Maple™ 14

The Essential Tool for Mathematics and Modeling

The Ideal Environment for All Your M

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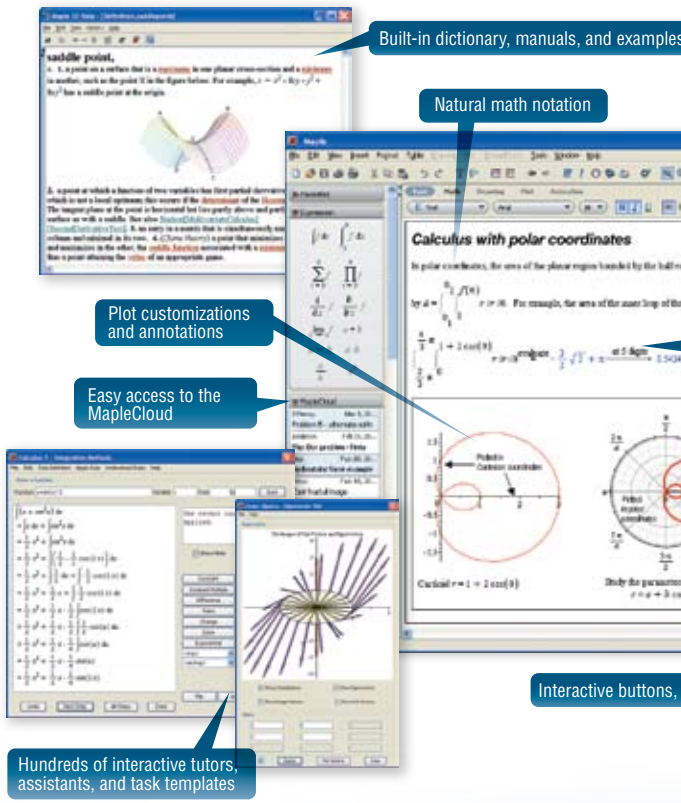


Maple™ is an essential tool for researchers, teachers, and students in any mathematical or technical discipline. It lets you explore, visualize, and solve even the most complex mathematical problems, reducing errors and providing greater insight into the math. Maple's world-leading computation engine offers the breadth, depth, and performance to handle every type of mathematics, redefining math education and opening new horizons in technical research. Teachers can bring complex problems to life, students can focus on concepts rather than the mechanics of solutions, and researchers can develop more-sophisticated algorithms or models.

Maple's intuitive user interface leads the pack among math software, with Clickable Math™ and Clickable Engineering™ techniques to ensure that students are instantly productive and engaged. Its smart document environment produces rich documents that are fully interactive and as professional looking as a textbook and can be easily shared with colleagues, students, or the entire Maple community through the MapleCloud™.

Maple is supported by the Teacher Resource Center, which contains a comprehensive collection of interactive demonstrations, lecture notes, Clickable Math applications, and testing content. Further resources for teachers and students include a Student Help Center, featured community content in the Maplesoft™ Application Center, and discussion forums. Maplesoft's complete academic solution also includes MapleSim™, a physical modeling and simulation tool; Maple T.A™, a powerful testing and assessment system; e-books; and more.

