FOCUS

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World's Largest Prime

Keith Devlin

Gordon Spence, a thirty-eight-year-old information technology manager for Thorn Microwave Devices Ltd., in Hampshire, England, has just computed his way into the mathematical record books by discovering the latest record prime number. Using a program written by George Woltman, which he downloaded over the World Wide Web and ran on his Pentium 100 PC, Spence discovered that the 895,932 digit number $2^{2976221} - 1$ is prime.

Like all record prime numbers in recent times, the new prime is a Mersenne number (that is, a number obtained by raising 2 to a power and then subtracting 1). There is a very efficient method to test if such numbers are prime that avoids getting bogged down with the enormous size of the number. The latest discovery is the thirty-sixth Mersenne prime to be found.

How big is a number with just short of 900,000 digits? Spence tries to explain it this way: Written out in full, it would fill a 450-page paperback book, it would stretch for 1.4 miles, and it would take 28 days to say the number, speaking for 8 hours a day.

It took Spence's PC fifteen days to complete the calculation that showed that this number is prime. To make sure the computation was correct, Spence asked veteran prime hunter David Slowinski to check the result. A previous holder of a number of record prime discoveries, Slowinski used a Cray T90 Supercomputer to repeat the calculation.

As Spence admits, he was lucky to make the discovery. He is one of over 2000 volunteers who use all their spare computer time to search for these gigantic numbers, as members of GIMPS, the Great Internet Mersenne Prime Search. GIMPS is a worldwide project coordinated by Woltman, a thirty-nine-year-old programmer living in Orlando, Florida, who wrote and supplies the software (in Windows, Mac, and Unix formats).

The hunt for record prime numbers used to be the exclusive domain of supercomputers. But by running the software on thousands of individual machines, it is possible to collectively surpass the power of even the world's most powerful supercomputer.

Woltman started GIMPS early in 1996, and it has rapidly attracted a substantial number of devotees. School teachers in elementary through high-school grades have used GIMPS to get their students excited about doing mathematics. Intel now uses the program to test every Pentium II and Pentium Pro chip before it ships.

Spence's discovery is the second success of GIMPS. Last November, Joel Armengaud found the previous world record, $2^{1398269} - 1$.

Spence explains what attracted him to join GIMPS in this way: "I saw it as my chance to make my (tiny) mark in the history books," adding the teaser, "Wouldn't you like to be the person who discovers the first million digit prime number?"

Readers whose curiosity has been aroused should start their hunt for prime fame at the GIMPS website, http://www.mersenne.org/prime.htm.

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Editor: Keith J. Devlin, Saint Mary's College of California; devlin@stmarys-ca.edu

Associate Editor: Donald J. Albers, MAA Associate Executive Director and Director of Publications and Electronic Services; dalbers@maa.org

Editor-Elect: Harry Waldman, MAA; hwaldman@maa.org

Managing Editor: Amy Fabbri, MAA; afabbri@maa.org

Copy Editor: Nancy Wilson, Saint Mary's College of California; nwilson@stmarys-ca.edu

Advertising Coordinator: Joseph Watson, MAA; jwatson@maa.org

Letters to the editor should be addressed to Keith Devlin, Saint Mary's College of California, P.O. Box 3517, Moraga, CA 94575; devlin@stmarys-ca.edu.

Subscription and membership questions should be directed to the MAA Customer Service Center, 1-800-331-1622; e-mail: maahq@maa.org; (301) 617-7800 (outside U.S. and Canada).

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EDITORIAL

Reduce Skills Teaching in the Math Class

This is my final issue of FOCUS as editor. I have enjoyed being able to contribute to the activities of the MAA, an association whose aims are very much in line with my own. It is tempting to devote this final editorial to an overview of FOCUS during the period of my stewardship. Tempting, but, I think, a temptation to be resisted. My time as editor has been a major episode in *my* life, one I will always look back on warmly—especially when the memory fades of those long, late night editing sessions as the copy deadline was just hours away. But the tenure of a FOCUS editor is surely a meaningless time period in the life of the Association or the life of mathematics, and as such of little interest to anyone else. So I'll just put on record my appreciation for the tremendous support I have received from the four people with whom I have worked closely on FOCUS: Nancy Wilson, my editorial assistant at Saint Mary's College, and Don Albers, Amy Fabbri, and Harry Waldman in Washington. It's been a great team I have enjoyed being a part of. My best wishes to my successor, Harry Waldman.

Now let me use the remainder of my editorial space to do what editorials are supposed to do: provoke, stimulate, sometimes amuse, and occasionally infuriate. This time, I'll try to do all four of those.

My thesis is this: We need to reduce drastically the time we spend teaching basic skills in middle and high school mathematics classes.

Here is my reasoning.

Few citizens in modern society need or make real use of any appreciable knowledge of, or skill in, mathematics. What mathematics they need and use they have probably already met by the time they are twelve years old.

On the other hand, the continuance of modern society requires a steady supply of a relatively small number of individuals having considerable training in mathematics. In order that the critical future supply of mathematicians does not dry up, we must ensure that all high school and university students are made aware of the nature and importance of mathematics so that those who find they have an interest in and aptitude for the subject can choose to study it in depth.

For me the above two observations have an obvious consequence for mathematics education: For the middle and high school grades, the main goal in the math class should be to create an awareness of the nature of mathematics and the role it plays in contemporary society. To do this, mathematics should be taught in much the same way as history or geography or English literature—not as a utilitarian toolbox but as a part of human culture.

In my view, an educated citizen should be able to answer the two questions:

- What is mathematics?
- Where and how is mathematics used?

At present, few people can answer either question correctly.

Existing methods turn off students in droves and produce math anxiety in many, and this is counterproductive. Teach mathematics as a part of our culture and the result will be many more students who are motivated to want to learn mathematics. *The aim of a mathematics education should be to produce an educated citizen, not a poor imitation of a $30 calculator.*

I should stress that I am not saying that basic numerical skills are not important. But I would put quantitative literacy on the same footing as ordinary literacy: both are so fundamental in today's society that they are everybody's responsibility. The development of basic quantitative skills are as much the responsibility of, say, the social studies teacher as language and presentation skills are the responsibility of the math and science teachers. To leave the development of quantitative skills to the mathematics teacher sends quite the wrong meesage to the student.

By changing our present education system radically so that, for the vast majority of students,

Letter to the Editor

To the Editor of FOCUS:

As the mother of a son with learning disabilities, I was concerned about the two articles by Randy Schwartz [FOCUS, August 1997] on teaching students with learning disabilities, especially the second with its emphasis on cognitive strategies. The assumption in this approach is that mathematics is procedural, essentially a bunch of algorithms (although of varying complexities). We all know that this is only a part (albeit important) of mathematics, and a serious article about teaching LD students has to deal with other aspects of mathematics. Furthermore, there is a circularity in the cognitive strategies approach. For example, step one begins: "Read the problem. If I don't understand, read it again." But the kid who needs help reading for understanding probably can't tell when she doesn't understand—the human mind loves to fill in blanks. This last is not a theoretical comment: I have seen my son skip entire lines when reading out loud, convinced that he understood what he'd read. You can imagine what he does with standard word problems.

While I share Mr. Schwartz' concern for LD students and appreciate his acknowledgement that yes they can be very bright, I am unhappy about seeing them relegated to performing algorithms—they can do better than that—and caution that while cognitive strategies may work for some students, it does not work for all, nor can it work in many areas of mathematics.

Name and address withheld. The writer is a mathematics professor with strong interests in mathematics education, who asked that FOCUS withhold her name to protect her son's privacy.

Polya Awards: Correction

We regret that in the report of the Awards Ceremony at the Atlanta Mathfest, which appeared in August's FOCUS, we inadvertently left out one of the two recipients of the Polya Award: Leon Harkleroad, currently at Cornell University.

Our apologies (and congratulations) to Leon.

Organize a Contributed Paper Session

The MAA Committee on Sessions of Contributed Papers selects topics and organizers for contributed paper sessions at national meetings. The committee would be delighted to hear from MAA members who would like to organize such a session or who have suggestions for topics. All that is required is a title, name(s) and address(es) of the organizer(s), and a short two- or three-sentence description.

Planning is now underway for the January 1999 meetings in San Antonio. The deadline for receipt of proposals for the San Antonio meetings is Tuesday, January 6, 1998 (Friday, January 9, 1998 if by e-mail or in person at the Baltimore meeting). Information should be sent to the chair of the committee, Elizabeth Teles, 11501 Chantilly Ln., Mitchellville, MD 20721; (703) 306-1668 (work); (301) 262-9586 (home); fax: (703) 306-0445; eteles@nsf.gov. E-mail submission is preferred.

the primary goal in the mathematics class is to create an awareness of the what, the how, and the why of mathematics rather than the development of skills that, apart from a tiny majority, none of them will ever make use of, we will achieve two important goals:

1. Tomorrow's citizens will appreciate the pervasive role played by one of the main formers of the culture in which they live their lives.

2. Those individuals who turn out to have an interest in and a talent for advanced mathematics will be exposed to the true nature and the full extent of the subject at an early age, and as a result will have an opportunity to pursue that interest to the eventual benefit of both themselves and society as a whole.

