

GEORGIA INSTITUTE OF TECHNOLOGY
School of Electrical and Computer Engineering

Course ECE 2040

Circuit Analysis

Assigned: November 17, 2000
Due: Monday, November 27, 2000

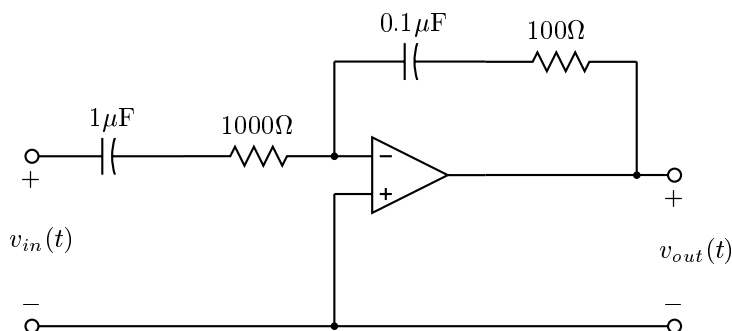
Problem Set #13

Reading: Read the following sections from the class notes:
Chapter 9, Sections 9.3, 9.4

Reading: Read the following sections from Dorf and Svoboda:
Chapter 13, Sections 13.4J
Chapter 16, Sections 16.6

Announcement: Quiz #4 will be held during the class hour on Wednesday, November 29, 2000. It will be a closed book test, although calculators are permitted and one 8.5in \times 11in sheet of hand-written notes are permitted. It will cover problem sets 10–13.

Problem 13.1:



Plot the asymptotic Bode plot for the magnitude of the frequency response of the above circuit

Problem 13.2: Sketch Bode magnitude and phase plots for the following system functions

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

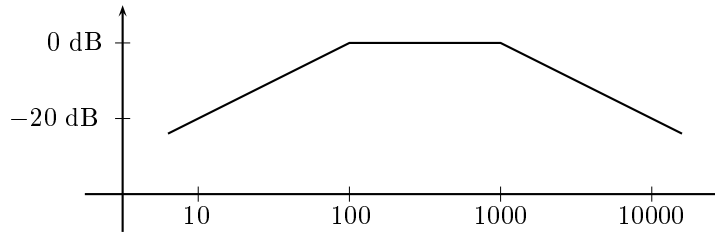
(b) $H(s) = 1 - 10s$

(c) $H(s) = \frac{s-20}{s+200}$

Problem 13.3: A circuit with the system function

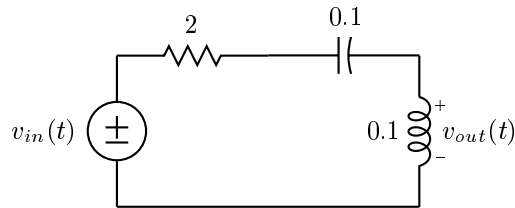
$$H(s) = \frac{ks}{(s+a)(s+b)}$$

has the Bode magnitude plot shown below.



Determine the values of k , a , and b .

Problem 13.4:



- (a) Calculate the system function of the above circuit.
- (b) Draw the Bode magnitude plot for the circuit.

Problem 13.5: The Bode magnitude plot for a circuit is shown below. We are told that all of the poles of the system and all of its zeros have negative real parts (i.e., they lie in the left-half of the s -plane). Determine the system function of the circuit.

