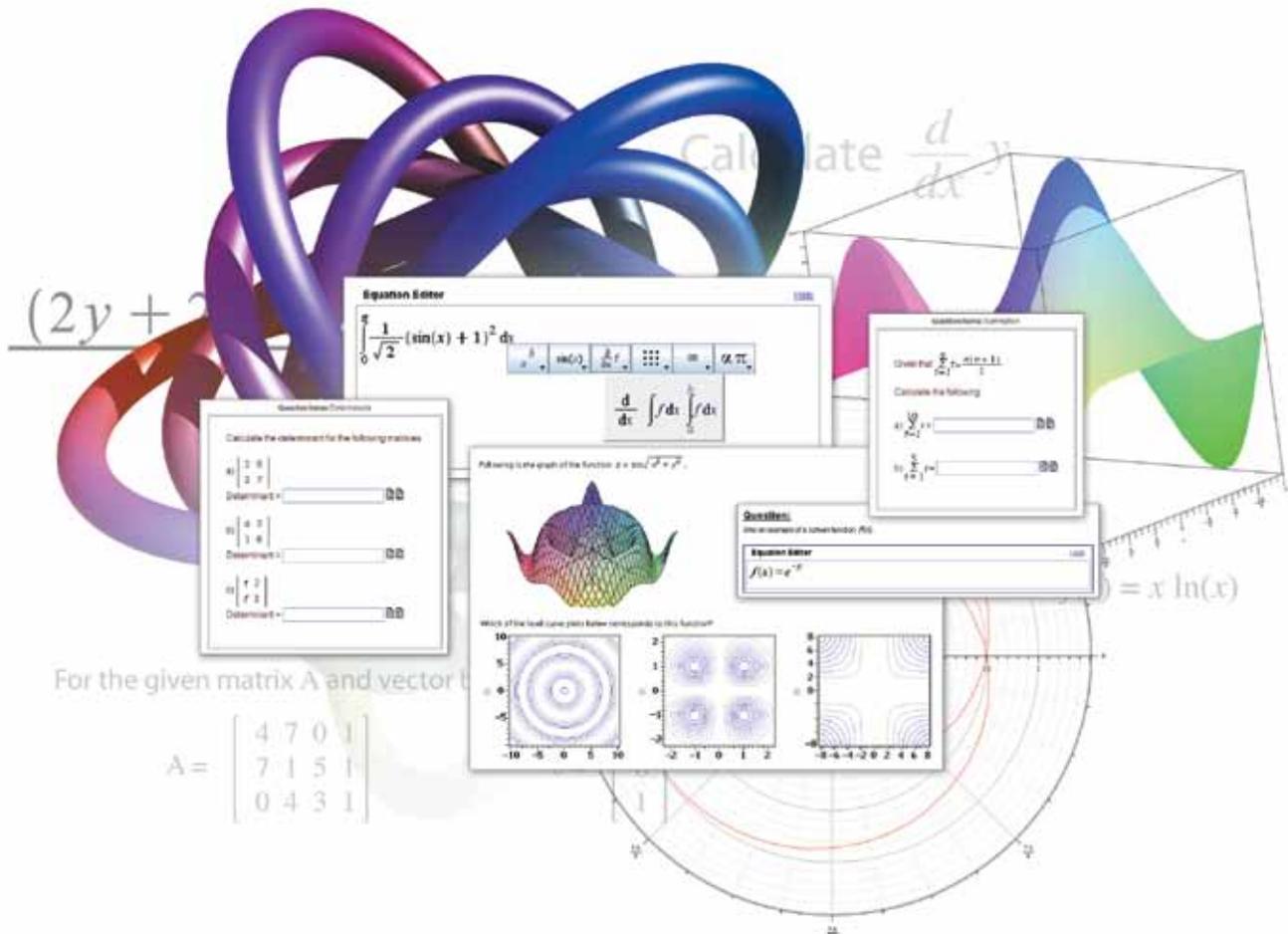# MapleT.A.™ 8

Online Testing and Assessment … Powered by Maple™

Maple T.A.™ is an easy-to-use web-based system for creating tests and assignments, and automatically assessing student responses and performance.

- **The only system designed 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.

- **Powered by Maple**
  Because Maple T.A. is powered by Maple™, it offers features especially suited for assessment in technical courses.

- **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.

Full Support for Mathematics

Maple T.A. is the only testing and assessment system designed for courses involving mathematics, and so it is your best choice for your mathematics, engineering, science, and other courses that use math. Maple T.A. lets you ask the questions you want, the way you want, and then grades the responses just like you would.

- **Natural math notation** is used in both the question text and student response.

