

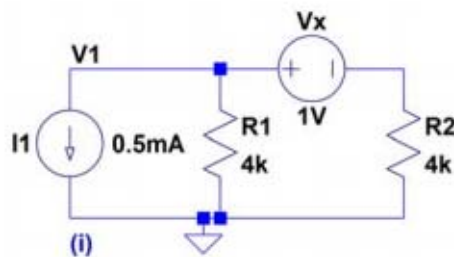
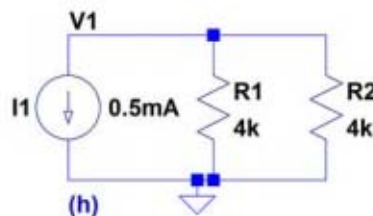
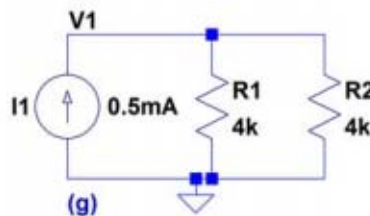
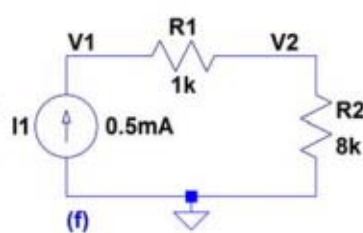
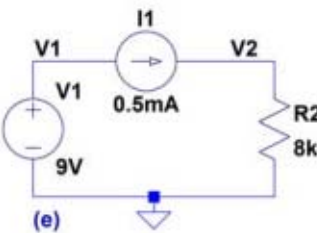
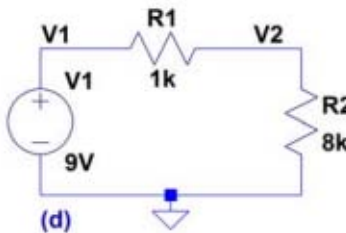
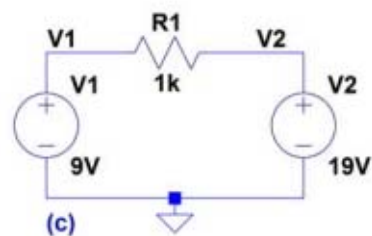
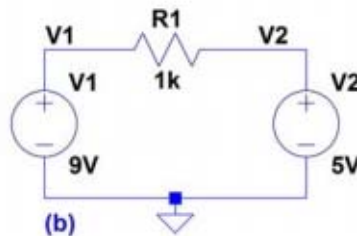
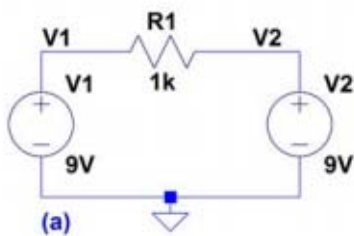
Final Exam – EE 220 Circuits I  
University of Nevada, Las Vegas

NAME: \_\_\_\_\_

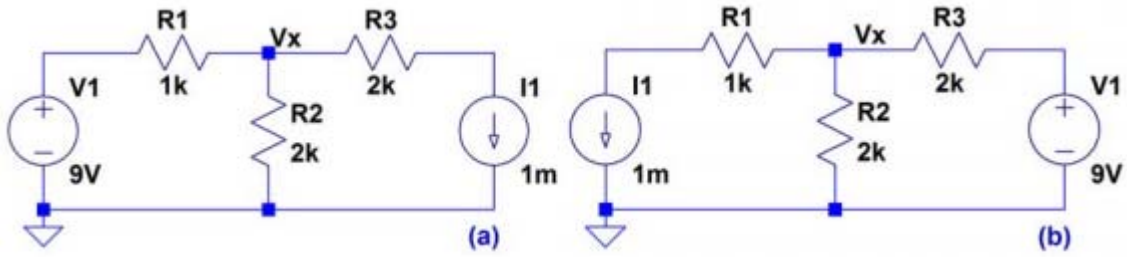
Closed book and notes.

Use the back of the sheet of paper when needed.

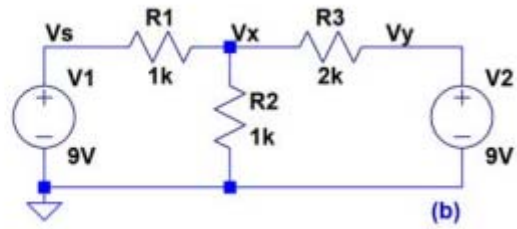
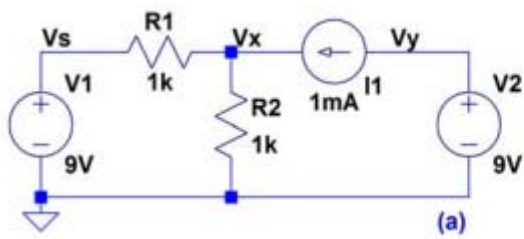
1. Find the currents and voltages in the following circuits. Clearly label the values on the schematics. No need to show your hand calculations, simply write the values. (10 points)



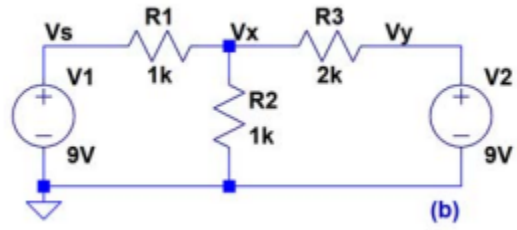
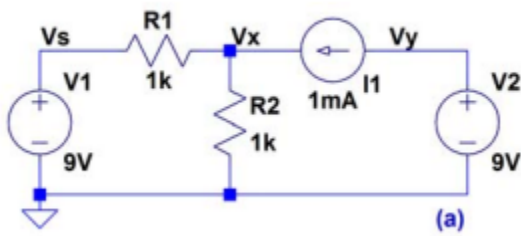
2. Using superposition show how to find  $V_x$  in each of the following circuits. Show your work for credit. (10 points)



