PH WORKSHEET

1. What is pH a measure of?

2. What is the equation used for finding pH?

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

4. Complete the following table

$[H_3O^+]$	$[OH^-]$	pH	pOH	Acidic/Basic?
1.0×10^{-9} M				
	4.1×10^{-2} M			
		3.75		
			5.45	

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

    a) 0.0010 M HCl   g) 0.024 M HCl

    b) 0.0010 M HNO3   h) 0.075 M KOH

    c) 0.010 M NaOH   i) 0.000034 M HCl

    d) 0.0035 M HCl   j) 0.000000000001M HCl

    e) 1.0 M HBr   f) 1.0 M KOH

6. A 2.63 g NaOH are dissolved in 156 mL of solution. Determine the NaOH concentration & the pH.

7. List 3 strong acids and explain why these acids are considered strong acids.

8. List 3 weak acids and explain why these acids are considered weak acids.

9. What is the pH and pOH of a 1.2×10^{-3} HBr solution?

10. What is the pH and pOH of a 2.34×10^{-5} NaOH solution?

11.   What is the pH and pOH of a solution made by adding water to 15 grams of
        hydroiodic acid until the volume of the solution is 2500 mL?

12.   What is the pH and pOH of a solution that was made by adding 400 mL of water to
        350 mL of 5.0 x 10^{-3} M NaOH solution?

13.   What is the pH and pOH of a solution with a volume of 5.4 L that contains 15 grams
        of hydrochloric acid and 25 grams of nitric acid?

14.   A swimming pool has a volume of one million liters. How many grams of HCl would need to be added to that swimming pool to bring the pH down from 7 to 4? (Assume the volume of the HCl is negligible)

ANSWERS

1. What is pH a measure of? **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?
1.0 x 10^{-9} M	**1 x 10^{-5}**	**9**	**5**	**Basic**
2.4 x 10^{-13} M	4.1x10^{-2} M	**12.6**	**1.4**	**Basic**
1.78 x 10^{-4} M	**5.62 x 10^{-11} M**	3.75	**10.25**	**Acidic**
2.82 x 10^{-9} M	**3.55 x 10^{-6} M**	**8.55**	5.45	**Basic**

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

   a) 0.0010 M HCl   **3**

   b) 0.0010 M HNO3   **3**

   c) 0.010 M NaOH   **12**

   d) 0.0035 M HCl   **2.46**

   e) 1.0 M HBr   **0**

   f) 1.0 M KOH   **14**

   g) 0.024 M HCl   **1.6**

   h) 0.075 M KOH   **12.9**

   i) 0.000034 M HCl   **4.5**

   j) 0.000000000001M HCl   **12**

6. A 2.63 g NaOH are dissolved in 156 mL of solution. Determine the NaOH concentration & the pH.

   2.63 g NaOH x <u>1 mol NaOH</u> =0.0658 mol NaOH   156 mL x <u>1 L</u> =
              40.0 g NaOH   1000 ML

   [NaOH]= 0.0658 mol NaOH/0.156 L = **0.42 M**

   pH =-log [0.42 M] = **0.37**

7. List 3 strong acids and explain why these acids are considered strong acids.

   $HClO_4$, H_2SO_4, HNO_3 They are strong since they dissociate 100% in water giving the maximum amount of H^+ ion from the compound

8. List 3 weak acids and explain why these acids are considered weak acids.

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

9. What is the pH and pOH of a 1.2 x 10^{-3} HBr solution?

   pH: 2.9   pOH: 11.1

10. What is the pH and pOH of a 2.34 x 10^{-5} NaOH solution?

   pOH: 4.6   pH: 9.4

11.	What is the pH and pOH of a solution made by adding water to 15 grams of hydroiodic acid until the volume of the solution is 2500 mL?

**pH: 1.6	pOH: 12.4**

12.	What is the pH and pOH of a solution that was made by adding 400 mL of water to 350 mL of 5.0×10^{-3} M NaOH solution?

**pOH: 2.7	pH: 11.3**

13.	What is the pH and pOH of a solution with a volume of 5.4 L that contains 15 grams of hydrochloric acid and 25 grams of nitric acid?

**pH: 0.82	pOH: 13.18**

14.	A swimming pool has a volume of one million liters. How many grams of HCl would need to be added to that swimming pool to bring the pH down from 7 to 4? (Assume the volume of the HCl is negligible)

3545 grams (100. moles)