The justification for goal 1 is simply this: A human life is the richer for having greater understanding of the nature of that life. The more ways we have to know our world and ourselves, the richer are our lives.

Turning to goal 2, any university mathematics instructor will tell you that the present high school mathematics curriculum does not prepare students well for university level mathematics. Nor is success at high school mathematics a good predictor of later success in mathematics. The reason is simple. School mathematics is largely algorithmic: To succeed, the student needs only to learn various rules and procedures and know when and how to apply them. In contrast, university level mathematics is highly creative, requiring original thought and the ability to see things in novel ways. Since the creative mathematician does often need to apply rules and use algorithmic thinking, many successful mathematicians did indeed excel in the high school mathematics class. But many university mathematics students who shone in high school find they struggle with and eventually give up the subject at university when they discover that algorithmic ability on its own is not enough. And the fact that some of the very best professional mathematicians did poorly at high school mathematics, but by some fluke were drawn to the discipline later in life, suggests that our present system of school mathematics education probably turns off a significant number of students who have the talent for later mathematical greatness.

I could go on, but I'm out of space. So in the best time-honored tradition of university teaching, I'll leave it as an exercise for the reader to complete the argument. As FOCUS editor, my fifteen minutes are up. *Au revoir.*

The opinions expressed in the FOCUS editorial are those of the editor and do not necessarily represent the official views of the MAA.

Twelve Months On Line

In the summer of 1996, **Dan Alexander** *decided to teach a calculus course on the World Wide Web. A year later, the course was over. Here he describes what happened in between.*

July 1996

During a Project Kaleidoscope eorkshop in Iowa City, I attend a talk about the University of Illinois' Internet calculus course and experience an epiphany as I suddenly become intrigued with the notion of teaching over the Internet. Yet it seems unlikely that I will teach a web course anytime soon—there are just too many difficulties to overcome: How would I produce material? How would I maintain contact with students? The list goes on.

Late Fall 1996

One obstacle is suddenly removed when my university decides to offer web courses during the summer of 1997. I impulsively volunteer to teach Internet Calculus I. Other obstacles begin to seem surmountable. After all, I am a mathematician, and mathematicians can do anything, right?

Winter 1996–97

I decide to produce course materials by converting LaTeX documents to html via latex2html run in a Linux environment. It takes me an evening or so of tinkering to get latex2html up and running. I also decide to keep things decidedly low-tech so anyone who can run Netscape 2 and use e-mail can take my course.

But the problem of notation persists: Students who use a word processing program when submitting work can use standard mathematical notation. I suspect, however, that many students will simply submit their assignments as standard e-mail, which generally does not support mathematical symbols.

One day while using calculators during a "normal" calculus class, I realize that if students can use calculator syntax to enter an integral, they can express integrals in much the same way in e-mail. I begin to devise a substitute mathematical notation suitable for e-mail.

Late Spring 1997

I finalize the structure of the course: it will run seven weeks, and at the beginning of each week, I will post a new interactive unit on the Internet, where it will remain for the duration of the course. Students will have a week to complete the unit and submit assignments. The units are a mixture of linked-text and still-graphics, and can be traversed as the student desires. Each unit takes about a week to produce, and it took the top student in the course over twenty hours to complete a typical unit.

Early June 1997

The first weeks of the class are a little rocky. Students complain about the readability of the latex2html equations, and I find the equations delicate and troublesome to edit. Cross-platform submission problems arise, and some students experience difficulty using the Internet. Two or three students seem to be MIA.

After the first week I decide to drop latex2html—and with it LaTeX—and switch over to the Netscape Gold html editor. Although the Netscape editor does not support mathematical symbols, the documents I produce with it are more readable and honest since I use the same notational conventions I expect of students. For example, I express limits as "lim x – > infty $f(x)/g(x)$" rather than as nice fractions with subscripts and the infinity symbol.

The other problems resolve themselves, and a routine develops: students work through the units, either e-mail or call when questions arise, and submit assignments in whatever way they find most convenient: fax, unformatted e-mail, MS Word, or even hand delivery.

I even take a long weekend to attend a wedding on the east coast. I monitor things via a friend's computer in Rhode Island.

Mid June 1997

My intern for the course tells me that students might like my web stuff better than my lectures.

"How can you say that?" I respond. "You've never even seen me teach!"

"No, no," he says, "I just mean that in a class a student can easily miss something you say. On the Internet, she can reread something until she gets it right."

The intern raises a good point. Perhaps Internet courses actually work better in some respects than standard courses.

Late June 1997

An article about my course, complete with my picture, appears in the *Des Moines Register*. The students who are interviewed speak favorably about it.

A Weeknight in Early July 1997, 3:30A.M..

The effort that goes into preparation has begun to exact a toll. The weekend getaways and the media attention have been replaced by exhaustion. This is the third night this week that I have been up working on the course until well after midnight. I should have taken notice last fall when the three biggest advocates of the Internet I knew each told me that while they admired my courage, there was no way they were going to teach a web course just yet. There's also probably something to the fact that the other Internet courses are being taught by tenured faculty.

To make things worse, in about four hours my wife will leave for work, and my four-year old daughter will demand my presence for *Sesame Street*.

Late July 1997

The course is over. Although I am exhausted and probably could've written two papers in the time it took to develop the course, I'm glad I did it. The students performed quite well, their evaluations are quite favorable, and the experience reinvigorates my teaching. I also have a document, imperfect though it is, which presents the calculus according to Dan Alexander.

Dan Alexander is in the Department of Mathematics and Computer Science at Drake University in Des Moines, Iowa. His e-mail address is daniel.alexander@drake.edu. The URL for his course is http://zelle.drake.edu/dan/dvc/m50CourseLinks.html.

DIMACS Workshop

Nucleic Acid Selection and Computing

Computer Science Department, Princeton University, Princeton, NJ, March 15–17, 1998

For further information, contact Laura Landweber, Princeton University; landweber@princeton.edu; or Richard Lipton, Princeton University; rjl@cs.princeton.edu. For local arrangements, contact Sandy Barbu, Princeton University; (609) 609-1771; barbu@cs.princeton.edu; WWW: http://dimacs.rutgers.edu/Workshops/index.html

Teachers of Statistics to Meet

Dex Whittinghill

Are you responsible for teaching all or most of the statistics in your department? Is a major portion of your workload teaching statistics? Has your department chair crowned you the course coordinator for introductory statistics? More importantly, do you feel the need or interest to talk to colleagues about issues in teaching statistics, yet have nobody with whom to speak?

This year at the Joint Mathematics Meetings in Baltimore, there will be an informal meeting of 'isolated teachers of statistics.' The ASA–MAA Joint Committee on Undergraduate Statistics and I are inviting you to attend this meeting with the intent that it will become a yearly occurrence. Although we are not going to solve all of your problems in one session, the following story is an example of what might happen after a meeting such as this.

In the summer of 1991, a group now known as the Isolated Statisticians met for the first time at their national meeting, the JSM. These individuals were largely from departments in which each was the only statistician. Like you, when they wanted to talk to someone about picking a statistics textbook, trying a new teaching technique for statistics, or incorporating technology into their statistics course, they found themselves with no one to exchange ideas. Starting with fifteen participants in 1991, the informal 'Isostat' meeting has become a yearly event. In 1996 at the Chicago JSM, the isolated statisticians began their own special session, and fifty-five attended the informal yearly meeting; forty-one attended in 1997. The isolated statisticians have also had their own national meeting in 1995, eleven regional workshops in 1996 and 1997, and have an e-mail network of 150 people. No longer that isolated, they can meet with their 'hyper-colleagues' once or twice a year and can exchange ideas with them every day.

You ask, "What's in it for me?" Although the idea for this meeting has been discussed in a variety of settings over the last few years, this summer Tom Moore of Grinnell College and Don Van Osdol of the University of New Hampshire asked me to organize it. This meeting is the first step in bringing isolated teachers of statistics together. On one hand, I will moderate an informal discussion where you can raise issues that are important or significant to you, the teacher of statistics. On the other hand, I will facilitate the beginning of what I hope is an ongoing exchange of ideas among the isolated teachers of statistics. Of course in an hour or two there are limitations to what we can do. Yet the ASA–MAA Joint Committee on Undergraduate Statistics is willing to help you interact among yourselves and with people that can help with your statistics teaching. With a little work, you can begin the road to being 'networked!'

Come join us on Friday, January 9, 7–9P.M. in the Convention Center. The room number will be posted in a subsequent announcement in *MAA Online*. If you do not have access to the web or prefer to be notified directly, e-mail me or write to me at the Department of Mathematics, Rowan University, Glassboro, NJ 08028. Questions or suggestions are also welcome. I look forward to meeting you in Baltimore.

Dex Whittinghill is in the Department of Mathematics at Rowan University in Glassboro, New Jersey. His e-mail address is whittinghill@rowan.edu.

MAA Minicourses and MAA Short Course Registration Form • Baltimore, MD

Name _____

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MAA Short Course (January 5-6)
Introduction to Mathematical Imaging Processing, organized by Akram Aldroubi, NIH; and Dennis Healy, DARPA.

