

ECSE 2010
Electric Circuits
Exam 1
Spring 2006

Name _____

Section (please circle one)

MR	MR	MR
10-12	2-4	4-6
Millard	Salama	Kraft

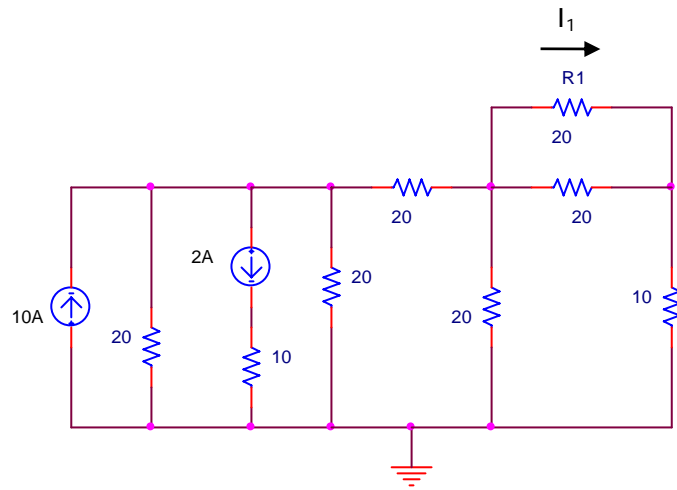
Problem No.	Pts.	Score
1	20pts	
2	20pts	
3	20pts	
4	20pts	
5	20pts	
Total	100pts	

Please Note:

- * Place all your answers in the spaces provided.
- * You MUST show your work to receive any credit.

Problem 1 (20pts)

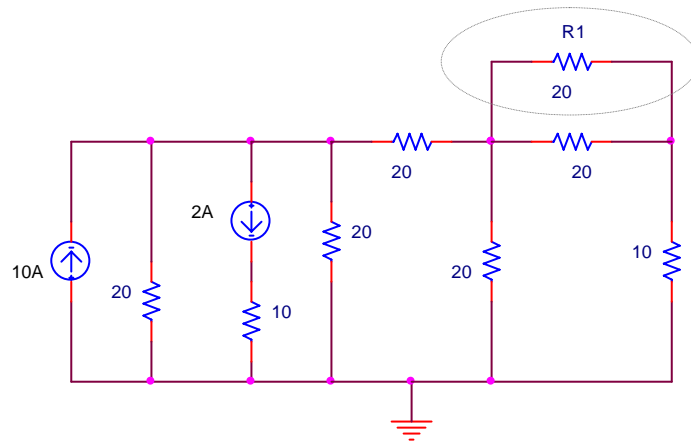
a.) Find I_1 in the circuit shown. (10pts)



I_1	
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Problem 1 (cont)

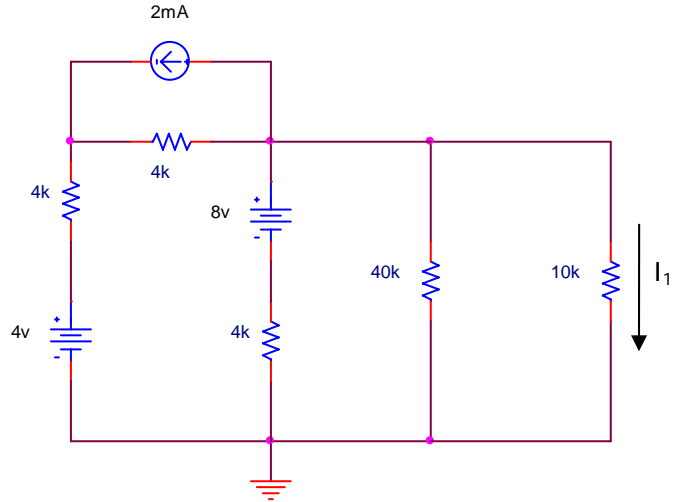
b.) Find the power absorbed by R_1 for in the circuit shown. (10pts)



P_{R1}	
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Problem 2 (20pts)

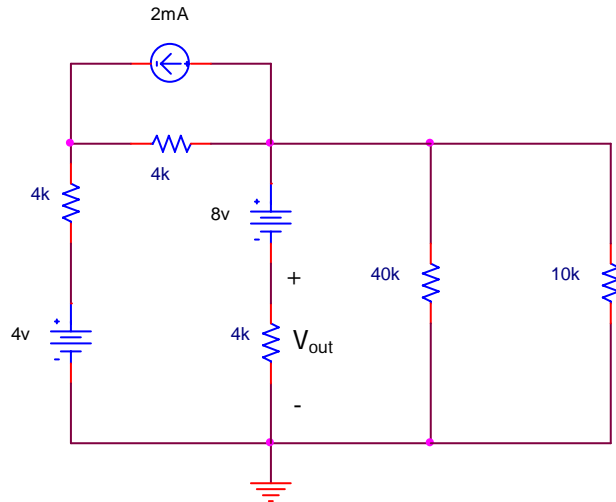
a.) Find I_1 (flowing through the 10k resistor) due to each of the sources using superposition for the circuit shown. (15pts)