- **Easy-to-use equation editor** makes it simple to enter mathematical expressions.

- **Free-response questions are graded for mathematical equivalence**. Where appropriate, responses do not need to be identical to the solution to be graded as correct; they just need to be equivalent. For example, if the correct answer is $x+y+\frac{1}{2}$, Maple T.A. will also accept $\frac{(2y+2x+1)}{2}$, and if the answer is $1-\sin(x)^2$, Maple T.A. will also accept $\cos^2(x)$.

- **Open-ended questions can have infinitely many answers**. With Maple T.A. you can ask questions for which you cannot know in advance how the student will respond, and Maple T.A. can still grade their responses automatically. You can ask questions such as "Give an example of a function that has a maximum at x = 0," "List two composite numbers that have no factors in common," or "Give an example of an invertible matrix."

- **Powerful algorithmically generated questions** turn one question template into hundreds or thousands of similar questions, providing individual homework assignments and lots of practice questions for your students.

- **Sophisticated visualization tools** let you easily include plots in your questions by taking advantage of the over one hundred 2-D and 3-D plot types and customization options available from Maple. When appropriate, you can even allow students to see a plot of their response before they submit their work.

- **A wide variety of mathematical and scientific question types** support free response questions, questions that require a numeric answer to fall within given margin of error, chemical formula questions, questions that handle units, multi-part questions, and more.

- **Flexible partial grading** lets you give partial credit for mathematical responses that are not completely correct, and you can control how generous or rigorous the grading will be.

- **Extensive mathematical knowledge** coming from Maple means Maple T.A. can automatically grade questions from virtually any area of mathematics.

Maple T.A. has been continually improved since its first release as a pilot project ten years ago. In the last 5 years alone, there have been 5 major releases, each with new features to help institutions offer high quality technical education to their students.

If you haven't looked at Maple T.A. lately, see what you've been missing!

New in Maple T.A. 8

Enhance Student Learning with Adaptive Questions

Adaptive questions provide students another chance when they give an incorrect response. Knowing the student is having trouble, the question can be adapted to:

- Provide more information.
- Let the student try a simpler version of the question before retrying the original problem.
- Walk the student through the problem one step at a time.
- Try the same question again for reduced credit.
- Present whatever other approach the instructor feels is appropriate.

With adaptive questions, instructors can control the behavior of the question, including:

- When a new version or solution step appears.
- The number of attempts that are allowed at each stage.
- How much credit the student gets, including partial credit for incomplete answers and penalty deductions for repeated attempts.
- If the correct answer should appear after the problem has been attempted the maximum number of times.
- When to move to the next question in the assignment.

Other Recent Additions

Flexible Matrix Questions (2011)

- Matrix questions are now highly flexible and easy to respond to. Students can enter arbitrary matrices of any size, in an intuitive, natural way. The instructor grades individual elements or the entire matrix at once, allowing greater precision in feedback and the option of partial grading.

Palettes for Integrals and Derivatives (2011)

- A natural math notation response area is available for all types of Maple-graded questions. The new math editor for responses to Maple-syntax questions offers palettes for a wide collection of math expressions, including new palettes for derivatives and integrals. Instructors can ask questions that require these elements in the response without requiring the students to know Maple syntax.
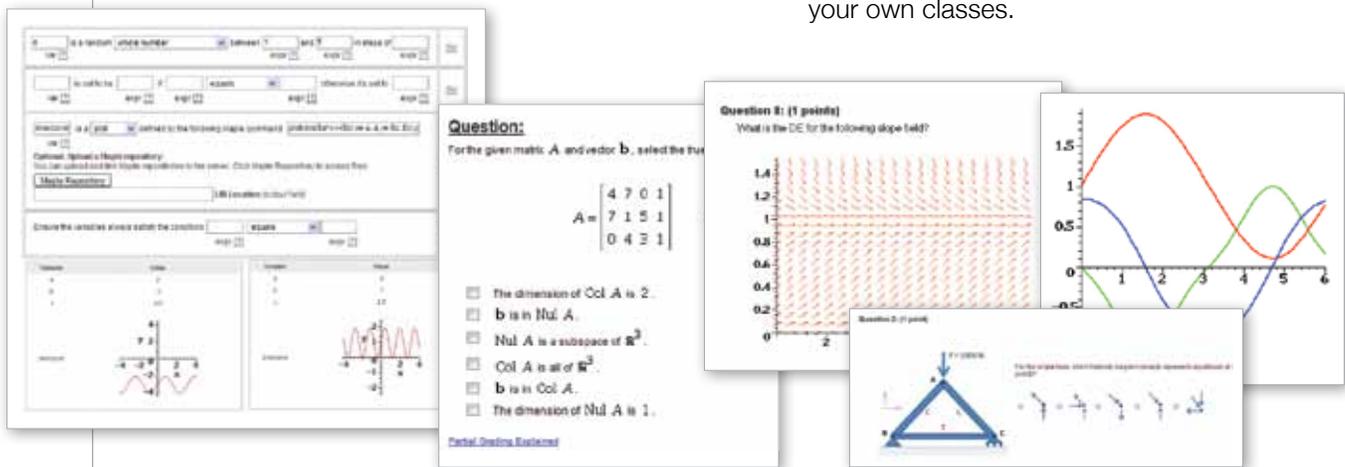
Powerful Mathematics Engine (Every year)

