

Wolfram Web Highlights

mathworld.wolfram.com

Eric Weisstein's *World of Mathematics (MathWorld™)*, the recipient of numerous honors and awards, is the web's most complete mathematical resource. *MathWorld* is a comprehensive and interactive mathematics encyclopedia intended for students, educators, math enthusiasts, and researchers. Like the vibrant and constantly evolving discipline of mathematics, this site is continuously updated to include new material and incorporate new discoveries.

integrals.wolfram.com

The Integrator, Wolfram Research's first web resource, uses web $Mathematica$ technology to bring the computational capabilities of $Mathematica$ to the web. Originally built as a technology demonstration, The Integrator has attracted tens of millions of visitors annually, ranging from secondary school students to professionals in all kinds of fields.

functions.wolfram.com

This website contains the world's most encyclopedic, and growing, collection of information about mathematical functions. It details the interrelationships between the special functions of mathematical physics and the elementary functions of mathematical analysis, as well as the interrelationships between the functions in each group. All formulas are available not only in $Mathematica$ StandardForm but also in MathML and ASCII form. $Mathematica$ notebooks and PDF documents containing all the information at functions.wolfram.com are available for download.

www.mathmlcentral.com

MathML Central is the place to go for information about MathML, its history, and its usage. Using web $Mathematica$ technology, *MathML Central* contains extensive interactive examples, documentation, tutorials, and other tools. These tools take advantage of $Mathematica$'s built-in capabilities for importing, processing, and exporting MathML. Learn how to render text, files, and URLs in MathML, how to convert expressions to MathML from other notations, and how to validate, plot, and integrate MathML expressions.

Books to Note

Mathematica in Action, Second Edition by Stan Wagon
<http://store.wolfram.com/view/book/ISBN0387986847.str>

Mathematica for Mathematics Teachers: Notes from an Introductory Course by Ed Paskell
<http://store.wolfram.com/view/book/ISBN0963167847.str>

The Student's Introduction to Mathematica: A Handbook for Precalculus, Calculus, and Linear Algebra by Bruce F. Torrence and Eve A. Torrence
<http://store.wolfram.com/view/book/ISBN0521594456.str>

sites to see

The Smithsonian Museum

A Smithsonian National Museum of American History exhibit on teaching math in America features $Mathematica$ as a key teaching tool in "The Information Age."
americanhistory.si.edu/teachingmath/index.htm

The Harker School

The outstanding Harker School has adopted $Mathematica$ for use in all upper-level mathematics classes from precalculus on.
users.harker.org/hs/joannem/HarkerMathematica

Torrey Pines High School

Torrey Pines teacher Abby Brown is teaching her students the "abbymath" way.
teachers.sduhsd.k12.ca.us/abrown/index2.html

Other Online Support

Mathematica Speaker Assistance Program

This program offers resources for use in your $Mathematica$ -related presentation or seminar, such as document templates, promotional materials and handouts, presentation wear, and publicity via our website. Wolfram Research is happy to provide these resources to speakers, trainers, and consultants to help make your presentation as dynamic and informative as possible.

Visit us at: www.wolfram.com/services/training/speakers

Mathematica Author and Publisher Program

Designed to support authors and publishers of $Mathematica$ -related books, this program provides complimentary support, tools, and information for book authoring, publishing, and marketing. In addition, all members of this program are automatically enrolled in and can take advantage of extended benefits offered through the $Mathematica$ Developer Program.

Visit us at: www.wolfram.com/company/programs/author

NCSA Training

Wolfram Research is helping to sponsor NCSA training and workshops for K–12 through community college teachers on how to use and/or create computing courseware. A series of six workshops are currently scheduled at upcoming conferences and events. In addition to the hands-on workshops, which will use $Mathematica$, Wolfram Research is offering trial CDs and low-cost $Mathematica$ licenses to NCSA members.

