The Language of Applied Mathematics

Source: The Princeton Companion to Applied Mathematics, Nicholas J. Highham, Princeton University Press, 2015.

Notation

Complex numbers

Most applied mathematics takes place in the set of complex numbers, $\mathbb{C}$, or the set of real numbers, $\mathbb{R}$.

Coordinate systems

Cartesian coordinates.

Polar coordinates.

Spherical coordinates.

Cylindrical coordinates.

Functions

Multivalued functions.

Linear function. Affine function.

Odd and even function.

Multivariate functions.

Limits and continuity

Convergence: determining δ as a function of ε.

One-sided limits.

Continuity at a point.

Continuity at an interval. Lipschitz continuity.

Limit of a sequence.

Convergence of infinite series. Partial sums.

Bounds

Sets and convexity

Order notation

Calculus

Ordinary differential equations

Partial differential equations

Other types of differential equations

Recurrence relations

Polynomials

Evaluation

Interpolation

Root finding

Rational functions

Special functions

Power series

Matrices and vectors

Vector spaces and norms

Inner products

Orthogonality

Norms

Convergence

Operators

Linear algebra

Condition numbers

Stability

Vector calculus