Part A: Into to Acids and Bases

1) Match the following acid-base definitions with their correct name:

Name	**Definition**
• Arrhenius acid	• A substance that produces OH^- ions in aqueous solution
• Arrhenius base	• A proton (H^+ ion) acceptor
• Brønsted-Lowery acid	• A substance the produces H^+ ions in aqueous solution
• Brønsted-Lowery base	• A proton (H^+) donor

2) Identify which are strong acids and which are weak acids. Hint if you know the 6 strong acids (in addition to $HClO_3$) from your text book then you can identify those that are weak.

List as SA or WA	
• HCN	• H_2SO_4
• HClO	• HNO_2
• $HCHO_2$	• H_3PO_4
• $HClO_4$	• $HC_7H_5O_2$

What does acid strength have to do with the bonding?

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And which of the above are polyprotic?

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3) Consider the ionization reaction between a weak acid and water shown below. Identify the conjugate acid and base.

$$H_2O(l) + HNO_2(aq) \leftrightarrow H_3O^+(aq) + NO_2^-(aq)$$

Part B: Acid ionization constant, K_a

4) Complete the weak acid table below by filling in each row with any m issing formulas, ionization reactions, or acid ionization constants, K_a.

Formula	Ionization reaction	K_a expression	pK_a
		$K_a = \frac{[H_3O^+][NO_2^-]}{[HNO_2]}$	3.34
$HC_2H_3O_2$			4.74
	$HClO(aq) + H_2O(l) \leftrightarrow H_3O^+(aq) + ClO^-(aq)$		7.54

All of the above are weak acids, assuming 1.0M solutions of all, use the $\mathbf{pK_a}$ values to identify the weakest of the series.

Part C: pH and pOH

5) Answer the following questions concerning a solution that has an $[OH^-] = 2.5 \times 10^{-9}$ M. (Be sure your answers have correct significant figures.)

a) What is the pOH of the solution?	c) What is the pH of the solution?
b) What is the $[OH^-]$ of the solution?	d) What is the $[H_3O^+]$ of the solution?

Part D: pH of Strong Acid and Weak Acid Solutions

6) What is the pH of a 0.55 M nitric acid solution solution? (Be sure your answers have correct significant figures.)

7) What is the pH of a 0.55 M hypochlorous solution. (Be sure your answers have correct significant figures.)

8) What is the Ka for the unknown monoprotic acid, HA, if the pH of the solution is 4.50?