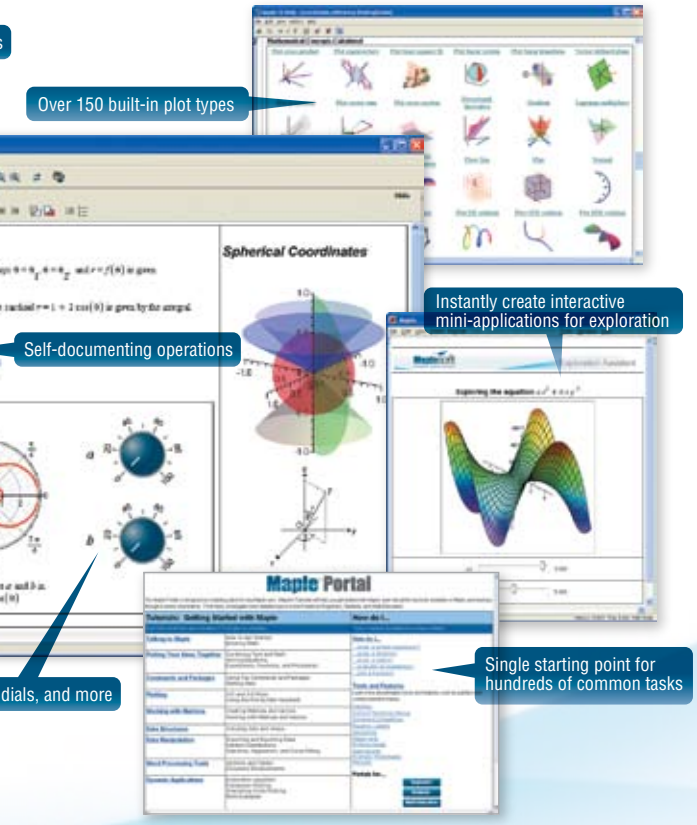
"With Maple, I can do unexpected things in an easy way; it is very simple, yet very powerful. Apart from my teaching, it also plays a very important part in my research on algorithms for dealing with geometric entities. I have been a faithful user of Maple all these years because my experience with it gets better every year."

Professor Laureano Gonzalez-Vega;
Mathematics, Statistics, and Computing Department;
Universidad de Cantabria, Spain

Key Features:

- Coverage of virtually every area of mathematics, including calculus, algebra, differential equations, statistics, linear algebra, geometry, and transforms
- Intuitive smart document environment
- Advanced easy-to-use math equation editor
- Self-documenting context-sensitive menus
- Units, dimensions, and tolerances
- Task templates and interactive task assistants
- Point-and-click tutors for key topics in calculus, algebra, and more

Mathematical Work

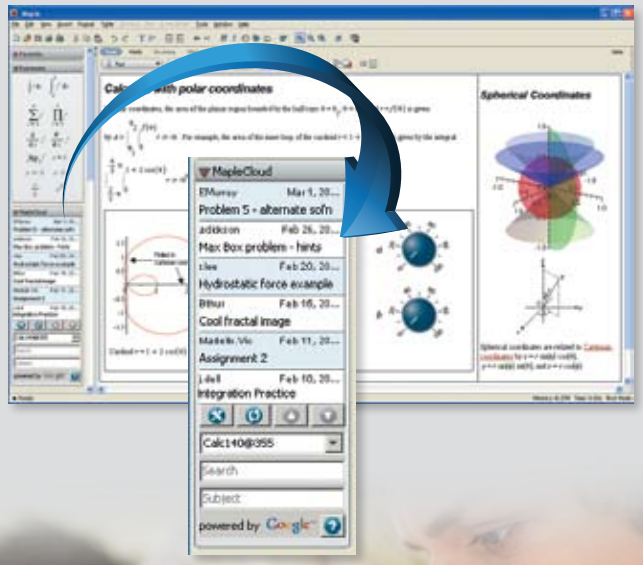


- 2-D and 3-D plotting and animation, with extensive annotation tools
- Extensive document creation tools
- Single integrated environment for creating, distributing, and receiving documents through the MapleCloud
- Interactive embedded components (sliders, buttons, dials, gauges, math entry boxes, etc.)
- Dictionary of technical terms
- Code generation (C, Fortran, Visual Basic®, Java™, MATLAB®)
- Connectivity to Excel®, MATLAB®, Java, Fortran, CAD systems, C, databases, and more

MapleCloud: A revolutionary way to share work with colleagues and students

Access to the MapleCloud Document Exchange is seamlessly integrated into the Maple environment.

- Easily and instantly share your work among a group of colleagues, with your class, or with Maple users worldwide
- Share your documents without the need for separate tools or cumbersome uploading and downloading
- Create, distribute, and receive technical documents in a single integrated environment



With Maple, Math Just Clicks!

"When students discovered Maple's interactive environment, it felt like a fresh new technique for learning math. No more long learning cycles and having to memorize numerous syntax and commands. With a click of the mouse, Maple presents the solution in the simplest way–I can't imagine it getting any simpler!"

