# Mathematics Tools that Enrich Your Classroom and Accelerate Your Research

Maplesoft™

Mathematics • Modeling • Simulation

A Cybernet Group Company

# Maple™

## The Essential Tool for Mathematics and Modeling

Mathematics plays a critical role in our modern world, which is why mathematicians, scientists, and engineers everywhere rely on Maple™ software. Maple helps you analyze, explore, visualize, and solve mathematical problems quickly, easily, and accurately. With over 5000 functions covering virtually every area of mathematics, Maple has the depth, breadth, and performance to meet all your mathematical challenges.

### Most Powerful Math Engine

Maple's world-leading computation engine offers the breadth, depth, and performance to handle every type of mathematics. With Maple, 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.

- 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

Maple's intuitive interface supports multiple styles of interaction, from Clickable Math™ tools to a sophisticated programming language. Using the smart document environment provided by Maple, you can automatically capture all of your technical knowledge in an electronic form that combines calculations, explanatory text and math, graphics, images, sound, and diagrams.

- 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

The Maple user community is made up of talented, passionate people from around the world who do amazing things with Maple every day. Their passion leads them to share their experiences and content to the benefit of the entire community. As a result, Maple users have access to a vast collection of resources and expertise that go far beyond the product itself.

- 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

Physics

Matrix and Vector Computations

Algebra

Differential Equations

Engineering

Statistics and Process Control

Math Education

Visualization

Curve Fitting

Optimization

Special Functions

Advanced Mathematics

Geometry

Units and Tolerances

Scientific Data Management

Financial Modeling

String Processing and Linguistic Research

CAD Connectivity

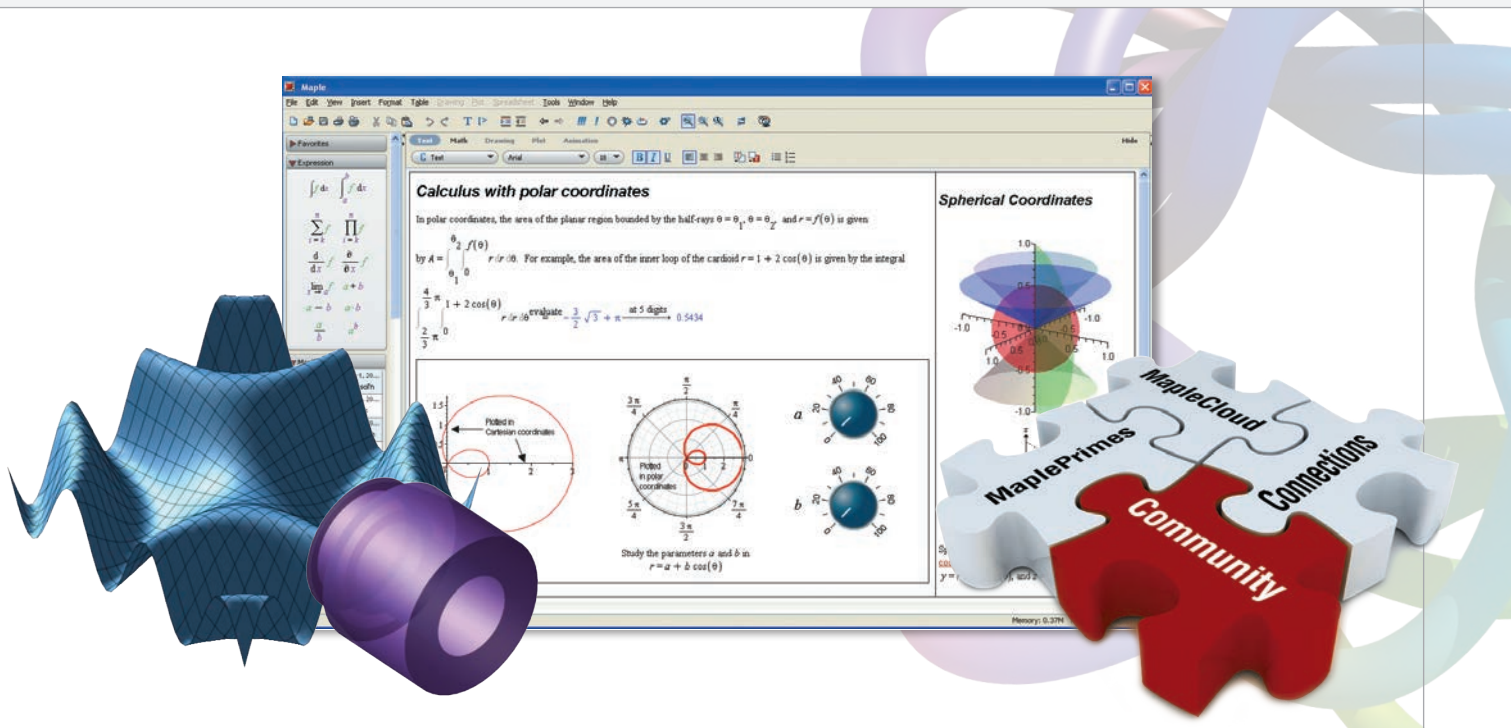
Code Generation

Testing and Assessment

Parallel and Grid Computing

Application Development

Web Deployment




## Maple Add-ons

### Global Optimization

Powered by Optimus®

