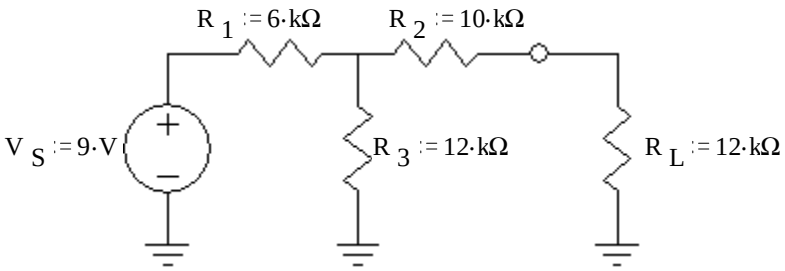
ECE 2210 / 00 homework DC5

a

Thevenin & Norton equivalent circuits

1. a) For the circuit shown, find and draw the Thevenin equivalent circuit. The load resistor is R_L.



b) Find the voltage across R_L (V_L) and the current through R_L (I_L) using your Thevenin equivalent circuit.

c) Find and draw the Norton equivalent circuit.

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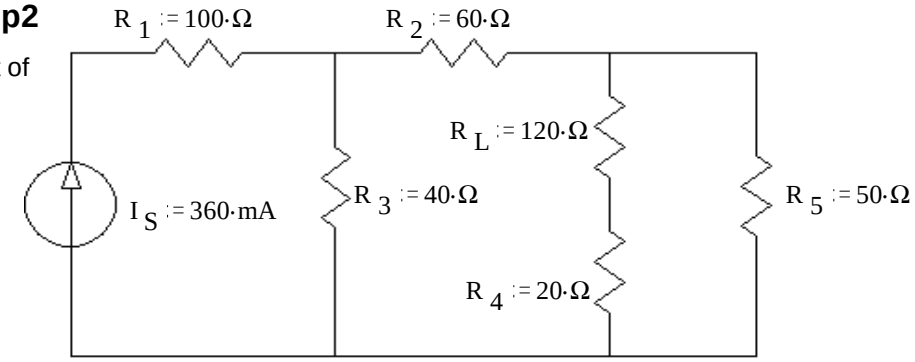
2. a) Find and draw the Thévenin equivalent of the circuit shown. The load resistor is R_L.



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

c) Find voltage across the load (V_{RL}).

d) Choose a value of load resistor (R_L) to maximize the power dissipation in the load and find that power.

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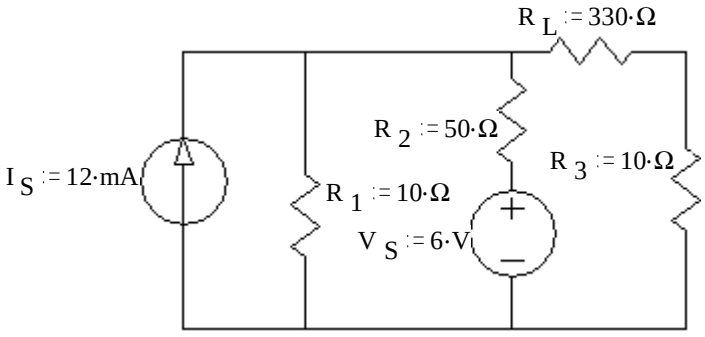
3. a) The load resistor is R_L, and is in a strange place in this circuit.
Hint: use superposition to find V_{Th}.
2nd hint: Nodal analysis is even easier.



b) Find and draw the Norton equivalent circuit.

c) Find V_L and I_L using your Norton equivalent circuit.

Answers

1. a) 6·V , 14·kΩ b) 2.77·V , 231·μA c) 429·μA , 14·kΩ
2. a) 4.8·V , 53.33·Ω b) 90·mA , 53.33·Ω c) 3.32·V d) 53.33·Ω 108·mW
3. a) 1.1·V , 18.3·Ω b) 60·mA , 18.3·Ω c) 3.16·mA, 1.042·V