- Every version of Maple T.A. uses the latest release of Maple as its mathematics engine. This means that all the new mathematics and visualization tools of Maple are always available to Maple T.A. users.

Easy Content Creation

Maple T.A. is the system of choice for those who want full control over their question content. Whether you want to customize the many available questions or write your own, Maple T.A. provides the most comprehensive, easiest-to-use authoring tools available for mathematics-based content.

- **Step-by-step Question Designer** walks you through the creation of a wide variety of questions.

- **Easy-to-use editor** lets you add formatting, images, plots, and special characters to questions.

- **International language support** allows questions to be written in any language.

- **Hints and feedback** for each question let you provide additional guidance to your students.

- **Thousands of built-in math commands** provide coverage of virtually all areas of mathematics, so you can create questions for any course, at any level.

- **Powerful algorithm design tools** make it easy to create sophisticated question templates which are used to generated hundreds of instances of a single question. You can vary more than one value in your question, set conditions on those variables, and even take advantage of sophisticated randomization tools found in Maple for generating mathematical objects, such as matrices, polynomials, and prime numbers.

- **Flexible content management tools** make it easy to organize, search, and share content and quickly assemble assignments.

- **Thousands of questions**, many of which have been field tested in courses, are freely available for you to use and customize for your own classes.

"...In addition, after moving to Maple T.A., we've found that we can save approximately $100,000/year on our marking 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

New in Maple T.A. 8

Enhanced Question Designer

The question designer in Maple T.A. provides an intuitive environment for authoring and modifying question content. The question designer walks you through the process step-by-step, providing a point-and-click interface for creating a wide variety of question types. It also helps you create powerful algorithms for algorithmically generated questions, and guides you through the process of adding hints, feedback, and solutions to your questions.

In Maple T.A., the question designer has been extended to provide an interface for authoring adaptive questions and controlling their behavior. It includes an easy method to define your primary and secondary questions, determine when each section appears, and control how the responses will be graded.
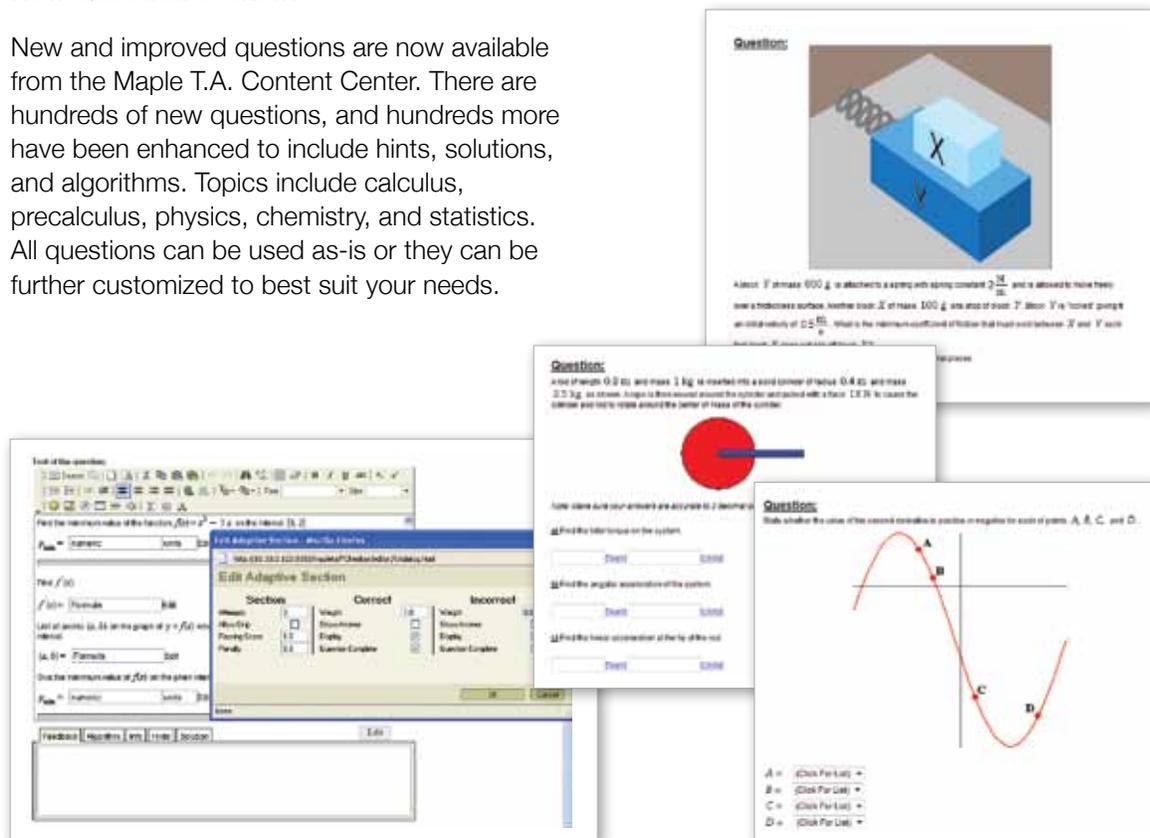
New Question Content