REGISTRATION FEES	Advance (by 12/19)	Regular & On-site
Students	$50	$60
Member: AMS, ASL, AWM, CMS, MAA, NAM, SMM	$125	$140
Nonmember	$175	$190

Minicourses (January 7-10)
To register for minicourses, you MUST be registered for the meeting. Register in advance by 12/19 to improve your chance for enrollment in the minicourses of your choice. Attendees may register for up to two minicourses. A 50% refund will be awarded for cancellation received by 12/31.

- ☐ Teaching a Course in the History of Mathematics — $45
- ☐ Interdisciplinary Lively Applications Projects — $45
- ☐ A Dynamical Systems Approach to the Differential Equations Course — $45
- ☐ Computability and Computational Complexity: What Is This All About? — $45
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BAL98

International Congress of Mathematicians 1998

Berlin, Germany

The Organizing Committee is pleased to announce that the next International Congress of Mathematicians will take place in Berlin, Germany, Tuesday, August 18, through Thursday, August 27, 1998. It will be held under the auspices of the International Mathematical Union (IMU) and sponsored by many other institutions.

Responsibility for the scientific program lies with the Program Committee appointed by IMU. There will be about twenty one-hour plenary lectures covering recent developments in the major areas of mathematics and about 170 forty-five-minute invited lectures in nineteen sections. The sections are logic, algebra, number theory and arithmetic algebraic geometry, algebraic geometry, differential geometry and global analysis, topology, Lie groups and Lie algebras, analysis, ordinary differential equations and dynamical systems, partial differential equations, mathematical physics, probability and statistics, combinatorics, mathematical aspects of computer science, numerical analysis and scientific computing, applications, control theory and optimization, teaching and popularization of mathematics, and history of mathematics.

Every registered participant (traditionally called Ordinary Member) of the congress will have the opportunity to give a short presentation, either during a poster session or in the form of a fifteen-minute lecture. Informal mathematical seminars may be organized at the initiative of groups of participants. English, French, German, and Russian are the official languages of the congress.

All plenary and invited lectures will be published in the *Proceedings of ICM '98*. After the congress, a complimentary copy of these proceedings will be sent to each Ordinary Member. Abstracts of all lectures and of all short presentations will be distributed free of charge to Ordinary Members at congress check-in.

The Fields Medals and the Nevanlinna Prize will be awarded during the opening ceremony on the first day of the congress. This will take place in the International Congress Center Berlin (ICC); all other scientific events will be held at Technische Universitaet Berlin. No scientific activities are scheduled for Sunday, August 23.

In an effort to reach out to a wider audience, ICM '98 organizers have initiated several cultural activities related to mathematics that are attractive to the general public. In particular, there will be a VideoMath Festival, software demonstrations, talks about mathematics and its relations to other subjects, several exhibitions (Mathematics in the Arts, etc.), and other events (Mathematics and Music, etc.). Special consideration will be given to the impact of the Nazi regime on mathematics in Berlin and Germany.

On August 18, a buffet-banquet for all registered participants will be held at noon directly after the Opening Ceremony in the ICC. During the congress, a number of guided tours of Berlin, visits to museums, and walking tours will be offered. On Sunday, August 23, it will be possible to choose from several excursions. For that evening, tickets have been reserved for the opera *The Magic Flute* at the Deutsche Oper. Registered participants may purchase tickets in advance for these events as well as for many day trips and pre- or post-congress tours to places of interest in the vicinity of Berlin.

Up-to-date information about all aspects of ICM '98 is available on the website http://elib.zib.de/ICM98. This includes information about registration, abstract submission, etc. E-mail correspondence should be directed to icm98@zib.de. It will be forwarded to an appropriate member of the Organizing Committee. If electronic communication is not available, you may write to ICM '98, c/o Prof. Dr. J. Winkler, TU Berlin, MA 8-2, Strasse des 17, Juni 135, D-10623 Berlin, Germany; fax: +49-30-314-21604.

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1998 Joint Mathematics Meetings

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Coming this Summer...

Mathfest 98

July 15-18, 1998
Toronto, Canada

Corollary Conference

A conference in honor of Ubi D'Ambrosio: This conference, held on the occasion of D'Ambrosio's 65th birthday and celebrating his role as the originator of ethnomathematics and his influence in mathematics education and in the history of mathematics, will take place on Tuesday, January 6, 1998, in the Omni Inner Harbor Hotel in Baltimore, MD. To register for the conference, please send a check, made payable to HPM, for $50, along with your name, addresses and phone numbers, to Karen Michalowicz, 5855 Glen Forest Dr., Falls Church, VA 22041.

AAAS Meeting to Offer Strong Mathematics Program

Warren Page

The 1998 Annual Meeting of the American Association for the Advancement of Science, February 12–17, 1998 in Philadelphia will feature many outstanding expository talks by prominent mathematicians. These include the following symposia (three-hour sessions) and invited talks sponsored by Section A (Mathematics) of the AAAS:

- Exploring New Frontiers in Geometry: In the World Around Us and in Our Classrooms I and II, organized by Colm Mulcahy and David Henderson
- The Chaotic Mathematical Mysteries of the Social Sciences, organized by Donald G. Saari
- Changing Pedagogy in Undergraduate Science and Mathematics Education, organized by Deborah Hughes Hallett and Brad Osgood
- From Riemann to Strings: The Ongoing Romance of Geometry and Physics, organized by Robert Osserman
- Wavelets and Applications, organized by Colm Mulcahy and Farid Dowla
- Elementary Methods in Number Theory, organized by Mel Nathanson
- Frontiers of the Physical Sciences I and II, organized by Warren Page
- Frontiers of the Physical Sciences Lecture: Jean E. Taylor, "From Soap Bubbles to Turbine Blades: Applications of Geometric Measure Theory"
- Topical theme Lecture: Tony DeRose, "How Geometry is Changing Hollywood"

Other symposia that will be of interest to mathematicians and mathematics educators include:

- Paradigms for the Sciences: Past, Present, and Future
- Not Merely by Science Alone: The Role of Values in Scientific Inquiry
- Population and Carrying Capacity: Beyond Malthus After Two Centuries
- Educational Technology, Contemporary Theories of Learning, and Some Applications
- The Role of Models in Science
- How Scientists Really Think
- Properties of Mind
- Data Selection: Good Research or Fudging the Data?

The above symposia are only a few of the 150 or so AAAS program offerings in the physical, life, social, and biological sciences that will broaden the perspectives of students and professionals alike. Indeed, AAAS annual meetings are the showcases of American science, deserving greater participation by mathematicians.

In presenting mathematics to the AAAS Program Committee, I have found the committee genuinely interested in more symposia on mathematical topics of current interest. The Section A Committee is looking for organizers and speakers who can present substantial new material in understandable ways.

For details of the program, see the October 31, 1997 issue of *Science*. I invite you to attend our Section A Committee meeting, 7:30–10:30 P.M., Friday, February 13, 1998, Room 110B of the Philadelphia Convention Center. The committee meeting is open to all who wish to stimulate interest and activities of the mathematical sciences within AAAS. Please send me, and encourage your colleagues to send me, symposia proposals for future AAAS meetings.

The AAAS wishes to acknowledge the AMS for their generous support.

Warren Page is senior consulting acquisitions editor of the MAA and the newly re-elected secretary of Section A of the AAAS.

Short Course Program

The Ohio State University Technology College Short Course Program—part of the Teachers Teaching With Technology Program—is now taking applications for mini-grants to partially fund one- to five-day hand-held technology-based short courses throughout the U.S. in 1997–98. You may select to host courses for the developmental level (DEV), for the college algebra–trigonometry level (ALGT), for the precalculus and calculus level (PCALC-CALC), for the calculus level (CAS-CALC), for teacher educators (MTE), for modeling science (M2S), for statistics and data analysis (STATS), and other affiliated courses. Participants will learn how to use Texas Instruments hand-held technology to enhance the teaching and learning of mathematics. Each course contains some use of the CBL and CBR to collect data for the purpose of mathematical analysis. Pedagogical, testing, and implementation issues are addressed in all courses. Academic year courses (one- to three-day) are intended for individual or small groups of colleges, and three- or five-day summer 1998 courses are intended for wide-based audiences. If you are interested in hosting a course, the mini-grant application form, short course prospectus, and program details are available at http://www.math.ohio-state.edu/shortcourse.

Hard copies of the forms can be obtained from Bert Waits and Frank Demana through Ed Laughbaum at Ohio State University, 231 W 18th Ave., Columbus, OH 43210; elaughba@math.ohio-state.edu. The College Short Course Program is endorsed by the American Mathematical Association of Two-Year Colleges (AMATYC) and has offered nearly one hundred courses in twenty-seven states in the last four years.

Symposium on Mathematical Modeling

June 12–13, 1998

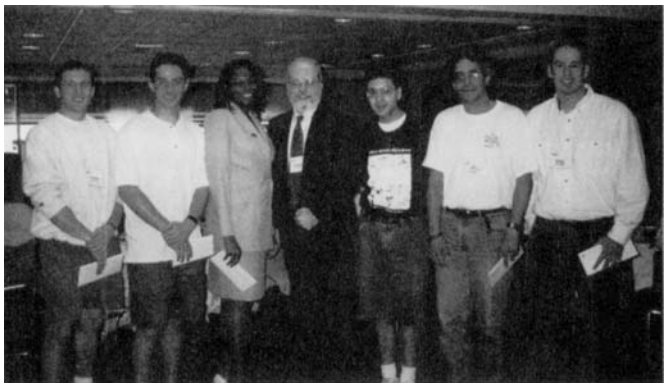
The Mathematics Department of the University of Wisconsin in La Crosse and the Consortium for Mathematics and its Applications (COMAP) is hosting a symposium to bring together mathematicians, scientists, and university educators for the purpose of sharing ideas, projects, and problems related to mathematical modeling in the undergraduate curriculum.

