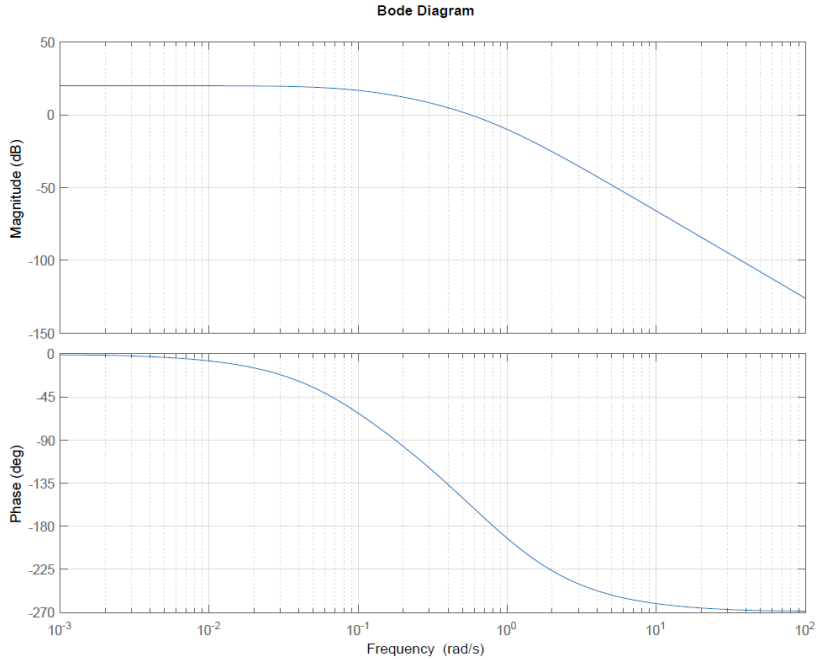
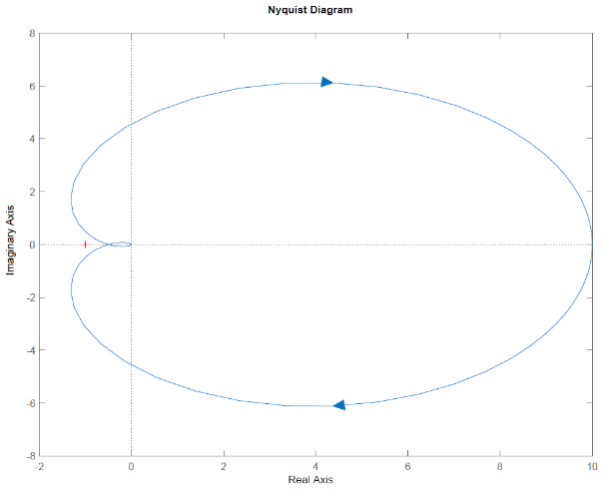
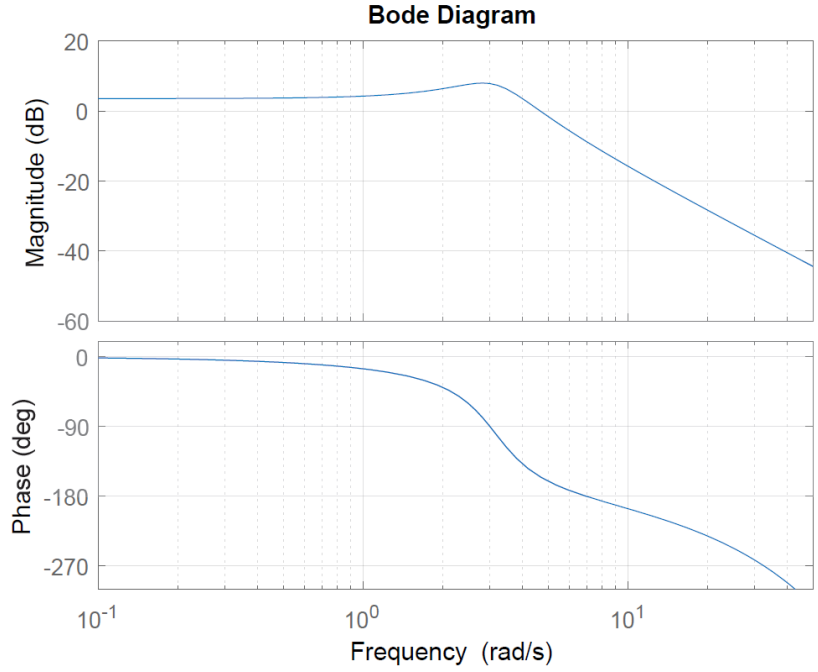
Function: $\frac{0.5}{(s+0.5)(s+1)(s+0.1)}$