Dr. Nick Zorka, Lawrence Tech University

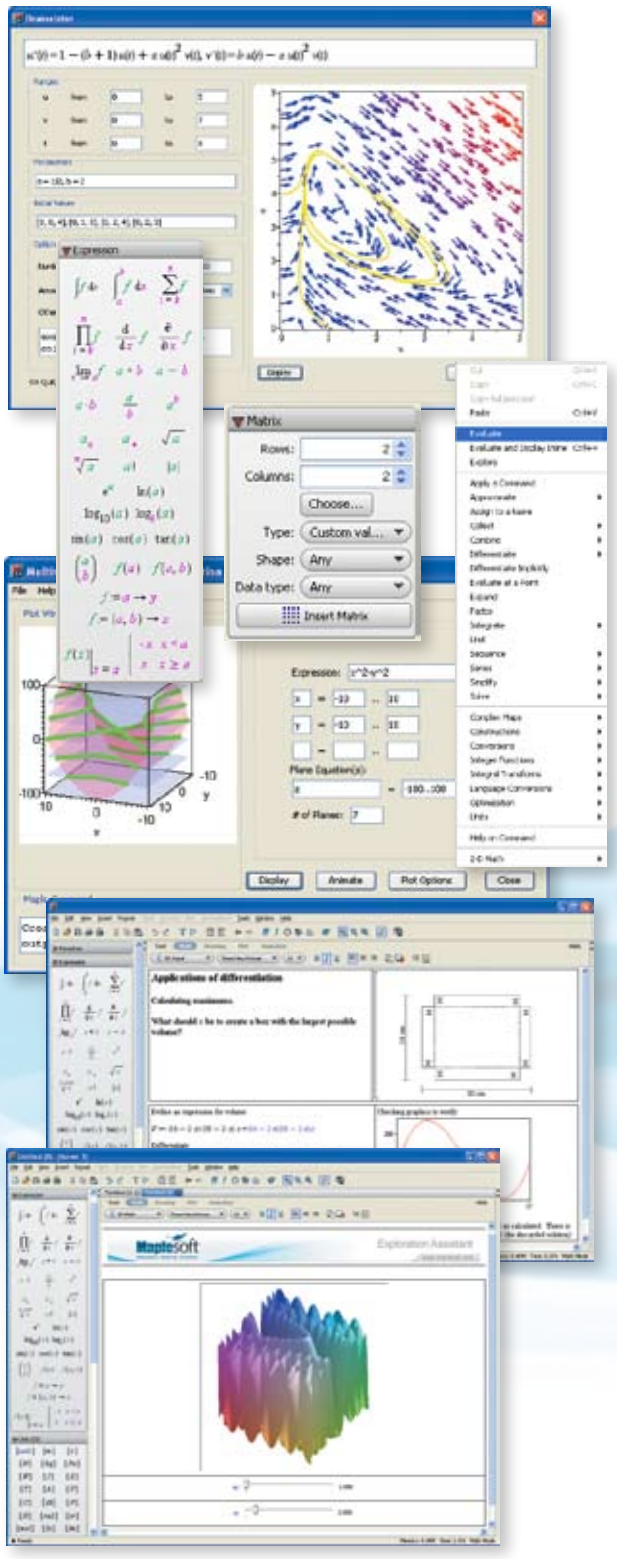
Maplesoft™ has introduced one of the most exciting concepts in math software history: Clickable Math™.

The idea of powerful mathematics delivered through very visual, interactive, point-and-click methods has launched a new generation of teaching and learning techniques in mathematics. The concept is simple: combine the legendary power of Maple software with a user environment that allows even novices to perform complex operations without knowing any commands or syntax. The result? You get all the rich benefits of Maple problem solving, visualization, and document processing, with virtually no learning curve.

