CW: pH Calculations

Name:_____

Period: 2   3   4

Directions: You must answer enough questions that add up to 15 points. Show ALL your work and make sure your answers are in the correct significant figures and units if needed. Make sure you write the correct number for each question you answer. You may do up to 1 more question for extra credit.

1. (1 point) Determine the pH of a 1.34×10^{-4} M HCl solution.	2. (1 point) Determine the pH of a solution of NaOH with a pOH of 3.42.	3. (2 points) Determine the pH of a 2.234×10^{-6} M H_2SO_4 solution.	4. (2 points) Determine the pOH of a 1.34×10^{-4} M HI solution.
5. (2 points) Determine the pOH of a 8.85×10^{-9} M KOH solution.	6. (2 points) Find the pOH os a 4.54×10^{-5} M $Ca(OH)_2$ solution.	7. (1 point) Find the pH of a 6.378×10^{-3} M $HClO_4$ solution.	8. (3 points) Find the pH of a 1.550×10^{-4} M $Sr(OH)_2$ solution
9. (2 points) Find [H+] of a solution of HBr with a pH of 3.50.	10. (3 points) Determine [H+] of a solution of LiOH with a pOH of 4.20.	11. (3 points) Determine [H+] of a solution of H_2SO_4 with a pH of 2.86.	12. (3 points) Find the [H+] of a solution of $Ba(OH)_2$ with a pOH of 3.75.

$pH = -log[H^+]$ $pOH = -log[OH^-]$ $pH + pOH = 14.00$

$[H^+] = 10^{-pH}$ $[OH^-] = 10^{-pOH}$ $[H^+] \times [OH^-] = 1.00 \times 10^{-14} \ M^2$

PH Calculations Key

1) 1 pt. $pH = -\log [H^+]$
$pH = -\log 1.34 \times 10^{-4} = \boxed{3.87}$

2) 1 pt. $pH + pOH = 14.00$
$pH + 3.42 = 14.00$
$ -3.42 \quad -3.42$
$ pH = \boxed{10.58}$

3) 2 pts. $[H^+] = 2(2.234 \times 10^{-6} M) = \boxed{4.468 \times 10^{-6} M}$

$pH = -\log [H^+]$
$pH = -\log 4.468 \times 10^{-6} = \boxed{5.350}$

4) 2 pts $pH = -\log [H^+]$
$pH = -\log 1.34 \times 10^{-4} = \boxed{3.87}$

$pH + pOH = 14.00$
$3.87 + pOH = 14.00$
$-3.87 -3.87$
$ pOH = \boxed{10.13}$

5) 2 pts $pOH = -\log [OH^-]$
$pOH = -\log 8.85 \times 10^{-9} = \boxed{8.05}$

6) 2 pts $[OH^-] = 2(4.54 \times 10^{-5} M) = 9.08 \times 10^{-5} M$

$pOH = -\log [OH^-]$
$pOH = -\log 9.08 \times 10^{-5} = \boxed{4.04}$

7) 1 pt. $pH = -\log [H^+]$
$pH = -\log 6.378 \times 10^{-3} = \boxed{2.195}$

8) 3 pts. $[OH^-] = 2(1.550 \times 10^{-4} M) = 3.100 \times 10^{-4} M$

$pOH = -\log [OH^-]$
$pOH = -\log 3.100 \times 10^{-4} = 3.509$

$pH + pOH = 14.00$
$pH + 3.509 = 14.00$
$\quad\quad -3.509 \quad -3.509$
$pH \quad = \boxed{10.49}$

9) 2 pts $[H^+] = 10^{-pH}$
$[H^+] = 10^{-3.50}$
$[H^+] = \boxed{3.16 \times 10^{-4} M}$

10) 3 pts $pH + pOH = 14.00$
$pH + 4.20 = 14.00$
$\quad -4.20 \quad -4.20$
$pH \quad = \boxed{9.80}$

$[H^+] = 10^{-pH}$
$[H^+] = 10^{-9.80}$
$[H^+] = \boxed{1.58 \times 10^{-10} M}$

11) 3 pts $[H^+] = 10^{-pH}$

$2[H^+] = 10^{-2.86}$
$\dfrac{2[H^+]}{2} = \dfrac{1.38 \times 10^{-3} M}{2}$
$[H^+] = \boxed{6.90 \times 10^{-4} M}$

12) 3 pts. $[OH^-] = 10^{-pOH}$

$2[OH^-] = 10^{-3.75}$
$\dfrac{2[OH^-]}{2} = \dfrac{1.78 \times 10^{-4} M}{2}$
$[OH^-] = 8.90 \times 10^{-5} M$

$[H^+] \times [OH^-] = 1.00 \times 10^{-14} M^2$
$\dfrac{[H^+] \times (8.90 \times 10^{-5} M)}{8.90 \times 10^{-5} M} = \dfrac{1.00 \times 10^{-14} M^2}{8.90 \times 10^{-5} M}$
$[H^+] \quad = \boxed{1.12 \times 10^{-10} M}$