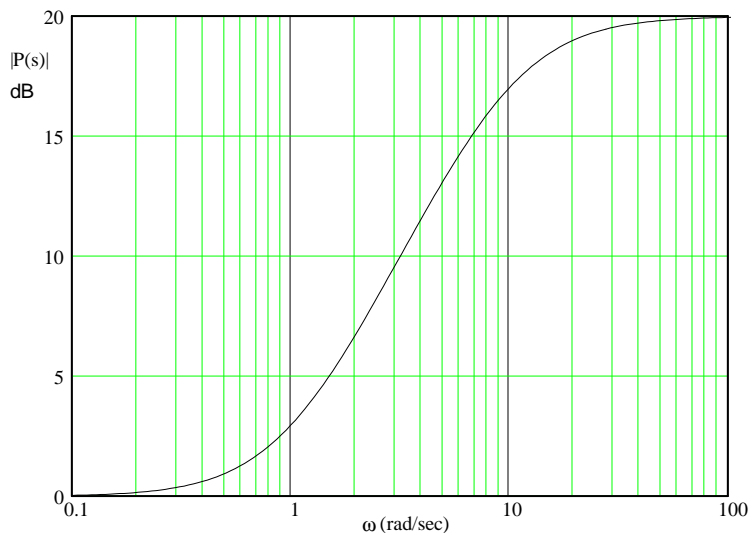Name_____ ECE 3510 Homework Bd3

You must show the work needed to get the
answers below. Add your own paper if necessary.

1. (a & c are from Problem 5.2 in Bodson text.)
  a) The magnitude Bode plot of a system is shown
     below. What are the possible transfer functions
   of stable systems having this Bode plot?

  b) A Bode plot is shown below, estimate of the transfer function of the system. Assume no negative signs
     in the transfer function (all poles and zeros in LHP). Show your work (how you made your estimate).
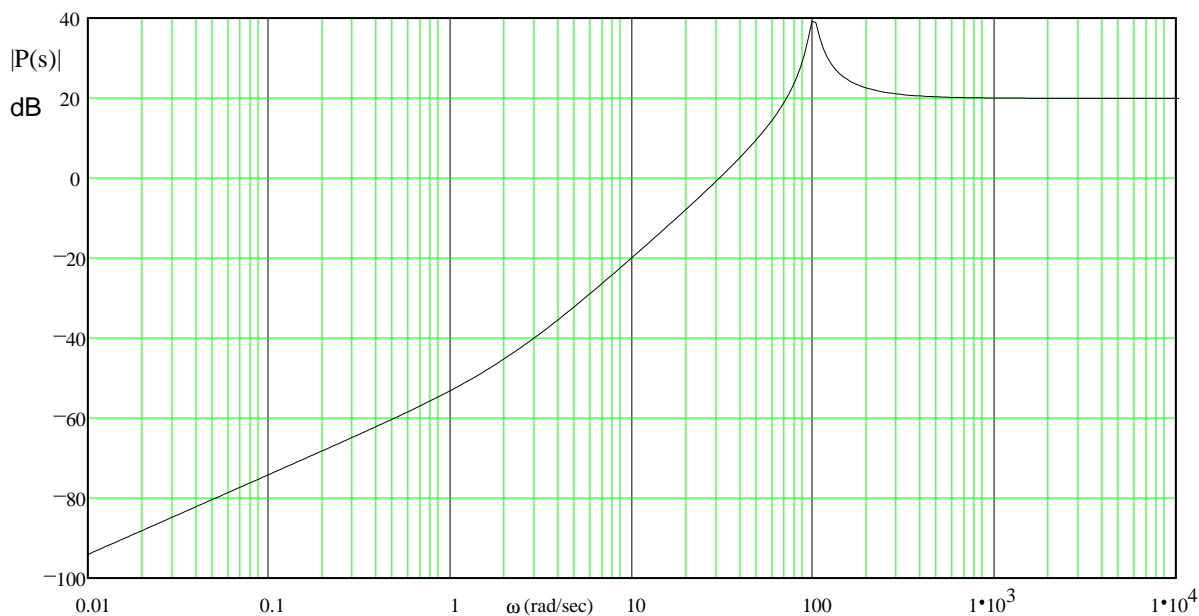
ECE 3510 hw Bd3 p2

c) The Bode plots of a system are shown. Give an estimate of the transfer function of the system. Show your work (how you made your estimate).

