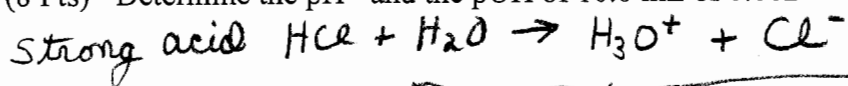


Turn off all cell phones. Show all work.

1. (8 Pts) Determine the pH and the pOH of 10.0 mL of 0.0020 M HCl?

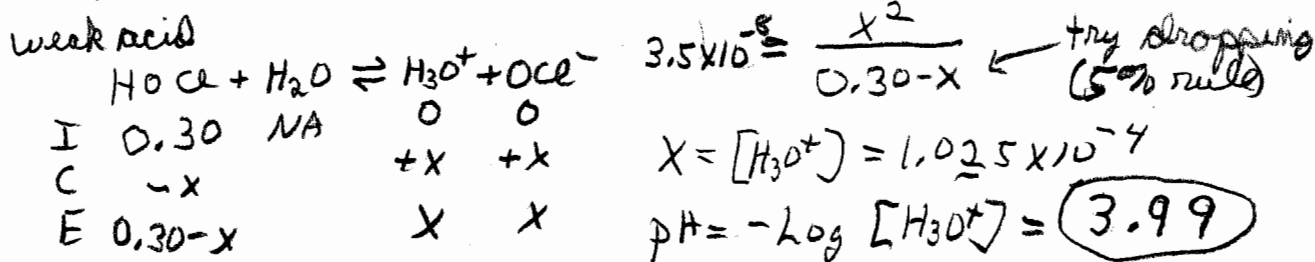


$$\text{pH} = -\log 0.0020 = \boxed{2.70} \quad \boxed{\text{pOH} = 11.30}$$

- b. Determine the concentration of
- $\text{H}_3\text{O}^+$
- and
- $\text{OH}^-$
- of the above solution.

$$[\text{H}_3\text{O}^+] = 0.0020 \quad [\text{OH}^-] = 10^{-11.30} = 5.0 \times 10^{-12}$$

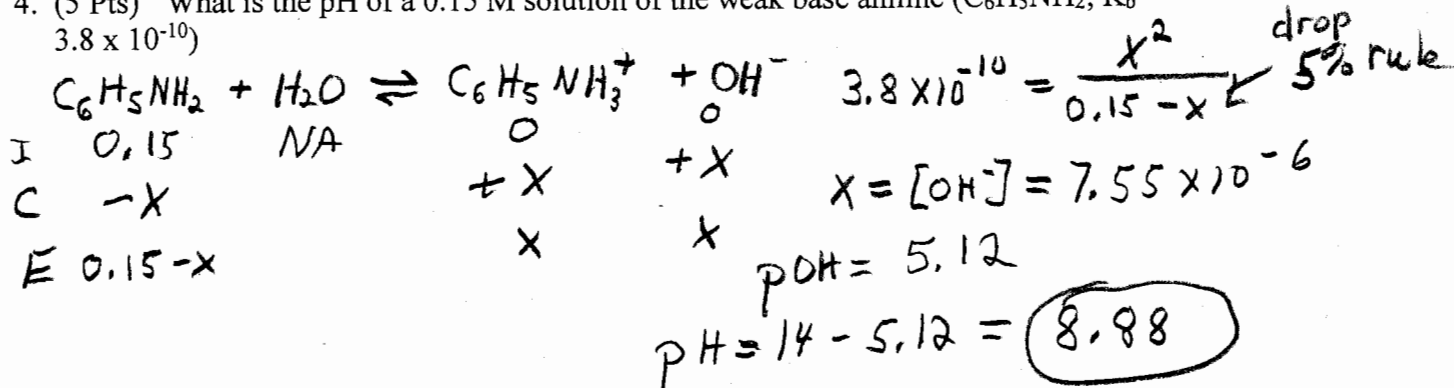
2. (4 Pts) What is the pH of a 0.30 M solution of HOCl (
- $K_a = 3.5 \times 10^{-8}$
- )



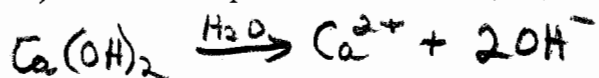
3. (4 Pts) a. What is the conjugate base of
- $\text{HCO}_3^-$
- $\text{CO}_3^{2-}$

- b. What is the conjugate acid of
- $\text{H}_2\text{PO}_4^{1-}$
- $\text{H}_3\text{PO}_4$

4. (5 Pts) What is the pH of a 0.15 M solution of the weak base aniline (
- $\text{C}_6\text{H}_5\text{NH}_2$
- ;
- $K_b = 3.8 \times 10^{-10}$
- )



5. (4 Pts) What is the pH of a 0.001 M
- $\text{Ca}(\text{OH})_2$
- solution?



$$[\text{OH}^-] = 2 \times 0.001 = 0.002$$

$$\text{pOH} = 2.70 \quad \text{pH} = 14 - 2.70 = \boxed{11.30}$$