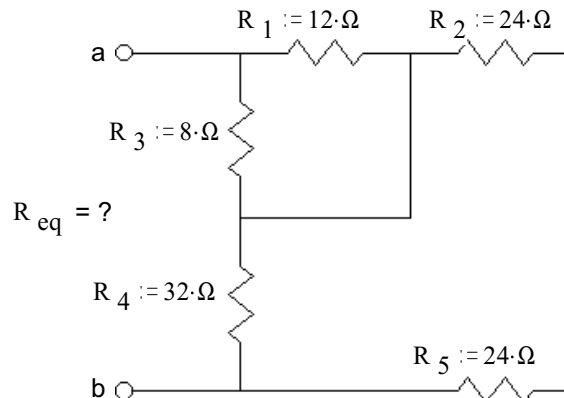


# ECE1050/60 Exam 1 given: Fall 04

(The space between problems has been removed.)

To get the most possible partial credit, always show all the intermediate values that you can calculate. If further calculations depend on a value that you can't figure out, just use a letter (like  $I_{R1}$ ) or a guessed value and proceed.

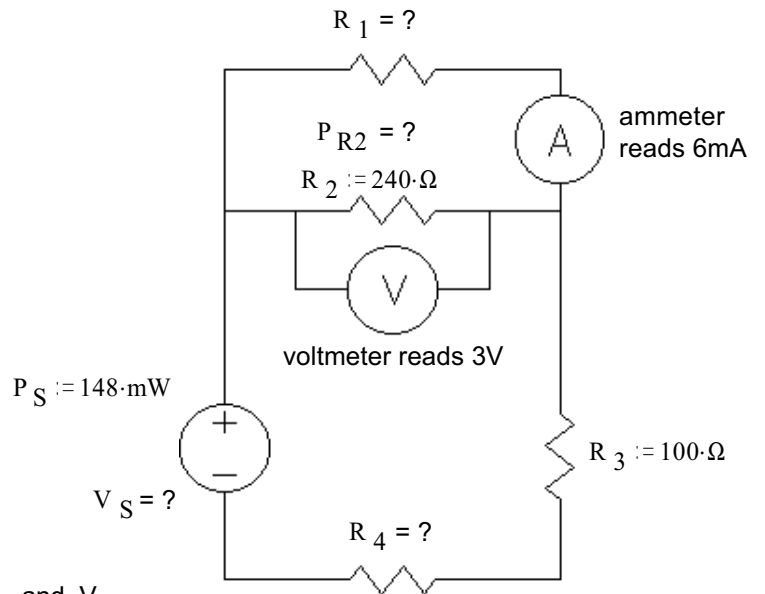
1. (12 pts) Find the equivalent resistance of this network, i.e. what would an ohmmeter read if hooked to the terminals a and b.



2. (5 pts) A 10V source is hooked to the terminals a and b at right. Use the voltage divider concept to find the voltage across resistor  $R_4$ .

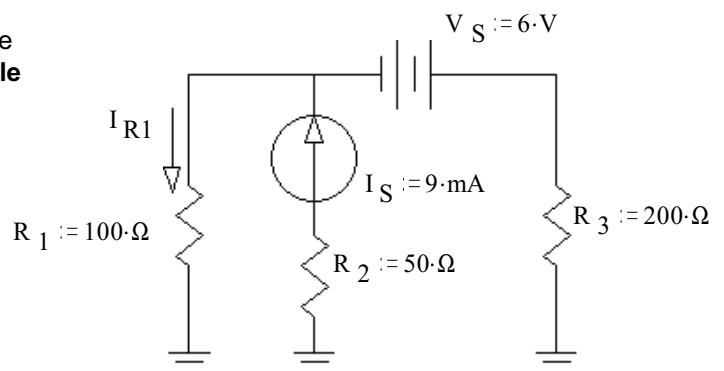
3. (24 pts) In the circuit shown find the resistor values of  $R_1$  &  $R_4$ , the power dissipated by  $R_2$ , and the source voltage ( $V_S$ ).

