

Nome: João Pedro Junqueira S. de Moraes
NUSP: 10774437

Dez 2020

PME3380 - Modelagem de Sistemas Dinâmicos

→ Exercícios da Aula do dia 12/11/2020

$$1) \text{ I) } G_1(s) = \frac{s^2 + 5s + 25}{s(s^3 + 7.4s^2 + 76s + 320)}$$

$$\text{II) } G_1(\omega j) = \frac{25 \left[1 - \left(\frac{\omega}{5} \right)^2 + \frac{\omega}{5} j \right]}{55 \left(\frac{\omega j + 1}{5} \right) \cdot 64 \left(1 - \frac{\omega^2}{64} + 0.09 + \omega j \right)}$$

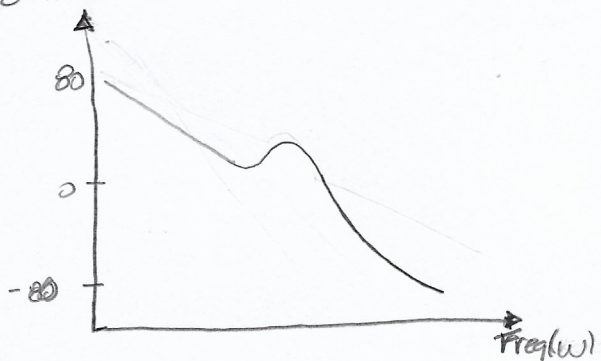
$$\rightarrow \omega_n = 5 \text{ rad/s}$$

$$\rightarrow \omega_r = \omega_n \sqrt{1 - 2\zeta^2} = 4 \text{ rad/s}$$

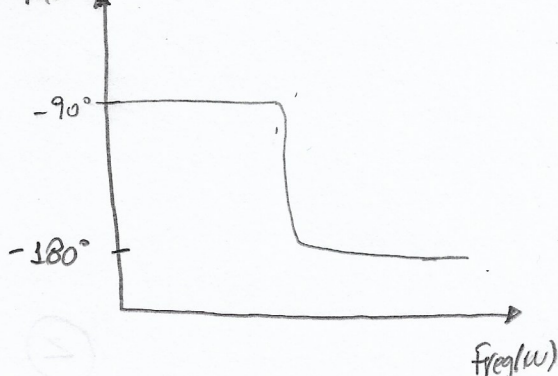
→ Desce: 20 db/década

Diagrama de Bode:

Magnitude (db)



Phase (°)



$$2) \quad G_{2(s)} = \frac{G(s+2)}{(s+12)}$$

$$\rightarrow \omega_n = 2 \text{ rad/s}$$

$$\rightarrow \text{Cresce: } 20 \text{ dB/década; } \phi = 90^\circ$$

$$\rightarrow \text{Polo em } f = 12 \text{ rad/s}$$

$$\rightarrow \text{Desce: } 20 \text{ dB/década; } \phi = -90^\circ$$

$$G_2(\omega j) = \frac{\left(\frac{\omega}{2}j + 1\right)}{\frac{\omega}{12}j + 1}$$

Diagrama de Bode

