1. After being on side 1 for a long time, the switch moves from side 1 to side 2 at $t = 0$.
   
   a) Find the value of $v_C(t = 0)$.
   
   b) Find an expression for $v_C(t > 0)$.
   
   c) Find the value of the energy stored by the capacitor at time $t = 3\tau$ where $\tau$ = time constant for circuit after $t = 0$.

2. A function generator outputs the following signal, $v_i(t)$.

   Design op-amp circuits to output each of the following waveforms when $v_i(t)$ is the input. You may use either one or two op-amps in each case.

   a)

   b)
3.

The above circuit is from Lab 4, but some of the component values have been changed.

a) Find the minimum and maximum values allowed for $R_1$ in order to achieve proper operation: 1) successfully generating a triangle wave (which requires that $v_1$ switches from high to low and back), and 2) avoiding clipping that would occur if $v_2$ exceeded the rail voltage for the op-amp.

b) Choose an allowed value for $R_1$ and calculate the period of $v_2(t)$.

c) Draw a graph of $v_2(t)$ and $v_3(t)$ for at least one period of $v_2(t)$. Label all important times and voltages on the graph.