Name _____ Date _____ Period _____

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8.7 pH and pKa

AP Chemistry

Show your work. Use the pH and pK_a relationships from the lesson.

1. (a) HF has $K_a = 6.8 \times 10^{-4}$. Find its pK_a.
(b) HCN has $K_a = 4.9 \times 10^{-10}$. Find its p$K_a$.
(c) Benzoic acid has pK_a = 4.20. Find its K_a.
(d) Which of the three acids is the strongest?

2. Benzoic acid (HA) has pK_a = 4.20. Complete the table. Use the ratio $[A^-] / [HA] = 10^{pH - pK_a}$.

pH	Predominant form	$[A^-] / [HA]$
2.00		
4.20		
7.40		

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3. The ammonium ion, NH_4^+, has pK_a = 9.25. At pH 7.40, which form predominates, NH_4^+ or NH_3? Calculate the ratio $[NH_3] / [NH_4^+]$.

4. An indicator, HIn, has pK_a = 5.0. HIn is red and In^- is blue. What color is the indicator at pH 3.0? At pH 5.0? At pH 7.0? Explain one of your answers using the ratio $[In^-] / [HIn]$.

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