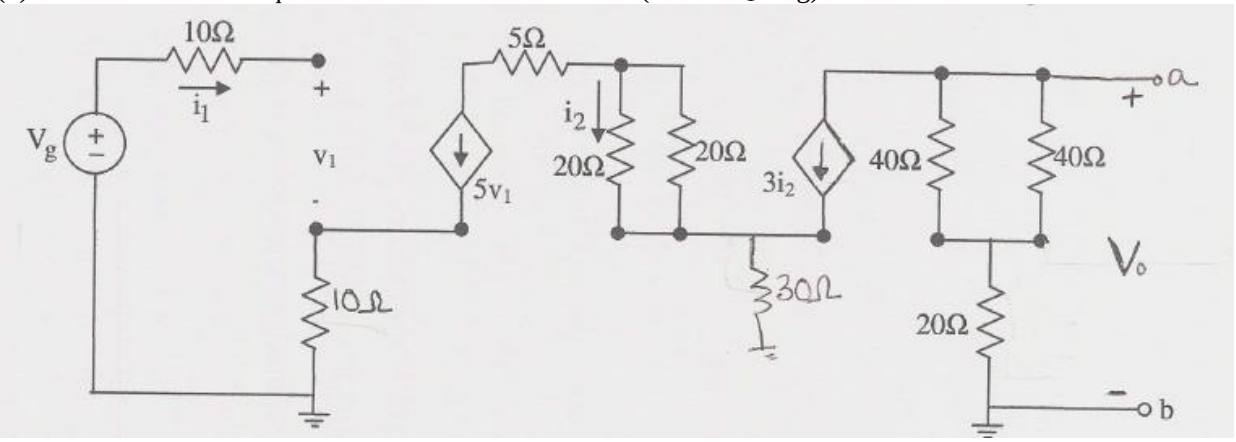
1. (a) Find V_o/V_g
   (b) Find the Thevenin equivalent between terminals a-b. (Note: $V_1 \neq Vg$)



2. Use the solution from Problem 1.
   (a)If Vg=2V DC, what is the output at Vo?
   (b)If Vg=5V DC, what is the output at Vo?
   (c)If Vg=sin(10t), what is the output at Vo? Make a rough sketch of Vo and Vg.
   (d) Note that this is an amplifier – the output is linearly related to the input by a gain value. Mathematically, this is expressed as:

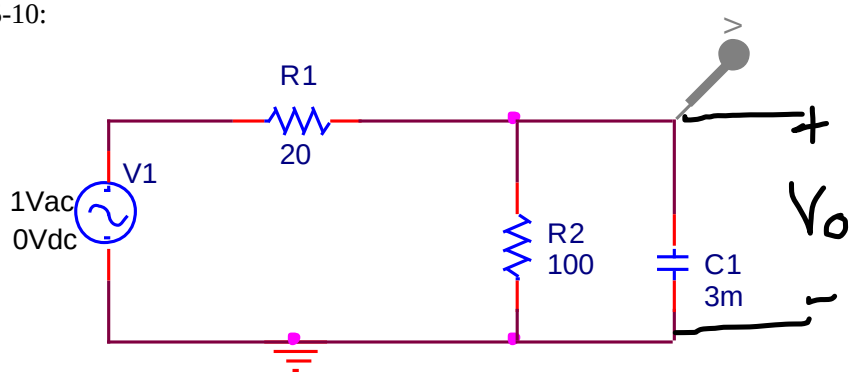
$$\frac{Vout}{Vin} = (gain)$$

   For this circuit, what variable is Vout and Vin. What is the numerical gain value?

3. Sketch the following waveforms. Identify the dc component of the waveform and the ac component of the waveform.
   a. Vs=10cos(2πt)
   b. Vs=3V+3cos(3t)
   c. Vs=5V±0.5V

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

Use the following figure for Problems 5-10:



5. Derive the transfer function $H(s) = \frac{V_o}{V1}$ by hand.
6 and 7. Use PSPICE to draw the circuit and print it out.
8. Simulate the circuit in PSPICE to obtain the Bode Plots for the circuit.
9. Use MATLAB and the result of the hand derivation to obtain the Bode Plots.
10. Sketch the straight-line approximation of the magnitude Bode plot on the same graph as that printed out in Problem 9. Note that PSPICE plots the results over frequency and the derived transfer function uses ω.