Lesson 26

Problem 26.1

Use Matlab to plot the frequency response plot (magnitude and phase) for the following transfer function. Turn in the Matlab plots with your own superimposed hand-drawn straight-line asymptotic frequency response sketches. Compare and contrast the asymptotic sketches to the exact responses. ("Hand-drawn" means use a straightedge.)

$$H_1(s) = \frac{10s+1}{(s+1)(0.1s+1)}$$

Problem 26.2

Repeat problem 26.1 with the following transfer function.

$$H_2(s) = \frac{10s^2+0.2s+0.1}{\left(\frac{s^2}{36}+\frac{s}{3}+1\right)\left(\frac{s}{2}+1\right)(2s+1)}$$

Problem 26.3

Figure 28.3 shows a Bode plot of an unknown system.

a) On Fig. 26.3, sketch straight-line asymptotes and determine a transfer function $H(s)$ that (approximately) models the system. ("Sketch" means use a straightedge.)
b) In Matlab, plot the Bode diagram of *your* transfer function $H(s)$. Turn in both Fig. 26.3 showing your straight-line asymptotic approximations and the Bode plot of your transfer function. Discuss the similarities and differences between your Bode plot and Fig. 26.3.

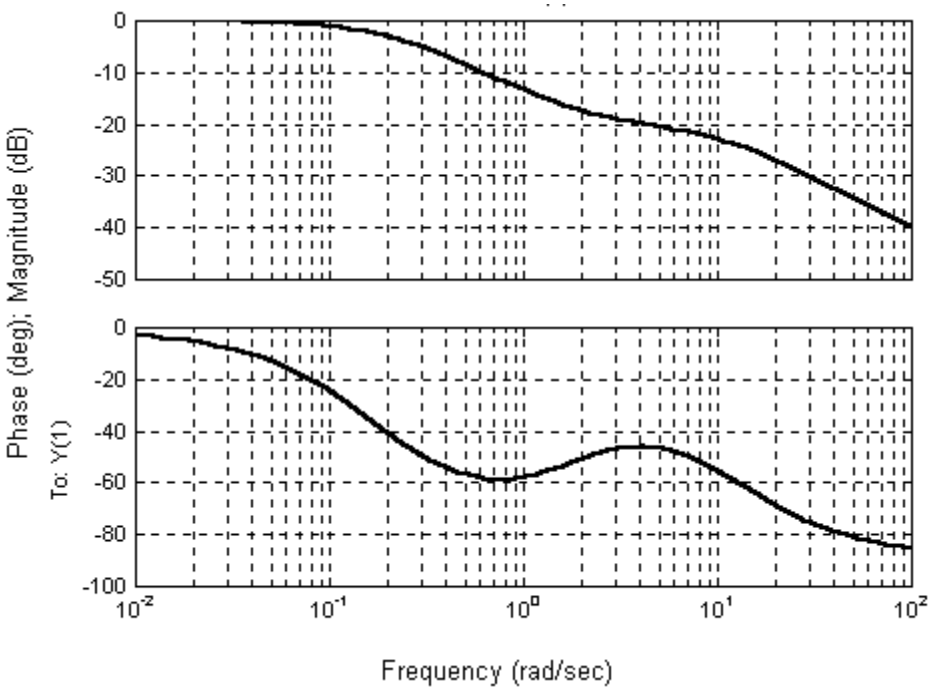

Fig 28.3: Frequency response plot of an unknown system.