

ECSE 2010  
Electric Circuits  
Exam 1  
Fall 2007

Name \_\_\_\_\_

Section (please circle one)

MWR  
10-12  
Millard

MWR  
12-2  
Zhang

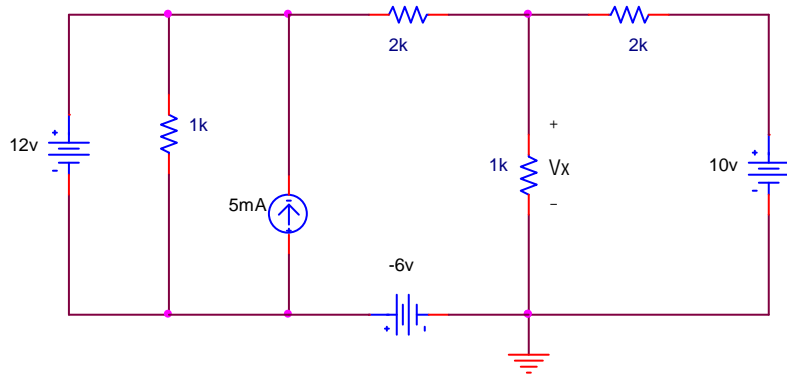
Problem No.	Pts.	Score
1	20pts	
2	20pts	
3	20pts	
4	20pts	
5	20pts	
Total	100pts	

Please Note:

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

Problem 1 (20pts)

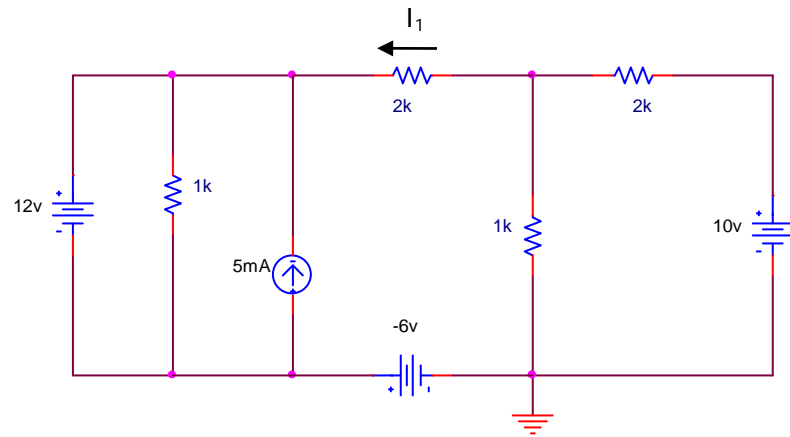
a.) Find the voltage  $V_x$  (across the 1k ohm resistor) in the circuit shown. (10pts)



$V_x$	
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Problem 1 (cont)

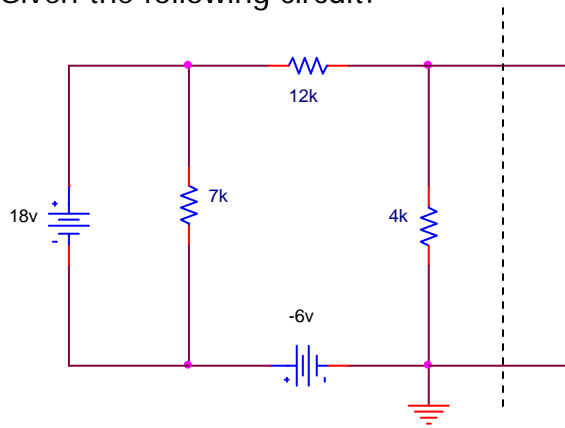
b.) Find the current  $I_1$  in the circuit shown. (10pts)



$I_1$	
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Problem 2 (20pts)

Given the following circuit:

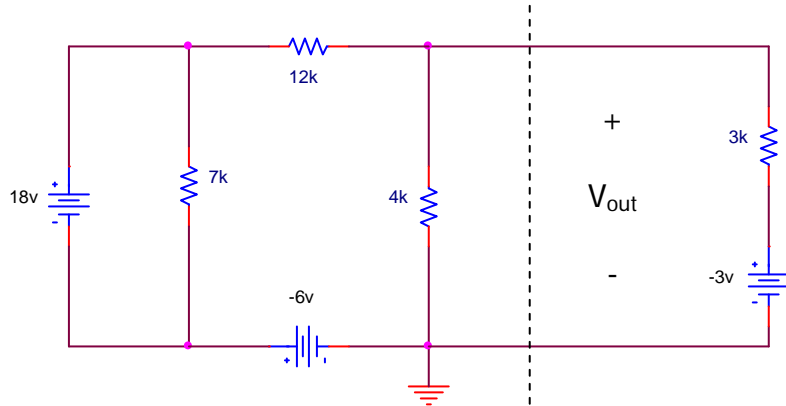


a.) Find the Thevenin equivalent circuit to the left of the dashed line. (10pts)