Clickable Calculus™, Clickable Algebra™, Clickable Engineering™…

No matter what the subject, Maple's point-and-click interface makes math easy to do, easy to learn, and easy to teach. The Maple features that deliver the Clickable Math concept include:

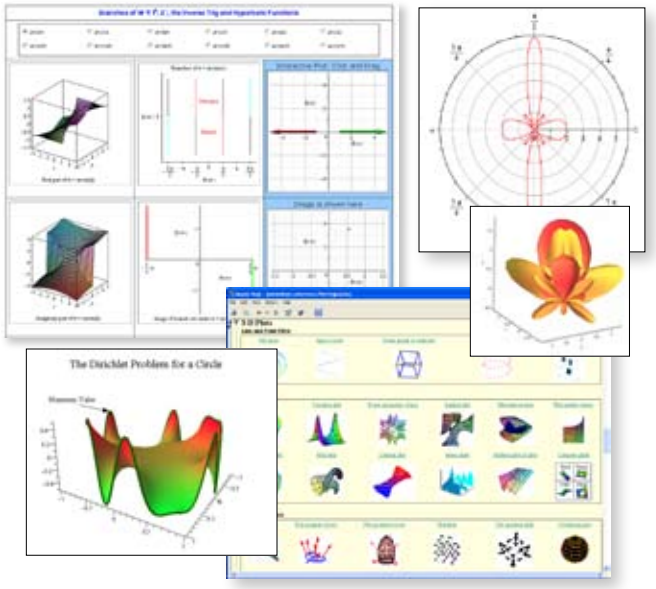
- Smart, context-sensitive right-click menus for instant access to solvers and other command-free operations
- Extensive range of palettes for visual editing of math expressions
- Interactive plotting and animation controlled by the mouse and not by endless parameters and attributes in a command
- "Drag and drop" operations on plots, expressions, text, and more
- Interactive assistants that provide easy mechanisms to solve and explore advanced topics such as differential equation solving, optimization, and advanced visualization
- Portals for students and math educators, which act as guides for hundreds of common tasks from mathematics courses
- Built-in selection of interactive tutors that offer visual learning environments for many important math topics in precalculus, calculus, linear algebra, and more
- Handwriting recognition of math symbols and equations
- WYSIWYG document processing features that let you create complex math documents more quickly and easily than in a word processor or LaTeX
- An Exploration Assistant that allows you to instantly create interactive mini-applications to explore the parameters of expressions



Millions Count on Maple

The result of over 20 years of cutting-edge research and development, Maple's math technology delivers the power and the precision you need, no matter what your technical discipline.

Intelligent symbolic and numeric algorithms find solutions fast, eliminating mechanical errors, saving time, and increasing comprehension. An extensive range of visualization and animation tools lets you see your mathematics in countless ways, improving insight and creativity. Convenient publishing tools let you present interactive content to your students, colleagues, and even peers around the world.

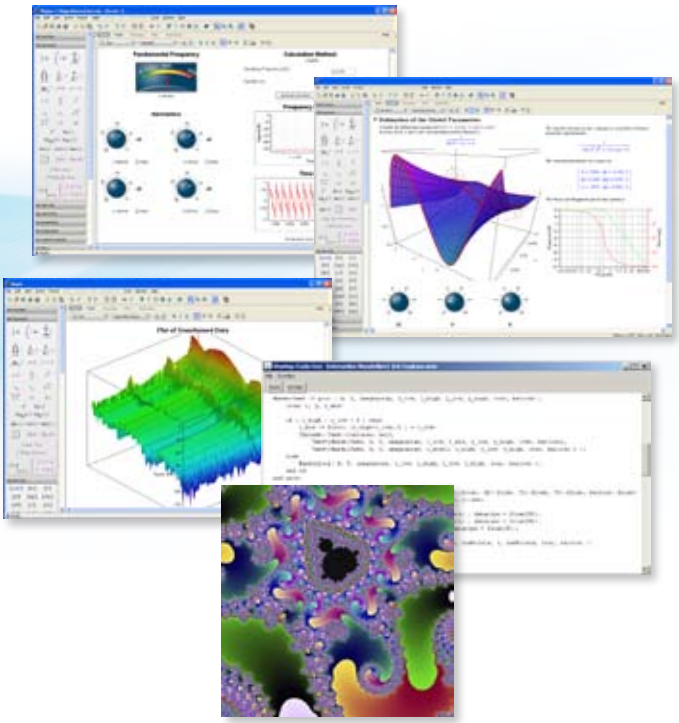


- Thousands of mathematical functions covering the entire technical curriculum - from basic algebra and precalculus, to calculus and differential equations, through to applied and advanced courses
- Hundreds of 2-D and 3-D plotting routines including explicit, implicit, parametric, polar, vector field, contour, logarithmic, dual-axis, statistical, and more
- Professional publishing tools include document processing tools, web publishing, live web content using MapleNet™, the ability to export to Microsoft® Word, LaTeX, and MathML 2.0, and a PowerPoint®-like slide presentation mode

