

# Maple V



POWERFUL TECHNICAL COMPUTING.

**Waterloo Maple**

Advancing Mathematics

# Maple V. The Future of Technical Computing.

Waterloo Maple is an innovative software development company, with an uncompromising commitment to the changing needs of its customers. Providing leading technology for over 15 years, the company is widely recognized for providing quality tools and services for the advancement of technical computing. Waterloo Maple's flagship product Maple V is highly regarded by educators, students and technical professionals. Maple V is the world's most powerful computer algebra system.

Maple V, developed at the University of Waterloo and other leading universities around the world sets the standard for a mathematical power. Waterloo Maple's vision is to create a rich open environment that allows mathematical information to be shared among Open Math™ compliant software. The result is a software program that combines an intuitive "Click & Solve"™ interface, a rich open environment and the unprecedented power of the Maple® mathematical engine.

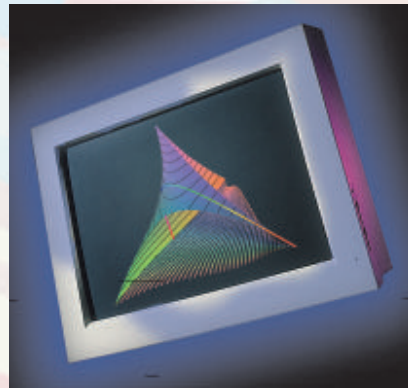
## The Power to Solve

Meet the challenge of today's classrooms with the power of Maple V. From simple in-class demonstrations of concepts to efficiently creating course materials, Maple V Release 5 is the ideal program for teaching mathematics. Its interactive open environment enables you to develop electronic questions, assignments and exams. Maple V makes learning fun and the teaching process more dynamic.

**"Maple V has always been a powerful tool for doing sciences. And now, with Release 5, Maple V offers real time viewing of 3-D graphs and full freedom of rotation, making it a powerful demonstration tool for the classroom".**

**"The changing needs in our students' curriculum makes Maple V the obvious choice. Educators of all levels should go out, buy this tool and have fun while discovering".**

Bernard Marcheterre  
Professeur de physiques, College de  
L'Assomption, Montreal, Canada



**P O W E R**

## A Standard Teaching and Learning Tool...

The use of technology in education has changed the way we teach and the way we learn. Technology in the classroom has enabled students to learn through interaction and exploration of concepts. Whether classes are taught on campus or through distance learning programs, Maple V is in use at institutions around the world to teach, prepare lessons and develop course materials at all levels of calculus, algebra, structural design, physics, chemistry, economics and more. From beginning classes in calculus to research in astrophysics, students use Maple V as a "hands-on" learning tool to make mathematics more dynamic and meaningful. Maple V Release 5 is the perfect tool for teaching, learning and solving mathematical problems.

## An Open, Complete Problem-Solving Environment

Maple V Release 5 incorporates Open Math, an

evolving set of standards which will enable consistent interpretation of mathematical information and expressions among programs. Waterloo Maple's vision is to develop a technical computing environment where educators and students learn only one interface to interact with a large number of commercially available packages.



**L E A R N**

# What's New in Maple V Release 5?



**S O L V E**

## Palettes Make it Easy

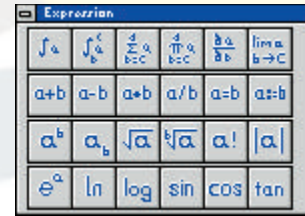
Maple V now contains a series of palettes that provide an easy way to enter Maple V expressions. The palettes contain Greek symbols and mathematical constructs such as integrals, limits, summations, square roots, and powers.

- Enter expressions quickly and intuitively with the "point and click" palette
- Easily create expressions, enter symbols and construct matrices from two-dimensional templates
- Enter Maple V commands and alter expressions quickly with the expression editor

## Context-sensitive Menus Guide You

Maple V Release 5 introduces expanded context-sensitive menus. Click on an expression and Maple V provides you with a menu of possible operations unique to that expression.

