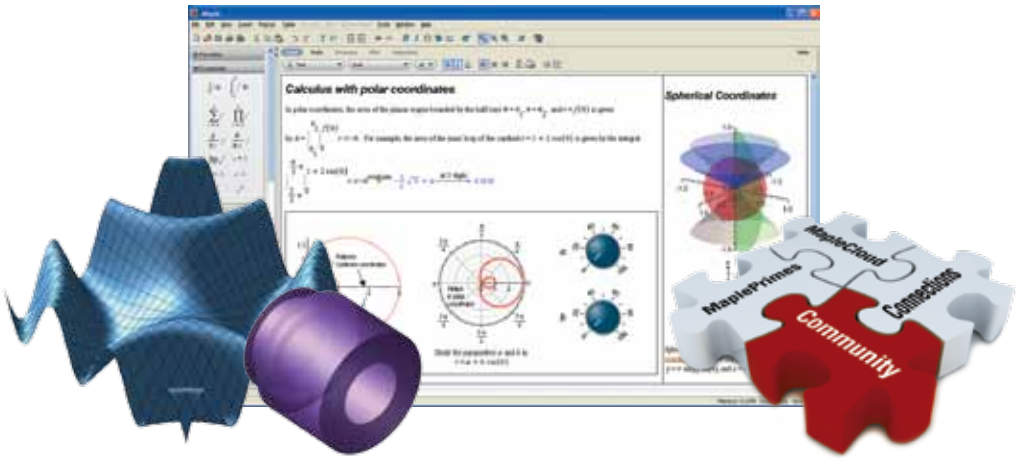
The Essential Tool for Mathematics and Modeling

Maple™ 17

Maple™ is an essential tool for researchers, teachers, and students in any mathematical or technical discipline.



Most Powerful Math Engine

- Over 5000 functions covering virtually every area of mathematics, including calculus, algebra, differential equations, statistics, linear algebra, geometry, and transforms
- Symbolic, numeric, and hybrid computation algorithms
- World-leading algorithms for solving problems that are beyond the reach of any other software system
- Efficient algorithms and tools for high performance computing and large-scale problem solving

Smart Document Interface

- Clickable Math™ interaction, including an easy-to-use math equation editor, Drag-to-Solve™, Smart Popups, and self-documenting context-sensitive menus
- Sophisticated programming language
- 2-D and 3-D plotting and animation, with extensive annotation tools
- Point-and-click tutors and Math Apps for teaching and learning key topics in calculus, algebra, and more
- Extensive document creation and word-processing tools

Passionate User Community

- MaplePrimes™, a web community dedicated to sharing experiences, techniques, and opinions
- The Möbius Project™, The Maplesoft Application Center and the MapleCloud™ Document Exchange, featuring thousands of examples, applications, and Math Apps contributed by the Maple community
- Teacher and student resource centers, with classroom materials, training videos, social networking communities, tips and techniques, and more

Application Areas

Calculus
Matrix and Vector Computations
Algebra
Differential Equations
Physics
Statistics and Process Control
Math Education
Visualization
Curve Fitting
Optimization
Special Functions
Advanced Mathematics
Engineering
Geometry
Units and Tolerances
Scientific Data Management
Financial Modeling
String Processing and Linguistic Research
CAD Connectivity
Code Generation
Testing and Assessment
Parallel and Grid Computing
Application Development
Web Deployment

Key Features

Mathematics

Maple includes over 5,000 computational functions covering virtually every area of mathematics, including:

- Abstract Algebra
- Algebra
- Algebraic Curves
- Calculus
- Combinatorial Functions
- Combinatorial Structures
- Complex Arithmetic and Functions
- Curve Fitting
- Differential Algebra
- Differential Equations
- Differential Forms
- Differential Geometry
- Discrete and Integral Transforms
- Dynamic Systems
- Euclidean Geometry
- Financial Mathematics
- Gaussian Integers
- Generating Functions
- Graph Theory
- Group Theory
- Lie Symmetries
- Linear Algebra
- Linear Functional Systems of Equations
- Linear Operators
- Linear Programming
- Linear Recurrence Equations
- Logic
- Numerical Approximations
- Number Theory
- Optimization
- Orthogonal Polynomials
- P-adic Numbers
- Physics
- Polynomials
- Polynomial Systems
- Q-Difference Equations
- Rational Normal Forms
- Real Domain Computations
- Series Expansions
- Scientific Constants
- Scientific Error Analysis
- Signal Processing
- Special Functions
- Statistics
- Statistical Process Control
- Symbolic-Numeric Algorithms for Polynomials
- Tensors
- Tolerances
- Units and Dimensions
- Variational Calculus
- Vector Calculus

Symbolic and Numeric Computations

- Work with exact quantities such as fractions, radicals, and symbols, eliminating accumulated round-off errors
- Choose from a variety of exact and approximate techniques, as best suits your needs
- Approximations can be computed at any precision that is required, and are not restricted by hardware limitations
- Solvers use a combination of symbolic and numeric techniques, allowing them to solve problems for which either approach alone would be insufficient

