ME 5200/6200 Classical Controls **Fall 2020**

Homework 10 **Due Wed. Dec. 9 by 11:59 pm**

Problem 1 [10 pts]

Calculate the magnitude and phase of

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

by hand for $\omega = 1, 2, 5, 10, 20, 50,$ and 100 rad/sec.

Problem 2 [30 pts]

Sketch by hand the Bode plots for L(s), then use the 'bode(SYS)" plot function in Matlab to create Bode plots and compare to your hand sketch. Note the units for the frequency when using the Matlab "bode" function.

(a) $L(s) = \dfrac{2000}{s(s+200)}$

(b) $L(s) = \dfrac{100}{s(0.1s+1)(0.5s+1)}$

(c) $L(s) = \dfrac{1}{s(s+1)(0.02s+1)}$

Problem 3 [20 pts]

Sketch by hand the Bode plots for L(s), then use the 'bode(SYS)" plot function in Matlab to create Bode plots and compare to your hand sketch.

(a) $L(s) = \dfrac{(s+2)}{s(s+10)(s^2+2s+2)}$

(b) $L(s) = \dfrac{(s+2)}{s^2(s+10)(s^2+6s+25)}$