Using the Maple Global Optimization Toolbox, you can formulate optimization models easily inside the powerful Maple numeric and symbolic system, and then use world-class optimization technology to return the best answer robustly and efficiently.

### GRIDComputing

With the Maple Grid Computing Toolbox, you can distribute computations across the nodes of a network of workstations, a supercomputer, or the CPUs of a multiprocessor computer. This allows you to handle problems that are not tractable on a single machine because of memory limitations or because it would simply take too long.

## Maple Sets a World Record for the Computation of a Mathematical Constant

Maple was used to set a world record for the computation of the most number of digits of the Landau-Ramanujan constant. This constant arises in a result from number theory concerning the number of integers that are the sum of two square numbers. Dr. David Hare, the manager of the Mathematical Software Development Group at Maplesoft, used Maple and the Maple Grid Computing Toolbox to calculate the value of this constant to 125,079 digits, beating the previous record by over 50,000 digits.

# E-learning Solutions

## Maple T.A.™

Online Testing and Assessment… Powered by Maple

### Why Choose Maple T.A.?

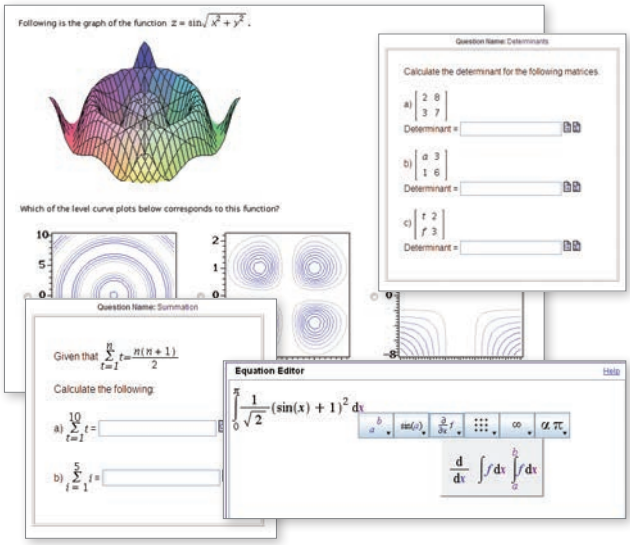
Maple T.A. is an easy-to-use web-based system for creating tests and assignments, and automatically assessing student responses and performance. It supports complex, free-form entry of mathematical equations and intelligent evaluation of responses, making it ideal for science, technology, engineering, mathematics (STEM), or any course that requires mathematics.

### So why choose Maple T.A.?

- Maple T.A. is designed especially for courses involving mathematics. Maple T.A. provides everything you would expect in an assessment system plus features designed specifically for technical courses involving mathematics.
- Maple T.A. is powered by Maple. Because Maple T.A. is powered by Maple, it offers features especially suited for assessment in technical courses
- Maple T.A. has the easiest and most comprehensive content authoring tools available. Whether you want to customize some of the thousands of available questions or create your own, Maple T.A. puts you in control of your testing content.

