067 \text{ kHz}$$

$$C2 = \frac{1}{Q \cdot \omega_{WB} \cdot R2} \Rightarrow C2 = 142,61 \text{ nF} \quad ; \quad C1 = \frac{1}{Q \cdot \omega_{WB} \cdot R2} \Rightarrow C1 = 348,1936 \text{ nF}$$

$$L1 = Q \cdot \omega_{WB} \cdot R2 \Rightarrow L1 = 246,21 \text{ mH} \quad ; \quad L2 = Q \cdot \frac{1}{\omega_{WB} \cdot R2} \Rightarrow L2 = 101,98 \text{ mH}$$