educational software

FOR SECONDARY SCHOOL & COMMUNITY COLLEGE EDUCATORS

news

SPRING 2003

A PUBLICATION OF WOLFRAM RESEARCH

Mathematica® 4.2 for the Classroom

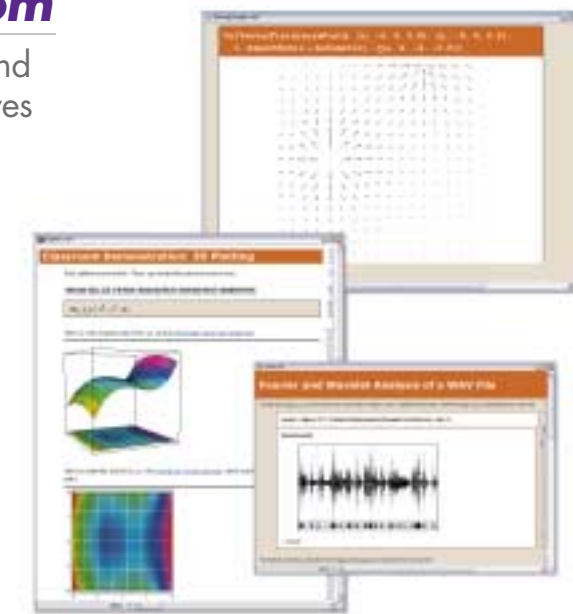
A special edition of $Mathematica$ for secondary school and community college classrooms and computer labs that gives you the same power and functionality as the professional version of $Mathematica$ at an exclusive low price.

$Mathematica$ offers you a single, integrated environment for word processing, calculation, and demonstration. The same system also gives your students a place to investigate real-world problems interactively, work on collaborative class projects, complete their assignments, or simply explore.

Combining the simplicity of a calculator with interactive calculation and visualization tools, $Mathematica$ gets the beginner going quickly and easily, while still giving the advanced user unmatched computational power.

For more information: www.wolfram.com/classroom

"I have successfully used Mathematica as a tool to generate analysis and synthesis for student thinking about functions. With Mathematica, students obtain a numerical, algebraic, and graphical perspective. They then write about their understanding. It works."
 Virginia G. Highstone, Mathematics Teacher, York High School



New Purchase Programs

Now, more than ever, it's easy to bring the tool of choice of leading universities and businesses worldwide to your campus. Wolfram Research introduces new pricing designed to make $Mathematica$ more affordable for your school than ever before. Choose from a number of flexible and cost-effective ways to license, deploy, and administer $Mathematica$ and other related products. Whether you need to purchase individual licenses or want to equip a department, a computer lab, or the entire campus, we work with you to integrate $Mathematica$ technology into your curriculum—at a price you can afford.

For more information:
www.wolfram.com/solutions/commcoll

- Large discounts for all Wolfram Research products
- Flexible license management options
- Free home use for faculty and staff
- Student purchase options
- Free automatic upgrades
- Complimentary copies of web $Mathematica$ Amateur

(Not all benefits are applicable to every program.)

upcoming events

january 15–18, 2003

2003 Joint Mathematics Meeting (JMM); Baltimore, Maryland
www.ams.org/amsmtgts/2074_jointsess.html

january 30, 2003

web $Mathematica$ Seminar; Long Beach, California
www.wolfram.com/services/seminars/la2003

april 9–12, 2003

NCTM 81st Annual Meeting; San Antonio, Texas
www.nctm.org/meetings/sanantonio/index.htm

april 10–12, 2003

2003 $Mathematica$ Developer Conference; Champaign, Illinois
www.wolfram.com/news/events/devconf2003

july 7–11, 2003

International $Mathematica$ Symposium 2003, Imperial College of Science, Technology and Medicine; London, England
metric.ma.ic.ac.uk/ims03



The Wolfram Education Group

Wolfram Education offers $Mathematica$ training courses throughout the year for all levels of users. For specific dates and locations check our online calendar at www.wolfram.com/services/education/courses/calendar.html

For a full schedule of upcoming events, including training and seminar opportunities, refer to the Wolfram Research Calendar online at: www.wolfram.com/services/training/calendar.html

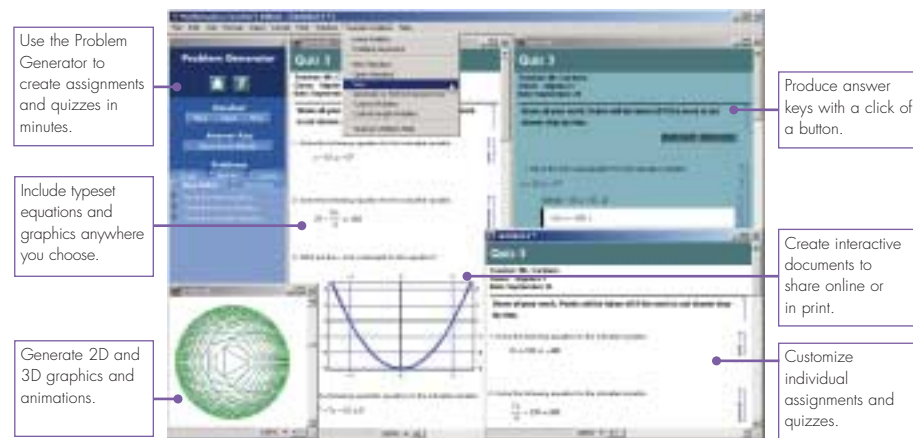
To have the latest news and updates from Wolfram Research delivered direct to your inbox, subscribe to *MATHwire*, our email newsletter, at: www.wolfram.com/mathwire

