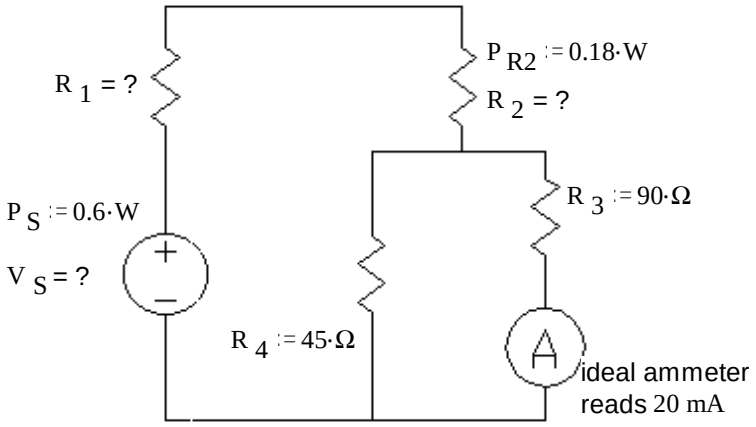
ECE 2210/00 Exam 1 given: Spring 18

(The space between problems has been removed.)

Closed Book, Closed notes, Calculators OK, Show all work to receive credit

Circle answers, show units, and round off reasonably

1. (24 pts) The ammeter, A, reads $20\ \text{mA}$.
   Remember that ideal ammeters have no resistance.

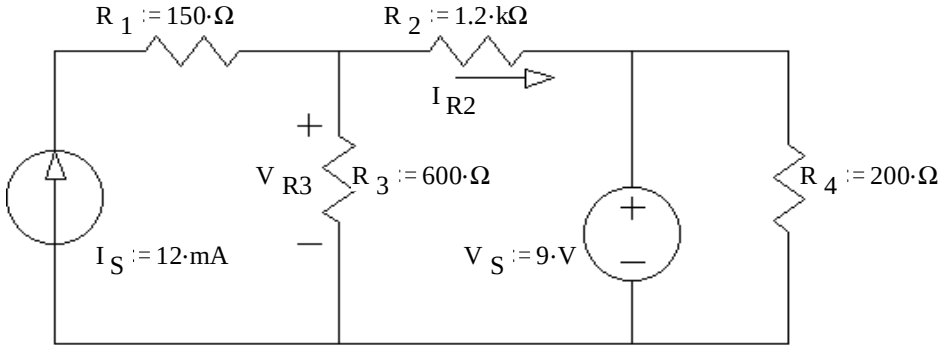


   a) The power dissipated by R_2 is $0.18\ \text{W}$, what is the value of R_2?

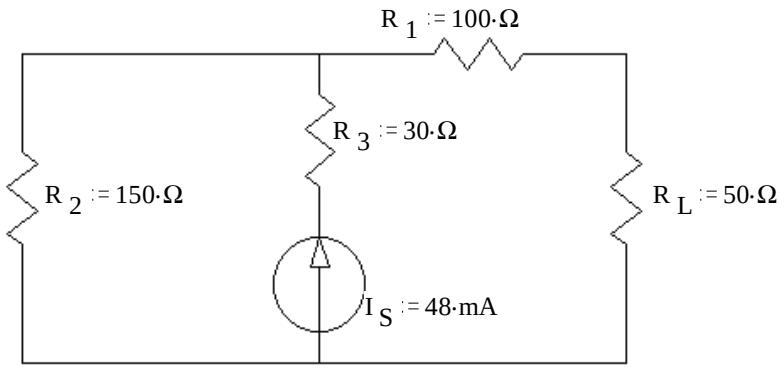
   b) The source provides 0.6W of power. What is the value of V_S?

   c) What is the value of R_1?

2. (24 pts) Use the method of superposition to find the voltage across R_3 (V_{R3}) and the current through R_2 (I_{R2}). Be sure to clearly show and **circle** your intermediate results.



3. (26 pts) a) Find and draw the Thévenin equivalent of the circuit shown. The load resistor is R_L.



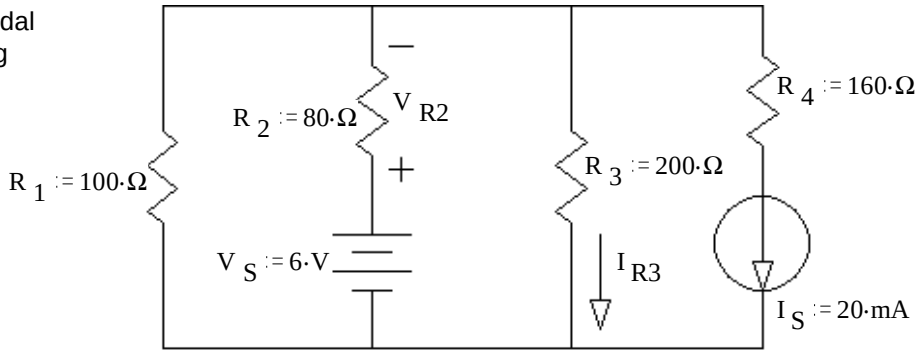
b) Find and draw the Norton equivalent of the same circuit.

c) Find the Voltage across the load using your Thévenin equivalent circuit. V_{RL} = ?

d) Select a load resistor to maximize the power delivered to the load and find that maximum power. P_{RLmax} = ?

4. (26 pts) a) Use nodal analysis to find the voltage across R_2 (V_{R2}).

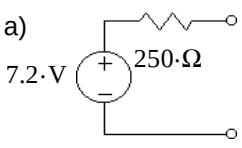
You **MUST** show all the steps of nodal analysis work to get credit, including drawing appropriate symbols and labels on the circuit shown.



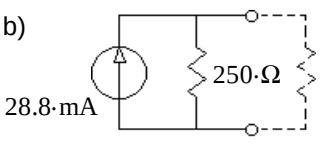
Answers

1. a) 50·Ω b) 10·V c) 86.7·Ω

3. a)



b)



c) 1.2·V
d) 51.8·mW

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2. - 1·mA 7.8·V

4. a) 4·V b) 10·mA