Submissions for 25–minute or 50–minute presentations are welcome. Both mathematical and pedagogical themes are welcome and a student presentation will be included. A one-page abstract must be received before Match 15, 1998 to be considered for inclusion.

For more information, contact the Mathematics Department, University of Wisconsin–La Crosse, La Crosse, WI 54601; (608) 785-6614; e-mail: skala@math.uwlax.edu.

Eight Win Student Paper Awards

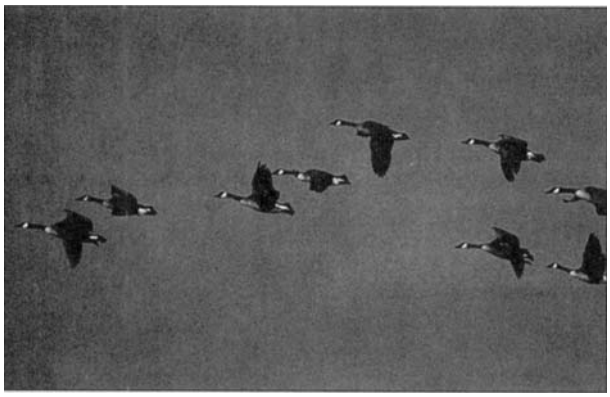
Presented during the Pi Mu Epsilon Banquet at the Atlanta MathFest last August were awards for outstanding presentations at the MAA Student Paper Sessions. Pictured here are most of the winners of those awards. From left to right they are Brian Munson (University of Oregon; "Clusters of Soap Bubbles and Immiscible Fluids: Part I"), Jonathan Kravis (Williams College; "Additional Topics in Alternating Graphs and Links"), Adraine Jordan (University of South Alabama; "Citation Analysis of Finance Research"), Charles Dimminnie (Student Paper Sessions Coordinator), Andrew Hetzel (University of Dayton; "On Ahmes' Expansions of Egyptian Fractions of Length Two"), Aref Nammari (Metropolitan State College of Denver; "Using Inventory Data to Determine Whether Underground Storage Tanks are Tilted"), and Matt Maurer (Saint John's University–Minnesota; "Validating a Health Questionnaire").



Winners not pictured are Diann Shehy and Rhonda Cook (Shippensburg University, joint winners; "Josephus and the Amazing Technicolor Fixed Points") and Sheila Page (Coastal Carolina University; "Modified Thresholding Techniques to Compress Images Using Haar Wavelets").

The monetary awards were made possible by a grant from the Exxon Education Foundation.

Birds flock together for protection. As it turns out, so do we.



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Employment Opportunities

CALIFORNIA

CALIFORNIA STATE UNIVERSITY, CHICO

Department of Mathematics and Statistics

The Department announces a tenure track positions in Mathematics Education at the Assistant Professor level beginning in the 1998-99 academic year. Minimum requirements: a doctorate in mathematics education, mathematics or a related field, including at least the equivalent of a strong master's degree in mathematics; evidence of quality teaching; a commitment to working with preservice and inservice teachers; capacity for excellence in research, writing, or other scholarly activities. The current salary range is $37,956 - $45,672 per academic year, depending on the level of appointment. Qualified candidates should submit a letter of application (including a statement of professional goals which addresses the qualifications and experiences required), a vita, and three letters of recommendation (including at least one relating to teaching effectiveness) to: Dr. Jim Jones, Mathematics education Search Committee, Department of Mathematics and Statistics, CSU, Chico, Chico, CA 95729-0525. Closing date: February 20, 1998. CSU, Chico is an EEO/AA/ADA/IRCA employer that is committed to a culturally diverse work force, hence all qualified individuals are encouraged to apply.

OCCIDENTAL COLLEGE

Los Angeles, California

Mathematics - Tenure-track assistant professor position (pending final approval). Field is open, but computer science, discrete mathematics, foundations, geometry, and topology are preferred. Our teaching environment encourages curricular and pedagogical innovation. Submit a current resume, three letters of recommendation (at least one of which evaluates teaching), and a statement of professional plans, interests, and goals. The statement should address teaching and curriculum for undergraduate mathematics at a liberal arts college, as well as mathematical interests and research plans. Send by February 3, 1998 to: Faculty Search Committee, Department of Mathematics, Occidental College, 1600 Campus Road, Los Angeles, CA 90041-3314. Occidental College committed to equity and excellence in education and strongly encourages applications from women and minorities. For more information, visit http://www.oxy.edu/departments/math/.

CONNECTICUT

SACRED HEART UNIVERSITY

Department of Mathematics
Fairfield, CT 06432

Sacred Heart University is the third-largest Catholic university in New England. The current student body is drawn from 25 states and more than 50 countries and numbers approximately 5,500 undergraduate and graduate students. In its strategic plan, the University has made a commitment to the liberal arts, the health sciences, business and education.

Position: Tenure-track position at the Assistant Professor level.

Qualifications: Ph.D. in Mathematics, specializing in Algebra and/or Statistics. Commitment to teaching and the use of technology in the classroom essential. Post-doctoral publications and grant writing experience preferred. Expected to teach major and non-major mathematics courses.

Applications must include a complete resume, transcripts and three letters of recommendation. The review and screening process will begin immediately.

Direct applications to: Rose Marie Kinik, Chair, Department of Mathematics, Sacred Heart University, 5151 Park Avenue, Fairfield CT 06432-1000

EOE/AA employer. Women and minorities encouraged to apply.

SOUTHERN CONNECTICUT STATE UNIVERSITY

Mathematics Department
501 Crescent Street
New Haven, CT 06515

Two tenure track positions at Assistant Professor rank, one in algebra, the other in geometry, beginning 8/24/98 to teach undergraduate/graduate courses in mathematics. Teaching load: 12 hours/sem. Salary range: $38,500 to $52,800. Qualifications: doctorate in mathematics with a specialty in algebra or geometry, evidence of quality teaching, potential for scholarly growth. Send letter of application, vita, transcripts (unofficial OK), statement of teaching philosophy, three letters of reference to Dr. Leo Kuczynski. Full consideration given to applications received by 1/23/98. (AA/EOE)

COLORADO

FORT LEWIS COLLEGE

The Department of Mathematics is seeking applicants for a tenure-track assistant professorship to begin in August, 1998. Terminal degree in Mathematics or Mathematics Education required for tenure. Candidates must be qualified to teach courses in mathematics education and have a commitment to support mathematics education activities in the region. For details, contact Cliff Capp, Department of Mathematics/CSIS, Fort Lewis College, Durango, CO 81301-3999, e-mail: capp_c@fortlewis.edu, or see our web page at http://www.fortlewis.edu/joblist.html. To apply, send letter of application, including your philosophy of education, vitae, transcripts showing highest degree awarded, and three current letters of recommendation, postmarked by Jan. 31, 1998. Fort Lewis College is an AA/EO employer. Women and minorities are especially encouraged to apply.

GEORGIA

GEORGIA SOUTHERN UNIVERSITY

Department of Mathematical Sciences

Two tenure track positions starting August 1, 1998. Salary dependent upon qualifications. Indicated degrees are required by the position starting date. All deadlines are postmark deadlines. Commitment to excellence in teaching and scholarly activity, as well as excellent command of written and spoken English, are required. College teaching experience is desirable. Departmental representatives will be available at the national AMS/MAA meeting at Baltimore in January 1998 to discuss these positions with interested parties. Send letter of application indicating position desired, curriculum vitae, unofficial transcripts of all college work, evidence of commitment to excellence in teaching and scholarship, a brief description of planned scholarly activities, and a letter of reference from each of three references by the indicated deadline to appropriate search chair (Applied Math or Math Ed), [search number], Department of Mathematics and Computer Science, Post Office Box 8093, Georgia Southern University Statesboro, GA 30460-8093.

The names of applicants and nominees, resumes and other general non-evaluative information are subject to public inspection under the Georgia Open Records Act. Georgia Southern is an equal opportunity/Affirmative Action Institution. Persons who need accommodation(s) in the application process under the Americans with Disabilities Act should notify the search chair.

Applied Mathematics. Assistant Professor. PhD. in an applied math area required. Preference will be given to applicants in the areas of Discrete Math, Numerical Analysis, Scientific Computing, Modeling, and Differential Equations but consideration will be given to applicants in all areas of applied math. At least one year of experience with the use of computational packages (such as Mathematica, Maple, or Matlab) is required. Interest in teaching freshman/sophomore-level mathematics courses required. three years college teaching experience preferred. Send applications and supporting materials to Applied Math Search Chair. Search #:34925. Deadline: January 16, 1998.