- Dynamic context-sensitive menus guide you through mathematical operations
- Solve equations with a click of the mouse
- Easily change style and plot attributes



## MATLAB® Link for Maximum Flexibility\*

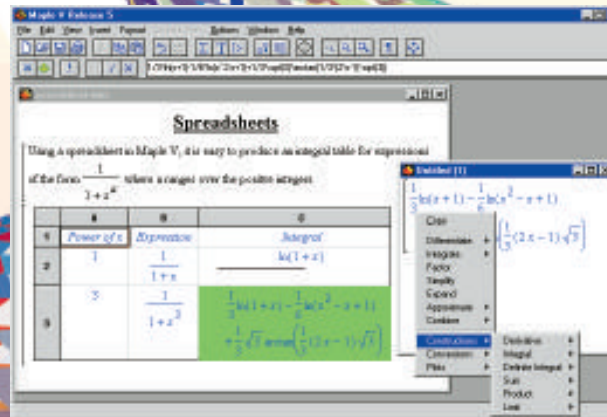
You can now execute your favorite MATLAB commands from inside Maple V.

- Link Maple V's symbolic power to MATLAB's numerical routines
- Communicate directly with the MATLAB engine and get results within Maple V
- Combine the power and flexibility of Maple V and MATLAB to solve a wider class of numeric and modeling applications

## Spreadsheet Functionality Combined with the Power of Maple V\*

You can create spreadsheets within a Maple V worksheet and perform Maple V operations right in the spreadsheet. This provides you with the functionality of spreadsheets and the symbolic power of Maple V.

- Work in a spreadsheet environment designed to be familiar to Excel™ users
- Drag and drop spreadsheet elements into a Maple worksheet for further exploration
- Use Maple V spreadsheet functionality for fast and easy matrix and plot generation



**"Maple V Release 5 offers the best of both worlds: the genius of Maple's symbolic mathematics linked with the raw power of MATLAB's numerical routines is, quite simply, mind-boggling. Complex problems can be broken down into components which, after algebraic processing can be fed directly into MATLAB."**

Nigel Backhouse  
Division of Applied  
Mathematics,  
The University of  
Liverpool



**L I N K S**

\* This feature is available on some platforms

# Maple V. "Click & Solve" Interface Technology.



## Enhanced Graphical User Interface

Maple V Release 5 is a revolution in the way educators and students can teach, use and learn mathematics. "Click and Solve" interface technology makes Maple V easy to use and fun to learn, allowing students to concentrate on exploring the many facets of mathematics.



# TEACH

## Export to HTML Makes Web Publishing Easier than Ever!

Publishing mathematics on the Web has always been difficult. Using Maple V Release 5, you can create HTML pages that include mathematical expressions and graphics with a few simple clicks of the mouse.

- Provide on-line course materials for students
- Perform collaborative research and complete projects over the Internet
- Publish technical papers with typeset math notation on the Web

## Gain New Insight with Powerful Visualization Tools

Using Maple V visualization tools, you bring mathematics to life. Colorful graphics let students explore the concepts being taught, adding new meaning and understanding.

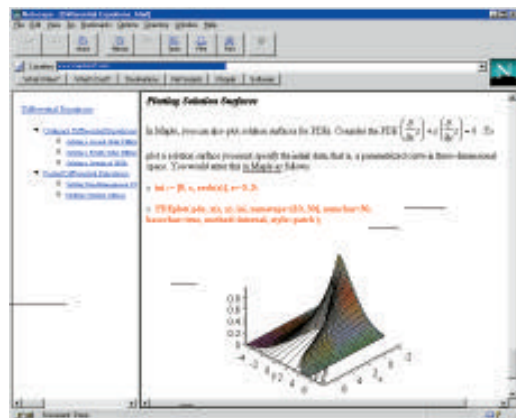
- Animation, rotation, and 2-D and 3-D visualization tools make solutions clearer and faster
- Communicate your solutions with a wide range of plotting tools
- Easily create graphs by dragging and dropping expressions\*

## More Mathematical Functionality than Ever Before!

- Solve a wider class of problems than ever before!
- Newly improved capabilities include integral transforms, elliptic integration, differential equation tools, combinatorial structures, Gröbner bases, statistical plotting, and improved 3-D geometry package.

“Smart plots and context sensitive menus complement the traditional Maple V command line nicely. I found them a convenient means for selecting and operating on a portion of a Maple expression that encouraged experimentation. I’m delighted to find that the context sensitive menus can be customized, this is consistent with Maple’s open architecture.”

Joe Riel



## Waterloo Maple

Advancing Mathematics

## How to get Maple V Working for you.

Waterloo Maple's uncompromising commitment to its customers goes beyond providing just software. We are committed to providing world-class services and support to our customers. Whether you require sales support, product training, mathematical consulting or technical support, Waterloo Maple has a team of distributors and service personnel to help you get the most out of Maple V.

To help your students explore the world of mathematics, Waterloo Maple has a variety of licensing programs to help you affordably provide your students and faculty with Maple V on your campus. From single copies for individual educators to multi-site campuses, Waterloo Maple has a licensing program that meets your needs. Call one of our education specialists for more information on how you and your students can use Maple V to explore the world of mathematics.