Answers
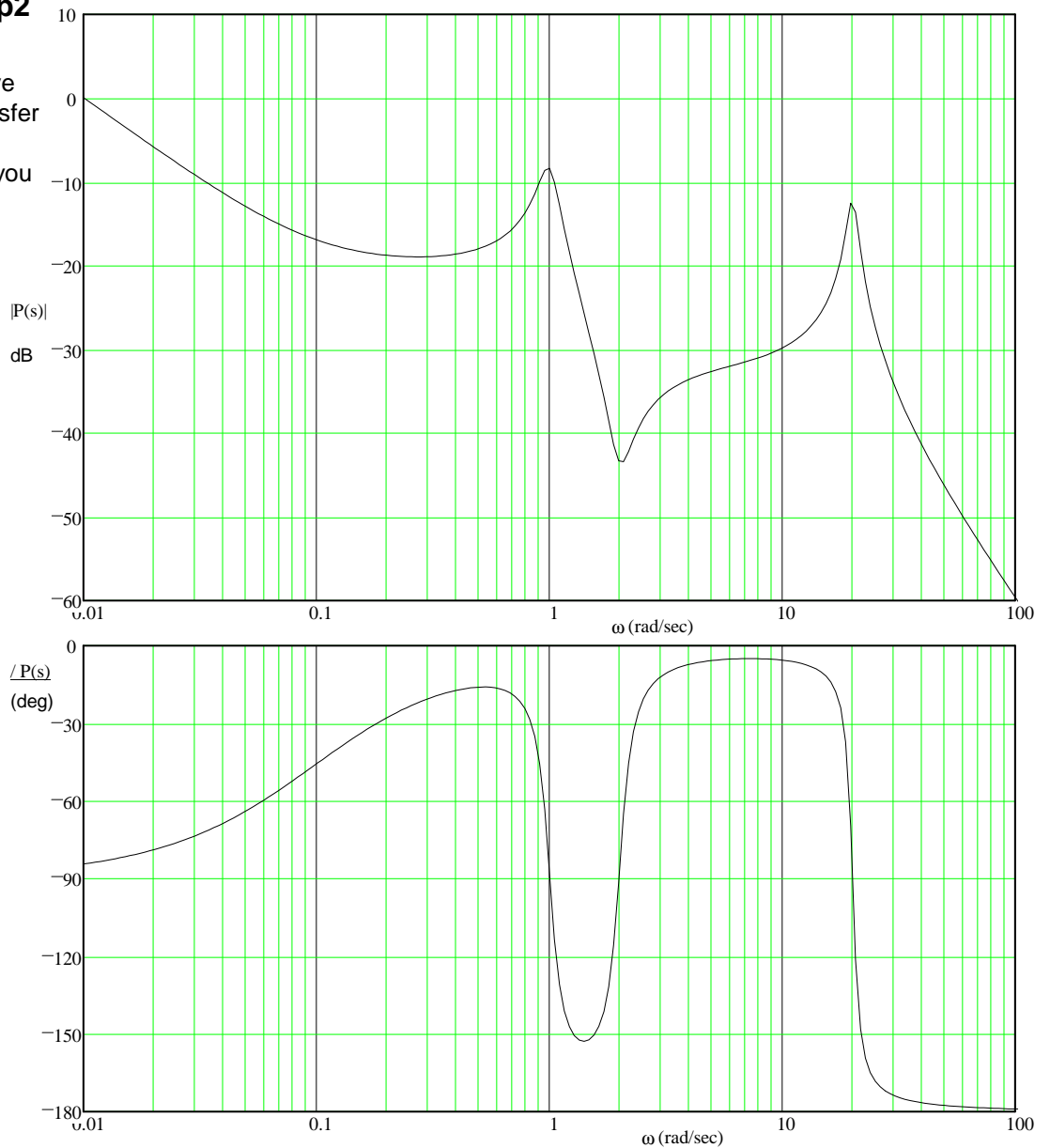
The rest are NOT stable

1.a) $P(s) = 10 \cdot \dfrac{s+1}{s+10}$ $10 \cdot \dfrac{s-1}{s+10}$ $-10 \cdot \dfrac{s+1}{s+10}$ $-10 \cdot \dfrac{s-1}{s+10}$ $10 \cdot \dfrac{s+1}{s-10}$ $-10 \cdot \dfrac{s-1}{s-10}$ $-10 \cdot \dfrac{s-1}{s-10}$ $-10 \cdot \dfrac{s+1}{s-10}$

b) $P(s) = \dfrac{10 \cdot s \cdot (s+2)}{\left(s^2 + 10 \cdot s + 10000\right)}$

c) $P(s) = \dfrac{10 \cdot (s+0.1) \cdot \left(s^2 + 0.4 \cdot s + 4\right)}{s \cdot \left(s^2 + 0.2 \cdot s + 1\right) \cdot \left(s^2 + 2 \cdot s + 400\right)}$

ECE 3510 hw Bd3 p2