

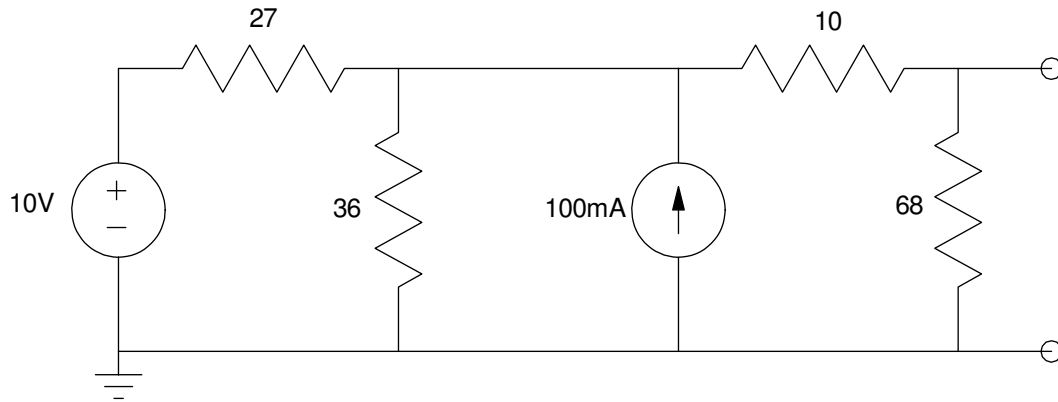
ECE 211 Test #2

Thevenin Equivalents - Max Power Transfer - Superposition - Operational Amplifiers

Thevenin Equivalent

Determine the Thevenin equivalent for the following circuit.

- Please show your work to get full credit



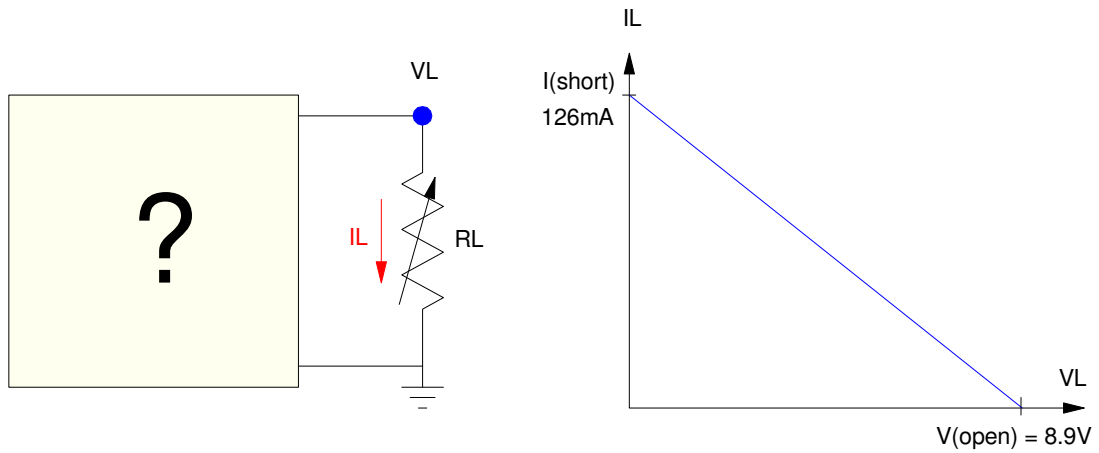
Max Power Transfer

Assume an unknown circuit has the following characteristics:

- Open-circuit voltage = 8.90V ($R_L = \text{infinity}$)
- Short-circuit current = 126mA ($R_L = 0$)