**Getting Started with Maple T.A. is Easy!**

Licensing options include a "Maplesoft-hosted" solution for worry-free server setup and maintenance.




## Maple T.A. and Course Management Systems

**Maple T.A. can be incorporated into virtually any course management system**, making for a seamless experience for instructors and students.

- Connectors are available for Blackboard®, Moodle™, and Desire2Learn™ environments.
- A web services API allows you to build your own connector to integrate Maple T.A. into other systems, including custom-built solutions.

*"...In addition, after moving to Maple T.A., we've found that we can save approximately $100,000/year on our grading budget, which we can use to support activities and programs we couldn't otherwise offer."*

Carrie Howells, Instructional Support Coordinator
Mathematics Faculty Computing Facility, University of Waterloo

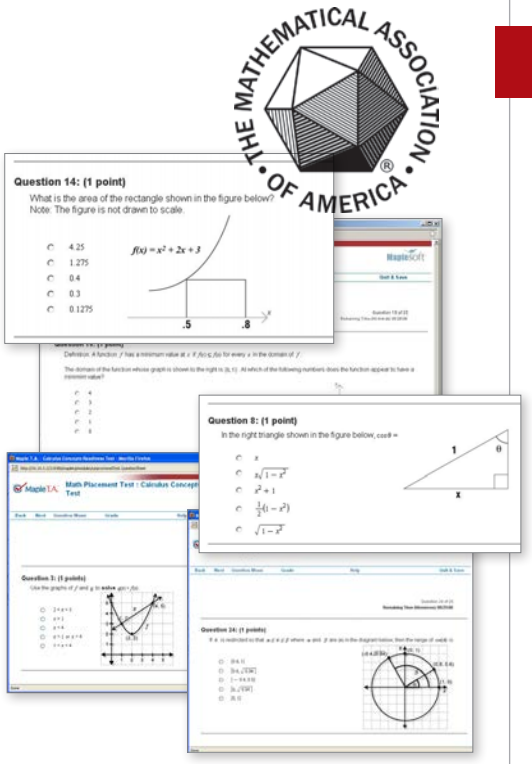
*"Reliability and accuracy were our key concerns when considering an effective solution. We found both these attributes in the Maple T.A. MAA Placement Test Solution."*

Wendiann Sethi, Director of the Department of Developmental Math
Seton Hall University

## Maple T.A. MAA Placement Test Suite

### Partnering with the Mathematical Association of America (MAA) to Revolutionize Placement Testing

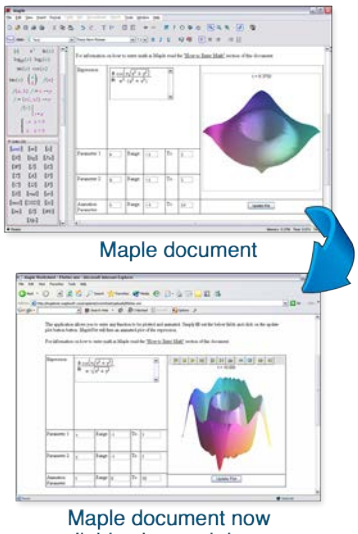
- **Easy to administer.** Deliver tests online, without the logistical headaches of room scheduling, paper copy delivery, marker hiring, marathon marking sessions, and manual mark entry.
- **Placement before scheduling.** Because tests are taken online, placement testing can be done at any time before students arrive on campus. Class scheduling can then be done using the placement information.
- **Created by experts.** MAA placement test items are written and MAA placement tests are constructed by panels of college mathematics teachers who are directly involved with teaching students the courses served by the placement tests. Final approval for each test comes from the MAA.
- **Comprehensive.** Topics include calculus and calculus concepts readiness; trigonometry and elementary functions; basic, regular, and advanced algebra; arithmetic; and high school mathematics. Standard, calculator-based, and algorithmic tests are available.




