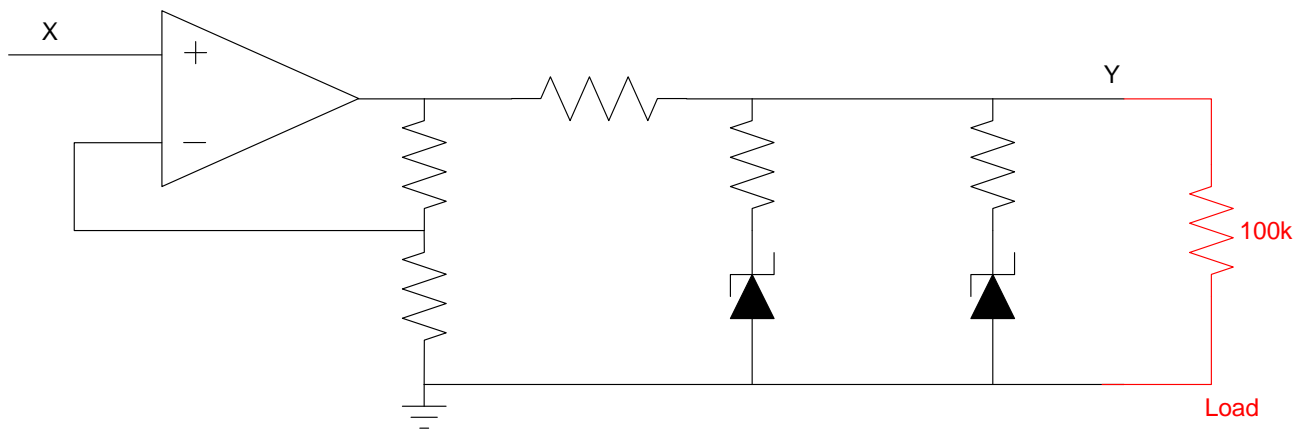
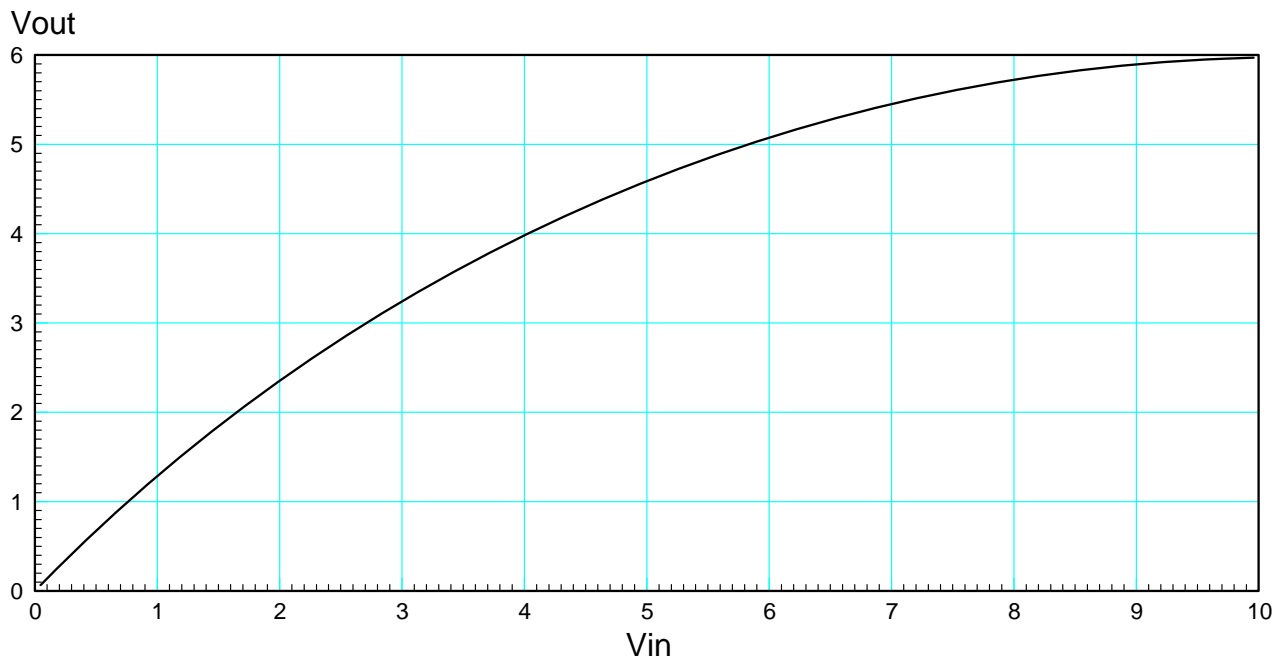


ECE 320 - Homework #4

Clipper, Max/Min, AC to DC Converters. Due Monday, September 18th, 2017

Clipper:

