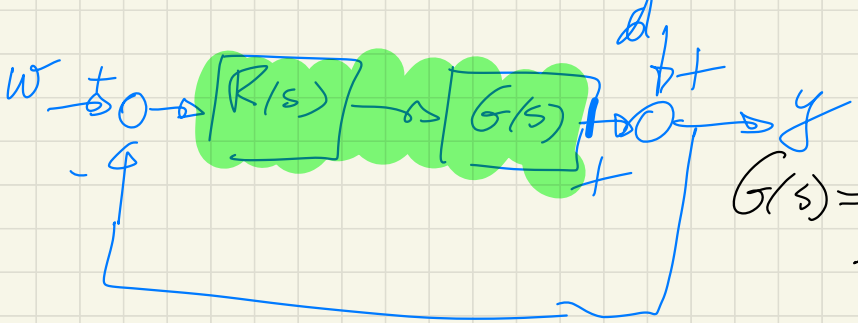
Fondamenti di Automatica

19 marzo 2021

Cenni di Controlli Digitali



$$G(s) = \frac{10}{1+10s} e^{-7s}$$

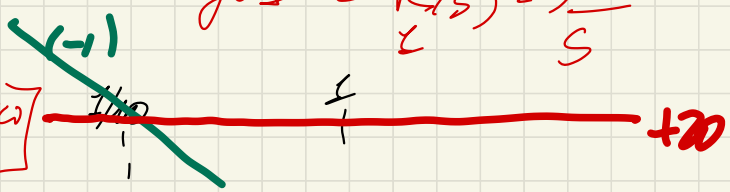
$R(s)$: $e_{\infty} = 0$ $w(t) = A \cdot 1(t)$ $d = B \cdot 1(t)$

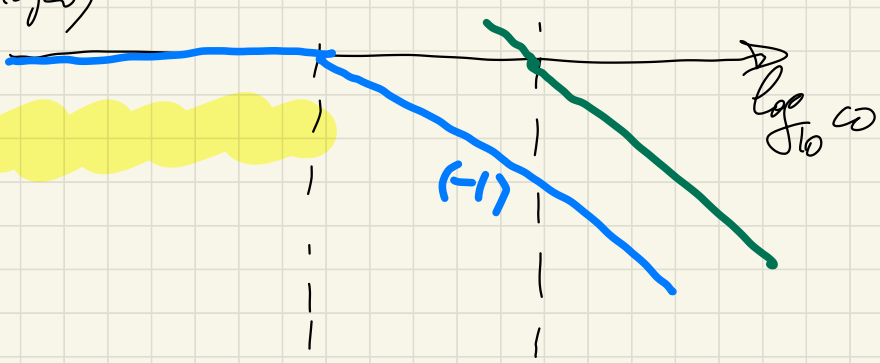
$\omega_c \geq \frac{1}{2}$ rad/s

$\varphi_m \geq 30°$

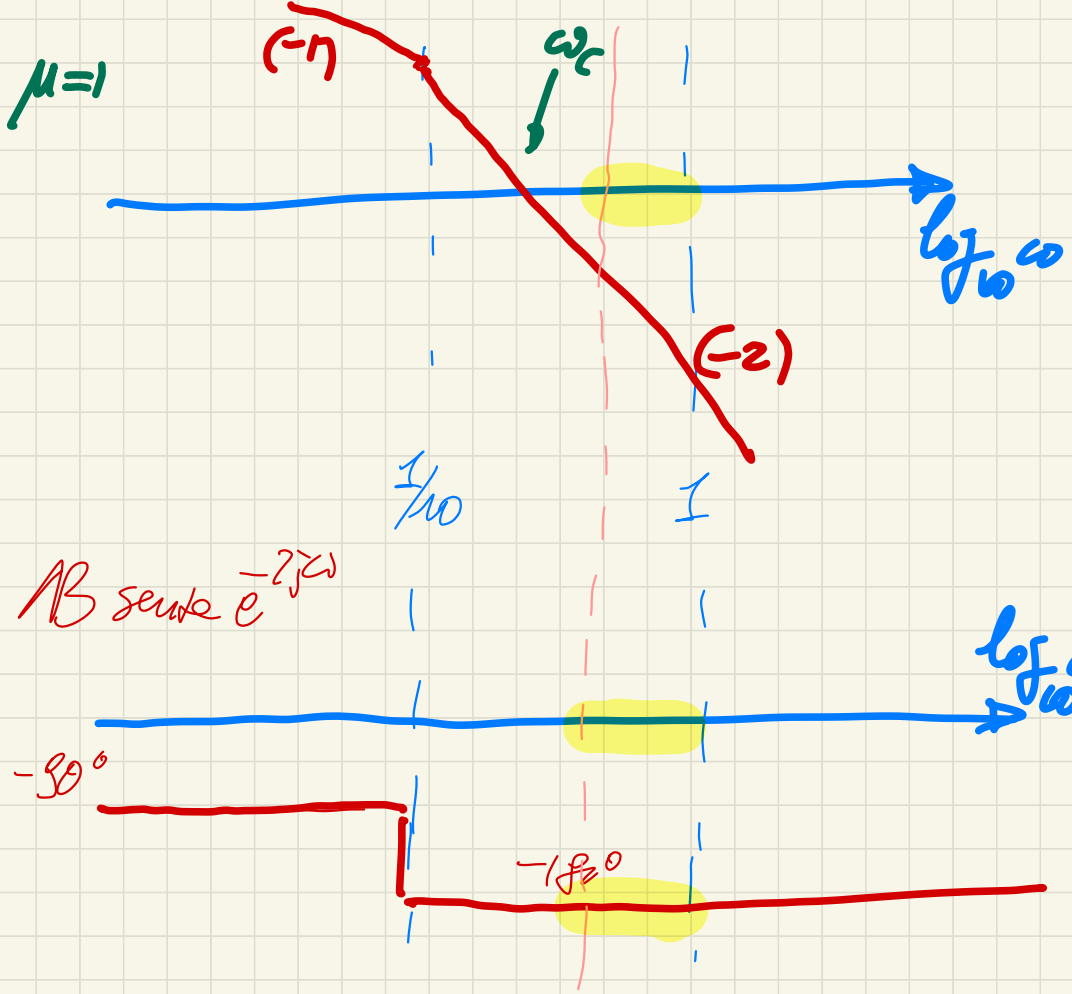
$\frac{1}{s} \rightarrow R(s) = \frac{\mu}{s}$

$$L(j\omega) = \frac{10\mu}{j\omega(1+10j\omega)} \cdot \left[1 \angle j2\omega\right]$$





$\mu = 1$



$$\angle L(j\tfrac{1}{2}) = \frac{10\mu}{(j\tfrac{1}{2})(1+10j\tfrac{1}{2})} \cdot e^{-2j\frac{1}{2}}$$

$$\angle = 0° - 90° - \arctg 5 - 2\cdot\tfrac{1}{2}\,\frac{180}{\pi} \simeq -275°$$

$$L(s) = \frac{10\mu}{s(1+10s)} e^{-2s}$$

$$R_2(s) = \frac{\mu(1+10s)}{s}$$

$$L_2(s) = \frac{10\mu}{s} e^{-2s} \qquad \mu = ?$$

$$\frac{1}{20}$$

$$\measuredangle L_2\left(j\tfrac{1}{2}\right) = 0° - 90° - 5 \cdot \frac{180}{\pi} \simeq -148°$$

$$\varphi_m \simeq 32°$$