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$$1) \quad G(s) = \frac{s^2 + 5s + 25}{s(s^3 + 7,4s^2 + 76s + 320)} \Rightarrow G(j\omega) = \frac{25 \left(1 - \frac{\omega}{\omega_n} \right)^2 + \frac{\omega}{\zeta \omega_n}}{s \left(\frac{\omega}{\omega_n} + 1 \right) \left(64 - \left(1 - \left(\frac{\omega}{\omega_n} \right)^2 \right) + 0,0375 \frac{\omega}{\omega_n} \right)}$$

→ CONSTANTES DE BODE:

$$\frac{25}{s \cdot 64} = \frac{s}{64} \Rightarrow$$

$$20 \log \left(\frac{s}{64} \right) = -22,14 \text{ dB}$$

$$\Rightarrow \omega_n = 5 \text{ rad/s} \Rightarrow \zeta = \frac{\omega_c}{25} = 0,15$$

$$\Rightarrow \omega_p = \omega_n \sqrt{1 - 2\zeta^2} = 3,5 \text{ rad/s}$$

$$\Rightarrow \eta_{\frac{1}{2}} = 20 \log \sqrt{1 - \zeta^2} = 1,25 \text{ dB}$$

$$\Rightarrow \omega_n = 8 \text{ rad/s}; \zeta = 0,15$$

$$\Rightarrow \omega_{rp} = \omega_n \sqrt{1 - 2\zeta^2} = 7,8 \text{ rad/s}$$

$$\Rightarrow M_{db} = 20 \log \left(20 \sqrt{1 - \zeta^2} \right) = 10,55 \text{ dB}$$

