Hawk-Hornet Invitational **Chemistry Lab** **Part 2**

Laboratory Portion

This part of the event involves the titration of an **unknown acid** with the strong base **NaOH**. The identity of the acid is irrelevant. Think of the acid as **HA,** with **A** being an ion with a negative one charge. Use the procedure outlined below to collect the data necessary to complete the questions that follow.

Procedure

1. Use the graduated cylinder provided to measure 5.0 mL of the weak acid into the small reaction flask.
2. Use one end of the piece of litmus paper to measure the initial pH of the weak acid.
3. Add 1 or 2 drops of phenolphthalein to the reaction flask.
4. Begin to titrate the weak acid with the provided NaOH. Add the NaOH drop-by-drop, carefully counting the number of drops required to cause the phenolphthalein to change color. Swirl the contents of the reaction flask as you add the drops of NaOH.
5. Measure the pH at the stoichiometric point using the other end of the piece of litmus paper.

Data

Initial pH = _____ Final pH = _____ Number of drops added = _____

Questions/Calculations. Use significant figures to round answers. Answers should include units and labels.

1. Determine the concentration of the hydrogen ions in the initial acid solution. (3 pts.)

2. Given an NaOH concentration of 0.400 moles/liter, determine the concentration of the initial acid solution. 20 drops = 1 mL (3 pts.)

3. Determine the value of the acid dissociation constant, K_a, for this acid. (3 pts.)

4. Sketch the approximate titration curve for this titration on the graph below. You will need to add your own axis numbering. Remember this is a sketch and is not meant of be highly accurate. (3 pts.)

5. Identify this acid as a strong or a weak acid. List at least two reasons for your selection.

   A. **Acid Strength (circle one):** **STRONG** **WEAK** (3 pts.)

   B. List and explain at least two reasons for your selection of acid strength.

1.

2.