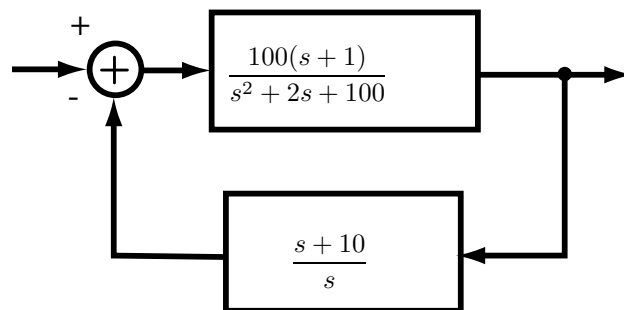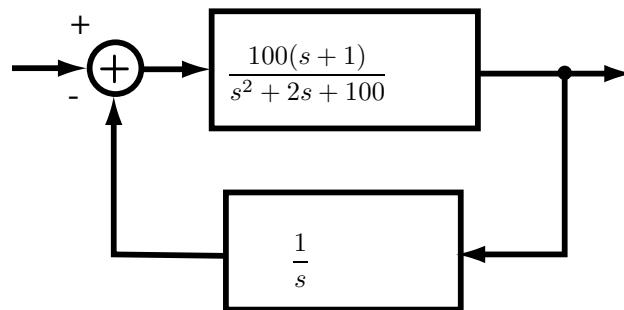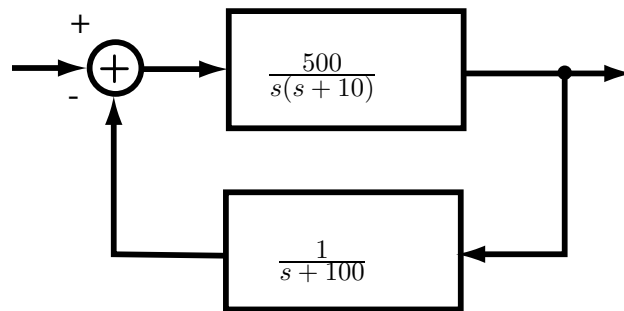# ECE311S: Dynamic Systems and Control
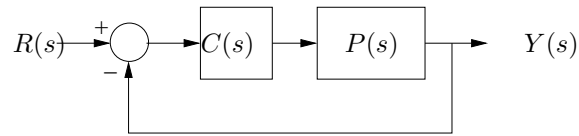
Problem Set 9

Problem 1

Draw the Bode plots and find the gain and phase margins of each of the following systems.
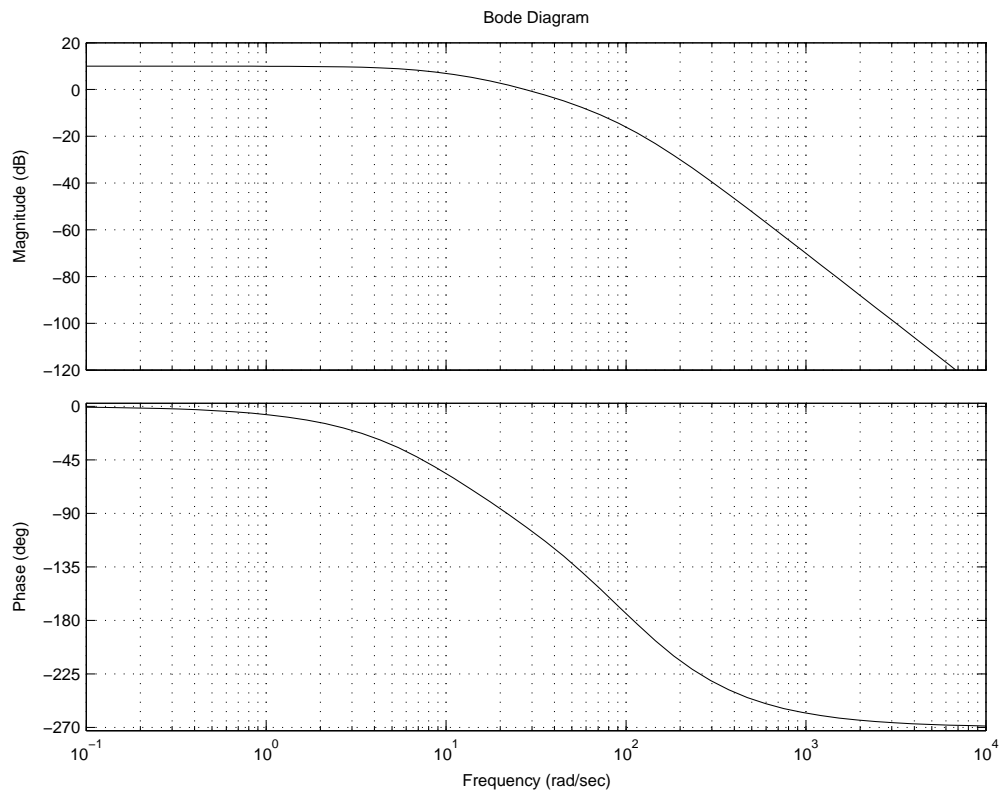
Problem 2

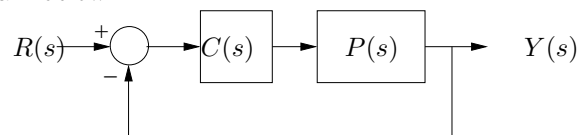You are given the block diagram below.

$$R(s) \xrightarrow{+} \bigcirc \xrightarrow{} \boxed{C(s)} \xrightarrow{} \boxed{P(s)} \xrightarrow{} Y(s)$$

The Bode plot of $P(s)$ is given below

Bode Diagram

Find the phase margin of the system.

Problem 3

You are given the block diagram below

$$R(s) \xrightarrow{+} \bigcirc \xrightarrow{} \boxed{C(s)} \xrightarrow{} \boxed{P(s)} \xrightarrow{} Y(s)$$

where the plant $P(s)$ is given as

$$P(s) = \frac{50}{s^2 + 2s + 100}.$$

Find the phase margin of the system before compensation.