# *University of Portland*
# *School of Engineering*

# EE 261-Electrical Circuits-3 cr. hrs.
# Fall 2006

# Midterm Exam # 1

(Friday, September 29, 2006)
(Closed Book Exam, One Formula Sheet Allowed)
(Total Time: 55 minutes)

## Name:_____☺

## *Signature:_____*☺

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

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

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**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 voltage $v_x$ across the 180 $\Omega$ resistor. (Please show your work clearly and provide brief justifications for the steps you take. Also, don't forget to provide the correct units for your answers.)
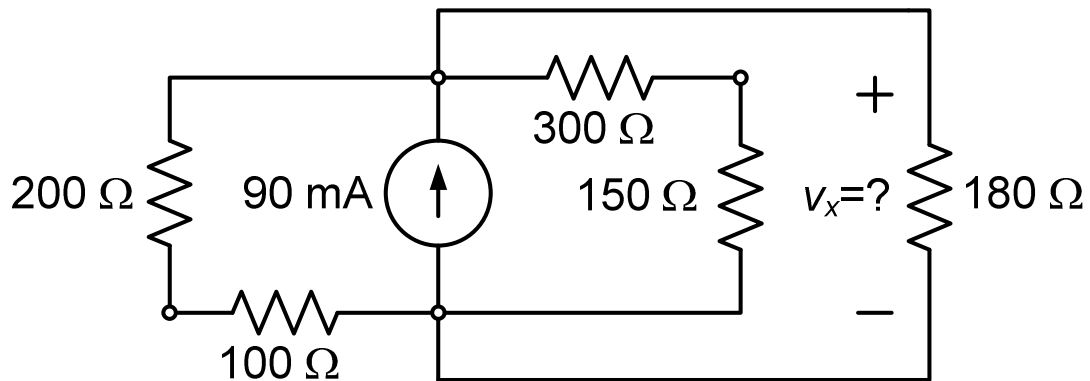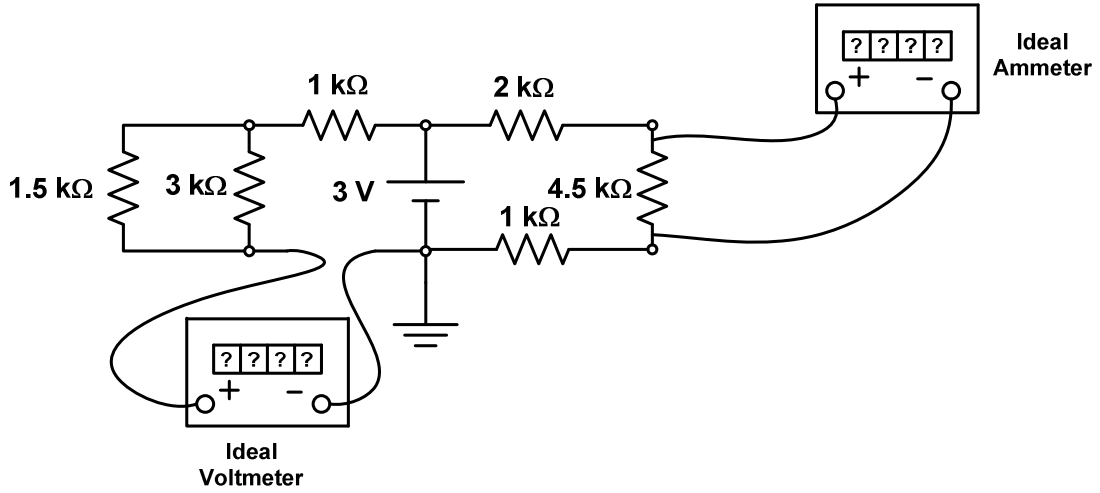
2. (Total: 25 Points) Consider the circuit with two digital multi-meters (DMM's) connected as shown.
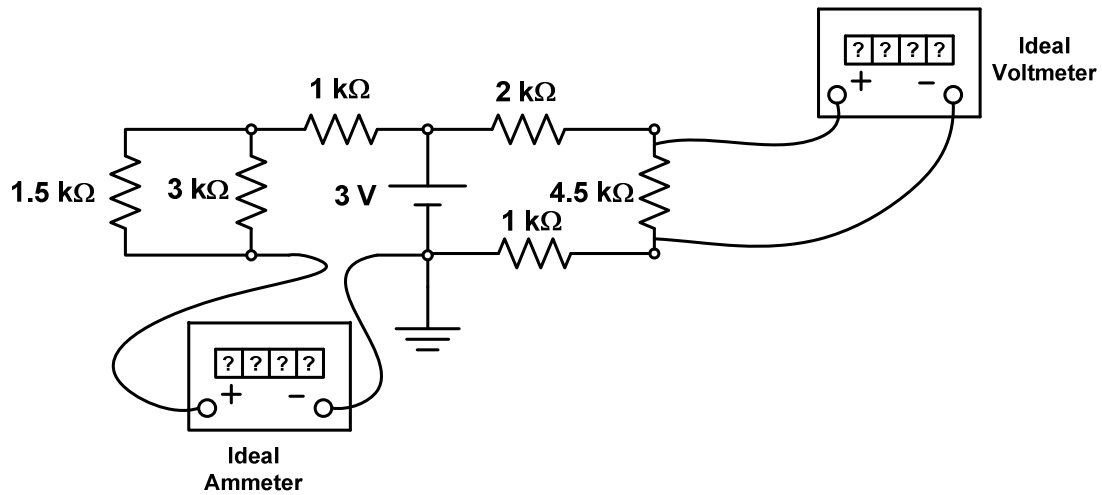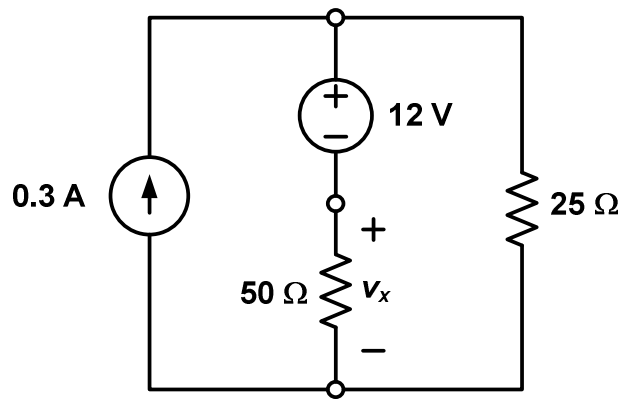


(a) (12.5 points) Find the two DMM readings. Please indicate the appropriate units. (*Note:* Pay attention to the polarities of each DMM!)

(b) (12.5 points) Repeat part (a) if both DMMs are mistakenly set as shown below. Again, indicate your units.

3. (25 Points) Consider the circuit shown. Determine the voltage $v_x$ across the 50 Ω resistor. Please show your work step by step.

4. (25 Points) In the circuit shown, find the power of each voltage source. Indicate the type of each power (i.e., supplied or absorbed). Please show your work step by step.

$v_S = 15$ V

$-$ $+$

4 kΩ     6 kΩ

1.5 kΩ     $+$ $-$ 9 V     3 kΩ