The following topics briefly summarize the mathematics minimums that you need to know for a general chemistry course.

POWERS AND ROOTS

$a^n = a \cdot a \cdot ... \cdot a \quad (n \ \ factors)$

$a^m a^n = a^{m+n}$

$\left(a^m\right)^n = a^{m \times n}$

$(ab)^n = ab \cdot ab \cdot ... \cdot ab \ (n \ \ factors) = a^n b^n$

$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$

$\left(a^m b^n\right)^p = a^{m \times p} b^{n \times p}$

$If \ \ a \neq 0, \ \ then \quad a^{-n} = \frac{1}{a^n}$

$\frac{a^n}{a^m} \quad = a^{n-m} \quad if \ \ n > m, \quad = \frac{1}{a^{m-n}} \quad if \ \ n < m, \quad = 1 \quad if \ \ n = m$

$If \ \ m \ and \ n \ are \ both \ \ integers \ with \ n > 0, \ and \ if \ \sqrt[n]{a} \ exists, \ then$

$a^{1/n} = \sqrt[n]{a} \quad and \quad a^{m/n} = \left(\sqrt[n]{a}\right)^m = \sqrt[n]{a^m}$

$If \ \ a \neq 0, \ then \quad a^0 = 1$

ALGEBRA

The associative law of addition: $(a+b)+c = a+(b+c)$

The associative law of multiplication: $(ab)c = a(bc)$

The commutative law of addition: $a+b = b+a$

The commutative law of multiplication: $ab = ba$

The distributive law: $a(b+c) = ab+ac$

Additive inverse exists: $a+x = 0, \ \ x = -a$

Multiplicative Inverse of a is (if a≠0): $a \times \left(\frac{1}{a}\right) = 1$

Example: Multiplying by equivalent amounts on each side of an equation

$$AB = CD \;\Rightarrow\; \left(\frac{1}{B}\right)AB = \left(\frac{1}{B}\right)CD \;\Rightarrow\; A = \frac{CD}{B}$$

$$\frac{A}{B} = \frac{C}{D} \;\Rightarrow\; \frac{A}{B} \times B = \frac{C}{D} \times B \;\Rightarrow\; A = \frac{CB}{D}$$

CONVERSION FACTORS

Each of the conversion factors produces a new number in different units.

$$X\ unit\ a \times \left(\frac{Y\ unit\ b}{1\ unit\ a}\right) \times \left(\frac{Z\ unit\ c}{1\ unit\ b}\right) = XYZ\ unit\ c$$

LOGARITHMS

Base The number that is raised to the x power as in 10^x or e^x. For the logarithm to the base b this means:

$$\log_b b = 1$$

Inverse functions Logarithms are inverse functions for the base raised to a power.

$$General: \quad y = b^x \quad \Rightarrow \log_b y = \log_b b^x = x$$
$$Base\ 10: \quad y = 10^x \quad \Rightarrow \log_{10} y = \log_{10} 10^x = x$$
$$Base\ e: \quad y = e^x \quad \Rightarrow \ln y = \ln e^x = x$$

Facts and manipulations of logarithms:

$$\log_b 1 = \log_b b^0 = 0$$

$$\log_b X^n = n \log_b X$$

$$\log_b (XY) = \log_b X + \log_b Y$$

$$\log_b \left(\frac{X}{Y} \right) = \log_b (XY^{-1}) = \log_b X + \log_b Y^{-1} = \log_b X - \log_b Y$$

$$\log_b \sqrt[r]{X} = \log_b X^{-r} = \frac{1}{r} \log_b X$$

If a and b are two bases and if X is any positive number, then

$$\log_a X = \frac{\log_b X}{\log_b a}$$

Converting between different bases:

A number, y, can be expressed as a base, b, to a power x:

Generally, for converting between base a and base b:

$$y = b^x \quad then$$

$$\log_b y = \log_b b^x = x \log_b b = x \quad and$$

$$\log_a y = \log_a b^x = x \log_a b \quad substituting \ for \ x$$

$$\log_a y = (\log_b y) \log_a b \quad or \quad \log_b y = \frac{\log_a y}{\log_a b}$$

Specifically, converting between base 10 and e:

$$for \ b = base \ e \ and \ a = base \ \ 10 \ \ one \ gets : \qquad y = e^x = \exp(x)$$

$$Then : \quad \log_e y = \ln y = x \qquad and \qquad \log_{10} y = x \log_{10} e$$

$$Substituting \ \ for \ x : \quad \log_{10} y = (\ln y) \log_{10} e$$

$$or \qquad \ln y = \frac{\log_{10} y}{\log_{10} e} = \frac{\log_{10} y}{0.43429} = 2.303 \times \log_{10} y$$

ROOTS OF EQUATIONS

Second order, or Quadratic equation,

$$ax^2 + bx + c = 0 \;\; has\ solutions: \;\; x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

FUNCTIONS

You should be familiar with the following functions:

polynomials, e^x, $\ln x$, $\log_{10} x$, $\cos x$, $\sin x$, $\tan x$

I suggest you make plots of these functions.