EE 230 — HW 4.19 Name_____

For the comparator circuit shown below, determine V_{L+} and V_{L-} and then calculate the V_{TL} and V_{TH}. The op amp uses matched positive/negative power supplies with $V_{S+} > 8$ V and $V_{S-} < -8$ V. For the Zeners, $V_Z = 5$ V.

Hint: Note that the output of an op amp will still saturate high or low at levels near the power supply voltages. All you need to do is determine the two values of v_o (across the Zeners) when the op amp is saturated either high or low. Once you know V_{L+} and V_{L-}, the rest is straight-forward. Also, remember that a forward-biased Zener is just like a regular forward-biased (non-Zener) diode.

V_{L+} = _____

V_{L-} = _____

V_{TH} = _____

V_{TL} = _____