

12. Find the pH of each solution:

- A. $[\text{H}^+] = 0.045 \text{ M}$
- B. $[\text{H}^+] = 8.7 \times 10^{-6} \text{ M}$
- C. $[\text{H}^+] = 0.0015 \text{ M}$
- D. $[\text{H}^+] = 1.2 \times 10^{-3} \text{ M}$

13. What are the pH values of the following solutions, based on their hydrogen-ion concentrations?

- A. $[\text{H}^+] = 1.0 \times 10^{-12} \text{ M}$
- B. $[\text{H}^+] = 1.0 \times 10^{-4} \text{ M}$

14. Calculate the $[\text{H}^+]$ for each solution:

- A. $\text{pH} = 5.00$
- B. $\text{pH} = 12.84$

15. What are the hydrogen-ion concentrations for solutions with the following pH values?

- A. 4.00
- B. 11.55

16. Calculate the pH of each solution:

- A. $[\text{OH}^-] = 4.3 \times 10^{-5} \text{ M}$
- B. $[\text{OH}^-] = 4.5 \times 10^{-11} \text{ M}$

17. Calculate the pH of each solution:

- A. $[\text{OH}^-] = 5.0 \times 10^{-9} \text{ M}$
- B. $[\text{OH}^-] = 8.3 \times 10^{-4} \text{ M}$

22. Determine the pH of each solution:

- A. $[\text{H}^+] = 1.0 \times 10^{-6} \text{ M}$
- B. $[\text{H}^+] = 0.00010 \text{ M}$
- C. $[\text{OH}^-] = 1.0 \times 10^{-2} \text{ M}$
- D. $[\text{OH}^-] = 1.0 \times 10^{-11} \text{ M}$

24. Find the hydroxide-ion concentrations for solutions with the following pH values:

- A. 6.00
- B. 9.00
- C. 12.00

63. Calculate the pH for the following solutions and indicate whether each solution is acidic or basic:

A. $[\text{OH}^-] = 1.0 \times 10^{-2} \text{ M}$

B. $[\text{H}^+] = 1.0 \times 10^{-2} \text{ M}$

64. What are the hydroxide-ion concentrations for solutions with the following pH values?

A. 4.00

B. 8.00

C. 12.00

65. Calculate the pH or $[\text{H}^+]$ for each solution:

A. $[\text{H}^+] = 2.4 \times 10^{-6} \text{ M}$

B. $\text{pH} = 13.20$

86. Calculate the $[\text{OH}^-]$ or pH of each solution:

A. $\text{pH} = 4.60$

C. $[\text{OH}^-] = 1.8 \times 10^{-2} \text{ M}$

B. $\text{pH} = 9.30$

D. $[\text{OH}^-] = 7.3 \times 10^{-9} \text{ M}$