Mathematics Education. Assistant Professor. Doctorate in a mathematical science required; PhD. or Ed.D in mathematics education preferred. Must be broadly trained in the mathematics with at least 24 semester hours of graduate level courses in pure or applied mathematics. Must exhibit evidence of a strong commitment to excellence in teaching and continued scholarly activity, and have familiarity with current directions in mathematics education, including the use of technology in the classroom. Primary interest in mathematics education required; experience in working with K-12

mathematics teachers preferred. At least three years teaching experience preferred. Candidates must be able to work effectively with professional and community groups. Duties include teaching undergraduate mathematics courses and undergraduate/graduate mathematics courses for mathematics education majors. Send applications and supporting materials to Math Ed. Sear Chair. Search #34927. Deadline January 16, 1998.

Georgia Southern University, a unity of the University System of Georgia, was founded in 1906 and became a regional university in 1990. The 601-acre campus is located in Statesboro, a community of approximately, 30,000 residents, 50 miles northwest of historic Savannah and 200 miles southeast of Atlanta. Anticipated fall quarter 1997 headcount of over 14,000 reflects a 115% enrollment growth since the fall of 1984, resulting in the addition of over 200 faculty positions. The university offers 23 baccalaureate degrees in 81 major fields of study, ten master's degrees in 40 fields, the Education Specialist degree with 16 majors, and Ed.D. programs in Educational Administration and Curriculum Studies.

INDIANA

BALL STATE UNIVERSITY
Assistant Professor
Department of Mathematical Sciences

Mathematics Education: tenure-track position available August 21, 1998. Responsibilities include: teaching both content and methodology (approximately 8 to 9 hours per semester); research; professional service; and working with prospective and in-service teachers at the elementary, middle school, or secondary level. Minimum qualifications: all requirements for a doctorate in mathematics education completed by time of appointment; current or previous teaching licensure or certification at the elementary or secondary level. Preferred qualifications: pre-college teaching experience: research interests compatible with those of the present faculty; documentation of successful college or university teaching; evidence of research potential. The Department of Mathematical Sciences includes faculty in Pure and Applied Mathematics, Statistics, Actuarial Science, and Mathematics Education. The department offers a range of academic programs leading to BA, MA, MS, and MAE degrees in these area. The department's URL is: http://www.-cs.bsu.edu/~math/

Competitive salary and benefits package. Send completed AMS Standard Cover Sheet (available from the AMS or from the department); curriculum vitae; and three letters of reference, at least one of which addresses, in depth, both teaching ability and performance to: Professor Kay Roebuck, Chair, Mathematics Education Search Committee, Department of Mathematical Sciences, Ball State University, Muncie, IN 47306-0490. (roebuck@wp.bsu.edu) Applicants should also notify the Committee Chair if they intend to attend the 1998 AMS/MAA Joint Meetings in Baltimore. Review of Applications begins immediately and continues until the position is filled.

Ball State University is an equal opportunity, affirmative action employer and is strongly and actively committed to diversity within its community.

KANSAS

EARLHAM COLLEGE

The Mathematics Department invites applications for a tenure-track faculty position: Ph.D. in mathematics or computer science. Our department has a long-standing commitment to teaching mathematics in a way that produces students who understand and know how to use mathematics. The program is focused on preparing our majors to go on in mathematics or related areas, and is committed to furthering the mathematical understanding and skills of other Earlham students by bringing mathematics to them in upper level courses within their own disciplines.

The College has a number of interdisciplinary programs, including African and African American Studies, Environmental Science, Management and Women's Studies. Each faculty member is encouraged to participate in and contribute to such programs.

As a Quaker College, we welcome applications from women, racial minorities and people sympathetic to Quaker values including social justice, simplicity, and consensus seeking. AA/EOC Send a letter of application, vita, a statement of your teaching philosophy, transcripts and three letters of recommendation to: Mic Jackson, Convenor, Mathematics Department, Earlham College, Richmond, IN 47374-4095, micj@earlham.edu.

PITTSBURG STATE UNIVERSITY
Assistant Professor

Pittsburg State University anticipates hiring 1 tenure track assistant professor and 1 one year full-time lecturer for Fall 1998. Tenure track position requires earned Ph.D. in Mathematics. We will consider applicants in all field of mathematics. Areas of particular interest are: discrete mathematics, numerical analysis, statistics, stochastic processes. For the one year position a PhD. in Mathematics is preferred. ABD will be considered. Applicants for both positions are expected to present evidence of excellent teaching and an active research program.

For the tenure track position the primary responsibility is teaching undergraduate and master's level mathematics major courses. Scholarship, academic advising, and service activities are also expected. Some teaching of service courses is required. For the one year position the primary responsibility is teaching undergraduate service courses. The standard teaching load for each position is 12 hours per semester. Salary for the tenure track position is from a base of $33,000. Salary for the one year position is $30,000.

For first consideration send letter of application, resume with five reference letters, and five names of references with addresses and telephone numbers by Feb. 2, 1998 to Elwyn H. Davis, Chairman, Department of Mathematics, Pittsburg State University, Pittsburg, KS 66762. (Telephone 316-235-4401, email - edavis@pittsburg.edu) Search will continue until positions are filled. Candidates must indicate which positions(s) they are interested in. Pittsburg State University is a multipurpose state-supported institution. Current enrollment is approximately 6,300 students. Baccalaureate, Master's and Specialist in Education degrees are offered. The university is an Equal Opportunity/Affirmative Action Employer.

WASHBURN UNIVERSITY
Position Announcement

MATHEMATICS: Mathematics or Statistics (tenure track). Doctorate required for appointment at rank of Assistant Professor. The department is committed to the highest quality of instruction. Selection will be based primarily on the documented potential of excellence in teaching undergraduate mathematics and statistics. Must demonstrate potential for scholarly activities. Review of applications will begin February 16, 1998 and continue until a suitable candidate is found. Respond to Dr. Gary Schmidt, Chair, Search Committee, Department of Mathematics and Statistics, Washburn University, Topeka, KS 66621. Affirmative Action/Equal Opportunity Employer.

KENTUCKY

MOREHEAD STATE UNIVERSITY

Invites applications for a tenure track position as Assistant Professor of Mathematics beginning August 1998. Responsibilities: Teach twelve hours per semester including introductory courses; provide service; advise students; participate in scholarly productivity. Qualifications: Ph.D. in related field-must have the equivalent of a master's degree in mathematics. ABDs with imminent completion will be considered. Good communication skills. Preferred Qualifications: Master's degree in computer science. Experience providing a learning environment in which communication skills are part of the course objectives. Experience teaching in an environment using graphing calculators and/or computers as an integral part of the teaching strategy. Experience teaching in an active learning environment. Familiarity with national standards for the teaching of mathematics and commitment to professional development as exhibited by participation at conferences and meetings. To ensure consideration, submit letter of application, curriculum vitae, and three letters of recommendation by January 2, 1998, to: Office of Human Resources, Attn: Math.#2676, Morehead State University, HM 101, Morehead, KY 40351. MSU is an EO/AA employer.

MASSACHUSETTS

SMITH COLLEGE
Department of Mathematics
Assistant Professor

The Mathematics Department of Smith College invites applications for a three-year, renewable, tenure-track position of assistant professor to begin in the fall of 1998. Candidates must have a Ph.D.in mathematics or statistics and must provide evidence of excellent teaching and an active

research program. All specializations will be considered. Send a curriculum vitae and arrange to have three letters of recommendation sent to: Mathematics Search Committee, Clark Science Center, Smith College, Northampton, MA 01063. To receive full consideration, you must provide a complete application before January 1, 1998. Smith College is an Equal Opportunity /Affirmative Action Institution. Minorities and women are encouraged to apply.

WILLIAMS COLLEGE
Department of Mathematics
Williamstown, Massachusetts 01267

Two full-time visiting positions in mathematics or statistics for the 1998-99 year, probably at the rank of assistant professor; in exceptional cases, however, more advanced appointments may be considered. Excellence in teaching and research, and Ph.D. required. For one of the positions the ability to teach statistics courses is a plus.

Please have a vita and three letters of recommendation on teaching and research sent to Visitor Hiring Committee. Evaluation of applications will begin November 15 and continue until the position is filled. As an EEO/AA employer, Williams especially welcomes applications from women and minority candidates.

MICHIGAN

KALAMAZOO COLLEGE
Assistant Professor of Mathematics

Kalamazoo College invites applications for a tenure-track position at the Assistant Professor level beginning September, 1998. A Ph.D. in mathematics, statistics, or operations research is required, with preference given to candidates of broader experience in mathematics, science or the liberal arts. Teaching load is two courses per quarter, three quarters per year. Salary is competitive and consistent with level of experience. For more information about the college, visit our web home page at www.kzoo.edu.

Experience with and interest in the application of statistics to problems in the life or social sciences is essential. The ideal candidate will also have an interest in developing an active research program that involves undergraduate student participation. Candidates are expected to have high aptitude and interest in undergraduate teaching and a commitment to the liberal arts.

Completed applications received by December 31, 1997 will receive full consideration, with later applications reviewed as needed until the position is filled. Send curriculum vitae, undergraduate and graduate transcripts (unofficial acceptable), a two-to-three page statement of teaching philosophy and research plans, and three letters of recommendation to

Prof. John Fink
Chair, Department of Mathematics
Kalamazoo College
1200 Academy Street
Kalamazoo, MI 49006-3295
fink@cc.kzoo.edu

Kalamazoo College encourages candidates who will contribute to the cultural diversity of the College to apply and to identify themselves if they wish. Equal Opportunity Employer.