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Go Back to School with Mathematica Teacher's Edition

Mathematica Teacher's Edition provides a wealth of tools to help teachers succeed in the classroom and bring mathematics alive for their students.



The unique point-and-click problem generator enables math educators to quickly and easily create original assignments, quizzes, and answer keys, while the underlying *Mathematica* computational engine easily tackles everything from simple calculator problems to advanced symbolic manipulations. The built-in courseware and classroom demos that range from pre-algebra to calculus enhance students' intuition and visualization capabilities.

Use *Mathematica Teacher's Edition* by itself or in conjunction with *Mathematica for the Classroom* to give students a head start by exposing them to the computing tools and methods they will use throughout their future academic and professional careers.

For more information:
www.wolfram.com/products/teachersedition

"Mathematica is central to all that I teach these days. It can be used in all areas of the secondary school curriculum from Algebra 1 to BC Calculus and in a variety of ways: as a graphing tool, as a powerful algebraic analytic tool, as a calculator, as a visualization tool, as a demonstration tool. In addition, it can be used as a mathematical word processor. In short, Mathematica makes available to teachers and students all the analytical, graphical, and symbolic tools needed to explore, teach, and master secondary mathematics. It also makes accessible many of the new ideas that have been and will be introduced into the curriculum, such as dynamical systems, fractals, digital image processing and cellular automata."

Jonathan Choate, Cochair
 Mathematics Department
 Groton School

Mathematica Goes Mobile

Mathematica Teacher's Edition for Mac OS X and *Mathematica for the Classroom* are an integral part of Apple Computer's new Math Curriculum Mobile Lab.

Apple's Curriculum Mobile Labs provide exceptional value for educators by combining the best curriculum software with Airport-enabled Apple iBooks and Apple Professional Development courses to create powerful, easy-to-use tools that can help raise student achievement in literacy, math, and science.

For more information:
www.apple.com/education/curriculumlabs/math612.html

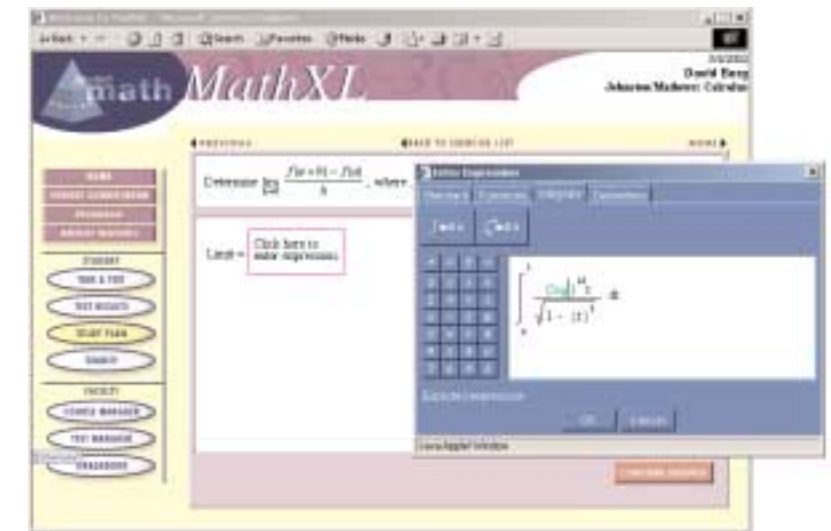
webMathematica in Education

Addison-Wesley Introduces MathXL and webMathematica Collaboration

Addison-Wesley, one of the world's most respected publishers, has launched new online calculus tutorials and testing using webMathematica technology from Wolfram Research. The web-based program is designed to help diagnose students' calculus skills and to create a personalized study plan based on their test results. To develop MathXL for Calculus, Addison-Wesley needed the display and evaluation capabilities of a symbolic online computing system, and webMathematica was the only tool that met these criteria.