1-800-267-6583

# The New Maple V

## Release 5

A RICH OPEN ENVIRONMENT.

# What's Inside Maple V Release 5?

Maple V provides an extensive library with more than 2,500 functions including:

## Symbolics and Numerics:

### Calculus

- Differentiation
- Numerical Integration
- Symbolic Integration
- Limits, Series
- Summations and Products
- **Integral Transforms:**
  - Laplace, Hankel, Fourier and more
- Discrete Transforms: including Z and FFTs
- (Fast Fourier Transforms)
- Piecewise-Defined Functions

### Equation Solving

- Linear and Nonlinear Systems
- **Ordinary and Partial Differential Equations**
- Symbolic, Numeric and Series Solutions
- Recurrence Relations
- Transcendental Equations
- Inequalities

### Elementary & Special Functions

- Trigonometric, Exponential, Error, Logarithm, Bessel, Zeta, Gamma, Hypergeometric, Airy, Elliptic, Kelvin and many others

### Linear Algebra

- Matrix Operations
- Eigenvalues and Eigenvectors
- Special Matrices
- Curvilinear Coordinates
- Matrix Normal Forms

### Plus

- Algebraic Number Fields
- **Combinatorics**
- Complex Numbers
- Differential Forms
- Financial Analysis
- Formal Logic
- Galois Groups
- Geometry
- Graph Theory
- **Gröbner Bases**
- Group Theory
- Lie Symmetries
- Linear Optimization
- Number Theory
- Numerical Approximations
- Orthogonal Polynomials
- Polynomial Factorization over GF(pk)
- Power Series
- Statistics
- Teaching Tools

## Graphics:

### 2D Plotting

- Graphs of Multiple Functions
- Semilog, Log and Loglog Plots
- Parametric, Phase and Polar Plots
- Conformal Maps
- Contour Plots
- DE Plots, PDE Plots and Phase Portraits
- Text Annotations
- Implicit Curves
- Inequalities
- Arrays of Plots
- Variety of Coordinate Systems:
  - Bipolar, Elliptic, Maxwell, Polar, Rose and many more
- User-defined Coordinate Systems

### 3D Plotting

- **3D Geometry**
- Multiple Functions
- Surface Lighting
- User Defined Color Function
- Implicit Surface Plots
- Cut-In and Cut-Out
- Contours and Polygons
- PDE Plots and Space Curves
- Text Annotations
- Variety of Coordinate Systems:
  - Cardiodal, Conical, Spherical, Toroidal and many more
- User-defined Coordinate Systems

### Animation

- 2D and 3D
- Interactive Control of Animation
- Playback
- Looping, Direction and Speed Controls

## Programming:

- Complete procedural programming language
- Syntax similar to standard languages
- Mathematical Data Types
- User Defined Data Types
- Built-in Full Featured Debugger: watch points, error trapping, break points, single stepping, etc.
- Library Archives
- Source Code available for user viewing
- Built-in routines are extendible

### Input and Output

- C-like file input and output
- Conversion of expressions and procedures to FORTRAN or C Code
- Export worksheets to LaTeX
- **Export to HTML**
- **MATLAB link**

## User Interface:

- **Spreadsheets**
- **Drag and drop**
- **Context menus**
- **Palette**
- **Expression editor**
- **Undo/redo**
- Comprehensive word-processing facilities
- Character-level Font Control: bold, italic, style, size etc.
- Collapsible sections and subsections for outlining
- Typeset Math Notation in input, output and text
- In-line executable or inert input
- Hyperlinking
- Selectable and re-usable output subexpressions
- Tool Bars
- In-line Graphics

## Architecture:

- Multiple Document Interface (MDI) allowing multiple worksheets
- Multiple kernels for multi-tasking operating systems
- OLE2 container support for Windows

## Support:

- 90 days technical support for current version of Maple V
- Optional extended support
- Guaranteed 3-day response time

## Documentation:

- Comprehensive On-line Help, including Full Text Searching, Help Browser and Hypertext Access
- Comprehensive set of manuals

- **Indicates new or improved features in Release 5**

## Available Platforms:

Windows '95, Windows NT, Windows 3.1+  
Macintosh, Power Macintosh  
Popular UNIX and Linux platforms.

Call for information on other platforms.

Only a fraction of Maple V's capabilities are summarized here, For specific information please contact:

# Waterloo Maple

**Advancing Mathematics**

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