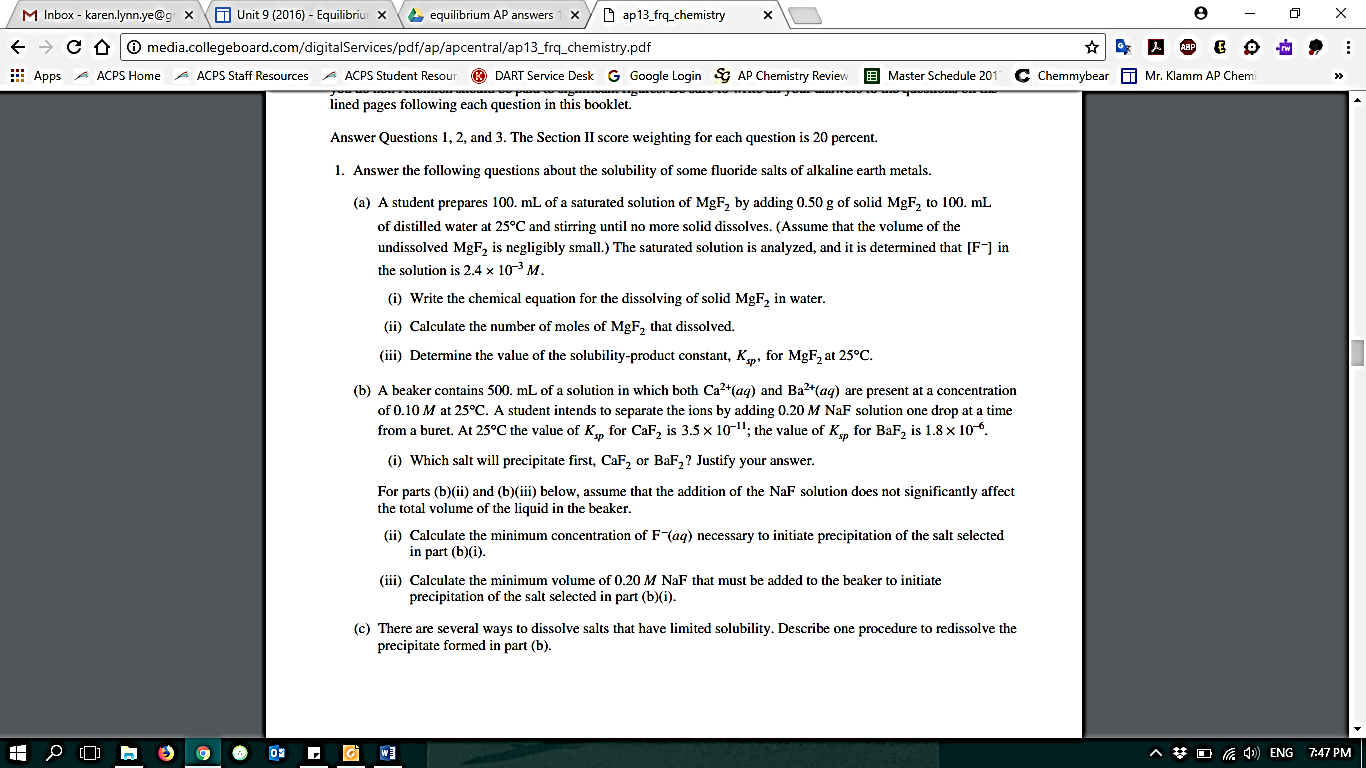
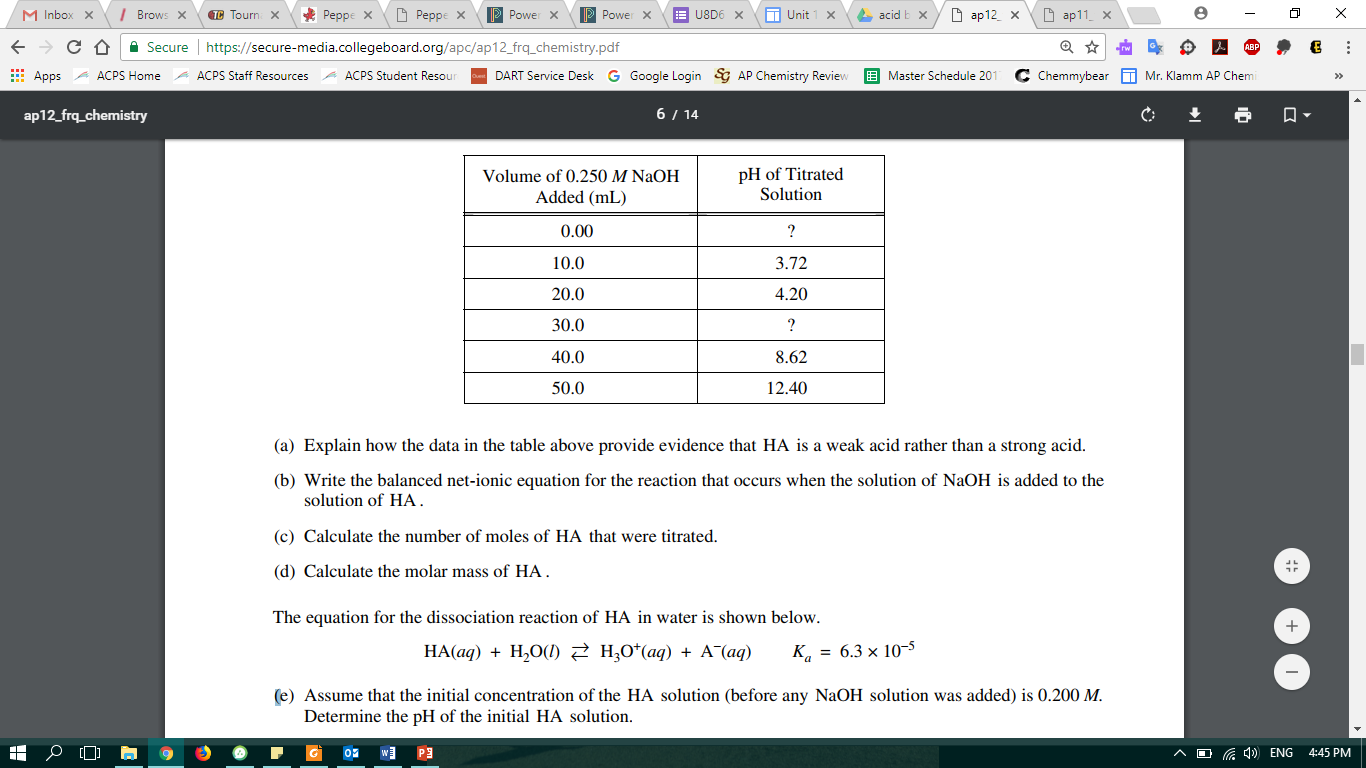
**Unit 5 FRQ Practice**

