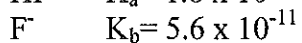
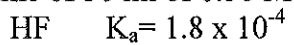


Name _____

Buffer Quest

Show your work clearly and box your answers!

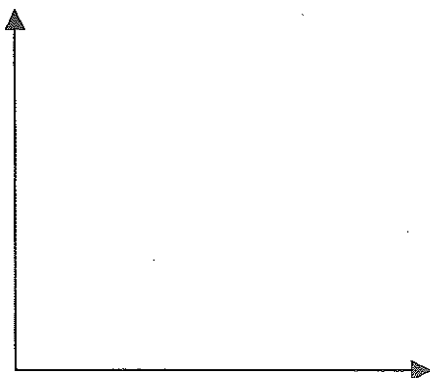
1. A volume of 50 ml of 0.50 M HF is titrated against 0.50 M NaOH.



- Find pH after
- a) no base has been added
 - b) 40 ml base added
 - c) 50 ml base added
 - d) 52 ml base added

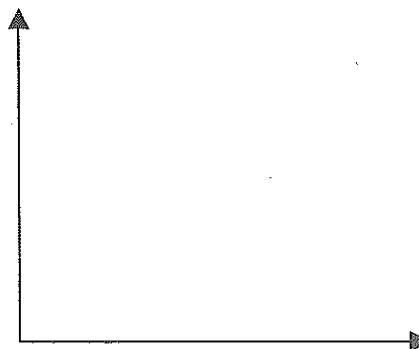
2. Draw the following titration curves.

a. HF with NaOH



b. H_3PO_4 with NaOH

(see values on other side)



3. Phosphoric acid, H_3PO_4 , has $K_{a1} = 7.5 \times 10^{-3}$, $K_{a2} = 6.2 \times 10^{-8}$, and $K_{a3} = 4.8 \times 10^{-13}$. You must make 1 L of a buffer with a pH of 12.50. You have access to H_3PO_4 , NaH_2PO_4 , Na_2HPO_4 , and Na_3PO_4 . How many grams of each substance will you use? If you do not give me a mass, I assume it is zero.

4. A buffer system is 1.00 M NH_3 and 0.80 M NH_4Cl . K_b for NH_3 is 1.8×10^{-5} .
- Find its pH.

b. Then, 1.5 g of NaOH are added to 500 ml of the buffer. Find new pH.