MINNESOTA

MOORHEAD STATE UNIVERSITY
Assistant Professor

Tenure track position (pending funding) at rank of assistant professor to begin September, 1998. A Ph.D. or Ed.D. in mathematics education is strongly preferred. Substantial progress towards a terminal degree is required. Eligibility for licensure at some level K-12 and good communication skills are required. Preference will be given to candidates with evidence of successful teaching experience at the K-12 and college level. Interest or experience in teaching a mathematics methods course for elementary education majors and evidence of ability to work effectively as a member of a teaching team are desirable. Duties include teaching mathematics education methods courses, elementary education content courses and undergraduate mathematics courses. Other responsibilities include advising secondary mathematics education majors, developing in-service workshops, working on assigned committees and maintaining an appropriate level of professional activity. The teaching load is twelve hours per semester, which may include supervising student teachers. Screening applications will begin January 19, 1998. Completed applications must include a resume, MSU Standard Application Form, graduate and undergraduate transcripts, and three current letters of reference. Apply to Don Mattson, Chair, Mathematics Department, Moorhead State University, Moorhead, MN 56563, (218) 236-2274. Fax - (218) 236-2168 and email: mattson@mhdl.moorhead.msus.edu. EO/AA.

NEW HAMPSHIRE

DARTMOUTH COLLEGE
John Wesley Young Research Instructorship in Mathematics

The John Wesley Young Research instructorship is a two year post-doctoral appointment for promising new or recent PhD's whose research interests overlap a department member's. Current departmental interests include areas in algebra, analysis, combinatorics, differential geometry, logic and set theory, number theory, probability and topology. Teaching duties of four ten-week courses spread over two or three quarters typically include at least one course in the instructor's specialty and include elementary, advanced and (at instructor's option) graduate courses. Nine-month salary of $39,000 supplemented by summer research stipend of $8,667 for instructors in residence for two months in summer. Send letter of application, resume, graduate transcript, thesis abstract, description of other research activities and interests if appropriate, and 3 or preferably 4 letters of recommendation (at least one should discuss teaching) to Betty Harrington, Department of Mathematics, 6188 Bradley Hall, Hanover, NH, 03755-3551. Applications received by Jan. 15 receive first consideration; applications will be accepted until position is filled. Dartmouth College is committed to affirmative action and strongly encourages applications from minorities and women.

DARTMOUTH COLLEGE

The Department of Mathematics anticipates an opening for a Professor of Mathematics, with appointment effective in the 1998-99 academic year. Field open. A candidate for the position must demonstrate evidence of an exceptional research program that has achieved peer-recognition and research leadership in the mathematical community. Moreover, a candidate must demonstrate a record of exceptional teaching and continued interaction with students at all levels of undergraduate and graduate study. Leadership in guiding PhD theses is also essential. Applications are welcome in all fields of mathematics.

To create an atmosphere supportive of research, Dartmouth offers new faculty members grants for research-related expenses, a quarter of sabbatical leave for each three academic years in residence and flexible scheduling of teaching responsibilities. The teaching responsibility in mathematics is four courses spread over two or three quarters. The department encourages good teaching with a combination of committed colleagues and bright, responsive students.

To apply, send a letter of application, curriculum vitae, and a brief statement of research results and interests, and the names of four references, at least one of which can specifically address teaching. these materials should be sent to Betty Harrington, Recruiting Secretary, Department of Mathematics, Dartmouth College, 6188 Bradley Hall, Hanover, NH 03755-3551. Applications complete by January 1, 1998, including reference letters (allow enough lead-time for us to make the solicitations from the names you provide), will receive first consideration. Dartmouth is committed to Affirmative Action and encourages applications from African Americans, Asian Americans, Hispanics, Native Americans and women. Inquiries about the progress of the selection process can be directed to C. Dwight Lahr, Recruiting Chair.

NEW JERSEY

THE COLLEGE OF NEW JERSEY
Department of Mathematics and Statistics
Vacancies for Fall 1998

Assistant Professor: Two tenure track positions teaching 12 hours per semester including general education courses. Req'd: Ph.D. or Ed.D, demonstrated commitment to quality teaching, strong research potential. Preference for one position will be given to candidates prepared to teach professional courses and for both positions to candidates with postdoctoral experience in teaching and research. Send vita and three letters of recommendation, at least one regarding teaching ability to: Search Committee, Department of Mathematics, TCNJ, P.O. Box 7718, Ewing, NJ 08628-0718. Deadline: January 15, 1998. TCNJ is an AA/EOE.

NEW YORK

COLLEGE OF STATEN ISLAND/THE CITY UNIVERSITY OF NEW YORK

Search reopened: The Department of Education of the College of Staten Island/CUNY invites applications for an anticipated tenure-track

position in Mathematics Education at the rank of Assistant or Associate Professor, to begin February or September 1998. To teach undergraduate and graduate courses, perform department and college service, advise students, and engage in scholarly activity. CSI is located on a new, attractive 204-acre campus in a suburban setting in close proximity to New York City.

Qualifications: doctorate in mathematics education or mathematics with appropriate experience in elementary or intermediate schools; evidence of commitment to research; strong background in mathematics and familiarity with curricula and materials for elementary and secondary levels required; expertise in integrating technology and instruction preferred.

Salary range: Assistant Professor: $34011 - $52213; Associate Professor: $42186 - $62394. Review of applications will begin November 14, 1997 and continue until the positions are filled.

Please send a letter of application, curriculum vitae, and names, addresses, and telephone numbers of three references to: Chair, Search Committee Mathematics Education, Department of Education, 3S-208, College of Staten Island/ CUNY, 2800 Victory Blvd, Staten Island, NY, 10314

EEO/AA/ADA employer

THE STATE UNIVERSITY OF NEW YORK COLLEGE AT POTSDAM
Assistant Professor

The State University of New York College at Potsdam invites applications for one (possibly two) anticipated full time tenure track position(s) effective September 1, 1998, at the rank of assistant professor. Responsibilities of the position are to teach twelve hours per semester of undergraduate and first year graduate courses. Required qualifications are a Ph.D. in any area of mathematics with a strong interest in and preparation for teaching undergraduate major mathematics courses. In addition, some preparation in computer science is desirable though not essential. Applications, which must include a letter of interest, a statement of the applicant's philosophy of teaching, a resume, three letters of recommendation describing teaching experience and abilities, and a transcript (a copy is acceptable) should be sent to Dr. Cheryl Chute Miller, Staffing Committee Chair, Math Department, SUNY Potsdam, Potsdam, NY 13676 (millercc@potsdam.edu). To ensure full consideration, complete applications must be received by January 21, 1998.

OHIO

DENISON UNIVERSITY

Has a three semester position in the Department of Mathematics and Computer Science beginning January 1998. PhD. required in mathematics. A commitment to quality instruction of undergraduates is essential.

Denison University is a liberal arts college of 1800 students located in a village of 4,000, seven miles from Newark (population 50,000) and 25 miles east of Columbus, Ohio. The Department of Mathematics and Computer Science offers B.A. and B.S. degrees in mathematics and computer science.

Send resume and transcripts of graduate work to:

Dr. Joan Krone, Chair
Department of Mathematics and
Computer Science
Dension University
Granville, Ohio 43023

Also ask three persons who know you well to send reference letters in support of your application.

Application will be processed until the position is filled.

OHIO UNIVERSITY
Department of Mathematics

Applications are invited for a tenure-track assistant professor position in set-theoretic topology, effective September 1, 1998. A Ph.D. in mathematics is required. Applicants must show exceptional promise in research and teaching. Preference will be given to candidates whose research interests complement those of the department faculty. The salary is competitive and there is an excellent fringe benefit package.

A review of applications will begin January 31, 1998. Send a letter of application, resume, and three letters of recommendation to: Chair, Search Committee, Department of Mathematics, 321 Morton Hall, Ohio University, Athens, Ohio 45701. Ohio University is an Equal Opportunity/ Affirmative Action employer, women and minorities are encouraged to apply.

THE OHIO STATE UNIVERSITY
Director of Mathematics-Statistics Learning Center

The Mathematics-Statistics Learning Center (MSLC) is an exciting new venture by the Mathematics and Statistics Department to provide

- tutoring services
- small group learning facilities
- computer laboratories
- faculty, TA, and peer-mentor training programs
- support for pedagogical experimentation
- state-of-the-art teaching materials.

The duties and responsibilities of the Director of the MSLC will include design and development of the MSLC, overseeing daily operations of the MSLC, working with faculty and TA's to improve teaching effectiveness, and teaching one lower division mathematics (or statistics) course per quarter.

We are seeking a dynamic, energetic individual with innovative ideas, and outstanding communication skills. Qualifications include an advanced degree in Mathematics, Statistics, or Mathematics Education, demonstrated excellence in teaching mathematical sciences at the college level, and some experience in administration.

The position is a twelve-month, full-time, Administrative and Professional staff appointment. Salary will be commensurate with qualifications and experience. Send a resume and letter of interest to Prof. W.J. Davis, Chair, MSLC Search Committee, Department of Mathematics, The Ohio State University, 231 West 18th Avenue, Columbus, OH 43210.