## MapleNet™

### Bringing the Power of Maple to Your Web Sites and Applications

- **With MapleNet, you can easily share your Maple documents, calculators, and technical applications.** Your colleagues and students can interact with your content, perform calculations, and visualize results, all from within a standard web browser. Maple provides the easiest interface available for creating web applications that rely on mathematical computations.
- **MapleNet provides a standard web services application programming interface (API)**, making the computational power of Maple available no matter what language or infrastructure you use to create your web site, desktop applications, and mobile applications.
- **MapleNet provides the tools you need to put mathematical power behind your web site.** MapleNet supports web content written as Java Server Pages (JSP), Java applets, and Maplet™ applications. With MapleNet, you can design custom web applications that perform live calculations based on user input and display the results using standard mathematical notation and dynamic, interactive plots and animations.


Maple document

Maple document now available via a web browser

# A New Way to Bring

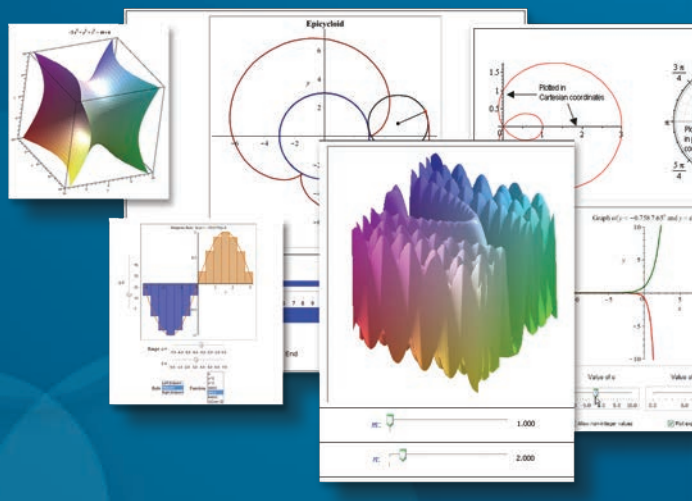
The Möbius Project
Mathematics Everywhere

## Create

Use Maple's Smart Document Interface to create interactive Möbius Apps to help you, your students, and your colleagues solve a problem, visualize a solution, explore a concept, and assess understanding. Easy-to-use Möbius Apps contain interactive elements such as sliders, buttons, and math entry boxes, as well as text, mathematics, plots, and images that explain or enhance the application.

**The Möbius Project** is Maplesoft's latest innovation for technical education. Create apps, share them with everyone, and grade them to assess understanding. With the power of Maple behind them, easy-to-use Möbius Apps™ can be developed for virtually any topic or discipline.

- Enhance instruction with quick visual aids to illuminate concepts
- Support independent learning, so students can reinforce concepts on their own
- Take advantage of new options for assessing understandeing



