

ECE 2210/00 Exam 1 given: Fall 14 (The space between problems has been removed.)

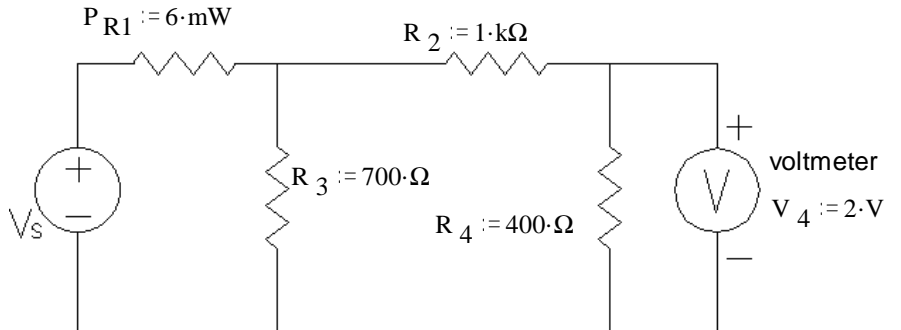
To get the most possible partial credit, always show all the intermediate values that you can calculate. If further calculations depend on a value that you can't figure out, just use a letter (like I_{R1}) or a guessed value and proceed.

1. (24 pts) In the circuit shown we measure the voltage across R_4 as 2.0 V.

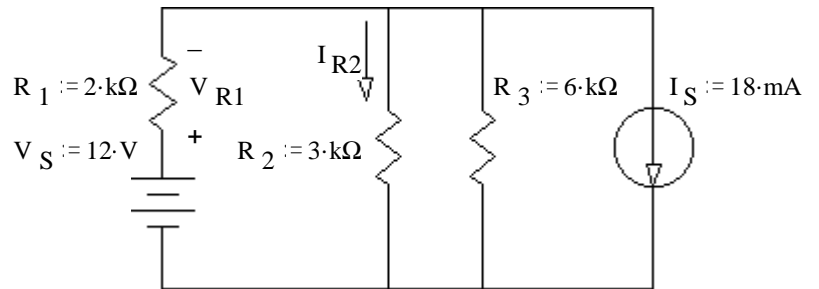
The power dissipated by R_1 is 6mW.

- a) What must V_s be?
- b) What is the value of R_1 ?
- c) How much power does R_4 dissipate?

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

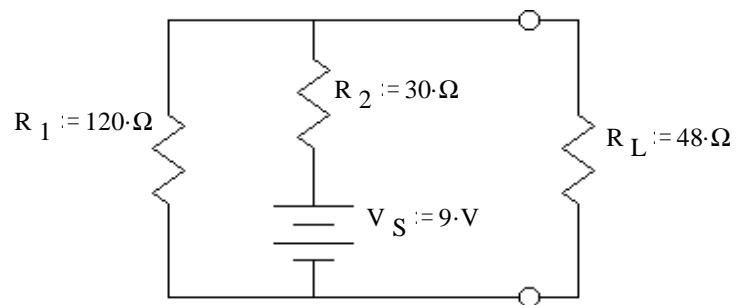


2. (25 pts) a) Use the method of superposition to find V_{R1} and I_{R2} . Be sure to clearly show and **circle** your intermediate results.



3. (18 pts)

a) Find and draw the Thévenin equivalent of the circuit shown. The load resistor is R_L .



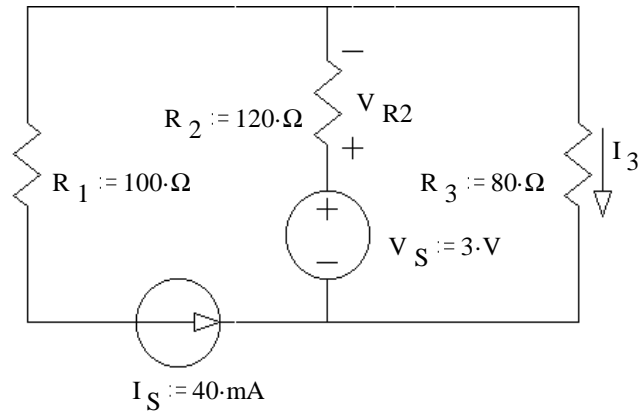
b) Find and draw the Norton equivalent of the same circuit.

c) Find the power dissipated by the load.

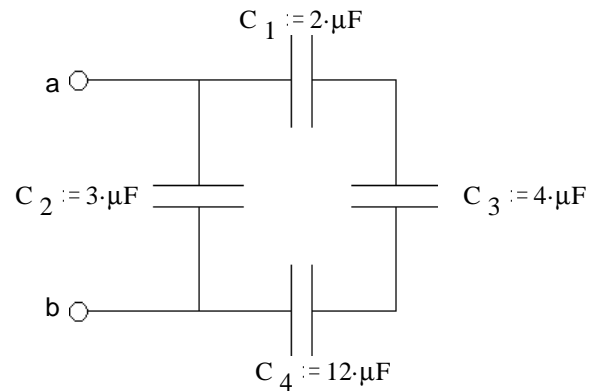
4. (24 pts) Use nodal analysis to a) find the voltage across R_2 (V_{R2}).

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

b) Find the current through R_3 (I_3).



5. (8 pts) Find C_{eq} between terminals a and b.



Answers

- | | | | | |
|-------------|------------|-----------|------------------------|-------------------|
| 1. a) 7.4 V | b) 26.67 Ω | c) 10 mW | 2. 2 mA - 6 mA = -4 mA | 6 V + 18 V = 24 V |
| 3. a) | b) | c) 0.48 W | 4. 3.72 V - 9 mA | 5. 4.2 μF |