Beyond the Classroom

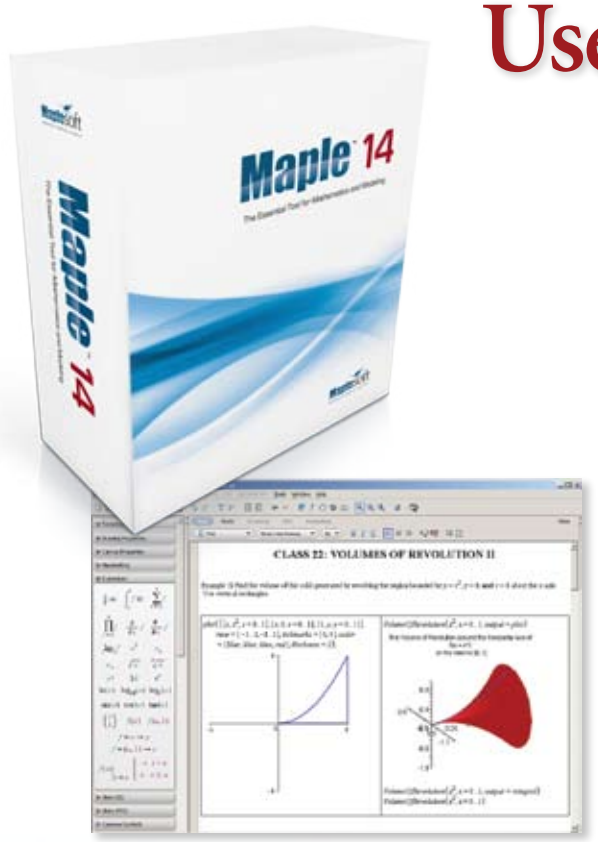
Maple is the mathematical tool of choice for research mathematics and technical computations.

No other math package strikes a better balance between ease of use and power, making Maple the ideal tool for the classroom and beyond. Unlike graphing calculators, Maple will stay with students through their undergraduate programs, graduate school, and into their professional careers. Unlike programming-based numerical tools, Maple's power flows in an intuitive, natural way. How you think about math is how you do your math in Maple.



- Support for abstract algebra, linear algebra, statistics, graph theory, single and multivariate calculus, differential geometry, integral transforms, differential algebra, number theory, advanced physics, and more
- Industry leading algorithms for differential equations (ODE, PDE, DAE, etc.)
- Symbolic, numeric, and hybrid computation algorithms
- Powerful high-level programming language designed for mathematics
- Efficient algorithms and tools for high performance computing (HPC) and large-scale problem solving, including multi-threading and parallelization
- Code generation, external calling, an open API, network tools, and built-in connectivity with MATLAB®, Excel®, the NAG® C library, and databases
- Available add-on products provide additional functionality, including global optimization solvers, finance, and grid computing

User Case Studies



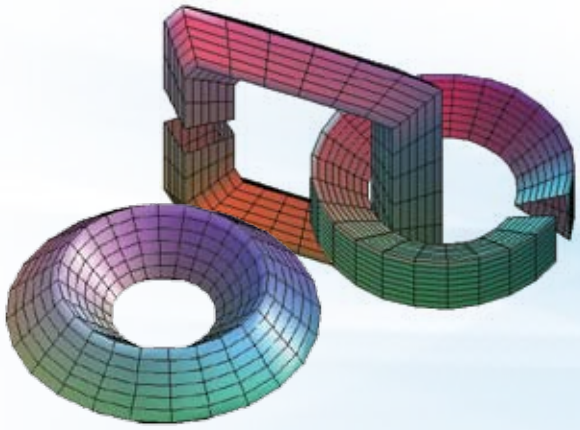
The Effect of Technology in the Classroom

Jack Weiner, a renowned professor and celebrated teacher at the University of Guelph, has incorporated Maple into several of his calculus courses. He uses Maple extensively during lectures to help him mathematically explore and visualize complex concepts such as Volumes of Revolution. Beyond the classroom, he has used the web-based testing system Maple T.A. to design completely algorithmic tests for every week of the course, demonstrating how effectively such tests can ensure mastery of the fundamental learning objectives of the course.