- 1) Design a circuit to approximate the following function.
 - Input: X. 0 .. 10V signal, capable of driving 20mA
 - Output: Y: 100k resistor
 - Relationship: shown below
 - Tolerance: +/- 1V
- 2) Check your design in PartSim (or similar program)

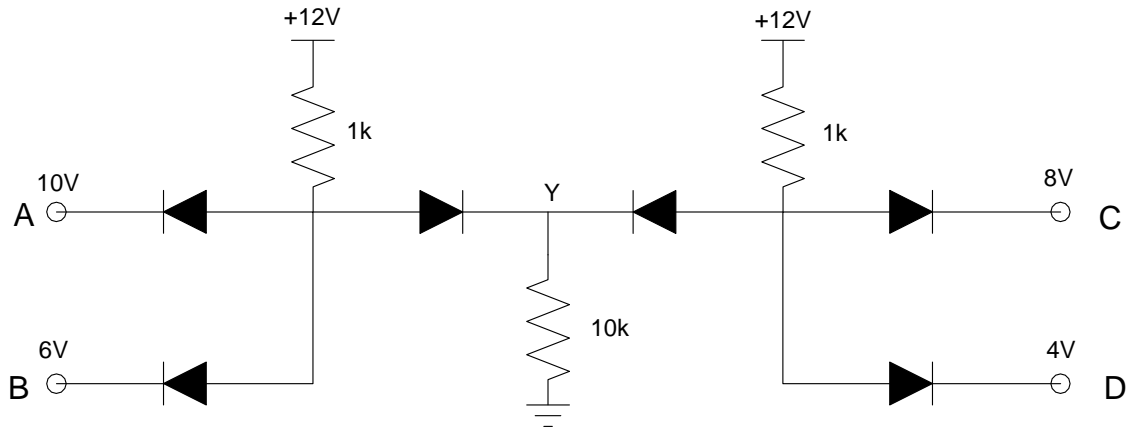


Max / Min

3a) Determine the voltages and currents for the following max/min circuit.

3b) What function does this implement?

$$Y = f(A, B, C, D)$$



AC to DC

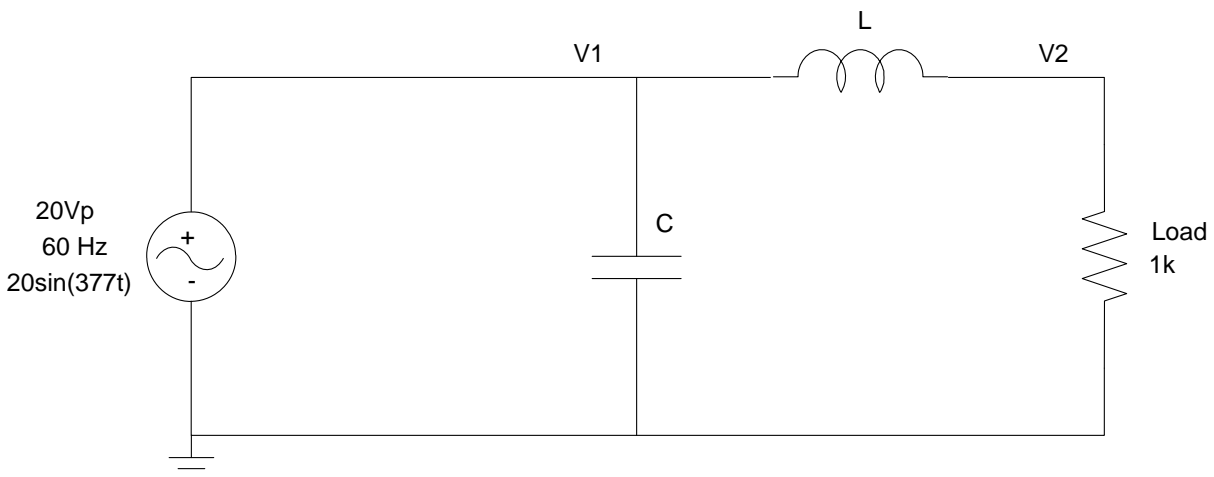
Design a circuit to meet the following requirements:

- Input: 20Vp 60Hz sine wave capable of driving 500mA (i.e. wall transformers in lab)
- Output: 1k Ohm resistor
- Relationship: V2 is a DC signal with 200mVpp ripple when the load is 1k Ohm
- Tolerance: +/- 50mVpp ripple with a 1k Ohm load

4a) Assume $L = 0$. Determine C so that the ripple at V2 is 1Vpp.

4b) Determine L so that the ripple at V2 is reduced to 200mVpp

4c) Check your design in PartSim



Lab:

6) Build and test one of these circuits in lab.