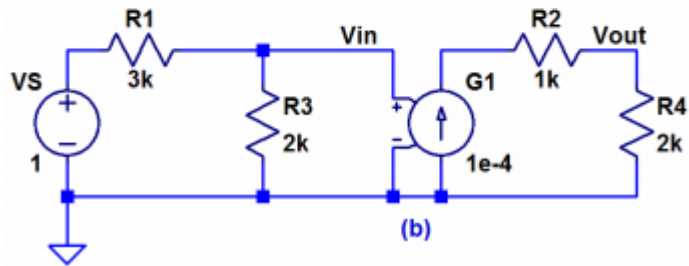
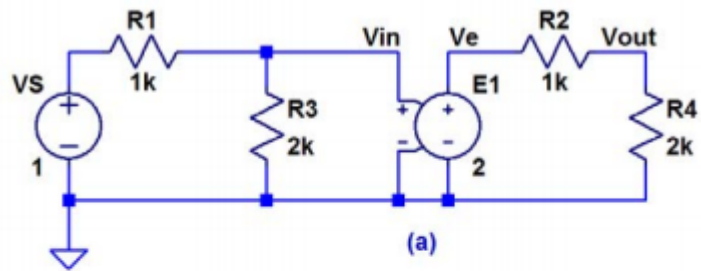
3. Find the voltages and currents in each of the following circuits using mesh analysis. Show your work for credit. (10 points)



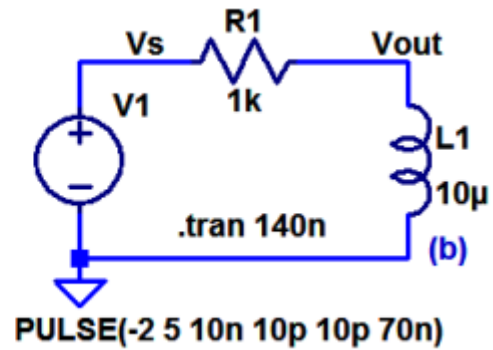
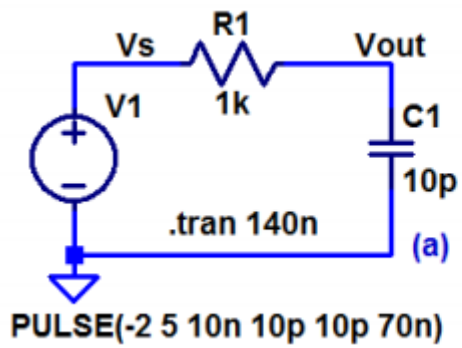
4. Find the Thevenin and Norton equivalent circuits between  $V_x$  and ground with  $R_2$  removed in the following circuits. Show your work for credit. (10 points)



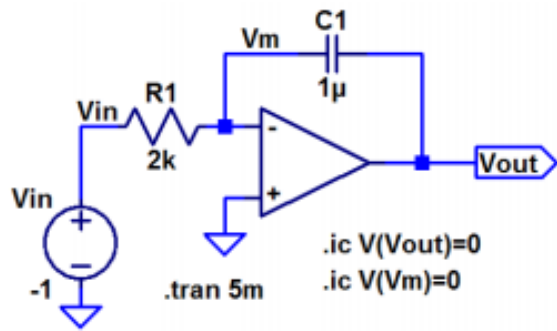
5. Find  $V_{out}$  in each of the following circuits. Show your work for credit. (10 points)



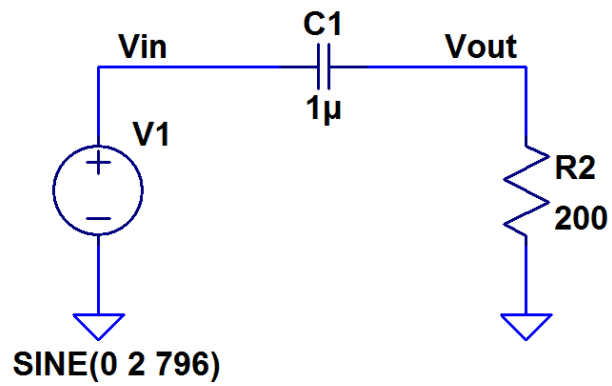
6. Write the equations and sketch along with the input pulse (on the same plot), for each of the input pulse's transitions, for the output of each of the following circuits. (10 points)



7. Plot the output of the following circuit from a time 0 to 5 ms. Assume that the capacitor is initially discharged (both sides are at 0 V). Ensure you show how you calculate  $V_{out}$ . (10 points)



8. Using phasor analysis sketch  $V_{out}$  and  $V_{in}$ , on the same plot, for the following circuit. Show your work (how you calculate the magnitude and phase shift of the output) for credit. Note that the input's peak voltage is 2 V. (10 points)





9. For the circuit in problem 8 determine, and sketch, the magnitude and phase responses of  $V_{out}/V_{in}$ . Your plots should be dB on the y-axis and log of frequency on the x-axis. (10 points)

10. A circuit has the following frequency response. If the input to the circuit is a 1 V peak sinewave at 500 Hz sketch the input and output sinusoids on the same plot in the time domain (x-axis is time). (10 points)