Professor Weiner has already started to see positive changes in his students' approach to learning. "I've seen technology make a profound difference for the student and for the instructor," he said. "It not only increases the efficiency of instruction, but also shows dramatic improvement in class grade averages and success rates. This helps to boost the students' overall motivation, retention, and comprehension."

Building Better Mathematicians

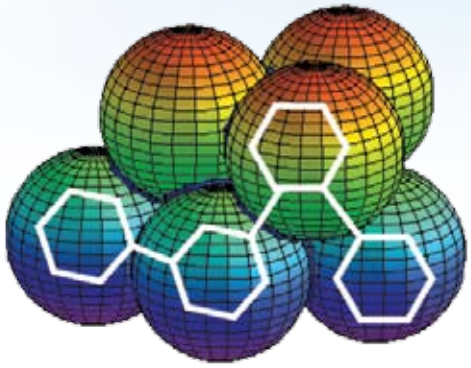
Math software technology from Maplesoft is helping Professor Roger Kraft teach math students at Purdue University Calumet. He uses Maple to give students a greater understanding of the subject, help clarify concepts taught in the classroom, and deliver an interactive medium for exploring and visualizing functions. Professor Kraft chose Maple for his classroom because of its consistent and easy-to-use interface, which enables instructors and students alike to capture the ideas, methods, and assumptions behind the math.



Professor Kraft has developed his own course material and homework assignments in Maple. One Maple homework assignment, for example, asks students to plot a parametric surface. Students interactively explore the solution space by writing down equations in a Maple document, plotting them with a suite of visualization tools, and documenting their methods. Professor Kraft explains, "Maple empowers students to explore the behavior of functions as they vary constants and parameters. The combination of the consistent user interface, math functions, and visualization tools means that students learn math faster with Maple."

Organic Synthesis with Maple

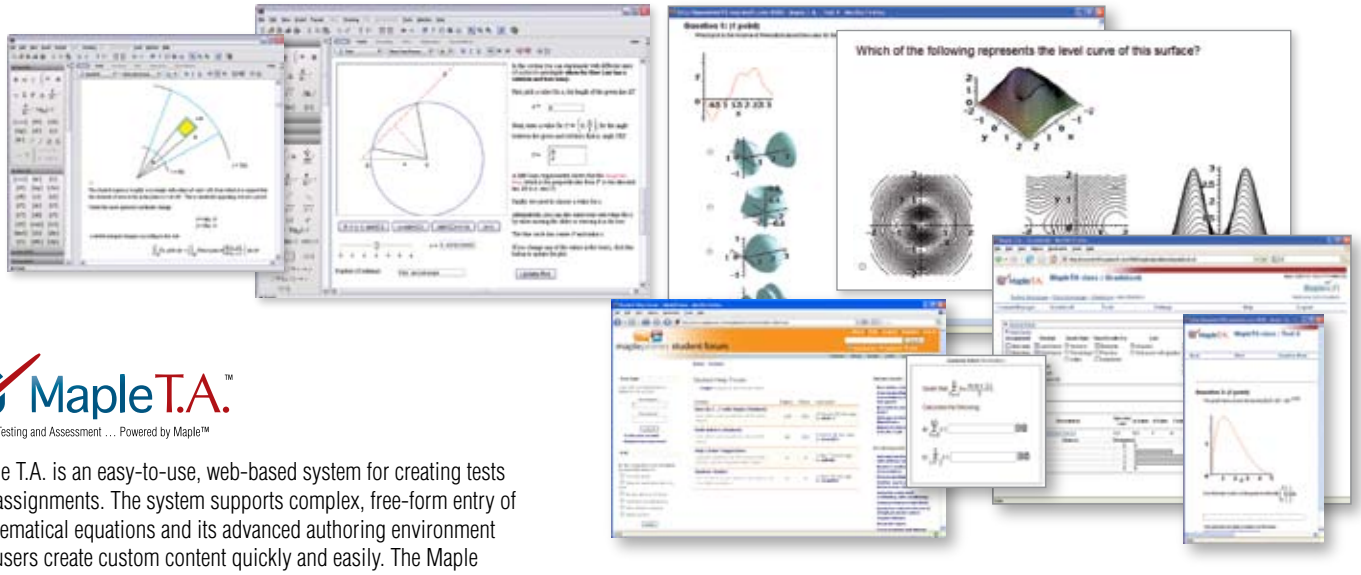
Joanna Ellis-Monaghan is a professor of mathematics at Saint Michael's College in Vermont who works in the area of Algebraic Combinatorics, with a particular interest in applied graph theory. Her recent interdisciplinary research work uses graph theoretic techniques to address problems arising from DNA sequencing and biomolecular computing, such as organic synthesis. Organic synthesis is concerned with assembling molecular structures in a desired form through organic reactions.



