

## Solving More Logarithm Problems

1.

$$\log_{10} 1000 - \log_{10} 100$$

2.

$$\log_6 2 + \log_6 10 + 3 \log_6 3 - \log_2 5$$

3.

The pH or acidity of a solution is given by the equation

$$pH = -\log C,$$

where C is the concentration of ions  $[H^+]$  in multiples of  $M=1\text{mol/L}$ .

a) Graph the function

b) What is the change in pH if the solution is diluted from a concentration of 0.1M to a concentration of 0.01M?

c) From 0.001M to 0.0001M?

d) Describe the change in pH when the concentration of any acidic solution is reduced to  $\frac{1}{10}$  of its original concentration.

e) Rearrange the equation to determine the concentration as a function of pH

4.

*Sample problem:* Sketch the graphs of  $f(x) = \log_{10}(100x)$  and  $g(x) = 2 + \log_{10}x$ , compare the graphs, and explain your findings algebraically.

5.

*Sample problem:* The pH or acidity of a solution is given by the equation  $\text{pH} = -\log C$ , where  $C$  is the concentration of  $[\text{H}^+]$  ions in multiples of  $M = 1 \text{ mol/L}$ . You are given a solution of hydrochloric acid with a pH of 1.7 and asked to increase the pH of the solution by 1.4. Determine how much you must dilute the solution. Does your answer differ if you start with a pH of 2.2?