I_1 (4v)	
I_1 (2mA)	
I_1 (8v)	

Problem 2 (cont)

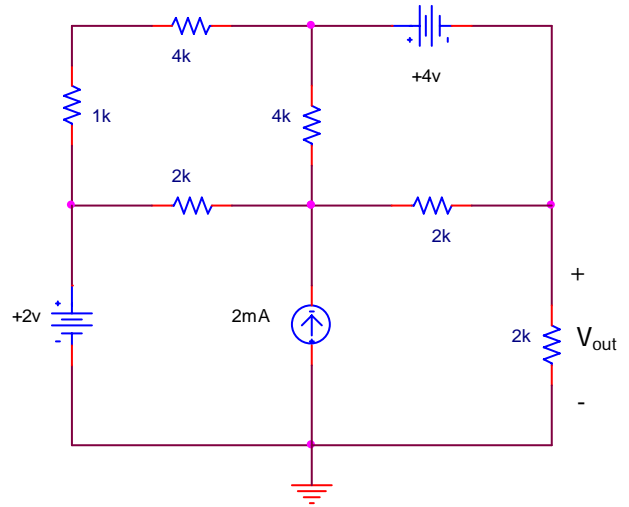
b.) Find V_{out} across the designated 4k resistor in the circuit shown. (5pts)



V_{out}	
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Problem 3 (20pts)

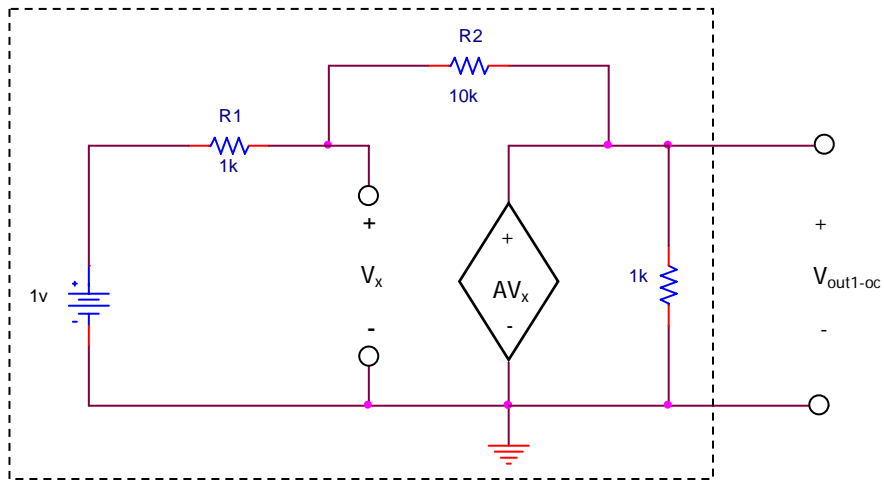
Find V_{out} for the circuit shown using your choice of either mesh or nodal analysis.



V_{out}	
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Problem 4 (20pts)

Given the following circuit:



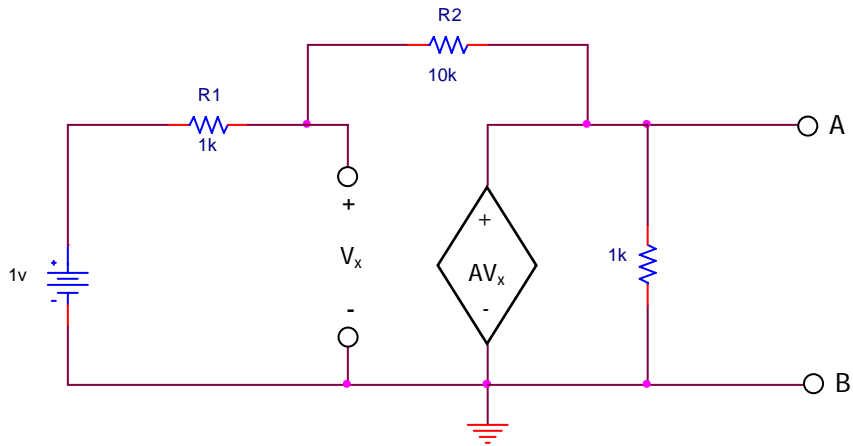
a.) Find $V_{out1-oc}$ ($V_{Thevenin}$), the open circuit output voltage if $A=9$. (5pts)

