

Sample Calculations pH Worksheet

$$[\text{H}_3\text{O}^+] \times [\text{OH}^-] = 1.0 \times 10^{-14}$$

$$\uparrow 1.50 \times 10^{-2} \text{ M (or } 1.50 \text{E-}02\text{)}$$

$$[\text{OH}^-] = \frac{1.0 \times 10^{-14}}{1.50 \times 10^{-2}} = 6.6666 \times 10^{-13} \approx \boxed{6.67 \times 10^{-13} \text{ M}}$$

$$\text{pH} = -\log_{10} [\text{H}_3\text{O}^+] = -\log(1.50 \times 10^{-2}) = \boxed{1.824}$$

solution is acidic

$$[\text{H}_3\text{O}^+] \times [\text{OH}^-] = 1.0 \times 10^{-14}$$

$$\uparrow 1.75 \times 10^{-3} \text{ M (or } 1.75 \text{E-}03\text{)}$$

$$[\text{H}_3\text{O}^+] = \frac{1.0 \times 10^{-14}}{1.75 \times 10^{-3}} = \boxed{5.71 \times 10^{-12} \text{ M}}$$

$$\text{pH} = -\log[5.71 \times 10^{-12}] = \boxed{11.243}$$

solution is basic

$$\text{pH} = 1.370 \rightarrow \text{solution is } \underline{\text{acidic}}$$

$$[\text{H}_3\text{O}^+] = 10^{-1.370}$$

$$= 0.0426579 \approx 0.0427 \text{ M} = \boxed{4.27 \times 10^{-2} \text{ M}}$$

$$[\text{H}_3\text{O}^+] \times [\text{OH}^-] = 1.0 \times 10^{-14}$$

$$\uparrow 4.27 \times 10^{-2} \text{ M}$$

$$[\text{OH}^-] = \frac{1.0 \times 10^{-14}}{4.27 \times 10^{-2}} = \boxed{2.34 \times 10^{-13} \text{ M}}$$