PROBLEM SET: 19.2 - pH and pOH					
1) What is the pH of each of the following solutions?					
a) 0.00015 M HCI	c) 0.0000006 M HCI				
b) 0.031 M HCI	d) 0.000001 M HCI				
2) What is the pH of a solution if $[H_3O^+] = 5.4 \times 10^{-8} \text{ M}$?					
3) The pH of a solution is determined to be 9.00. What is the $[H_3O^+]$?					
4) The pH of a solution is determined to be 4.56. What is the $[H_3O^*]$?					
5) What is the pH of each of the following solutions?					
a) 0.025 M Na OH	c) 0.000051 M Na OH				
b) 1.13 M Na OH	d) 0.00073 M Na OH				
6) Determine the pH of the following solutions.					
a) 0.000014 M HNO₃	c) 2.50 x 10 ⁻⁶ M HNO ₃				
b) 0.0045 M HCI	d) 8.75 x 10 ⁻³ M HCI				
7) Determine the $[H_3O^+]$ for the following solutions:					
a) drain cleaner with a p	oH of 13.2 c) ammonia with a pH of 11.3				
b) human blood with a p	bH of 7.4 d) apple juice with a pH of 3.5				
8) Determine the pOH and pH of the following base solutions:					
a) 0.00045 M KOH	c) 2.80 x 10 ⁻⁴ M NaOH				
b) 0.685 M KOH	d) 3.1 x 10 ⁻¹¹ M NaOH				

9) Determine the $[H_3O^+]$ and the $[OH^-]$ of the following solutions:

a) a solution with a pH of 5.85.

- b) a solution with pH of 11.3.
- c) a solution with a pH of 1.5.

10) What is the **pH** and the **pOH** of the following solutions?

a) 0.000005 M solution of HBr (acid)

b) 2.45 x 10⁻³ M solution of KOH (base)

11) The pH of sea water is 8.3. What is the [OH] and the $[H_3O^+]$ of sea water?

12) Calculate the **pH**, **pOH**, **[OH**⁻] and **[H**₃**O**⁺] for the following solutions:

a) 0.00082 M HNO₃ c) 1.5 x 10⁻⁴ M KOH

b) strawberries with a pH = 3.55

d) soap with a pH of 10.8

13) Complete the following chart:

[H+]	[OH-]	рН	рОН	acid or base?
		3 55		
		5.55		
5.14 x 10 ⁻¹⁰ M				
			11.68	
	9.35 x 10 ⁻¹² M			
		8.70		