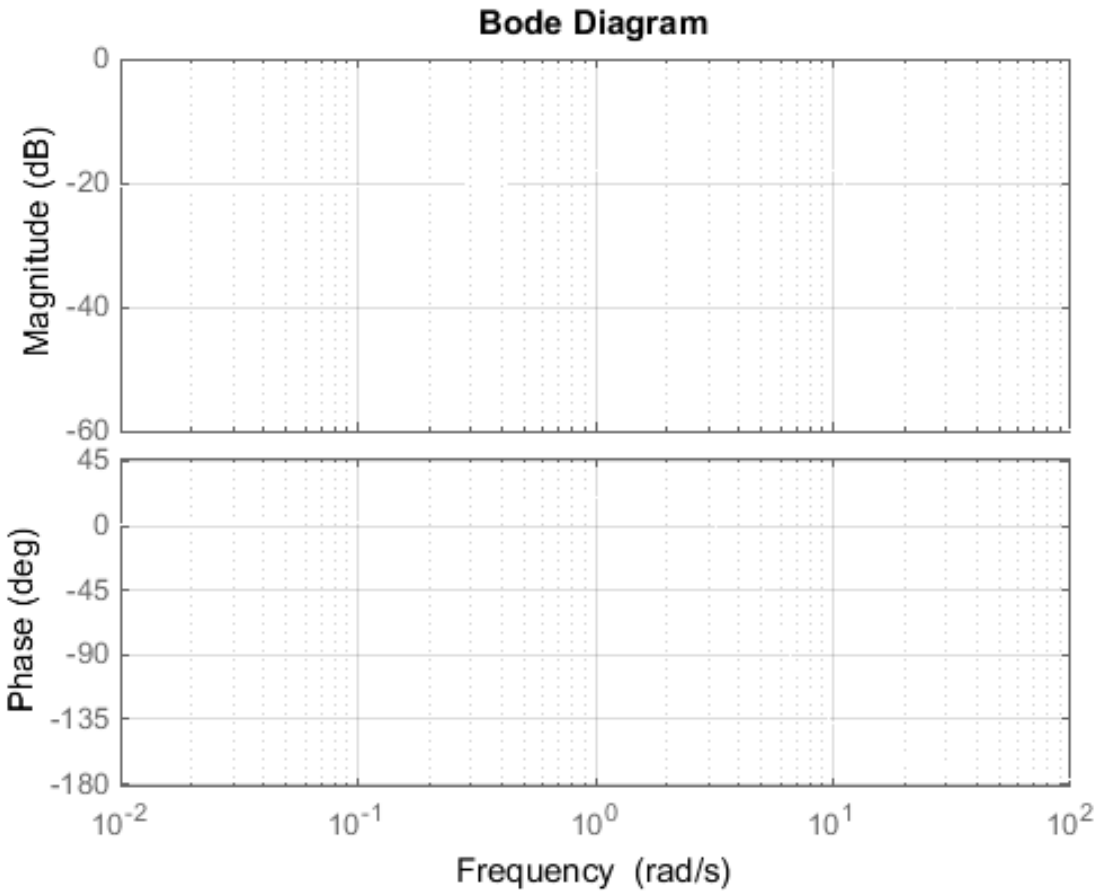
Assigned: 3/4/2021
Due: 3/11/2021 @ 11:59 pm

Name: _____ ID: _____

1.) (60 pts) Please consider the system described by the following transfer function:

$$G(s) = \frac{10(s+1)}{(s+4)(s^2+6s+81)}$$

a) Find expressions for the gain and phase shift of the system in response to a sinusoidal input.
b) Verify the above expressions by numerical simulation of the responses using MATLAB or Simulink for different sinusoidal inputs with the following frequencies: ω = 0.1; 1; 10; and 100 rad/s.
c) Write down the corner frequencies and sketch the Bode diagram by hand.
d) Plot the Bode diagram for the system using MATLAB and compare with your sketch in (c)



Name: _____ ID: _____

2.) (20 pts) Please solve Problem B-7-3 from Ogata (page 562).

Name: _____ ID: _____

3.) (10 pts) Please solve Problem B-7-4 from Ogata (page 562).

Name: _____ ID: _____

4.) (10 pts) Please solve Problem B-7-5 from Ogata (page 562).