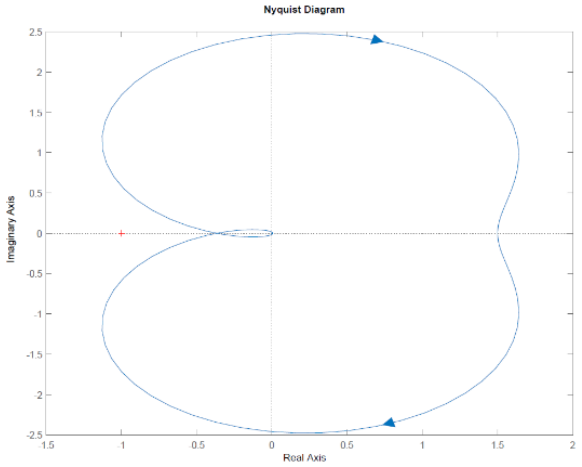




Gain Margin	Phase Margin
At what frequency does phase equal -180°? 0.7 rad/sec	At what frequency does magnitude equal 0dB? 0.6 rad/sec
At this frequency, what is the magnitude (in dB)? -5dB	What is the phase at this frequency? -160°
Compute the gain margin as number of dB below 0dB. 5dB = 20log(GM) GM = 1.8	Compute phase margin as number of degrees above -180° 20°

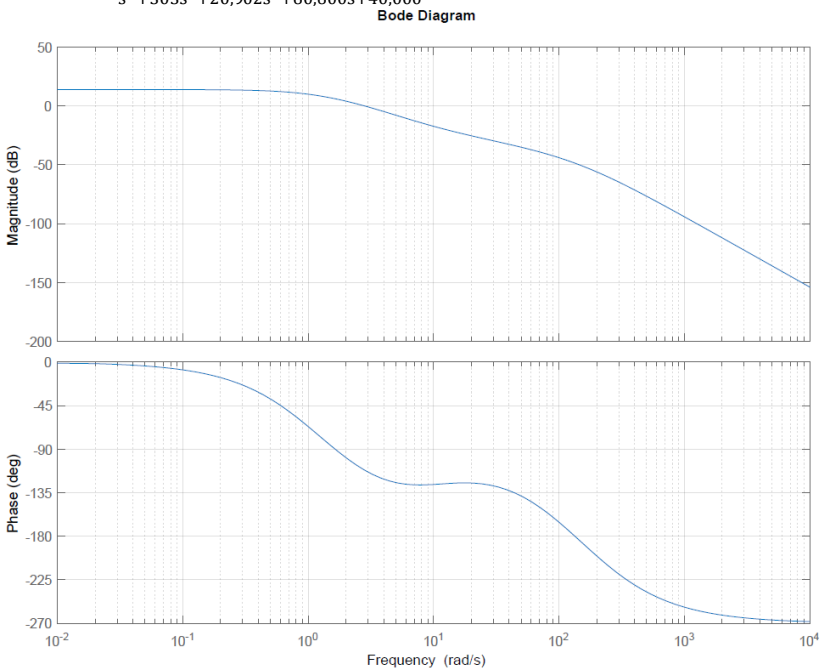
Function: $\frac{0.5e^{\frac{-s}{20}}}{(s+0.5)(s+1)(s+0.1)}$

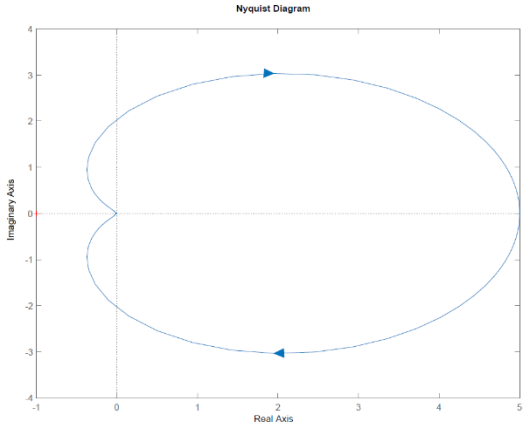




Gain Margin	Phase Margin
At what frequency does phase equal -180°? 7 rad/sec	At what frequency does magnitude equal 0dB? 5 rad/sec
At this frequency, what is the magnitude (in dB)? -10dB	What is the phase at this frequency? -160°
Compute the gain margin as number of dB below 0dB. 10dB = 20log(GM) GM = 3.2	Compute phase margin as number of degrees above -180° 20°