New and improved questions are now available from the Maple T.A. Content Center. There are hundreds of new questions, and hundreds more have been enhanced to include hints, solutions, and algorithms. Topics include calculus, precalculus, physics, chemistry, and statistics. All questions can be used as-is or they can be further customized to best suit your needs.

Other Recent Additions

Flexible Question Management Tools (2009)

Content management tools make it easy to organize, search, and share content and quickly assemble assignments. Instructors can:

- Make individual questions public with the click of a button so they can be shared by all instructors using the system. Any instructor can use public questions in any class.
- Create question groups and subgroups to organize related content.
- Tag individual questions as belonging to multiple groups and subgroups.
- Search for questions by group, question type, and information field.
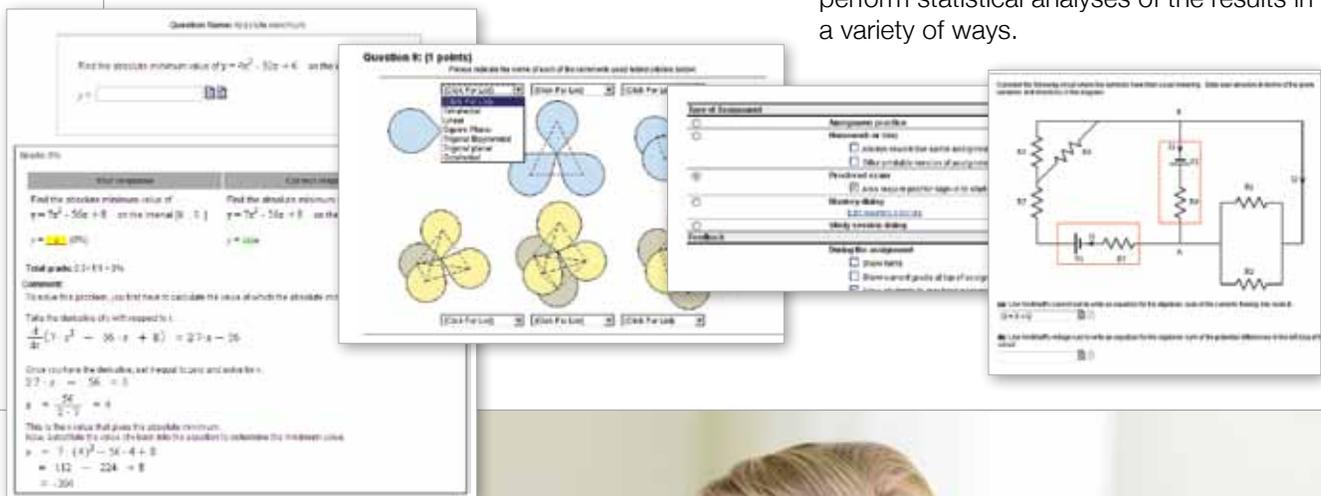- Search for questions containing specified keywords in the question text.

Everything else you want in a testing and assessment system

Of course, Maple T.A. has all the features you would expect in any testing and assessment system, in addition to all the features that make it ideal for math-based testing, including lots of different question types, control over numerous aspects of the assignments, and a gradebook that is second to none in terms of its flexibility and analytical tools.