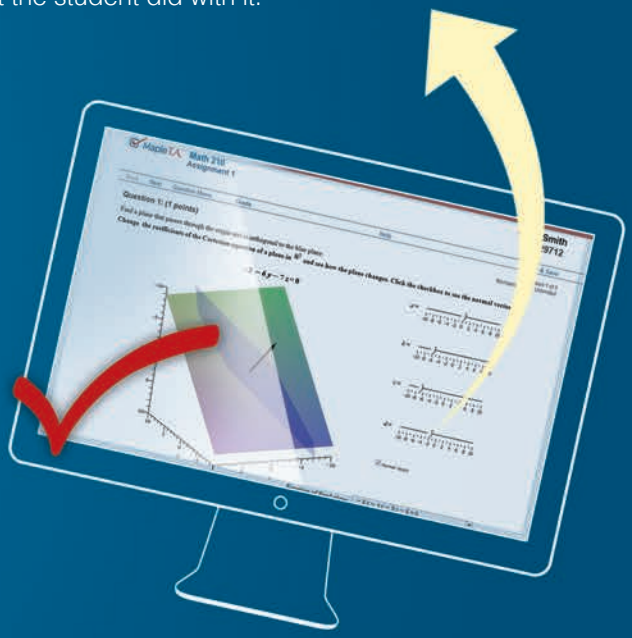
# Maple Technology to the Classroom

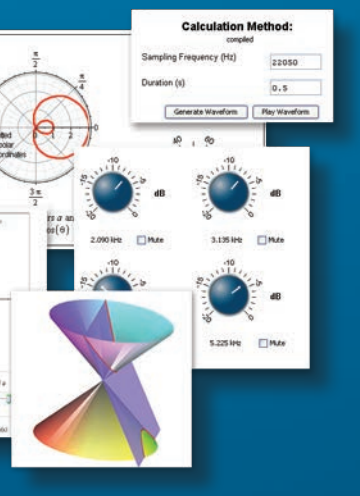
## Grade

Möbius Apps are gradeable by Maple T.A., giving you a whole new way to measure and deepen students' understanding. You can give students access to a Möbius App to help them answer an assignment question, or even make the Möbius App itself the question. Maple T.A. will automatically grade the Möbius App by looking at what the student did with it.

## Share

To make your Möbius Apps available to everyone, post them to the MapleCloud. Your students can access Möbius Apps from any computer, tablet, or smart phone using a web browser, and an extremely powerful MapleNet server will provide the mathematical engine that powers the Möbius Apps. Your students can also download the free Maple Player to run Möbius Apps right on their own computers or use the Apps inside Maple.






**Examples of Möbius Apps:**

- Definition of a limit
- Approximating the volume of a sphere
- Radioactive decay
- Throwing footballs
- Least squares approximation
- Supply and demand
- Integration
- Midpoint of a line segment
- Vertex of a parabola
- Exploring logarithmic growth
- Linear approximation of a function
- Tower of Hanoi
- Root finding
- And more!

Visit **www.möbius-project.com** to learn more!

# Interactive E-books

### The Mathematics Survival Kit

The Mathematics Survival Kit - Maple Edition is an interactive electronic book designed to help students overcome many of the common difficulties encountered when studying mathematics. Author Jack Weiner covers over 100 topics that typically plague students, based on his 30 years of teaching experience, high school course outlines, and typical first year university calculus and algebra curricula. This electronic book provides clear explanations and examples, illustrative plots and animations, and hundreds of randomly generated practice problems, including hints, answers, and automatic verification of student responses.

### Advanced Engineering Mathematics

Advanced Engineering Mathematics with Maple is the definitive reference software and textbook for engineering mathematics. As the only fully electronic book of its kind on this popular subject, it is an essential resource for every engineering professional or student. The author, Dr. Robert J. Lopez, is a renowned professor and Maple expert who has pioneered the instructional use of Maple for general and engineering mathematics. A companion student manual and instructor manual are available.

### Calculus Study Guide

The Calculus Study Guide, Second Edition, fully leverages Maple's Clickable Math approach to help make this fundamental subject transparent to your students. This guide completely covers introductory courses in both differential and integral calculus. For each topic, there is a synopsis of the essential ideas and a set of examples that illustrate key points. The over 300 examples make extensive use of Maple's Clickable Math approach to illuminate the subject matter and bring the spark that ignites understanding and insight.