Note: feel free to show answers & work right on the schematic



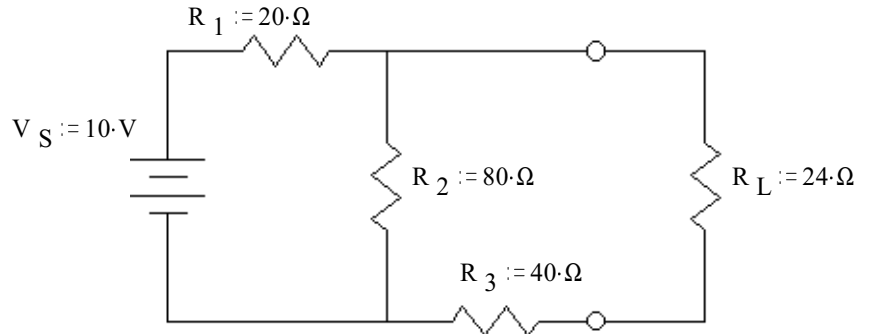
Reminder, you were asked for 4 items:  $R_1$ ,  $R_4$ ,  $P_{R2}$ , and  $V_S$ .

4. (15 pts) a) Use the method of superposition to find the current through  $R_1$ . Be sure to clearly show and **circle** your intermediate results.



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5. (18 pts) a) Find and draw the Thévenin equivalent of the circuit shown. The load resistor is  $R_L$ .

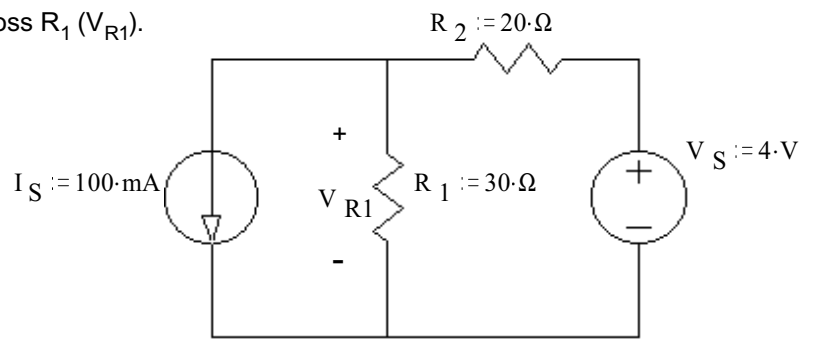


b) Find and draw the Norton equivalent of the same circuit.

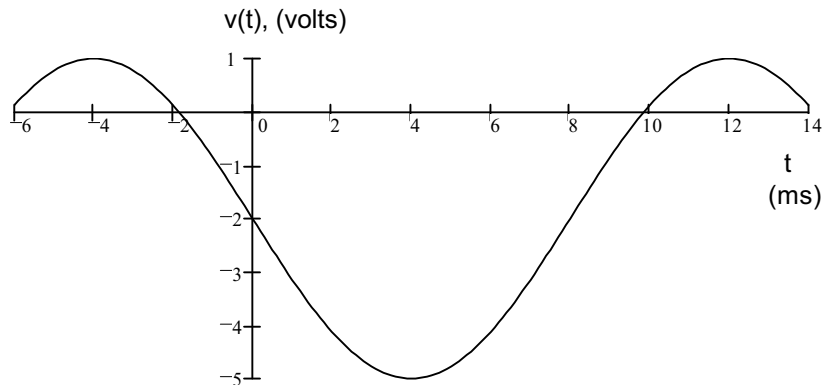
c) Find the load current using your Thévenin equivalent circuit.

6. (15 pts) Use nodal analysis to find the voltage across  $R_1$  ( $V_{R1}$ ).

You **MUST** show all the steps of nodal analysis work to get credit, including drawing appropriate symbols and labels on the circuit shown.

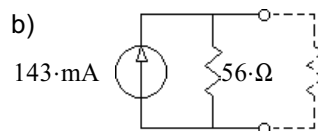
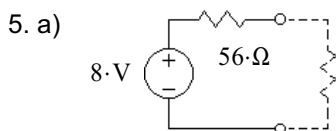


7. (11 pts) For the waveform shown, find a complete expression for  $v(t)$ , include numbers and units.



**Answers**

- 1.  $24\cdot\Omega$       2.  $8\cdot V$
- 3.  $500\cdot\Omega$      $170.3\cdot\Omega$      $37.5\cdot mW$      $8\cdot V$
- 4.  $6\cdot mA - 20\cdot mA = -14\cdot mA$



c)  $0.1\cdot A$

6.  $1.2\cdot V$

7.  $3\cdot V\cdot\cos(392.7\cdot t + 90\cdot\text{deg}) - 2\cdot V$

ECE 1050 / 60 Midterm #1 Arn Stolp

Name \_\_\_\_\_

Scores:

Pages 1&2 \_\_\_\_\_ of a possible 41 pts

Pages 3&4 \_\_\_\_\_ of a possible 33 pts

Pages 5&6 \_\_\_\_\_ of a possible 26 pts

Total \_\_\_\_\_ of a possible 100 pts