- **Over 15 question types**, including mathematical free response, multiple choice, fill-in-the-blank, matching, clickable image, and numeric with margins of error, cover all your needs for both technical and non-technical subjects.

- **Five different assignment types** allow for practice, homework, mastery, and high-stakes testing.

- **Flexible assignment properties** determine start and end times, how much feedback the student gets during the assignment, passing score, number of attempts, restrictions on where they can take the assignment, and more.

- **An intuitive assignment editor** makes it easy to construct assignments and set assignment properties.

- The **flexible gradebook** captures student results for individual assignments and questions within an assignment, and can perform statistical analyses of the results in a variety of ways.

New in Maple T.A. 8

Secure the Testing Environment Using the Maple T.A. Proctored Browser

The internet provides reams of useful information and tools to students, but when they are taking a test or doing a graded assignment, instructors sometimes wish it was not quite so easy to get at. With Maple T.A. 8, instructors can declare the internet and local computer programs off-limits by requiring students to take their test or assignment in the Maple T.A. Proctored Browser.

- When using the Maple T.A. Proctored Browser, students must stay inside the Maple T.A. environment until the test or assignment is completed. They cannot access other web sites or programs.

- Instructors can require the use of the Maple T.A Proctored Browser through a simple check box in the assignment policies.

- The Maple T.A. Proctored Browser can be installed on lab computers in advance, or students can download and install it themselves.

Other New Features

- Instructors can require that students access Maple T.A. from a given list of IP addresses, to ensure students can take assignments only from approved computers or labs.

- The student's name and student number appears at the top of every page, so supervisors can ensure that the correct student is taking the correct test.

- A new assignment property allows the cumulative assignment score to appear at the top of the page as the student takes the assignment, so students can monitor their progress as they go.

Recent Additions

Enhanced Gradebook (2011)

The flexible gradebook in Maple T.A. provides all the tools you need to track and analyze your students' progress. It captures student results for individual assignments and questions within an assignment and allows you to set up grading schemes that include work done outside of Maple T.A., import and export grades, and more. Its unsurpassed statistical analysis tools provide in-depth insight of the results from the student, assignment, and question point of view, so you can get the information you want in the form you need.

In 2011, the gradebook was enhanced to include even more options for analyzing grades, so instructors can gain a detailed understanding of how students are performing. Enhancements include:

- The grading scheme for the entire course can be defined inside Maple T.A., with appropriate weightings and flexible policies for dealing with missed, repeated, and worst assignments.

- Instructors can view all responses to an assignment question, enabling them to easily look for patterns, such as common errors.

- Instructors can access complete gradebook data for assignments given to multiple child classes.

- Class grades for external assignments can be imported into Maple T.A. using a CSV file.

Maple T.A. can be seamlessly integrated into all your institution's systems and routines, ensuring a smooth experience for students, instructors, and administrators alike.

- Authentication via LDAP allows you to integrate Maple T.A. with your campus database for user authentication, making class administration easy to manage.

- Class roster import, manual registration, and student self-registration are all available.

- Content can easily be shared between instructors, making multi-section courses simple to administer.

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

- Integration with MapleNet™ (available separately) provides enhanced performance and the ability to use multiple back-end servers for large-scale installations.

- The Maple T.A. interface can be easily translated to other languages.

New in Maple T.A. 8

**Integration with
Course Management Systems**

You can incorporate Maple T.A. into virtually any course management system through the use of the following tools.

- The Maple T.A. Connector for Blackboard® Software (available separately) integrates Maple T.A. into your existing Blackboard course management system.

- Maple T.A. includes a connector for integrating with the Moodle™ course management system.

- A web services API allows you to build your own connector to integrate Maple T.A. into other course management systems, including custom-built solutions.

New in Maple T.A. 8, connectivity with course management systems has been extended to include Moodle 2.

Administration Tools

Maple T.A. comes with an administration interface that makes it easy to set up and monitor Maple T.A. Starting from this single screen in Maple T.A., administrators can configure email, Maple, Apache Tomcat, and the underlying database, view usage statistics, and more. New tools in Maple T.A. 8 allow system administrators to monitor individual Maple T.A. software components.

Recent Additions

Translatable Interface and Language Packs (2010, 2011)

Maple T.A. has full support for international languages, including:

- Support for international characters in questions.

- A translatable interface, including menus, buttons, instructions, and messages displayed to the students and instructors.

- Language packs for French, Traditional Chinese, and Brazilian Portuguese.

Licensing and Hosting Options

Maplesoft offers a range of flexible pricing and licensing options to suit your budget, technology infrastructure, and the policies of your institution. Both Maplesoft hosted and customer hosted options are available, as well as a student purchase model.