Professor Ellis-Monaghan and her colleagues used Maple to develop a geometric placement method for creating knots out of hydrocarbon chains, thus providing a strategy for their synthesis. This new design strategy is important because it facilitates further study of the properties of knotted molecules in general. Professor Ellis-Monaghan says, "Maple is an essential component of all my research programs. I use it on a daily basis, from the myriad small computations that inevitably crop up in a project, to major mathematical manipulations and visualizations. I find it especially valuable as a visualization tool that leads to a deeper understanding of the areas under investigation."

Add-on Products and E-Books

For a complete academic solution, Maplesoft offers a growing selection of add-on products and e-books that will enhance and extend the Maple experience. Here are just a few of the add-on products and e-books available.



Maple T.A.™

Online Testing and Assessment … Powered by Maple™

Maple T.A. is an easy-to-use, web-based system for creating tests and assignments. The system supports complex, free-form entry of mathematical equations and its advanced authoring environment lets users create custom content quickly and easily. The Maple T.A. system does the marking automatically and makes it simple to analyze the results. No other math software company offers this type of testing and assessment technology.

Maple T.A. MAA® Placement Test Suite

Partnering with the MAA to revolutionize placement testing

Maplesoft has partnered with the Mathematical Association of America (MAA) to revolutionize placement testing. The Maple T.A. MAA Placement Test Suite combines the MAA tests with Maple T.A., an online placement testing solution that offers easy administration, instant results, and flexible scheduling for incoming students, all at a fraction of the cost normally associated with traditional placement methods.

The Mathematics Survival Kit

Maple™ Edition

The Mathematics Survival Kit is an interactive e-book designed to help students overcome many of the common difficulties encountered when studying mathematics. This e-book provides clear explanations and examples, illustrative plots and animations, and hundreds of randomly generated practice problems.

Advanced Engineering Mathematics

The Advanced Engineering Mathematics with Maple interactive e-book is the definitive reference software and textbook for engineering mathematics. A companion Student Manual and an Instructor Manual are also available.

Calculus [study guide] Precalculus

Interactive Study Guide

Two study guides are available: the Calculus Study Guide and the Precalculus Study Guide. Each of these self-study tools will maximize students' understanding of these topics.

Teacher Resource Center

The course content in the Teacher Resource Center is designed to provide you with all the materials you need to incorporate Maplesoft technology in your classroom. Much more than a set of simple demos, this content acts as the starting point for creating an engaging, enriching classroom experience. Content includes:

- Motivating and modifiable lecture notes
- Engaging and flexible demonstrations
- Relevant, reusable assignment questions
- Clickable Math applications

Additional Maplesoft resources for teachers and students include:

- The **Application Center**, with over 2000 applications and tutorials contributed by the Maplesoft community
- The **Student Help Center**, to support students learning mathematics and Maple
- The **MaplePrimes™** web community, dedicated to sharing experiences, techniques and opinions about Maple and other Maplesoft products