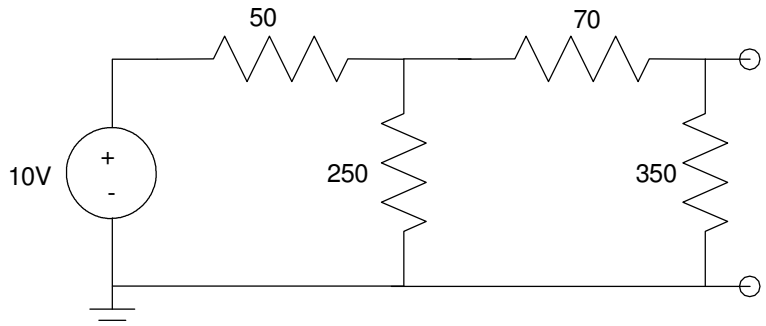
# EE 206: Homework #5

Thevenin Equivalents, Maximum Power Transfer. Due Monday, October 5th

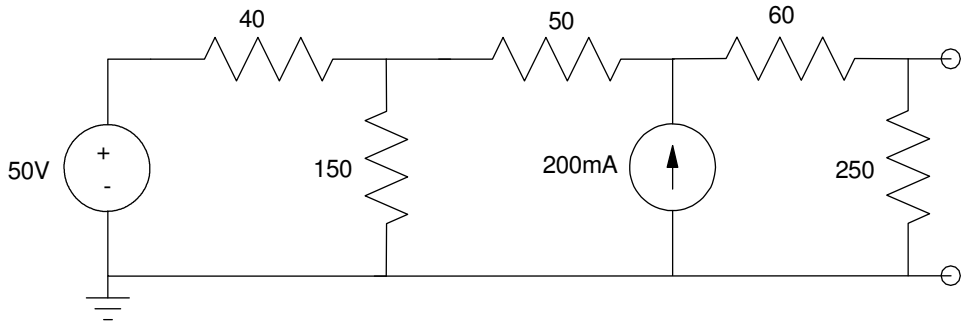
Please make the subject "EE 206 HW#5" if submitting homework electronically to lauren.n.singelmann@ndsu.edu (or on blackboard)

## Thevenin Equivalents

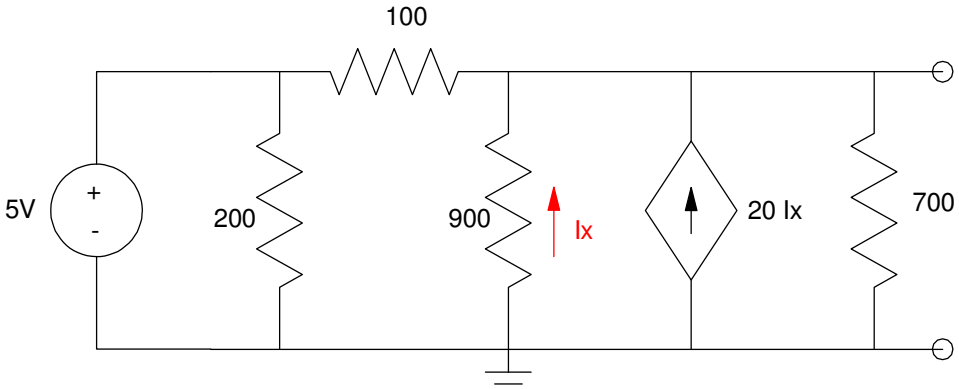
1) Find the Thevenin equivalent for the following circuit by transforming between Thevenin and Norton equivalents:



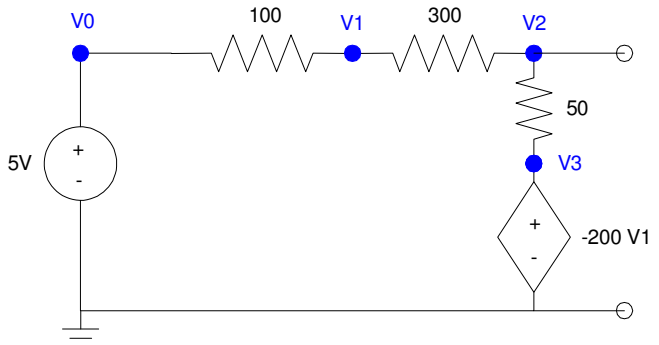

2) Find the Thevenin equivalent for the following circuit by transforming between Thevenin and Norton equivalents:




3) Find the Thevenin equivalent for the following circuit:

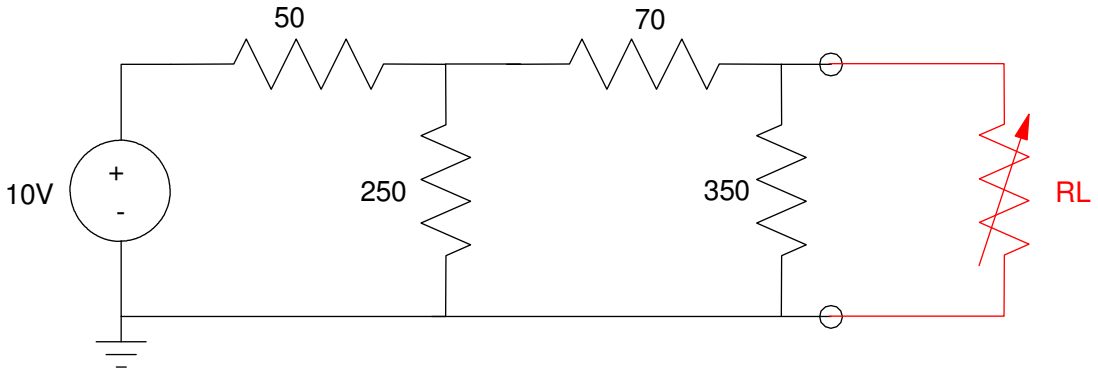


4) Find the Thevenin equivalent for the following circuit:




## Maximum Power Transfer

5) Determine RL so that the maximum power is delivered to the load (RL)




## CircuitLab

6) Simulate the circuit of problem 5. Determine the voltage and current at the load for

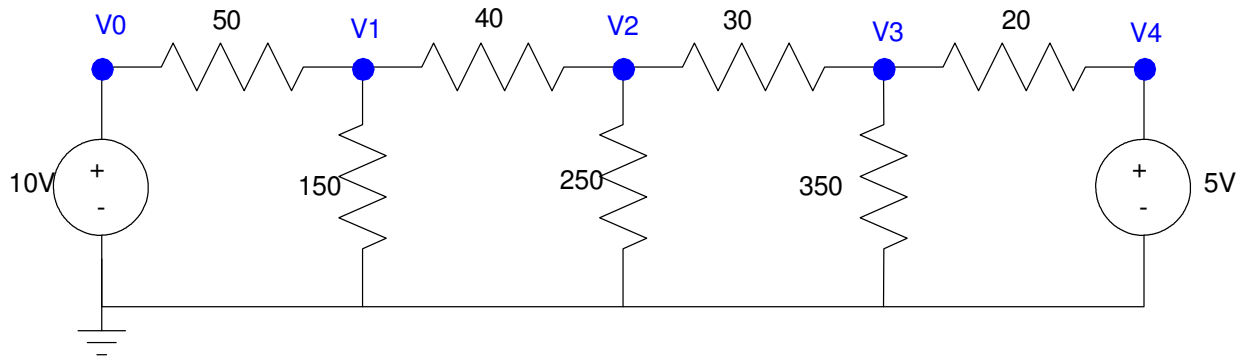
| | V | I | Power |
|---|---|---|---|
| R = 0 | | | |
| R = 10 | | | |
| R = max power | | | |
| R = 50 | | | |
| R = 100 | | | |
| R = infinite | | | |

## Superposition

7) Use Circuitlab to determine the votlage at Y assuming Va = 10V, Vb = 0V.

8) Use Circuitlab to determine the voltage at Y assuming Va = 0V, Vb = 5V.

9) Use Circuitlab to determine the votlage at Y assuming V1 = 10V, Vb = 5V




Does problem 7 + problem 8 = problem 9?

| | Va | V1 | V2 | V3 | Vb |
|---|---|---|---|---|---|
| Va = 10V<br>Vb = 0V | 10.00 V | | | | 0.00 V |
| Va = 0V<br>Vb = 5V | 0.00 V | | | | 5.00 V |
| Va = 10V<br>Vb = 5V | 10.00 V | | | | 5.00 V |