$V_{TH}$	
$R_{TH}$	

Problem 2 (cont)

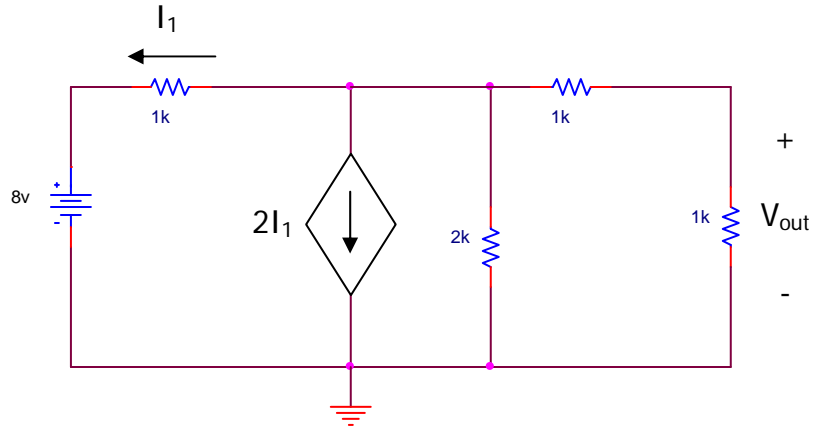
b.) Find  $V_{out}$  across the 4k resistor if it is connected to the series 3k resistor and -3v source as shown below. (10pts)



$V_{out}$	
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Problem 3 (20pts)

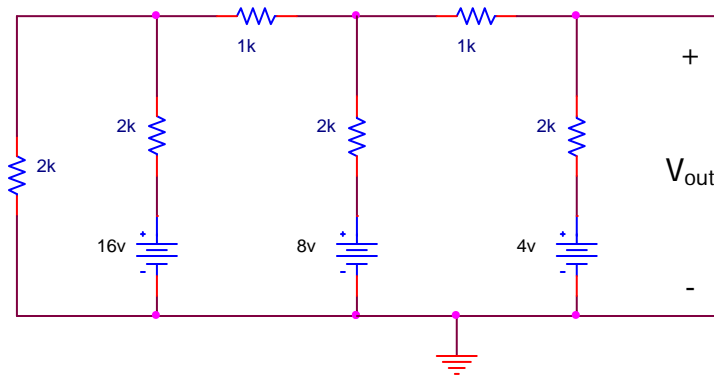
Find  $V_{out}$  across the 1k resistor in the circuit shown below. Please show all your work.



$V_{out}$	
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Problem 4 (20pts)

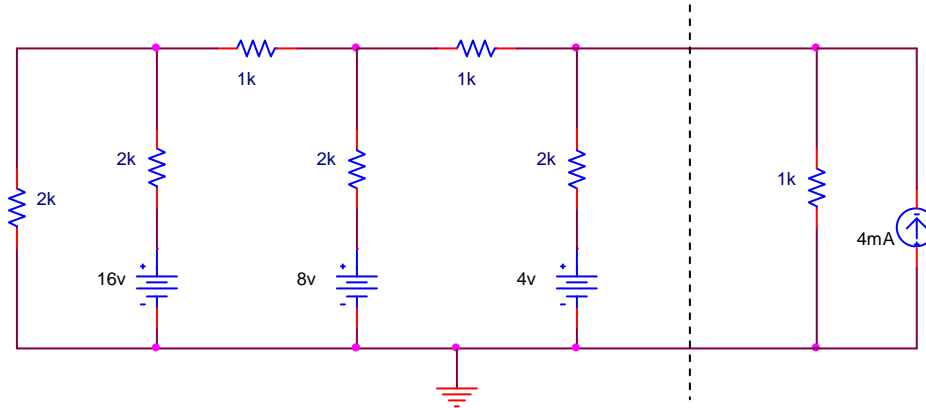
a.) Find the voltage  $V_{out}$  (which is taken across the combination of the 2k ohm resistor and the 4v source) due to each of the sources using superposition for the circuit shown. (12pts)



$V_{out}$ (16v)	
$V_{out}$ (8v)	
$V_{out}$ (4v)	

Problem 4 (cont)

