EE 230 — HW 4.9 Name_____

(a) Design a *clipping* circuit which takes an input voltage, v_s, that can vary between -5 V and +5V and produces an output voltage that:

- equals -3.5 V volts when $v_s \leq$ -3.5 V,
- equals the source voltage when -3.5 V $\leq v_s \leq$ +3.5 V, and
- equals +3.5 V when $v_s \geq$ +3.5.

The limits don't have to be exact, there can be a ±0.25 voltage variance in the limits.

For your design, you cannot use Zener diodes.

Hint: Think "stacks of diodes". Also, remember that diodes must have a current limiting resistor when forward biased.

(b) Test your design using SPICE. For the source, use a sine wave with an amplitude of 5 V. Perform a transient response that runs for at least two periods of the sine wave. Plot both the input and output together on one graph. (Or for even more fun, build the circuit in lab and test it using an oscilloscope.