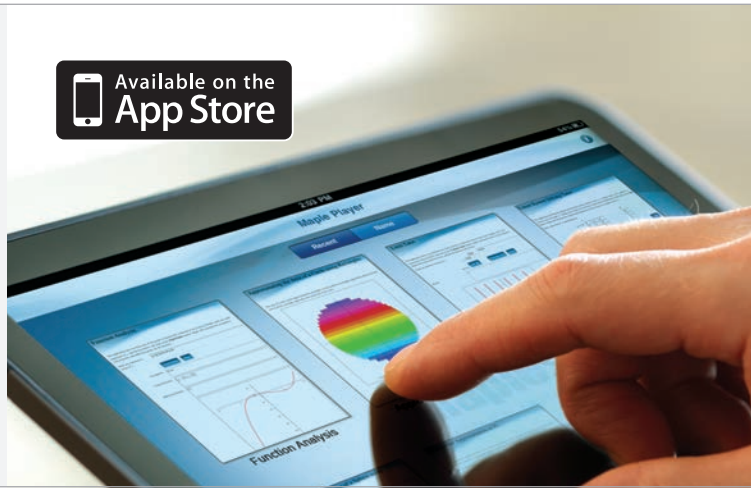
### Precalculus Study Guide

The Precalculus Study Guide is an exercise-based electronic version of the introductory chapter in the standard calculus text, providing solutions to more than 60 problems. To maximize understanding, the problems are each given in standard textbook format, with dedicated Maplet tutors and Maple commands. High school and university students in, or thinking about taking a calculus course, and students wanting additional insight into selected topics in algebra and trigonometry would all benefit from the guide.

## Maple Player for iPad®

The Maple Player is a free application for the iPad that lets you view and interact with Maple documents. It takes advantage of the powerful Maple computation engine, so you can enter values, move sliders, and click buttons to perform new calculations and visualize the results.

For even more Maple on the iPad, visit The Möbius Project website, www.möbius-project.com.




## Licensing Options

Maplesoft offers a wide variety of flexible licensing options to suit your institution's budget, infrastructure, and policies. We will be happy to work with you to find the best solution to meet the needs of your institution.

# Teaching Resources

### Video Series: Teaching Concepts with Maple

This collection of videos, together with step-by-step Maple applications that you and your students can use and modify, makes it easy to explore a wide variety of mathematical concepts using Clickable Math techniques. Created by Dr. Robert Lopez, Emeritus Professor of Mathematics at the Rose-Hulman Institute of Technology and Maple expert, this series covers topics taken from a wide variety of courses. Subjects include:

- Differential calculus
- Multivariate calculus
- Linear algebra
- Algebra and precalculus
- Integral calculus
- Differential equations
- Vector calculus
- Trigonometry

### Thousands of Homework Questions

Maple T.A. users can take advantage of thousands of free questions on calculus, precalculus, algebra, physics, and more. Questions and assignments can be freely used, recombined, and modified.

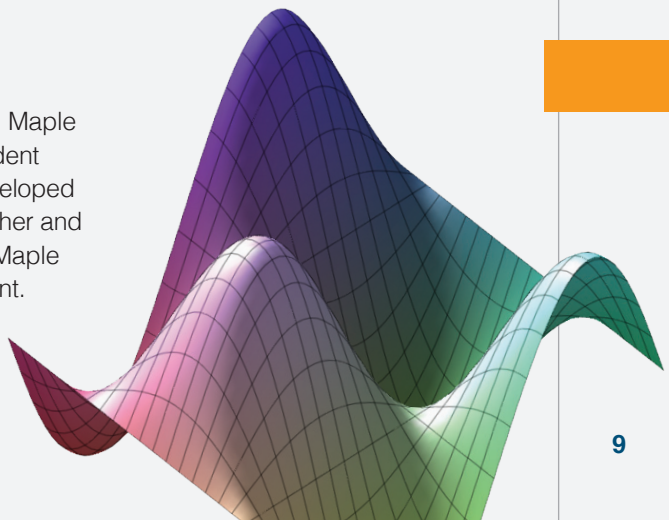
### Clickable Math Applications for the Classroom

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. Classroom materials include interactive concept demonstrations, lecture notes, homework assignments, and more.

Visit the Maplesoft Teacher Resource Center: **www.maplesoft.com/teacherresource**

### Teaching Calculus with Maple: A Complete Kit

Everything you need to teach Calculus 1 and Calculus 2! Leveraging both Maple and Maple T.A., Teaching Calculus with Maple includes lecture notes, student worksheets, Maple demonstrations, Maple T.A. homework, and more. Developed at the University of Guelph under the leadership of an award-winning teacher and field-tested in classes with hundreds of students, Teaching Calculus with Maple makes it easy to provide students with a rich, effective learning environment.



# What Customers Are Saying

"Maple goes out of the way to make the learning curve as short as possible."