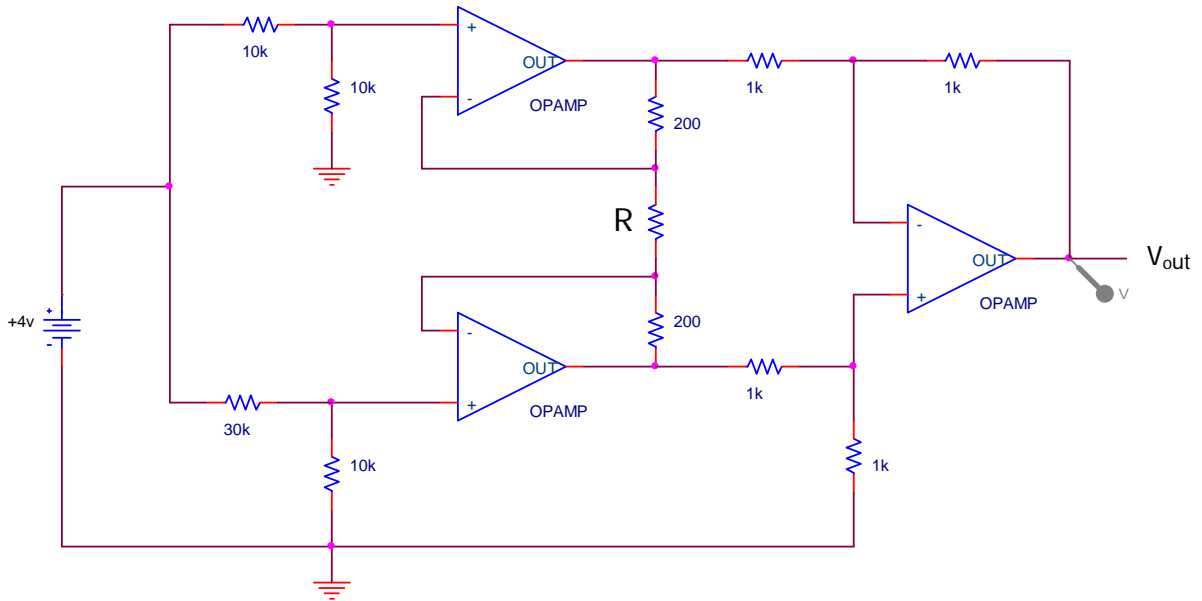
b.) Find the power supplied by the 4mA source in the circuit shown.  
Hint: Use the result from part a. (8pts)



$P_{4mA}$	
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Problem 5 (20pts)

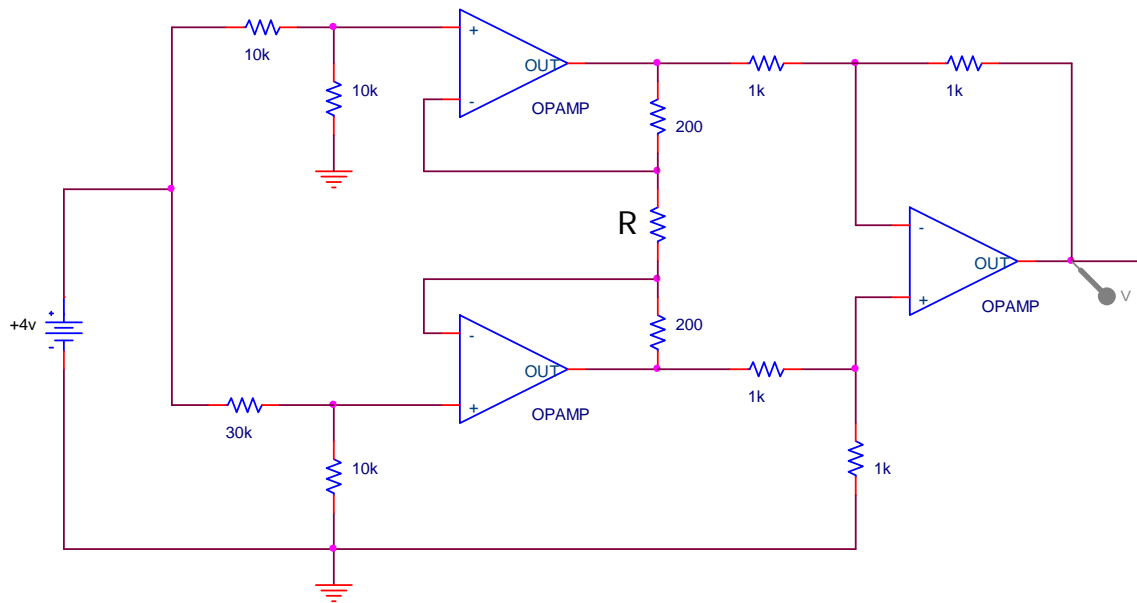
Assume that all the Op Amps have  $\pm 15$  volt supplies for the following circuits.



a.) Find the voltage ( $V_{out}$ ) that would be recorded by the probe in the above circuit if the resistor  $R = 100\text{meg}$  ohms. (10pts)

$V_{out}$	
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Problem 5 (cont)



b.) Find the voltage ( $V_{out}$ ) that would be recorded by the probe in the above circuit if the resistor  $R = 100$  ohms. (10pts)

$V_{out}$	
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Extra space (if needed)

Name \_\_\_\_\_

Extra space (if needed)

Name \_\_\_\_\_