

Escola Politécnica da USP

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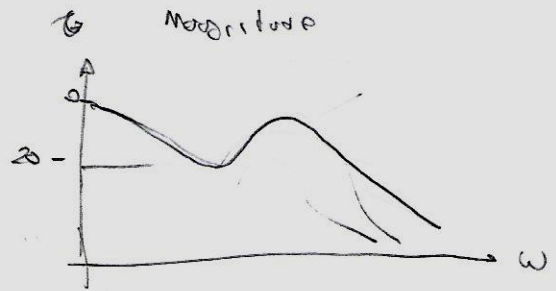
PMZ 3380 - Modelagem de Sistemas Dinâmicos - Ex 12/12

$$1) G(s) = \frac{s^2 + 5s + 25}{s(s^2 + 7.9s + 76.0 + 320)} = \frac{25(1 - (\frac{w}{8})^2 + (\frac{w}{8})s)}{s \cdot 5(\frac{w}{5} + 1) \cdot 64(1 - (\frac{w}{8})^2 + 0.375w/s)}$$

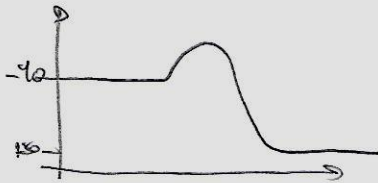
→ Constante de Bode = $\frac{5}{64} \rightarrow \log(\frac{5}{64}) \cdot 20 = -22,19 \text{ dB}$

$\omega_m = \frac{5 \text{ rad}}{2} \approx 2,5 \text{ rad/s}$

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



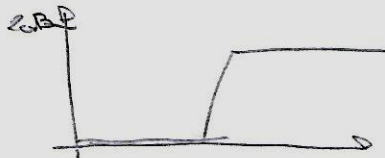
Phase



$$2) G(s) = \frac{G(s)}{s \cdot 12} \Rightarrow G(s\omega) = \frac{1(\frac{w}{2}s + 1)}{(\frac{w}{2}s + 1)}$$

$\omega_{rip} = 2 \text{ rad/s}$
 $\omega_{r2} = 2 \text{ rad/s}$

Ganho:



Phase