Evaluation of applications will begin in early December, 1997, and will continue until a suitable candidate is found. THE OHIO STATE UNIVERSITY IS AN AFFIRMATIVE ACTION, EQUAL OPPORTUNITY EMPLOYER.

Send inquiries for information to davis@math.ohio-state.edu. Learn more at http://www.math.ohio-state.edu and http://www.stat.ohio-state.edu.

THE UNIVERSITY OF AKRON
Department of Mathematical Sciences
Assistant Professor

A tenure-track Assistant Professor Position is available starting Fall, 1998. Applicants should demonstrate potential for excellence in both teaching and research. Two-thirds of the teaching responsibility consists of general education courses. The remainder of the teaching load may consist of other undergraduate and graduate courses. Applicants should possess a Ph.D. in mathematics with specialization in one of the areas of algebra, discrete mathematics, or geometry. Preference will be given to candidates demonstrating experience and/or interest in applications or modeling.

The University of Akron is the third largest state university in Ohio. The department offers Bachelor and Master degrees in Applied Mathematics, Mathematics, Statistics and Computer Science. An Engineering Applied Mathematics doctoral program, emphasizing interdisciplinary applied mathematics, is offered cooperatively through the College of Engineering. See http://www.math.uakron.edu/ for more information about the department. All materials (application letter, curriculum vitae, unofficial copy of graduate transcripts, and three letters of recommendation) should be sent to:

Chair, Mathematical Sciences
Search Committee
Department of Mathematical Sciences
The University of Akron
Akron, OH 44325-4002

Inquiries may be sent to stef@uakron.edu. Review of completed applications will begin January 15 and continue until the position is filled. Women and minorities are encouraged to apply. The university of Akron is an equal education and employment institution.

UNIVERSITY OF DAYTON

Applications are invited for a tenure track position at the assistant professor level to begin in August, 1998. A Ph.D. degree in mathematics education or a Ph.D. degree in mathematics with

a strong commitment to mathematics education at the K-12 level and the potential to become an effective teacher are required. We seek an individual who will actively develop relations between the university and the community, will work with the appropriate faculty in the School of Education, and will actively pursue grants to develop professional development programs for teachers. Responsibilities include teaching, advising, and curriculum development in an undergraduate mathematics education program. The teaching responsibilities are three classes each semester, primarily in the undergraduate mathematics education curriculum and in the undergraduate mathematics curriculum.

The University of Dayton is a private comprehensive Catholic university founded by the Society of Mary in 1850. It has more than 6000 undergraduate and 3000 graduate students. The Department of Mathematics offers B.A. degrees in mathematics and an M.S. degree in applied mathematics. The School of Education offers a B.S. degree in education with certification in elementary and secondary teaching. Moreover, we offer B.A. and B.S. degrees in mathematics with certification in secondary teaching.

The selection process will begin on December 1, 1997, and continue until the position is filled. Please send a resume and three letters of recommendation to the Hiring Committee, Department of Mathematics, University of Dayton, Dayton, Ohio 45469-2316 or to math@udayton.edu. Please include an e-mail address in your correspondence. Further information can be obtained at http://www.udayton.edu/~mathdept. The University of Dayton is an equal employment opportunity employer. Women, minorities, individuals with disabilities, Vietnam era veterans are strongly encouraged to apply.

PENNSYLVANIA

MUHLENBERG COLLEGE

The Muhlenberg College Mathematical Sciences Department invites applications for a tenure-track assistant professorship beginning August 1998. The position requires demonstrated teaching excellence and ongoing professional activity. Applicants should have a PhD in the mathematical sciences and teaching experience in both mathematics and computer science. Teaching assignments will include courses in both areas. Standard teaching load is three courses per semester, one of which may be scheduled in the evening. The department offers BS degrees in mathematics and computer science. Muhlenberg College is an independent, undergraduate, coeducational institution, located in the picturesque Lehigh Valley just south of the Pocono Mountains and within easy driving distance of both Philadelphia and New York City.

To apply send a resume, statement or letter detailing teaching experience and research, and three letters of recommendation to Dr. Benjamin, Mathematical Sciences Department, Muhlenberg College, Allentown, PA 18104-5586. Application review begins Dec. 15, 1997 and will continue until the position is filled. EOE.

PENN STATE BEAVER

Assistant Professor, Mathematics

The Commonwealth College invites applications for a tenure-track, 36-week position. Starting date: August 1998, or as negotiated. Appointment is in the Commonwealth College to teach standard freshman and sophomore college level mathematics courses. Candidates in all areas of mathematics will be considered. Candidate must also be committed to scholarly endeavors including research and publications, and participate actively in campus life. Ph.D. in mathematics and some teaching experience, possibly as a graduate student. A full description of the position and its location is available at: http://www.cwc.psu.edu/ Applicants should submit a letter of application, resume, academic transcript, and the names, addresses (including e-mail if possible), and phone numbers of three references to: Dr. John Madden, Acting Associate Dean, The Pennsylvania State University, 111 Old Main, Box 005M, University Park, PA 16802. Applications will be reviewed beginning immediately and will continue until a suitable candidate is found. An Affirmative Action/Equal Opportunity Employer. Women and Minorities Encouraged to Apply.

PENN STATE FAYETTE

Assistant Professor, Mathematics

The Commonwealth College invites applications for a tenure-track, 36-week position. Starting date: August 1998, or as negotiated. Appointment in the Commonwealth College. Tenure-track faculty are evaluated in the areas of teaching, research, and service with a typical course load of three courses in the areas of Introductory Calculus, Linear Algebra, Differential Equations, and Vector Calculus. A Ph.D. in Mathematics is required and at least several years of postdoctoral teaching experience is a plus. Evidence of research productivity will be essential. A commitment to alternative learning techniques and environments will also be considered an asset. A full description of the position and its location is available at: http://www.cwc.psu.edu/ Applicants should submit a letter of application, resume, academic transcript, and the names, addresses (including e-mail if possible), and phone numbers of three references to: Dr. John Madden, Acting Associate Dean, The Pennsylvania State University, 111 Old Main, Box 005M, University Park, PA 16802. Applications will be reviewed beginning immediately and will continue until a suitable candidate is found. An Affirmative Action/Equal Opportunity Employer. Women and Minorities Encouraged to Apply.

PENN STATE MCKEESPORT

Assistant Professor, Mathematics

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WEST CHESTER UNIVERSITY

Assistant Professor of Mathematics

West Chester University of Pennsylvania's Department of Mathematics invites applications for a tenure-track assistant professor position in mathematics education beginning August, 1998. Responsibilities include teaching 4 courses per semester assigned from among undergraduate mathematics and undergraduate and graduate level courses in mathematics education. The duties also include assisting with advising and coordination of the department's programs in mathematics education at both the undergraduate and graduate levels. A candidate must have an earned doctorate in mathematics education or a related field, with at least the equivalent of a master's degree in mathematics. The principal qualification is excellence in teaching and a strong potential for scholarship. Preference will be given to candidates who possess a valid Pennsylvania Department of Education teaching certificate for grades 7-12 or its equivalent.

To apply, submit a curriculum vitae, a brief statement of teaching philosophy, a brief research prospectus, graduate degree transcripts, and three letters of recommendation (at least one letter should address teaching and at least one should address scholarship). Submission of additional evidence of teaching effectiveness is encouraged. Review of applications will begin December 1, 1997 and will continue until the position is filled. Finalist must successfully complete an interview/demonstration of teaching effectiveness. Applicants should submit all materials to Dr. Richard Branton, Chair, Search Committee, Department of Mathematics, West Chester University, West Chester, PA 19383. No applications by fax or e-mail.

West Chester University is an Affirmative Action/Equal Opportunity Employer. Women and minorities are encouraged to apply.

TENNESSEE

THE UNIVERSITY OF TENNESSEE

The Mathematics Department of The University of Tennessee (www.math.utk.edu) seeks to fill a tenure-track assistant professorship with an Outreach Mathematician (OM). The duties of the OM will be to foster close relations between the University and the community colleges and/or high schools across the state as well as teach in the department.

A Ph.D. in Mathematics or a doctoral degree in another discipline with a Master of Science degree in Mathematics is required together with a

clear commitment to outreach activities. Some postdoctoral experience is preferred, but not required. Dedication to teaching is paramount. Employment begins August 1, 1998.

We seek a person who will participate in the education program of the department, actively pursue grants to conduct workshops for teachers, carry out systematic school visits, become involved in state-wide mathematics education reform, and work with the appropriate faculty in the College of Education.

Interested applicants should arrange to have a vita, three reference letters, a statement of accomplishments, qualifications, plans for outreach activities, and evidence of quality teaching sent to Professor John B. Conway, OM Search, Mathematics Department, University of Tennessee, Knoxville, TN 37996-1300. Electronic applications are not acceptable. Use of the recent AMS application form is encouraged. Review of applications will begin January 1 and will continue until the position is filled.

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TEXAS

UNIVERSITY OF TEXAS-PAN AMERICAN
DEAN, College of Science & Engineering

The newly formed College of Science and Engineering at UT-PAN American is seeking a dean. The College is comprised of the departments of Biology, Chemistry, Computer Science, Engineering, Mathematics, Physics and Geology. Bachelor's degrees are offered in each department, with Master's degrees in Biology, Computer Science, and Mathematics.

