1. Consider the following situation: Two beakers labeled 1 and 2 are each filled with 50.0ml of neutral water. A chemist has two unknown solution of monoprotic acid dissolved in water. The chemist adds 5 drops of unknown solution A to beaker 1 and 5 drops of unknown solution B to beaker 2. The pH in beaker 1 drops to 6.2 and the pH in beaker 2 drops to 5.9. Classified True or False, explain why?
    a. Unknown B is a stronger acid than unknown A.
    b. The hydrogen ion concentration in beaker 1 is higher than the hydrogen ion concentration in beaker 2.
    c. Unknown A and unknown B are both weak acids.
    d. Unknown A and unknown B are both diluted solutions.
    e. The pOH of the solution in beaker 1 is greater than the pOH of the solution in beaker 2.

2. An unknown organic acid is somewhat soluble in water. When 6.25g of the unknown acid is added to 1.20 L of neutral water, the freezing point decrease to -.0793 and the pH decrease to 2.79.
    a. compute the molecular weight of the unknown acid
    b. compute the Ka and pKa of the unknown acid.
    c. Find the unknown acid, using table of Ka
    d. Use an appropriate source to find the molecular weight of the compound for c. does this molecular weight match with what you compute for part a?

3. A mixture of 1.00mmol of H_2 and 5.00mmol of I_2 is placed in a .5L container at a certain temperature and allowed to come to equilibrium. Analysis of the mixture shows that the concentration of HI is .87mM.
    a. Compute K_c for the reaction $H_2 + I_2$ yield 2HI

    b. Compute Kp for the reaction.

    c. Is the reaction product favored or reaction favored?

    d. If some HI were added to the flask at equilibrium , would the reaction shift to the left, shift to the right or stay the same.

    e. If some H2 were added to the flask at equilibrium , would the reaction shift to the left, shift to the right or stay the same?

f. If 1.200mmol if H2 and 1.200mmol of HI are added to the flask, will the equilibrium shift to the left, right or stay the same? Justify your answer by computing the reaction quotient.