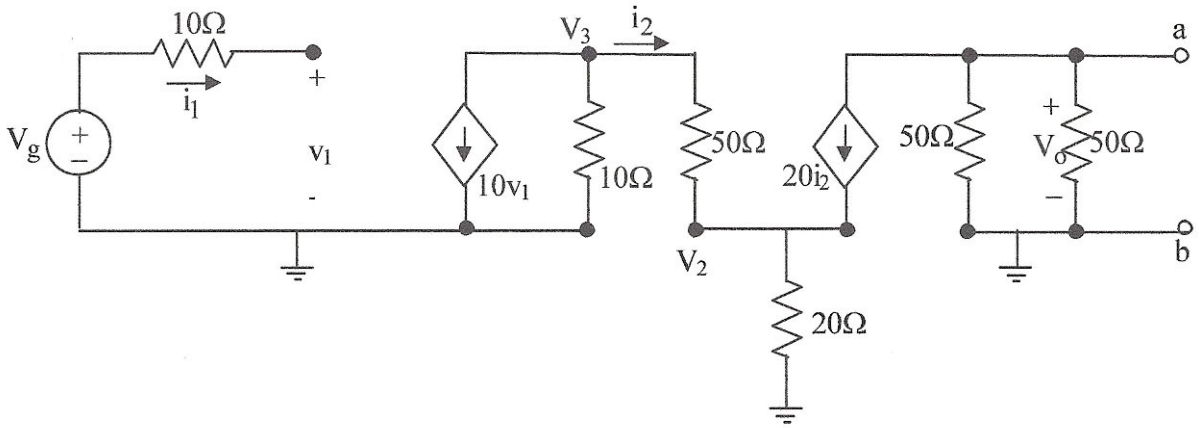
**ECE2280** **Homework #1** **Spring 2009**

**Homework #1:**

1. Given $V_g$=10mV, find $V_o$. Find the Thevenin equivalent between terminals a-b.




2. Give expressions for the sine-wave voltage signals having:
   a. 5V peak amplitude and 1kHz frequency
   b. 120Vrms and 60Hz frequency
   c. 200mV peak-to-peak and 1000 rad/sec frequency
   d. 0.1V peak and 10ms period

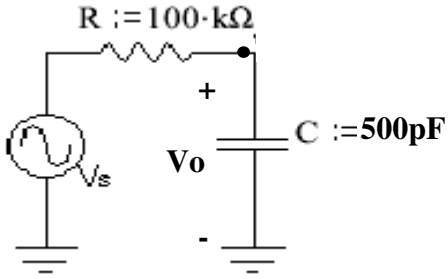
3. Explain in your own words the procedural steps for plotting Bode Plots. (Note: I would prepare this question for use during an exam)

4. (a) Plug in values of ω from 0.1 to $10^5$ rad/sec. Plot this graph of dB vs ω. (Convert Volts/Volts to dB)
   (b) Sketch the Bode plots using a straight-line approximation (procedures described in class)
   (c) Use Matlab to obtain the Bode Plot.
   (d) Compare the three. What differences do you see?

$$H(s) = \frac{10{,}000(s+10)}{(s+1{,}000)(s+100)}$$

5. Sketch the Bode plot using a straight-line approximation (procedures described in class) and then use Matlab to obtain the Bode Plot. Compare the two.

$$H(s) = \frac{100s^2}{(s+1)(s+10)}$$




6. Use PSPICE to simulate the circuit of Fig. 1 and determine the Bode Plots. Print out the schematic, along with the plots. ***(Double points – counts as three homework problems)***

**Fig. 1**

7. Analyze the following circuit to find the transfer function Vout/Vs. Solve the circuit symbolically first (with $R_1$, $R_2$, $R_3$, $R_4$, C) and then plug in their values. Create a rough sketch of the transfer function using a straight-line approximation procedure.