# ECE 3042
# Homework Assignment No. 6
## Fall 2009 Homework Problem Set for Experiment No. 5

**Due Week of October 19**

1. Use either Cadence or National Instruments SPICE to plot the voltage transfer characteristic $V_o$ versus $V_i$ for the circuit shown below for $-9\,\mathrm{V} \le V_i \le 9\,\mathrm{V}$. Assume that the op amp is ideal and that each of the four diodes is a 1N4148 (use the PSpice model for the 1N4148 diode). The component values are: $V^+ = 15\,\mathrm{V}$, $V^- = -15\,\mathrm{V}$, $R_1 = 4.7\,\mathrm{k\Omega}$, $R_2 = 5.6\,\mathrm{k\Omega}$, $R_3 = 11\,\mathrm{k\Omega}$, and $R_4 = 15\,\mathrm{k\Omega}$. Compare the simulation results with the theoretically expected values with regard to break points and slopes. Also plot the currents in the four diodes as functions of $V_i$.

2. Use either Cadence or National Instruments SPICE to plot the output voltage $v_o(t)$ as a function of time for the circuit shown below if the input is

$$v_i(t) = A\sin(\omega t)$$

where $A = 3,7\,\mathrm{V}$ and $f = 1\,\mathrm{kHz}$ for two cycles of $v_i(t)$. Compare the peak value of the output with the theoretically expected value.