

Exercise: Lead lag control

Consider a unity feedback control system

$$G(s) = \frac{10}{s(s+1)(s+2)}$$

Design a controller that gives the controlled system

ω_n equal to or larger than ω_n for $G(s)$

$K_v = 10$

Phase margin $\geq 45^\circ$

Gain margin $\geq 10\text{dB}$

Make a bode plot and closed loop step response for the controlled system to check your design

Hint: start designing by fulfilling the dynamic demands (gain and phase margin)

(You may use Matlab to draw the bode plots and steps)