webMathematica provides the long sought-after ability to quickly and easily add interactive calculations to the web. With MathXL for Calculus, students can get unlimited practice from algorithmically generated tutorial exercises correlated to each chapter and section of their Addison-Wesley textbook. Instructors can create customized tests and quizzes, and view all student test results, study plans, and tutorial work in the online grade book.

webMathematica is fully compatible with state-of-the-art dynamic web systems, which made it easy for Addison-Wesley to integrate webMathematica into their existing web foundations. Because every piece of MathXL for Calculus is delivered over the internet, it is also ideal for online



or distance learning courses, and Addison-Wesley is leading the way in utilizing this unique technology for this purpose.

Preview MathXL for Calculus using the login name/password combination: previewmathxl/adopt.

Select "Johnston/Mathews: Calculus" from the "Choose Course/Book" scrolling menu.

For more information: www.mathxl.com

"webMathematica is revolutionizing our approach in many of our courses. We have likened its impact in mathematics education to that of equation editors in word documents. Students can now access course material, concepts, and labs over the web.... It is proving to be a more stimulating, worthwhile, and accessible interaction for our students."

Mike Martin, Math Professor, Johnson County Community College

Additional webMathematica Sites

Calc101.com offers both free and pay-per-use calculators that lead secondary school and college students through integration and differentiation computations.
www.calc101.com

Professor James Wyant at the University of Arizona uses webMathematica to compute and model optical patterns for teaching and research.
www.optics.arizona.edu/jcwyant/math.htm

Johnson County Community College uses Mathematica and webMathematica to help students visualize concepts and graphs, and learn more interactively.
web.jccc.net/academic/math/webmath.htm

inside Wolfram Research

with Theodore Gray, Director of User Interfaces

Q: How does Wolfram Research address the specific needs of teachers in the products it offers?

A: We created *Mathematica Teacher's Edition*, which utilizes *Mathematica* technology, to help alleviate the time and planning constraints of teachers. It has a test-generating feature that lets you select the degree of difficulty and type of answer for a wide range of problems from basic math to calculus. It can generate individual problems or complete tests and worksheets that meet those specifications, along with the answer keys. Every problem is a unique, randomly generated example—not taken from a limited set of canned problems—yet each one gives you an answer that

makes sense and that is guaranteed to match the criteria you specified.

Q: Beyond problem solving, what are some advantages of using *Mathematica* in the classroom environment?

A: As the premier technical computing environment, *Mathematica* is a mathematical playground without equal that lets students explore on their own. If your students have access to a copy of *Mathematica*, they have a completely open-ended, unrestricted world of numerical, symbolic, and graphical computing at their fingertips. Has a student ever asked you what one million factorial is? *Mathematica* will

compute each and every one of the 5.5 million digits of the answer in a couple of minutes.

Q: Can *Mathematica* help integrate language and writing skills into the math or science classroom?

A: *Mathematica's* notebook interface encourages students to document what they have done and learned by allowing them to add text, titles, section headings, and other annotations directly to the interactive calculations they have carried out. It is a complete environment for working and for writing reports, which is exactly how it is used by professional scientists and engineers throughout the world.

user profile

NYU professor Glennys Farrar and several of her colleagues at Columbia University and Barnard College are working together with students and teachers from New York City high schools to implement the New York Schools Cosmic Particle Telescope Project (NYSCPT). With support from the National Science Foundation and Wolfram Research, they plan to build a cosmic particle observatory that will enable them to detect and study rare and powerful cosmic particles.

In the pilot phase, there are ten detectors in service, which were built by students during an intensive two-week summer institute at NYU this past August. Located at schools in diverse neighborhoods including Stuyvesant, Queens, and the Bronx, each detector is attached to a circuit board and a computer on which donated copies of *Mathematica* are being used for measurement and analysis. "I just thought it would enormously expand the horizons of these kids to have [*Mathematica*] to play with," says Farrar.

"The goal is not for them to learn tons about astrophysics," she told the *New York Times* in a November interview, "but to introduce them to real science. They are amazed that this is what scientists do, and that I don't know how it's all going to come out." Eventually, they hope to have thousands of detectors spread out in schools throughout the city, approximately 1/2 kilometer apart.

For more information:
physics.nyu.edu/NYSCPT