Mathematical functions, polynomial expressions, logarithms, the exponential function, units of a measurement, interconversion of units, constants and variables, equation of a straight line, plotting graphs.
Algebric operations on real scalar variables (e.g., manipulation of van der Waals equation in different forms).Roots of quadratic equations analytically and iteratively (e.g., pH of a weak acid).
Mathematical series: Power series, Maclaurin, Taylor series, convergence (e.g., pressure virial equation of state, colligative properties). Trigonometric functions, identities.
Differential calculus: The tangent line and the derivative of a function, numerical differentiation (e.g., change in pressure for small change in volume of a van der Waals gas, potentiometric titrations), differentials, higher order derivatives, discontinuities, stationary points, maximum&minimum problems, inflexion points, limiting values of functions: L'Hôpital's rule, combining limits.