Find

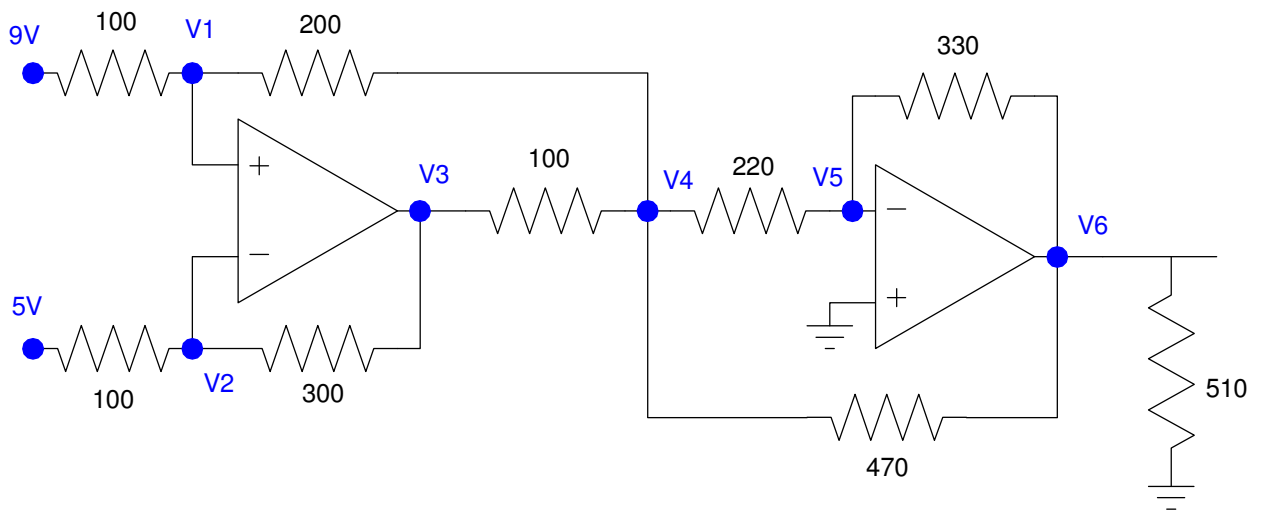
- R_L for the maximum power transfer to the load
- The maximum power you can get from this circuit



Ideal Op-Amps

Write the voltage node equations for the following circuit.

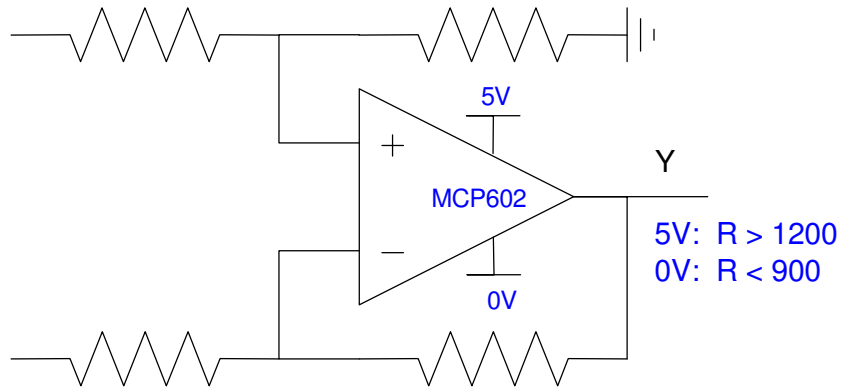
- Assume ideal op-amps.
- You don't need to solve (just write six equations for six unknowns)



Schmitt Triggers

Design a circuit which outputs

- 5V when $R > 1200$ Ohms
- 0V when $R < 900$ Ohms
- No change for $900 < R < 1200$ Ohms

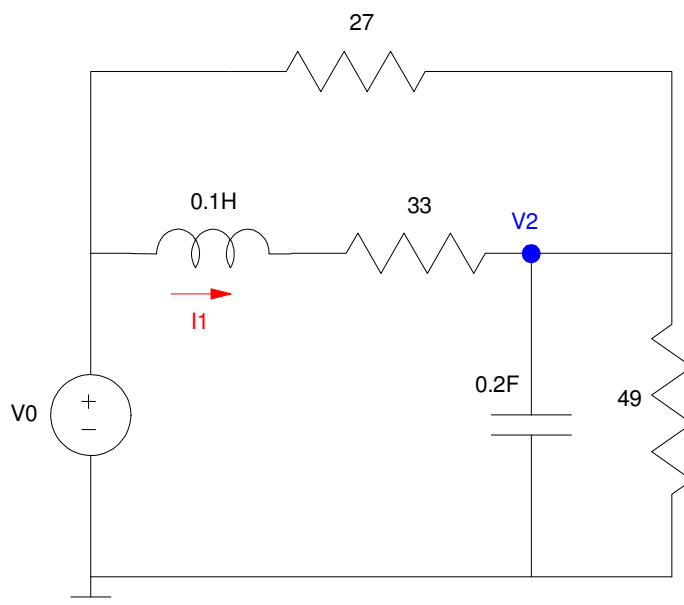


Capacitors & Inductors

Write the differential equations which describe the following RLC circuit

- You don't have to solve - just write the differential equations
- hint: Use the inductor and capacitor VI equations:

$$V = L \frac{dI}{dt} \qquad I = C \frac{dV}{dt}$$



Phasors

Find the impedance Z_{ab}

- Please show your work to get full credit

