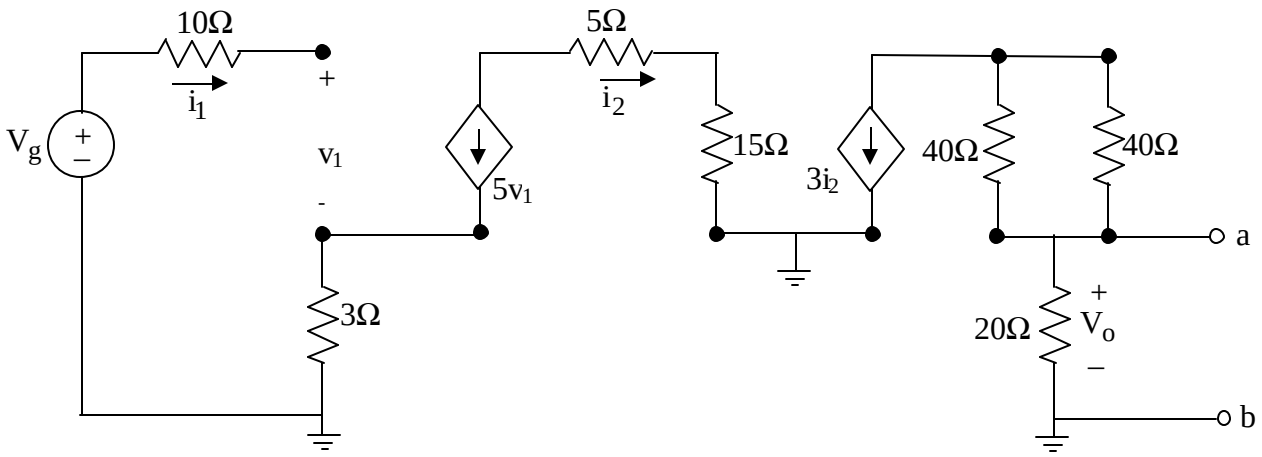
Homework #1:

1. Given V_g=10mV, find V_o. Find the Thevenin equivalent between terminals a-b. (Note: $v_1 \neq Vg$)



2. Sketch the following waveforms. Identify the dc component of the waveform and the ac component of the waveform.
   a. Vs=10cos(10t) V
   b. Vs=3V +7cos(10t) V
   c. Vs=3V $\pm$ 0.25V

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 Volts vs ω.
   (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?

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

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.

$$H(s) = \frac{100{,}000(s+10)^3}{s^2(s+10k)(s+1k)}$$

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 two homework problems)***

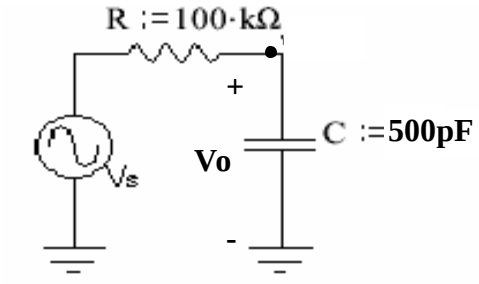


Fig. 1

7. Analyze the following circuit to find the transfer function Vi/Vs. Solve the circuit symbolically first (with R_S, R_i, R_1, C_i) and then plug in their values. Create a rough sketch of the transfer function using a straight-line approximation procedure.