1. Answer the following questions regarding the decomposition of arsenic pentafluoride, AsF5(g) .
2. A 55.8 g sample of AsF5(g) is introduced into an evacuated 10.5 L container at 105°C. What is the initial molar concentration of AsF5(g) in the container?

At 105°C, AsF5(g) decomposes into AsF3(g) and F2(g) according to the following chemical equation. AsF5(g) ⇆ AsF3(g) + F2(g)

1. In terms of molar concentrations, write the equilibrium-constant expression for the decomposition of AsF5(g).
2. When equilibrium is established, 27.7 percent of the original number of moles of AsF5(g) has decomposed.
3. Calculate the molar concentration of AsF5(g) at equilibrium.
4. Using molar concentrations, calculate the value of the equilibrium constant, Keq , at 105°C
5. 

**Unit 6 FRQ Practice**

1. A 1.22 g sample of a pure monoprotic acid, HA, was dissolved in distilled water. The HA solution was then titrated with 0.250 M NaOH. The pH was measured throughout the titration, and the equivalence point was reached when 40.0 mL of the NaOH solution had been added. The data from the titration are recorded in the table below.
   1. Explain how the data in the table above provide evidence that HA is a weak acid rather than a strong acid.
   2. Write the balanced net-ionic equation for the reaction that occurs when the solution of NaOH is added to the solution of HA .
   3. Calculate the number of moles of HA that were titrated.
   4. Calculate the molar mass of HA.
   5. Assume that the initial concentration of the HA solution (before any NaOH solution was added) is 0.200 M. Determine the pH of the initial HA solution. The equation for the dissociation reaction of HA in water is: HA(aq) + H2O(l) ⇆H3O+(aq) + A−(aq)   
       Ka = 6.3 × 10−5
   6. Calculate the value of [H3O+] in the solution after 30.0 mL of NaOH solution is added and the total volume of the solution is 80.0 mL.