pH Worksheet Key

1. What is pH's relation to H^+? The concentration of H^+ in solution.

2. What is the equation used for finding pH? pH = -log [H^+]

3. What is the equation that relates to pH and pOH? pH + pOH = 14

4. Complete the following table

[H_3O^+]	[OH^-]	pH	pOH	Acidic, Basic, C
1.0×10^{-3} M	1.0×10^{-11} M	3	11	Acidic
1.0×10^{-9} M	1.0×10^{-5} M	9	5	Basic
1.0×10^{-8} M	1.0×10^{-6} M	8	6	Basic
1.0×10^{-2} M	1.0×10^{-12} M	2	12	Acidic
1.0×10^{-7} M	1.0×10^{-7} M	7	7	Neutral

5. What would be the pH of each of the following

a) 0.0500 M HCl ___1___
b) 0.0500 M $Ba(OH)_2$ ___13___
c) 0.025 M $NaOH$ ___12___
d) 0.0005 M HCl ___3.46___
e) 1.0 M HBr ___0___
f) 1.0 M KOH ___14___
g) 0.02 M HCl ___1.70___
h) 0.075 M H_2SO_4 ___0.918___
i) 0.0005 M HCl ___3.3___
j) 0.0000001 M HCl ___6.97___

6. 0.100 g $NaOH$ are dissolved in 250 mL of solution. Determine the $NaOH$ concentration & the pH

$$0.100 \text{ g NaOH} \times \frac{1 \text{ mol NaOH}}{40.0 \text{ g NaOH}} = 0.0025 \text{ mol NaOH} \qquad 250 \text{ mL} \times \frac{1 \text{ L}}{1000 \text{ mL}} =$$

$[NaOH] = 0.0025 \text{ mol NaOH} / 0.250 \text{ L} = 0.01 \text{ M}$

$pH = -\log(0.01) = 12$

7. Cut (1) strong acids and explain why these acids are considered strong acids

HCl, HI, HBr, $HClO_4$, HNO_3 They are strong ones they dissociate 100% in water giving the maximum amount of H^+ ions from the compound

8. Cut (2) weak acids and explain why these acids are considered weak acids

$HC_2H_3O_2$, H_2SO_3, H_3PO_4, HNO_2 These are weak ones they dissociate much less than 100% in water so there is a large portion of the original acid present

9. Cut (3) strong bases and explain why these bases are considered strong bases

$NaOH$, $Ba(OH)_2$ They are strong ones they dissociate 100% in water giving the maximum amount of OH^- ions from the compound. The water formed is a very stable compound

10. Cut (4) weak bases and explain why it is considered a weak base

NH_3 This compound does not hold onto the protons very strongly so there is a less stable effect it does accept the protons (NH_4^+)