Visualization

- 2-D and 3-D graphs and animations, created through menus, commands, and interactive assistants
- Over 170 plot types and options, including implicit, contour, complex, polar, vector field, conformal, density, ODE, PDE, engineering, and statistical plots
- Smart plot view automatically focuses on the region of a 2-D plot that is most meaningful
- Light modeling, legends, axis control, titles, glossiness, gridlines, and transparency
- Display typeset text and mathematical expressions in plot titles, labels, legends, tickmark labels, and axis labels
- International (non-English) characters in titles, legends, and labels
- Plot annotations for 2-D and 3-D plots include arrows, shapes, and drawing tools
- Zoom and pan 2-D and 3-D plots and animations
- Real-time rotation of 3-D plots
- Fly-through animations of 3-D plots using user-defined camera paths
- Interactive control of parameters through sliders
- Live Data Plots for creating and customizing statistical plots such as area charts, histograms, and pie charts
- Standard geometric objects, regular solids, and polyhedra
- Layering of graphics and animations of different types
- Wide variety of coordinate systems

User Interface

- Easy problem entry with Clickable Math features, including a math equation editor, palettes, Smart Popups, Drag-to-Solve, and self-documenting context menus
- Technical document environment with comprehensive word processing tools, including a spell-checker that understands math terminology
- Hundreds of task templates for fill-in-the-blank problem solving
- Interactive assistants for many tasks, including equation manipulation, analyzing ODEs and ODE systems, creating plots and matrices, converting units, and exploring parameters in expressions
- Command completion and code editor
- Custom Maple snippets palettes for reusing fragments of a Maple document
- Tables, symbolic spreadsheets, code regions, drawing canvas, and interactive components such as buttons, sliders, and dials
- Maple Portal provides a starting point for any Maple user, with tutorials, interactive assistants, task templates, and links to specialized content for students, math educators, and engineers
- MapleCloud for easy exchange of documents and Math Apps with colleagues and students

Mathematics Education

- Over 250 interactive tutors and Math Apps to explore, visualize, and learn key concepts from precalculus, calculus, linear algebra, multivariate calculus, vector calculus, numerical analysis, complex variables, differential equations, and more
- Step-by-step tutors let students practice working through problems, not just find the answer. Step-by-step tutors are available for fundamental skills, including differentiation, integration, limits, Gaussian elimination, eigenvalues, and matrix inverses
- Over 40 visualization tools use 2-D and 3-D plots and animations to illustrate mathematical concepts, including Taylor approximation, Newton's method, surfaces and volumes of revolution, cross products, and differential equations
- Graphing Calculator interface
- Portals designed for students and math educators, acting as guides to hundreds of common tasks, tutorials, and instructional resources for mathematics courses
- Dictionary of mathematical terms

Programming

- Full featured programming language for scripts, programs, and full applications
- Interpreted language supports easy exploration and fast prototyping
- Procedural, functional, and object oriented programming
- Advanced features include operator overloading, assumptions on variables, and exception handling
- Debugging, profiling, security, and library management tools
- Source code of most routines available for viewing
- Create and manipulate many kinds of data structures, including sets, strings, lists, arrays, stacks, queues, records, and modules
- Tools for manipulating mathematical objects, including polynomials, integrals, and sums
- Powerful type system, including ability to extend existing types
- Generate and manipulate Maple worksheets through their XML representation
- User-level routines for multi-threaded and multiprocess programming on multi-core computers
- Compiler package, CUDA™ support, parallel algorithms, and optimization tools promote highly efficient user code for numeric computations
- External function interface for transparent access to dynamic libraries
- Interactive embedded components include buttons, sliders, plots, check boxes, list boxes, toggle buttons, radio button, dials, gauges, data tables, videos, and mathematical expression boxes for entering and displaying 2-D math
- Customizable context-sensitive menus
- Tools for building interactive applications

Connectivity

- Code generation for Visual Basic, MATLAB®, Java, C, C#, and Fortran code
- Internet connectivity
- MATLAB® connectivity includes two way integration and code translation
- Mathematica® Notebook conversion and command translation tools
- OpenMaple™ API for C, C#, Java, and Visual Basic programs
- External calling to Java, C, C#, and Fortran
- Connect with Microsoft® Excel®, databases, and CAD systems
- MathML 2.0 presentation and content support
- Import and export of XML documents
- Export documents to HTML, XML, MathML, LaTeX, RTF, PDF, and ePUB
- Export plots to BMP, DAE, DXF, EPS, GIF, HPGL, JPEG, PCX, POV, TEK, WMF, and X3D
- Import, manipulate, and export data from WAV, JPEG, and TIFF files
- Import data from Microsoft Excel, ASCII, CSV, Matrix Market, MATLAB®, and more
- Share solutions with the Maple Player or over the web with MapleNet™

Maplesoft

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