1. A solution is $1x10^{-4}$ M in NaI, Na_2SO_4, and Na_3PO_4. What would the order of precitipation be as a source of Pb^{2+} is added gradually to the solution? The relevant K_{sp} values are:
 K_{sp} $PbI_2 = 8.5x10^{-9}$ K_{sp} $PbSO_4 = 1.8x10^{-8}$ K_{sp} $Pb_3(PO_4)_2 = 7.9x10^{-43}$

2. What is the pH at which $Cr(OH)_3$, $K_{sp} = 6.3x10^{-31}$, just starts to preceipitate from a $1.0x10^{-12}$ M Cr^{3+} solution?

3. Solution A is 1.0 L of pure water. Solution B is 1.0 L of $3.4x10^{-2}$ M NaCl. How many more moles of AgCl ($K_{sp} = 1.77x10^{-10}$) dissolve in solution A than solution B?

4. For a specific reaction, which of the following statements can be made about K, the equilibrium constant?
   a. It always remains the same at different reaction conditions.
   b. It increases if the concentration of one of the products is increased.
   c. It changes with changes in the temperature.
   d. It increases if the concentration of one of the reactants is increased.
   e. It may be changed by the addition of a catalyst.

5. Barium sulfate is LEAST soluble in a 0.01 M solution of which of the following?
   a. $Al_2(SO_4)_3$
   b. $(NH_4)_2SO_4$
   c. Na_2SO_4
   d. NH_3
   e. $BaCl_2$

Questions 6-7: The graph below shows the titration curve that results when 100. mL of 0.0250 M acetic acid is titrated with 0.100 M NaOH.

mL of 0.100 M NaOH Added
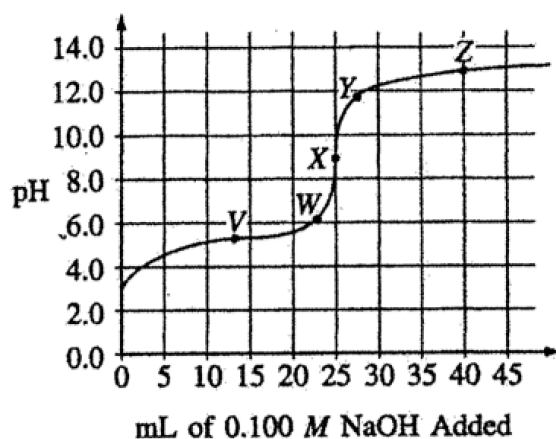
6. Which of the following indicators is the best choice for this titration?

Indicator	pH range of color change
a. Methyl orange	3.2 – 4.4
b. Methyl red	4.8 – 6.0
c. Bromothymol blue	6.1 – 7.6
d. Phenolphthalein	8.2 – 10.0
e. Alizarin	11.0 – 12.4

7. Which part of the curve corresponds to the optimum buffer action for the acetic acid/acetate ion pair?
   a. Point V
   b. Point X
   c. Point Z
   d. Along all of section WY
   e. Along all of section YZ