V_{TH}	
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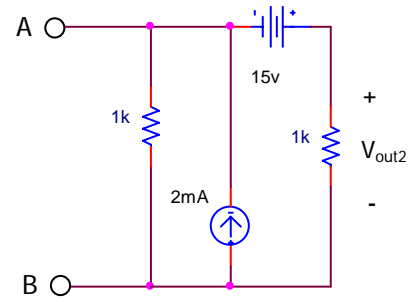
b.) Find the equivalent resistance ($R_{Thevenin}$) that a multimeter would read across the two wires that exit the box if $A=9$. (5pts)

R_{TH}	
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Problem 4 (cont)



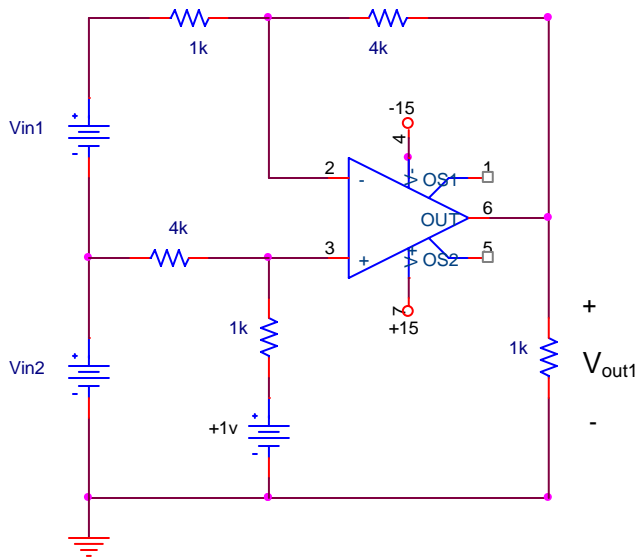
c.) Find V_{out2} if the following load network is connected to the output of the above circuit and $A=100,000$. (10pts)



V_{out2}	
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Problem 5 (20pts)

Assume that all the Op Amps have ± 15 volt supplies for the following circuits.

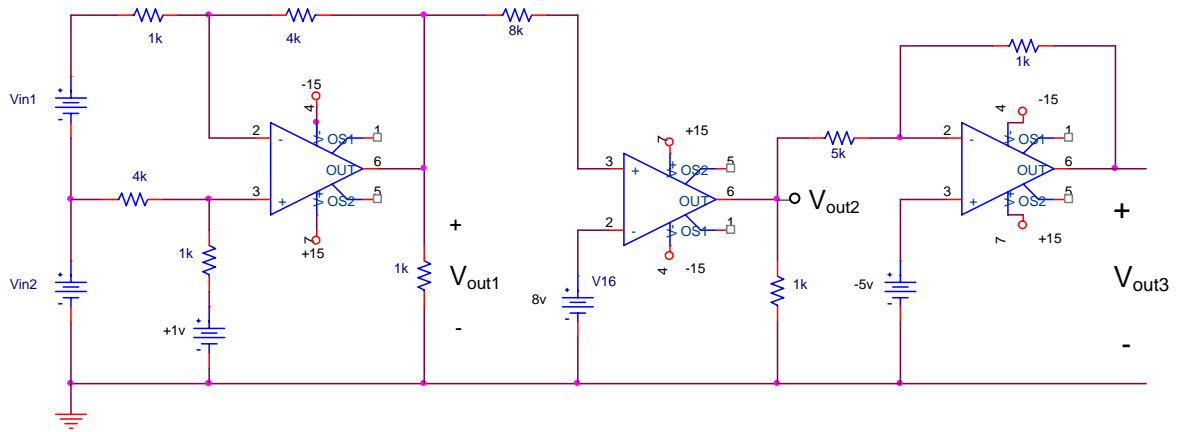


a.) Find V_{out1} in terms of V_{in1} and V_{in2} (shown the above circuit). (10pts)

V_{out1}	
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Problem 5 (cont)

b.) Find the expression relating V_{out2} to V_{out1} . (5pts)



V_{out2}	
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c.) Find V_{out3} if $V_{in1} = -2v$ and $V_{in2} = +2v$ (using the circuit shown in part B above). (5pts)

V_{out3}	
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Extra space (if needed)

Name _____

Extra space (if needed)

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