University of Portland
School of Engineering

EE 261-Electrical Circuits-3 cr. hrs.
Fall 2008

Midterm Exam # 1

(Friday, September 26, 2008)
(Closed Book Exam, One Formula Sheet Allowed)
(Total Time: 55 minutes)

Name:_____☺

Signature:_____☺

"An honest mind possesses a kingdom."
**Lucius Annaeus Seneca (4B.C.–65A.D.)**

"Honest people are the true winners of the universe."
Anonymous

NOTE: On all the problems, please show your work clearly, and provide the appropriate units for your answers. Also mark on the schematic to show any current or voltage that you define in your solution.

1. (25 points) In the circuit shown, find the value of the current i_x flowing through the 1.5 kΩ resistor. (Please show your work clearly and provide brief justifications for the steps you take. <u>Also, don't forget to provide the correct units for your answers.</u>)
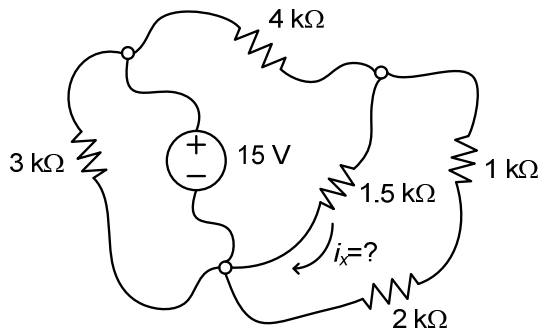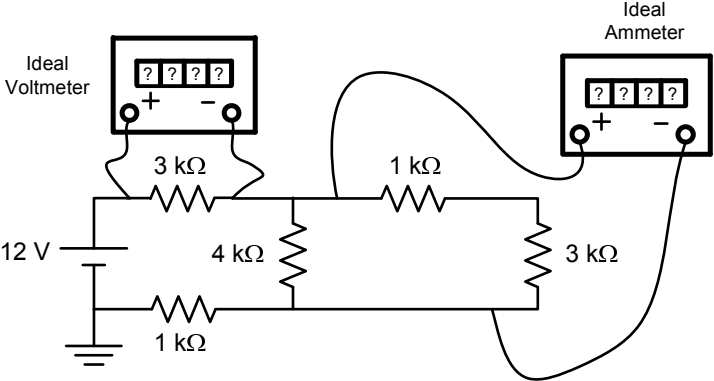
2. (Total: 25 Points) Consider the circuit with two digital multi-meters (DMM's) connected as shown.
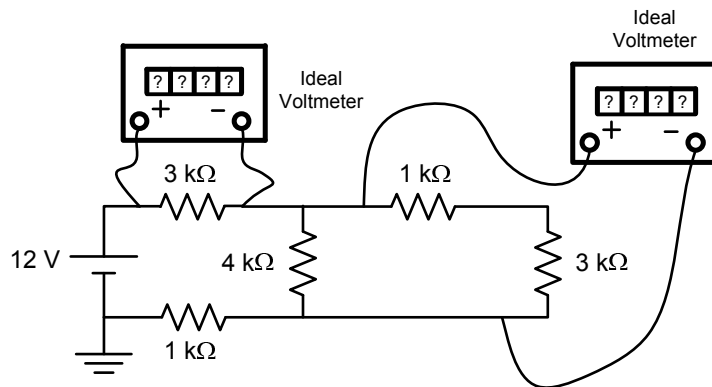
(a) (12.5 points) Find the DMM readings if both of them are set to measure voltage, and indicate the units. (Note: Pay attention to the polarities of each DMM!)

(b) (12.5 points) Repeat part (a) if one DMM by mistake is set to measure current. Again, indicate your units.

3. (25 Points) Consider the circuit shown. Determine the voltage V_x across the 20 Ω resistor. Please show your work step by step.

0.5 A

10 Ω

30 Ω

10 V

20 Ω

$+\ V_x=?\ -$
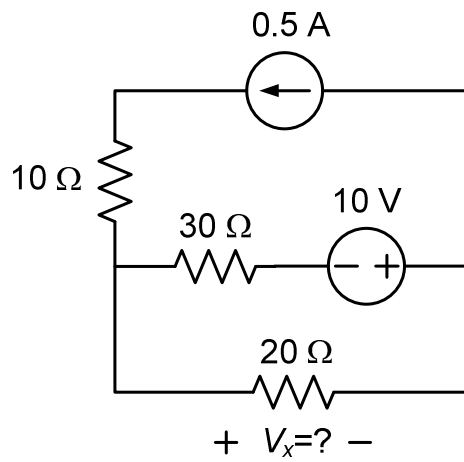
4. (25 Points) In the circuit shown, first, find the node voltages v_a, v_b, and v_c. Then, use these node voltage values to determine the power of each element. Indicate the type of each power value (i.e., absorbed or supplied). Please show your work step by step. **Don't forget to calculate the power values!**

14 mA

2 kΩ   b   1 kΩ

a

c

3 kΩ   20 V   1 kΩ