

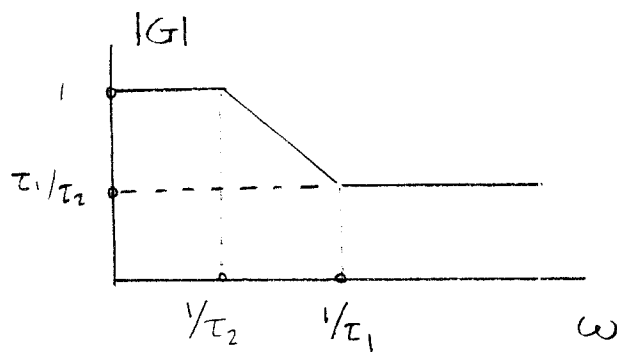
$$H(s) = \frac{\tau_1 s + 1}{\tau_2 s + 1} ; \quad \tau_1 < \tau_2$$

(a) FRF: $G(\omega) = \frac{1 + j\omega\tau_1}{1 + j\omega\tau_2}$

(b) Magnitude: $|G(\omega)| = \frac{\sqrt{1 + \omega^2 \tau_1^2}}{\sqrt{1 + \omega^2 \tau_2^2}}$

Phase: $\angle G(\omega) = \tan^{-1} \omega\tau_1 - \tan^{-1} \omega\tau_2$

(d) Bode Plot Magnitude (c) $\omega \rightarrow 0, |G| \rightarrow 1$



$$\omega \rightarrow \infty, |G| \rightarrow \tau_1/\tau_2$$



Corner frequencies

(e) $\frac{\tau_2}{\tau_1} = 100, \Rightarrow \frac{1/\tau_1}{1/\tau_2} = \frac{\tau_2}{\tau_1} = 100 \Rightarrow 2 \text{ decades}$