

Problem Set 6b: Acid and Base Calculations

1. Calculate the pH of the solutions, given the following $[H^+]$, and then identify the solution as acidic, basic, or neutral.

- a) $[H^+] = 1.2 \times 10^{-2} M$
- b) $[H^+] = 5.8 \times 10^{-9} M$
- c) $[H^+] = 3.92 \times 10^{-12} M$
- d) $[H^+] = 4.52 \times 10^{-5} M$

2. Draw the pH scale shown below. Place answers 1a-1d on the scale in their respective spots.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

3. Calculate the $[H^+]$ in the following solutions, given their pH, and identify the solution as acidic, basic or neutral.

- a) pH = 2.5
- b) pH = 11.7
- c) pH = 6.8
- d) pH = 3.31

4. Compare the pH values for each of the solutions listed in the table below.

Solution	pH
1	2.5
2	1.5
3	4.6
4	9.4
5	7.1

- a) Which solution is the most acidic?
- b) Which solution dissociates to produce the highest concentration of H^+ ions?
- c) Which solution is more acidic, solution 2 or 3? How much more acidic is that solution?
- d) Which of the solutions would be bitter to the taste and feel slippery?
- e) Which solution(s) would react with zinc?
- f) What evidence would you look for to determine whether any of the solutions had reacted with zinc?