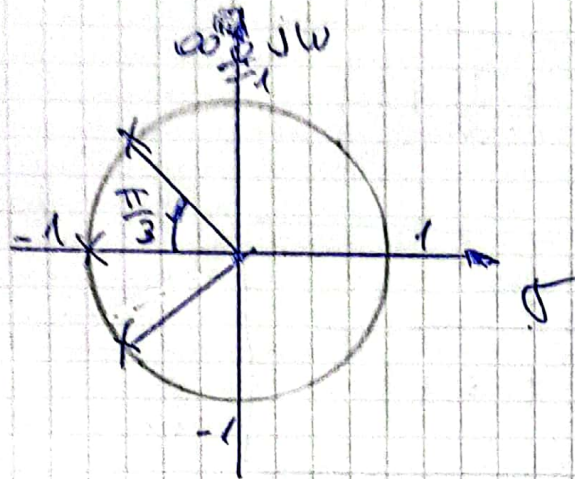


1er ParcialDiagrama de polos y ceros

Polos:

$$\left\{ -1; \frac{1}{2} \pm j\frac{\sqrt{3}}{2} \right\}$$

$$T(s) = \frac{1}{(s+1)(s^2 + as + 1)}$$

$$a = 2 \cos \frac{\pi}{3} = 1$$

$$W_0 = 1 \rightarrow \text{Norma 1/2000}$$

$$\frac{W_0}{Q} = a = 1 \Rightarrow Q = 1$$

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

Transferencia

para bajas

frecuencias

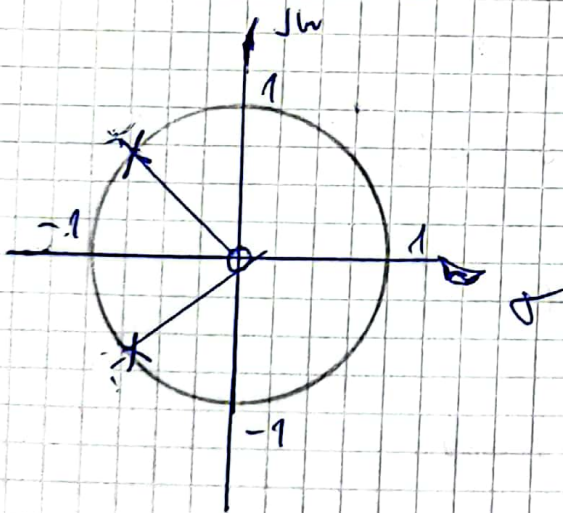
Norma (1/2000)

Transformación $lp \rightarrow Hp$

$$\omega_{lp} = \frac{1}{\omega_{hp}}$$

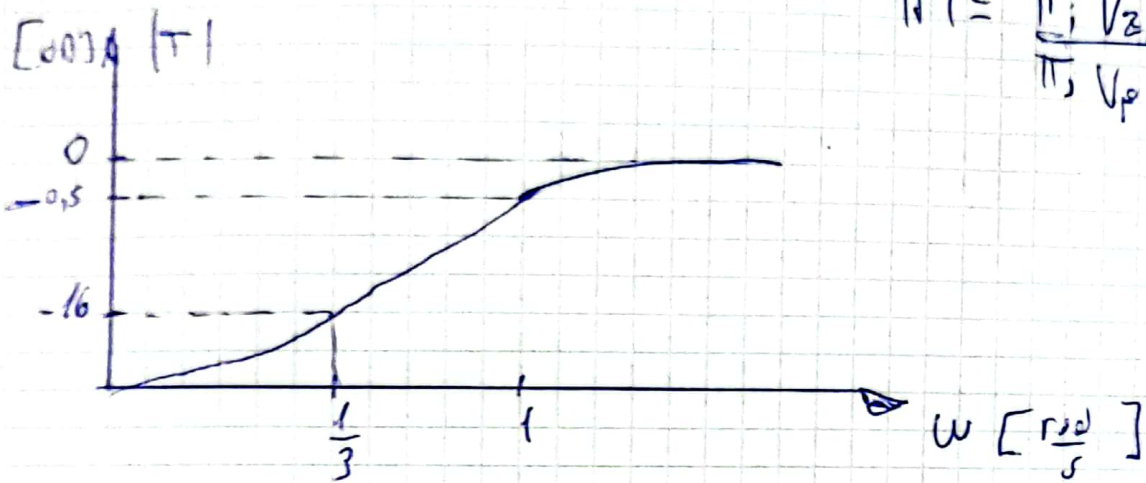
$$T(s) = \frac{1}{\left(\frac{1}{s} + 1\right) \left(\frac{1}{s^2} + \frac{1}{s} + 1\right)}$$

$$T(s) = \frac{s}{s+1} \cdot \frac{s^2}{s^2+s+1}$$



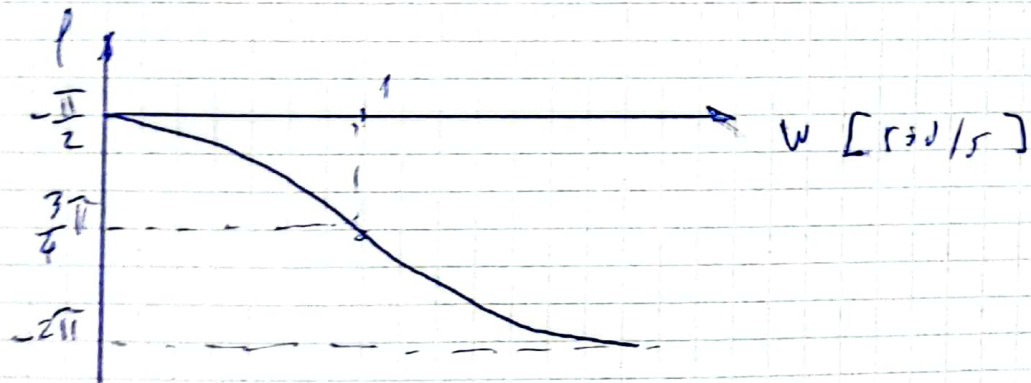
Resposta em frequência

Módulo



$$|T| = \frac{\prod_i |V_{z_i, \omega}|}{\prod_j |V_{p_j, \omega}|} \frac{z_{0, \omega}}{p_{0, \omega}}$$

Fase



$$\phi = \alpha_{z_i, \omega} - \alpha_{p_j, \omega}$$

Aparte zeros - Aparte polos