

Name:

Date:

Period:

Seat #:

**Directions:** Any worksheet that is labeled with an \* means it is suggested extra practice. We do not always have time to assign every possible worksheet that would be good practice for you to do. You can do this worksheet when you have extra time, when you finish something early, or to help you study for a quiz or a test. If and when you choose to do this Extra Practice worksheet, please do the work on binder paper. You will include this paper stapled into your Rainbow Packet when you turn it in, even if you didn't do any of this. We want to make sure we keep it where it belongs so you can do it later if you want to (or need to). If you did the work on binder paper you can include that in your Rainbow Packet after this worksheet. If we end up with extra class time then portions of this may turn into required work. If that happens you will be told which problems are turned into required. Remember there is tons of other extra practice on the class website...and the entire internet! See me if you need help finding practice on a topic you are struggling with.

Show all work for each question, box your final answer

$$pH = pKa + \log \frac{[salt\ form]}{[acid\ form]}$$

A buffer is prepared containing 0.800 molar acetic acid and 1.00 molar sodium acetate. What is its pH? (4.849)	A buffer is prepared containing 1.00 molar anisic acid and 1.00 molar sodium anisate. What is its pH? (4.471)
A buffer is prepared containing 0.700 molar anisic acid and 0.300 molar sodium anisate. What is its pH? (4.103)	A buffer is prepared containing 0.800 molar ammonia and 1.00 molar ammonium chloride. What is its pH? (9.151)
A buffer is prepared containing 1.00 molar nicotine and 1.00 molar nicotine hydrochloride. What is its pH? (8.021)	A buffer is prepared containing 0.700 molar nicotine and 0.300 molar nicotine hydrochloride. What is its pH? (8.389)
Aspirin has a pKa of 3.4. What is the ratio of A <sup>-</sup> to HA in: (a) the blood (pH = 7.4) ( $10^4 = 10000 = [A^-]/[HA]$ ) (b) the stomach (pH = 1.4) ( $10^{-2} = 0.01 = [A^-]/[HA]$ ) <b>General comment about the solutions:</b> You have to find the ratio between A <sup>-</sup> and HA so the concentrations are not needed	You need to produce a buffer solution that has a pH of 5.27. You already have a solution that contains 10.0 mmol (millimoles) of acetic acid. How many millimoles of sodium acetate will you need to add to this solution? The pKa of acetic acid is 4.75. (33.1 millimoles of sodium acetate)
A solution containing 50.00 mL of 0.1800 M NH <sub>3</sub> (K <sub>b</sub> = 1.77 x 10 <sup>-5</sup> ) is being titrated with 0.3600 M HCl. Calculate the pH: a. initially (11.252) b. After the addition of 5.00 mL of HCl (9.850) c. After the addition of a total volume of 12.50 mL HCl (9.248) d. After the addition of a total volume of 25.00 mL of HCl (5.084) e. After the addition of 26.00 mL of HCl (2.324)	1.00 L of a solution containing 0.0500 mole of HAC and 0.100 mole of NaAc is prepared. Ignore the autoionization of water for the purposes of this problem - for part B only. The K <sub>a</sub> of HAC equals 1.77 x 10 <sup>-5</sup> (a) Calculate the numerical value of the reaction quotient, Q for the initial condition. (Q <sub>a</sub> = 2.00 x 10 <sup>-7</sup> ) (b) Which way will the reaction shift? (c) Calculate to 3 significant digits the pH of this solution (pH = 5.053)
Calculate the ratio of CH <sub>3</sub> NH <sub>2</sub> to CH <sub>3</sub> NH <sub>3</sub> Cl required to create a buffer with pH = 10.14 (base/acid ratio = 0.313)	Fifty percent of a weak acid is in an ionized form in a solution with pH of 5.000, what is the pKa value for the weak acid? (pH = pKa)