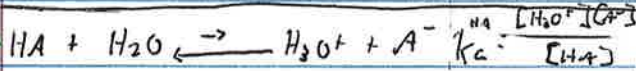
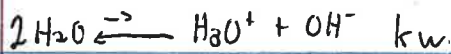
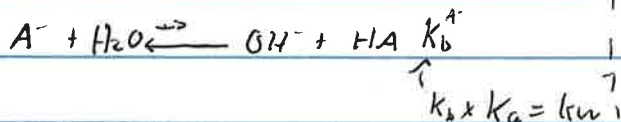


3/12

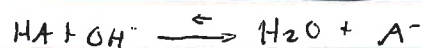
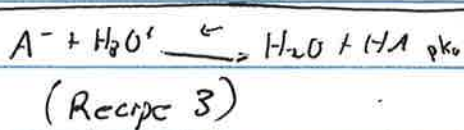
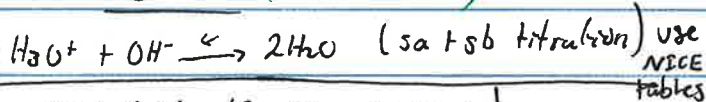
ch 15



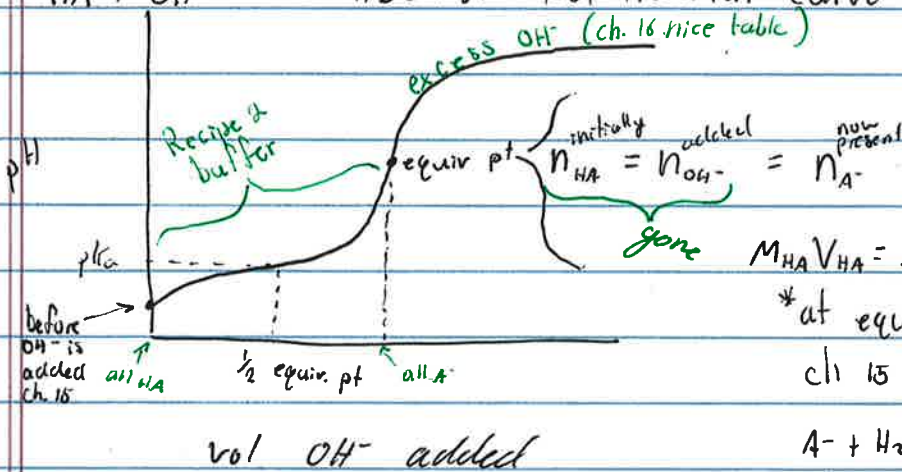
basis for  
henderson-  
Hasselbalch equation



ch 16 (neutralizations)



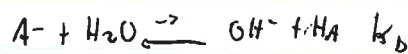
$\text{HA} + \text{OH}^- \rightleftharpoons \text{H}_2\text{O} + \text{A}^-$  titration curve:



$$M_{\text{HA}} V_{\text{HA}} = M_{\text{OH}} V_{\text{OH}} = n_{\text{A}^-}$$

\* at equiv pt, it's all  $\text{A}^-$

ch 15  $K_b$  400 rule NICE



$$[\text{A}^-] = \frac{n_{\text{A}^-}}{V_{\text{initial}} + V_{\text{total}}} \quad \leftarrow \text{from } K_a \text{ (Prom pKa)}$$

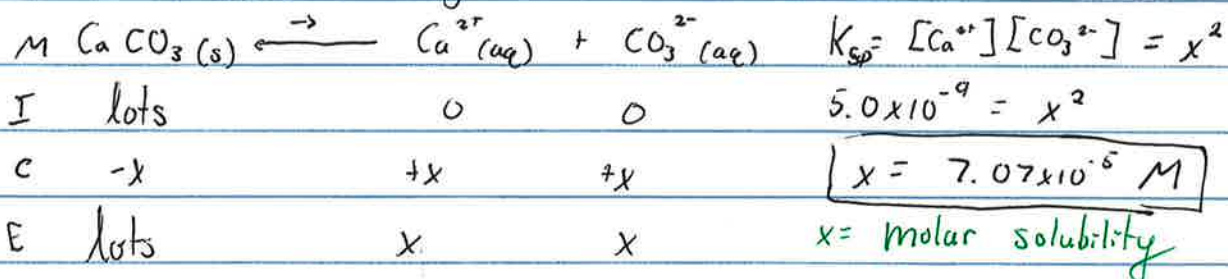
Henderson Equations

recipe 1:  $\text{pH} = \text{pKa} + \log \left( \frac{n_{\text{wb}}}{n_{\text{wa}}} \right)$

recipe 2:  $\text{pH} = \text{pKa} + \log \left( \frac{0_{\text{mol}} + n_{\text{OH}^-}}{n_{\text{wa}} - n_{\text{OH}^-}} \right)$

