

Punto Ejercicio 6

MESSA-2008/02

P2]

$$G(s) = \frac{K_0}{j\omega(1+j\frac{\omega}{5})^2} = \frac{25 K_0}{-10\omega^2 + j(25\omega - \omega^3)}$$

$$\Rightarrow |G(s)| = \frac{25 K_0}{\sqrt{100\omega^4 + (25\omega - \omega^3)^2}} \quad (1)$$

$$\text{y } \angle G(s) = \text{arctg} \left(\frac{-(25\omega - \omega^3)}{-10\omega^2} \right) \quad (2)$$

Del diagrama: para $\omega = 5$ se calcula el margen de Ganancia.

$$\Rightarrow |G(s)| = \frac{25 K_0}{\sqrt{100 \cdot 5^4 + 0}} = \frac{K_0}{10}$$

La ganancia en decibelios:

$$A_{db} = 20 \log |G(s)|$$

y el margen de ganancia es $(0 - A_{db}) = -A_{db}$

$$\text{para que } -A_{db} \geq 6 \text{ db} \Rightarrow -20 \log \left| \frac{K_0}{10} \right| \geq 6$$

$$\Leftrightarrow \log \left| \frac{K_0}{10} \right| \leq 6/20$$

$$\Leftrightarrow K_0 \leq 19,95$$