Something to keep in mind: When **equal** amounts of acid and base are mixed (at the equivalence point) the resulting solution will behave as follows:

Strengths of Acid and Base	Resulting Solution pH
Strong Acid + Strong Base	7 (Neutral)
Strong Acid + Weak Base	< 7 (Acidic)
Weak Acid + Strong Base	> 7 (Basic)
Weak Acid + Weak Base	< 7 if acid's K_a > base's K_b = 7 if acid's K_a = base's K_b > 7 if acid's K_a < base's K_b

1. Practice with the common ion effect: In the lab you make a solution that is 0.0048 M HNO_2 and 0.00056 M $LiNO_2$. What is the pH of your solution?

2. Which of the following can form a buffer?
    a. HCl and CH_3COOH
    b. H_2CO_3 and $NaHCO_3$
    c. $NaOH$ and $NaCl$
    d. $NaCH_3COCOO$ and $CH_3COCOOH$
    e. $HClO$ and $KClO$

3. Ascorbic acid, $H_2C_6H_6O_6$ (s), is a diprotic acid with K_1 of 7.9×10^{-5} and K_2 of 1.6×10^{-12}. In a 0.005 M aqueous solution of ascorbic acid, which of the following species is present in the lowest concentration?
    a. H_2O (l)
    b. H_3O^+ (aq)
    c. $H_2C_6H_6O_6$ (aq)
    d. $HC_6H_6O_6^-$ (aq)
    e. $C_6H_6O_6^{2-}$ (aq)

4. Determine the pH of an HCN/KCN buffer containing 0.100 mol HCN and 0.070 mol KCN before and after the addition of 50.0 mL of 0.100M HCl to 1.00 L of buffer.
K_a for HCN is 4.79 x 10^{-10}

5. A 25.0 mL sample of 0.175 M methylamine (CH_3NH_2, a weak base, $K_b = 4.4$ x 10^{-4}) is titrated with 0.150 M HBr. What is the pH at one-half of the equivalence point?

6. Please circle the best acid to combine with its sodium salt to make a solution buffered at pH 4.25. For the best choice, please calculate the ratio of the conjugate base to the acid required to attain the desired pH.

Chlorous acid, $HClO_2$	Formic acid, $HCHO_2$	Hypochlorous acid, $HClO$
$pK_a = 1.95$	$pK_a = 3.74$	$pK_a = 7.54$

7. What change will be caused by addition of a small amount of HCl to a solution containing fluoride ions and hydrogen fluoride?
   a. The concentration of hydronium ions will increase significantly.
   b. The concentration of fluoride ions will increase as will the concentration of hydronium ions.
   c. The concentration of hydrogen fluoride will decrease and the concentration of fluoride ions will increase.
   d. The concentration of fluoride ions will decrease and the concentration of hydrogen fluoride will increase.
   e. The fluoride ions will precipitate out of solution as their acid salt.