1. Answer the following questions about the ionization of trichloracetic acid.
   a. At 25.0° C , what is the standard Gibbs Free energy for the ionization of trichloroacetic acid given the
      $\Delta H°$ is 6.3 kJ/mol and the $\Delta S°$ is 8.4 J/mol-K. Is the ionization product or reactant favored?

   b. What is the pKa of trichloracetic acid?

   c. Is trichloracetic acid weaker or stronger than acetic acid ($K_a = 1.8 \times 10^{-5}$)

2. It is determined for chemical reaction that ΔH° is 185 kJ/mol and ΔS° is 1.8 J/mol-K. Answer the following questions

a. Is the reaction endo or exothermic at 25.0 °C?

b. What is the ΔG° for the reaction? Is the reaction spontaneous at 25.0°C?

c. At what temperature does the reaction become spontaneous? Is this temperature practical for lab? (you can assume enthalpy and entropy changes do not vary significantly with temperature)