

Name: \_\_\_\_\_ Due Date: October 20, 2009

Show all work. You are only allowed to work alone, but may see me.

1. (4 Pts) Determine the pH of the solution that results from the mixing of 80.0 mL of 0.100 M NaOH, 94.0 mL of 0.0500 M KOH, 42.5 mL of 0.075 M HCl, 37.0 mL of 0.065 M HNO<sub>3</sub>, and 2.00 quarts of distilled water.

2. Calculate the pH of a titration of 50.00 mL of 0.100 M Phenylacetic acid,  $K_a = 4.9 \times 10^{-5}$ , with 0.100 M NaOH at the following points:

**SHOW ALL WORK IN NEAT DETAIL ON A SEPARATE PAGE.**

(Be sure to write chemical equations and  $K_a$  or  $K_b$  expressions when needed.)

- a. (4 Pts) Before any NaOH is added.
- b. (4 Pts) After 14.7 mL of NaOH are added.
- c. (4 Pts) After 25.00 mL of NaOH are added.
- d. (4 Pts) After 50.00 mL of NaOH are added.
- e. (4 Pts) After 52.00 mL of NaOH are added.
- f. (1 Pt) What is the  $pK_a$  of the acid (show calculation)?