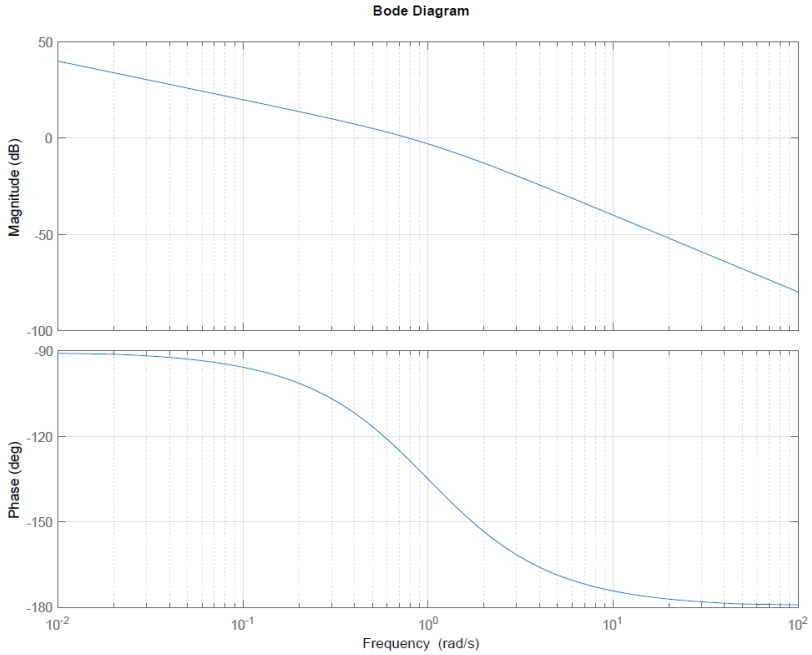
Function: $\frac{20{,}000s+20{,}000}{s^4+303s^3+20{,}902s^2+60{,}600s+40{,}000}$

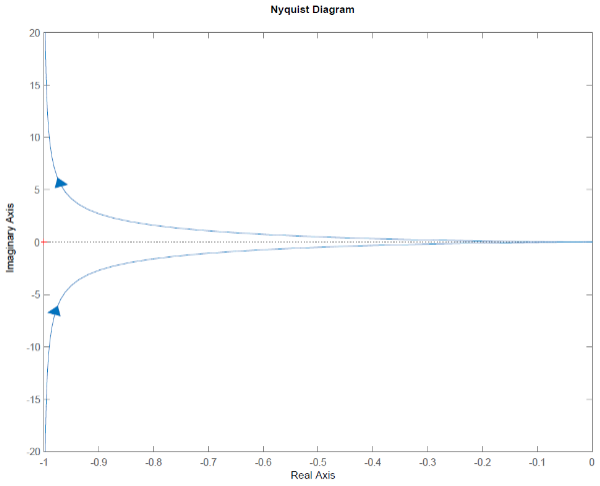




Gain Margin	Phase Margin
At what frequency does phase equal -180°? 130 rad/sec	At what frequency does magnitude equal 0dB? 3 rad/sec
At this frequency, what is the magnitude (in dB)? -50dB	What is the phase at this frequency? 110°
Compute the gain margin as number of dB below 0dB. 50dB = 20log(GM) GM = 316	Compute phase margin as number of degrees above -180° 70°

Function: $\frac{1}{s(s+1)}$





Gain Margin	Phase Margin
At what frequency does phase equal -180°? $\omega \to \infty$	At what frequency does magnitude equal 0dB? 0.8 rad/sec
At this frequency, what is the magnitude (in dB)? $\omega \to -\infty$	What is the phase at this frequency? -130°
Compute the gain margin as number of dB below 0dB. $GM \to \infty$	Compute phase margin as number of degrees above -180° 50°