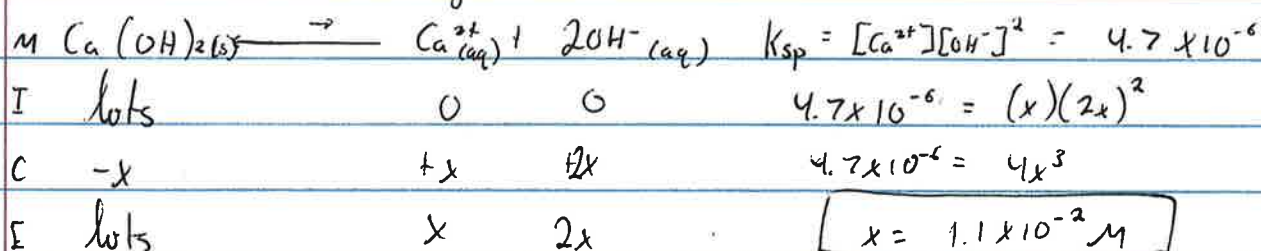
recipe 3:  $\text{pH} = \text{pKa} + \log \left( \frac{n_{\text{wi}} - n_{\text{H}_2\text{O}^+}}{0_{\text{mol}} + n_{\text{H}_3\text{O}^+}} \right)$

What is the molar solubility of  $\text{CaCO}_3$  in water?



$$[\text{Ca}^{2+}] = 7.1 \times 10^{-5} \text{ M} = [\text{CO}_3^{2-}]$$

What is the molar solubility of  $\text{Ca}(\text{OH})_2$  in water?



$$[\text{Ca}^{2+}] = 0.0106 \text{ M} \quad [\text{OH}^{-}] = 0.0212 \text{ M}$$

what is the pH?

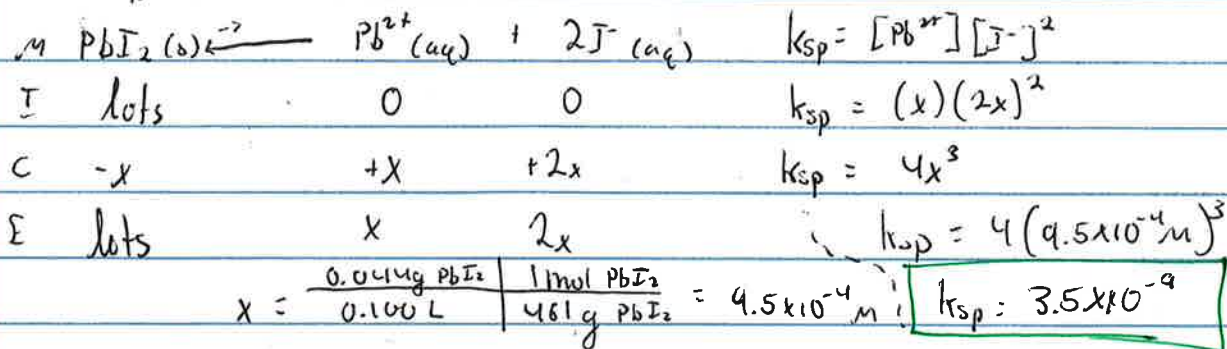
$$\text{pOH} = -\log(0.0212 \text{ M})$$

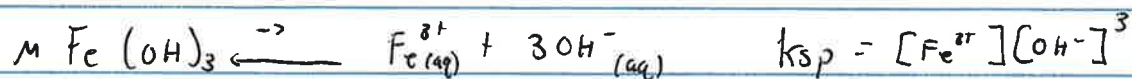
$$\text{pOH} = 1.68$$

$$\text{pH} = 14 - 1.68 = 12.32$$

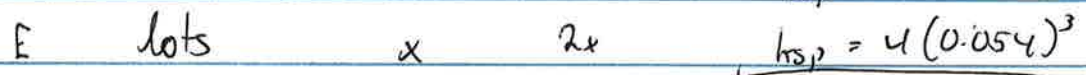
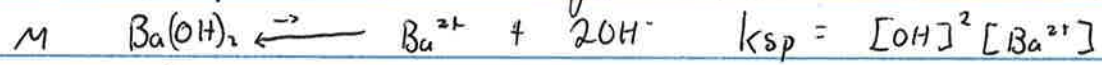
0.044 g  $\text{PbI}_2$  dissolves to make 100 mL solution. What is

$K_{\text{sp}}$  for  $\text{PbI}_2$ ?





A saturated solution of barium hydroxide has a  $\text{pH} = 13.03$   
 What is  $K_{sp}$  for barium hydroxide?



E  $\text{pOH} = 14 - 13.03$

$\text{pOH} = .97$

$[\text{OH}^-] = 0.107$

$2x = 0.107$

$x = 0.054$

$K_{sp} = 6.16 \times 10^{-4}$