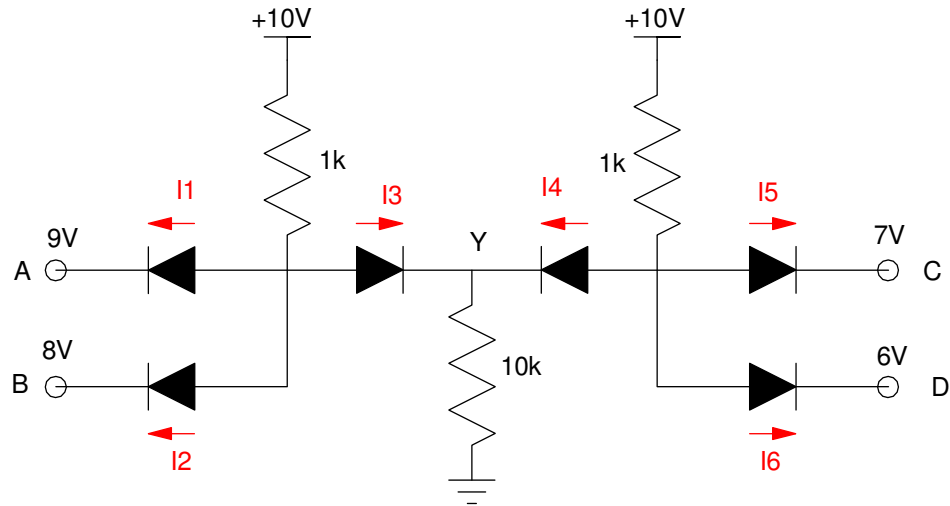


ECE 320 - Homework #4

Max/Min Circuits, Clipper Circuits, Transistors. Due Monday, Feb 4th, 2019

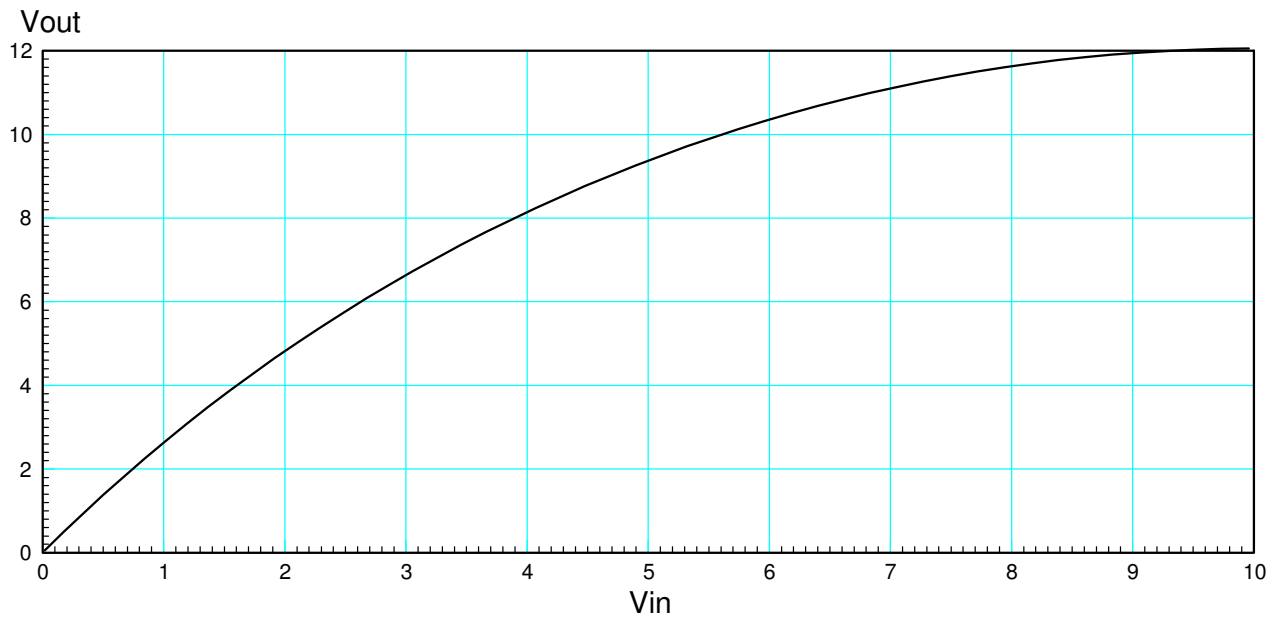
Max/Min:

- 1) Determine the voltages and currents for the following max/min circuit. What function does this circuit implement? $Y = f(A, B, C, D)$
- 2) Check your results in PartSim



Problem 1 & 2

Clipper Circuits:



Problem 3

3) Design a circuit to approximate the following function subject to the following requirements:

- Input: 0 .. 10V, capable of 100mA
- Output: 100k resistor
- Relationship: Graph below, +/- 200mV

4) Check your design in PartSim

5) Design a circuit which meets the following requirements:

- Input: -10 .. +10V, capable of 100mA
- Output: 1k resistor
- Relationship:

$$V_{out} = \begin{cases} +5V & V_{in} > +5V \\ V_{in} & -5V < V_{in} < +5V \\ -5V & V_{in} < -5V \end{cases}$$

Transistors

6) For the following transistor circuit and VI characteristics for the transistor, determine

- The current gain, β
- The load line
- The operating point for $V_{in} = \{0V, 5V, 10V, 15V\}$

