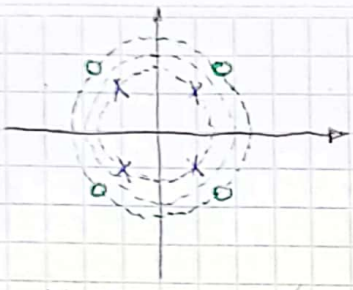
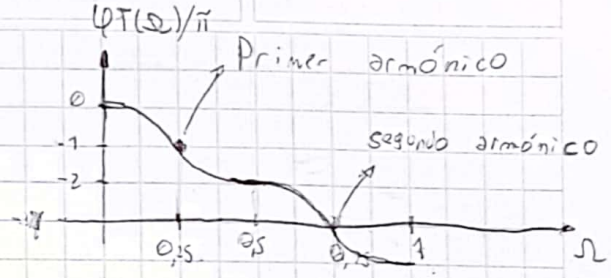
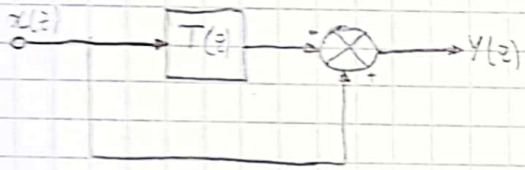
$$T(z) = \frac{\alpha z^4 + 1}{z^4 + \alpha}$$

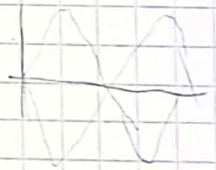




$$\frac{F}{F_S} = \frac{\Omega}{2\pi} \Rightarrow f_S = \frac{2\pi f}{\Omega} \Rightarrow f_S = \frac{2\pi \cdot 125\,Hz}{\pi/4}$$

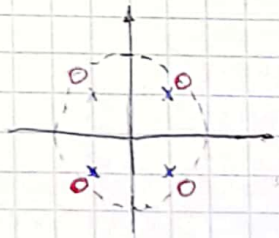
$$f_S = 4\,kHz$$





$$Y(z) = X(z)\,T(z) + X(z) \Rightarrow H(z) = \frac{Y(z)}{X(z)} = T(z) + 1 = \frac{\alpha z^4 + 1}{z^4 + \alpha} + 1$$

$$\Rightarrow \frac{z^4(\alpha+1) + (1+\alpha)}{z^4 + \alpha} = (\alpha+1) \cdot \frac{z^4 + 1}{z^4 + \alpha}$$



⇒ Se verifican los ceros en los lugares deseados.

Sumando la entrada fuerzo los ceros en la circ. unitaria a No influye, solo cambia el radio de los polos y la ganancia general del sistema.