

Exercícios - aula 12/11

$$G(s) = \frac{s^2 + 3s + 25}{s(s^2 + 7.14s^2 + 76s + 320)} \Rightarrow G(\omega j) = \frac{25}{320} \frac{(1 - (\omega/5)^2 + \omega/5)}{(\omega/5 + 1)(1 - (\omega/5)^2 + 0.64\omega/5)}$$

tes de Bode: $k_b = \frac{5}{64}$, $20 \log(k_b) = -22.14 \text{ dB} \Rightarrow \text{Fase } 0^\circ$

$\omega_n = 5 \text{ rad/s} \Rightarrow$ dupla de polos complexos conjugados $\zeta = \frac{\omega_n}{2B} = 0.125$

liza de ω_{r_2} : $\omega_n \sqrt{1 - 2\zeta^2} = 3.5 \text{ rad/s}$

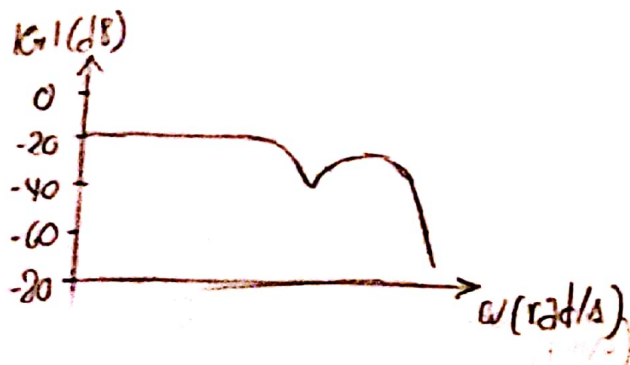
liza de η_{r_2} : $(2\zeta \sqrt{1 - \zeta^2})^{-1} = 1.25 \text{ dB}$

$\omega \gg \omega_{r_2} \Rightarrow$ aumento de 40 dB/década

t integração $1/s \Rightarrow$ decaimento 20 dB/década

gráficos:

ganho



Polos em $-s \Rightarrow$ decaimento 20 dB/década

Polos complexos: $\omega_n = 8 \text{ rad/s}$, $\zeta = 0.125$

$$\omega_{rp} = \omega_n \sqrt{1 - \zeta^2} \approx 7.8 \text{ rad/s}$$

$$\eta_{dB} = 20 \log(2\zeta \sqrt{1 - \zeta^2})^{-1} \approx 10.5 \text{ dB}$$