Joshua Holden, Rose-Hulman Institute of Technology, USA

**"…after moving to Maple T.A., we've found we can save approximately $100,000 per year on our grading budget…"**

Carrie Howells, University of Waterloo, Canada

"I must say that our placement process has been completely transformed [by the Maple T.A. MAA Placement Test Suite]. Now administering the placement tests is totally stress-free and hardly involves any staff time."

Wendiann Sethi, Seton Hall University, USA

**"The depth of questions possible with Maple T.A. and the Maple engine is what I consider its biggest strength."**

Phillipa Williams, University of Canterbury, New Zealand

"Using Maple made the calculations more thorough and secure; its computational power can calculate and explore very sensitive details, so it was a trusted companion in our discovery process."

Gábor Domokos, Budapest University of Technology and Economics, Hungary

"The students really appreciate the power and the beauty of Maple, and as a result, gain a greater appreciation of the subjects being studied."

Joanna Ellis-Monaghan, Saint Michael's College, USA

# Maplesoft Resources

### Teacher Resource Center

Maplesoft has revolutionized how mathematics and engineering is taught and learned. This site is designed to ensure you get the most out of your teaching experience using Maplesoft products. 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.

Visit www.maplesoft.com/teacherresource

### Student Help Center

The Student Help Center provides an unmatched online support system to students in their math and engineering studies. The site contains a dedicated student forum, online calculators, training videos, a homework resource guide, and much more.

Visit www.maplesoft.com/studentcenter

### Application Center

The Application Center features over 2,000 applications and tutorials contributed by the Maplesoft user community. This growing collection shows how Maplesoft solutions are applied to solve technical problems.

Visit www.maplesoft.com/applications

### Training

Maplesoft offers a comprehensive set of complementary training materials. From training videos to recorded training seminars to downloadable documentation, you have many options to get up to speed with Maplesoft products.

Visit www.maplesoft.com/support/training

### MaplePrimes

MaplePrimes is a web community dedicated to sharing experiences, techniques, and opinions about Maplesoft products, as well as general interest topics in mathematics and engineering.

Visit www.mapleprimes.com

### MapleCloud

You can instantly access content created by Maple users worldwide, including Math Apps contributed to The Möbius Project, using the MapleCloud Document Exchange. This dynamic collection of Maple documents is available from within Maple itself and can be loaded into your Maple session at the click of a button.

### Social Networking Communities

Online communities for Maplesoft enthusiasts are available through social networking sites Facebook® and LinkedIn®. You can also visit the Maplesoft channel on YouTube® to watch tutorials and other videos on mathematics, engineering, and related topics, or you can follow Maplesoft on Twitter™.


### Maplesoft Webinars

Maplesoft's monthly webinars provide an excellent opportunity to learn about interesting applications, new techniques, and products. Hosted live by senior Maplesoft representatives, these one-hour interactive sessions also offer the opportunity to ask questions and interact with the presenter.

Visit www.maplesoft.com/company/webinars

### Maplesoft Subscriptions

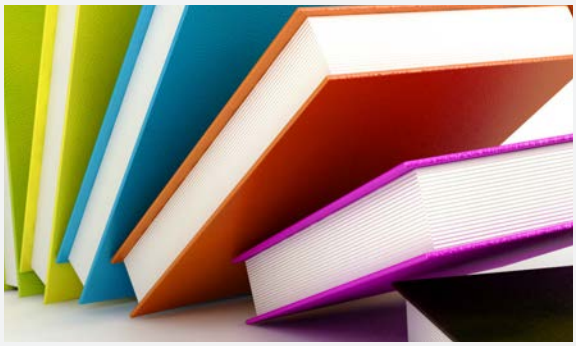
Do you want to hear from Maplesoft? Join the tens of thousands of others who have already signed up.

Visit www.maplesoft.com/subscribe

## Author Support Program

The Maplesoft Author Support Program may be able to help you! If you are eligible, you will be entitled to get copies of our products, and we will promote your book through the Maplesoft marketing network.

Visit www.maplesoft.com/books/author.aspx

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