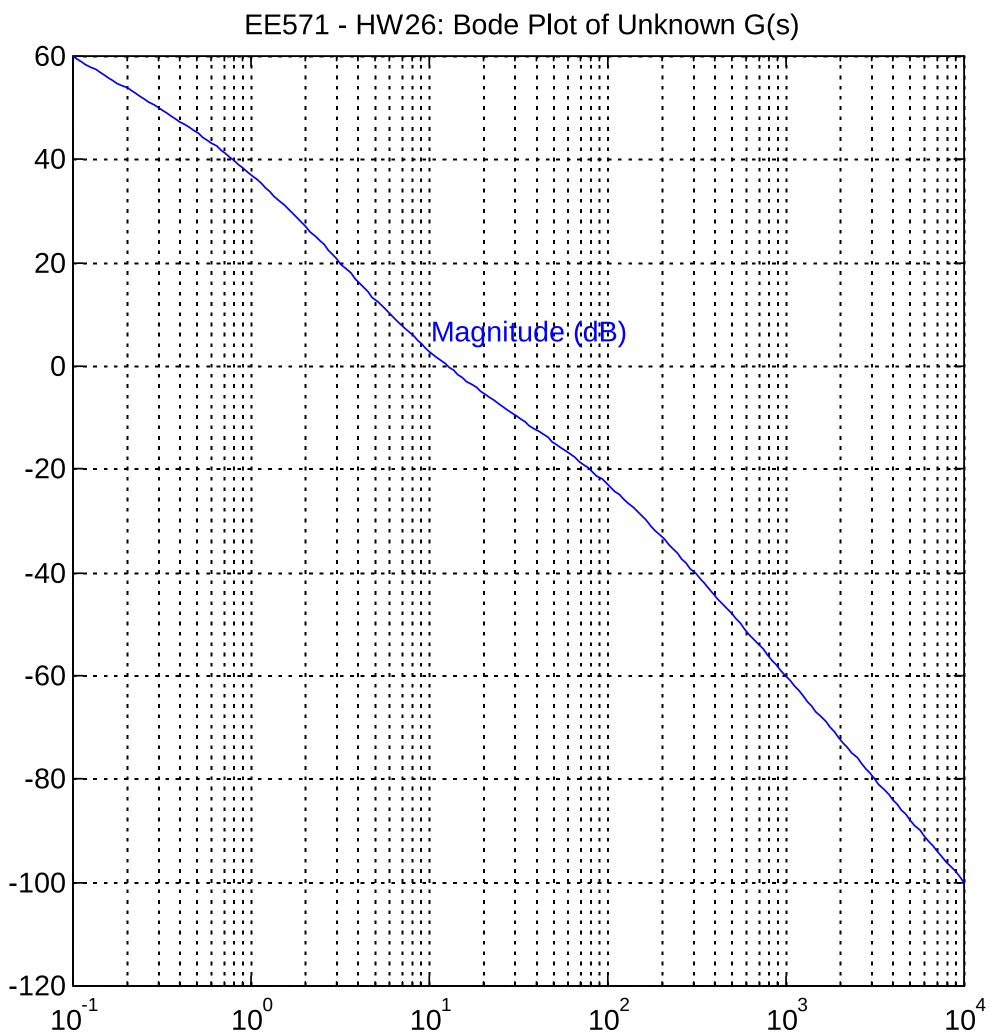
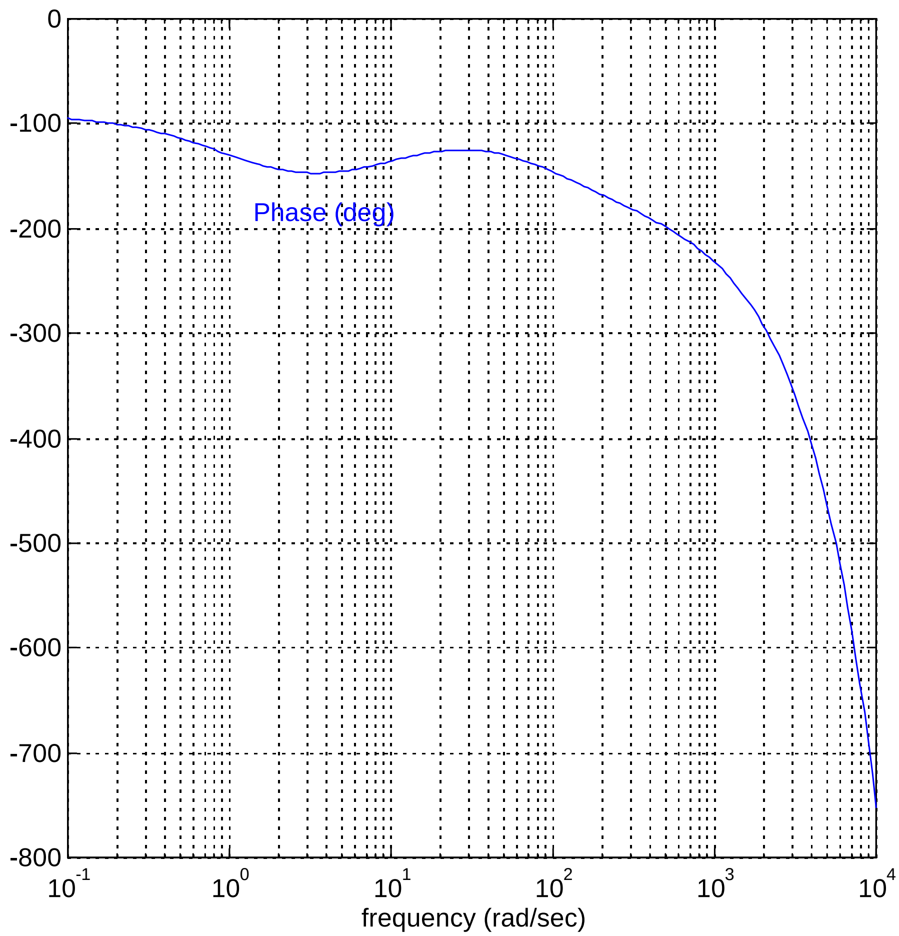
1. a) Sketch the Bode Plots of the following NON-MINIMUM phase systems:

i) $G(s)=10(s-1)/[s^2(s/10 + 1)]$ ii) $G(s)=10(s+1)/[s(s/10 - 1)^2]$ iii) $G(s)=10(s+1)/[s((s/10)^2 - 1)]$ (careful!!)

b) Sketch the Bode Plot of the 2nd order transfer function, $G(s)=10/[(s/10)^2+(s/10)+1)]$

c) Find G(s) from the following Bode Magnitude plot and phase plot (hint: think transportation lag):





2. a) Use your answers from HW#25 to sketch the polar plots of:

i) $G(s)=10(s+1)/[s^2(s/10 + 1)]$ ii) $G(s)=10(s+1)/[s(s/10+1)^2]$ iii) $G(s)=10(s+1)/[s((s/10)^2+1)]$

b) For the open-loop transfer function, $G(s)=10/[s(s+1)(s/10 + 1)]$, draw the appropriate Nyquist Path then make a Nyquist plot.

c) Use your Nyquist plot to determine what would happen if we formed a closed-loop system out of G(s), would the closed-loop system stable (i.e., does the Nyquist plot encircle the point $-1+j0$)? Hint: You may want to have Matlab make a Bode plot of G(s) then look at the magnitude of $G(j\omega)$ when the phase plot crosses –180 degrees. If this magnitude is greater than 0 dB (i.e., greater than 1), then the Nyquist plot will encircle the point $-1+j0$.