1. Calculate the pH when 24.9 mL of 0.100 M HNO$_3$ has been added to 25.0 mL of a 0.100 M KOH solution.

2. Calculate the pH of a solution formed by adding 10.0 mL of 0.050 M NaOH to 40.0 mL of 0.0250 M benzoic acid (HC$_7$H$_5$O$_2$, $K_a = 6.3 \times 10^{-5}$).

3. The $K_{sp}$ for LaF$_3$ is $2 \times 10^{-19}$. What is the solubility of LaF$_3$ in water in grams per liter?

4. Will Ag$_2$SO$_4$ ($K_{sp} = 1.5 \times 10^{-5}$) precipitate when 100 mL of 0.050 M AgNO$_3$ is mixed with 10 mL of $5.0 \times 10^{-2}$ M Na$_2$SO$_4$ solution?