UTPA is a growing university with approximately 12,700 students. Qualifications for the position include: earned doctorate with credentials sufficient for an appointment as full professor in one of the College's departments, and administrative experience at the level of Department Chair or above. Application should send 1) a letter of interest, 2) a detailed vitae, and 3) a list of three references with addresses and phone numbers to: Director, Personnel Office, University of Texas-Pan American, 1201 W. University Drive, Edinburg, TX 78539-2999. Position will remain open until filled. UTPA is an AA/EEO Employer. (F97/98-03)

WASHINGTON

PACIFIC LUTHERAN UNIVERSITY
Mathematics Department
Assistant Professor

One, possibly three, position as a tenure track assistant professor of mathematics beginning September 1998. Teach three undergraduate courses per semester. Seeking person with a doctorate in mathematics or mathematical statistics. Teaching experience is preferred; must demonstrate interest in and promise of teaching excellence. Qualifications to teach mathematics as a part of liberal arts education and/or to conduct undergraduate research will influence the hiring decision. A commitment to scholarly activity in its broadest sense is essential. Application should include: letter addressing qualifications and scholarly interests, resume, statement of teaching philosophy in an undergraduate program, transcript of graduate and undergraduate work, and at least three letters of recommendation (at least two of which address teaching qualifications). Evidence of effective teaching, such as student evaluations, is also desirable. Send to: Gary D. Peterson, Chair of Search Committee, Mathematics Dept., Pacific Lutheran University is a comprehensive institution enrolling 3600 students. As "New American College," PLU accents integration between liberal arts and professional programs. In the best Lutheran tradition, the university's primary mission is to educate students for lives of thoughtful inquiry, service, leadership, and care.

Pacific Lutheran University embraces the goal of Equal Opportunity and Affirmative Action, and actively encourages applications from women and ethnic minorities.

WESTERN WASHINGTON UNIVERSITY

Department of Mathematics. Tenure-track Assistant Professor. Begin Fall 1998. Statistics or stochastic processes preferred. Ph.D. refereed publications and evidence of effective teaching required. Independent grant-funded research expected. Commitment to innovative undergraduate instruction essential. Teaching assignments include large lower-division classes. WWU has 500 faculty and 12,000 students beside Bellingham Bay between Seattle and Vancouver, with access to excellent recreational opportunities and metropolitan facilities. Get Position Announcement and WWU Summary from www.wwu.edu/~mathweb or address below, and submit summary, vita, transcripts, description of research and teaching accomplishments and interests, and four letters of recommendation addressing both teaching and research, by January 16,1998, to: Search Committee, Math, WWU, Bellingham, WA 98225-9063. Tel: (360) 650-3785. Fax: (360) 650-7788. Email: mathdept@henson.cc.wwu.edu. No electronic applications. AA/EOE.

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Mathematics Faculty

Salem State College is seeking to fill a tenure track position in Mathematics for the Fall of 1998. Responsibilities include teaching mathematics courses for majors and non-majors and advising math majors. Required qualifications include a Ph.D. in Mathematics or Applied Mathematics and demonstrated ability to perform the above responsibilities. Preferred are an interest in teaching graduate courses, interest in developing an undergraduate research program, specialization in Number Theory or Combinatorics, experience in incorporating technology in the classroom, college level teaching experience and experience in and/or commitment to working in a multicultural, multiracial environment with students of diverse backgrounds and learning styles. All faculty are expected to serve as role models and mentors for a diverse student body. Salary is competitive and commensurate with education and experience.

Application review will begin January 5, 1998 and continue until the position is filled. Please apply immediately. Letter of reference not included in application package should be sent directly to the Mathematics Department.

To apply, send letter of application specifying the Department and position for which you are applying, resume, appropriate transcripts and three letters of reference to: Office of Equal Opportunity and Human Rights, Salem State College, 352 Lafayette St., Salem, MA 01970.

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Salem STATE COLLEGE

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Calendar

ALLEGHENY MOUNTAIN – March 27–28 1998, Clarion University of PA, Clarion, PA

EASTERN PA & DELAWARE – April 18, 1998, Shippensburg University, Shippensburg, PA

FLORIDA – March 6–7, 1998, Florida Atlantic University, Boca Raton, FL

– March 5–6, 1999, Florida Gulf Coast Comm College, Panama City, FL

ILLINOIS – March 27–28, 1998, McKendree College, Lebanon, IL

INDIANA – March 20–21, 1998, Ball State University, Muncie, IN

– November 7, 1998, St. Mary's College, Notre Dame, IN

– March, 1999, Indiana University, Bloomington, IN

INTERMOUNTAIN – April 10–11, 1998, Brigham Young University, Provo, UT

IOWA – April 17–18, 1998, Luther College, Decorah, IA

KENTUCKY – March 27–28, 1998, Morehead State University, Morehead, KY

LOUISIANA–MISSISSIPPI – March 6–7, 1998, University of New Orleans, LA

– March 5–6, 1999, Jackson State University, Jackson, MS

MD–DC–VA – April 17–18, 1998, Virginia State University, Petersburg, VA

– Fall 1999, Towson State University, Towson, MD

MICHIGAN – May 1–2, 1998, Western Michigan University, Kalamazoo, MI

– May 1999, Eastern Michigan University, Ypsilanti, MI

MISSOURI – April 17–18, 1998, Southwest Missouri State University, Springfield, MO

– Spring 1999, Rockhurst College, Kansas City, MO

NEBRASKA–SOUTHEAST SOUTH DAKOTA – April 17–18,1998, Wayne State College, Wayne, NE

NORTH CENTRAL – April 24–25, 1998, Augsburg College, Minneapolis, MN

NORTHERN CALIFORNIA – February 21, 1998, Stanford University, Stanford, CA

OHIO – April 17–18, 1998, John Carroll University, Cleveland, OH

OKLAHOMA–ARKANSAS – March 27–28, 1998, University of Arkansas–Little Rock, AR

– March 26–27, 1999, Southern Nazarene University, Bethany, OK

PACIFIC NORTHWEST – June 18–20, 1998, Washington State University, Pullman, WA

ROCKY MOUNTAIN – April 17–18, 1998, Arapahoe Community College, Littleton, CO

– April 1999, Adams State College, Alamosa, CO

– April 2000, Colorado State University, Ft. Collins, CO

SOUTHEASTERN – March 13–14, 1998, College of Charleston, SC

SOUTHERN CALIFORNIA – March 7, 1998, University of Redlands, Redlands, CA

October 17, 1998, Pepperdine University, Malibu, CA

SOUTHWESTERN – April 3–4, 1998, Pima Community College, Tucson, AZ

SEAWAY – April 24–25, 1998, York University, Toronto, Ontario, Canada

– November 1998, Nazareth College, Rochester, NY

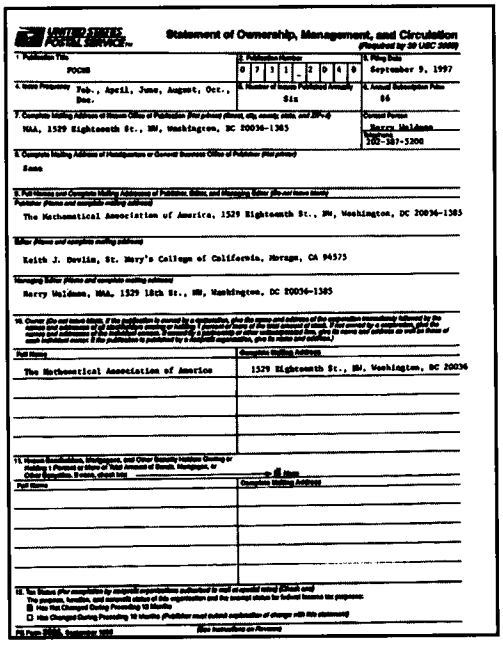
TEXAS – March 26–28, 1998, Southern Methodist University, Dallas, TX

– Spring 1999, Southwest Texas State University, San Marcos, TX

– Spring 2000, University of Texas at Austin, Austin, TX

WISCONSIN – April 24–25, 1998, University of Wisconsin–Stevens Point, Stevens Point, WI

– April, 1999, Concordia University, Mequon, WI



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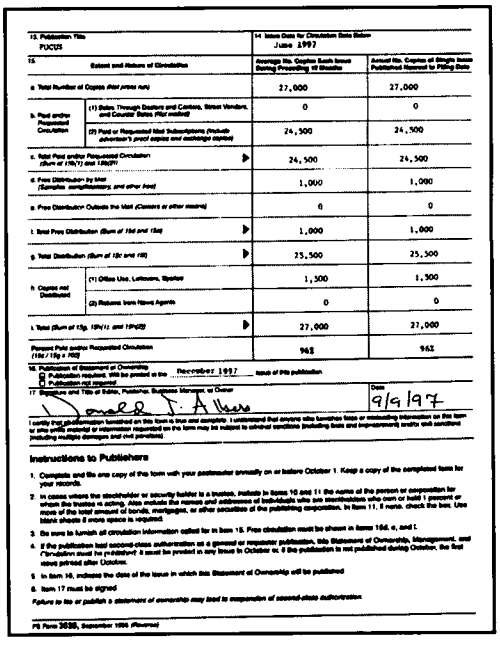

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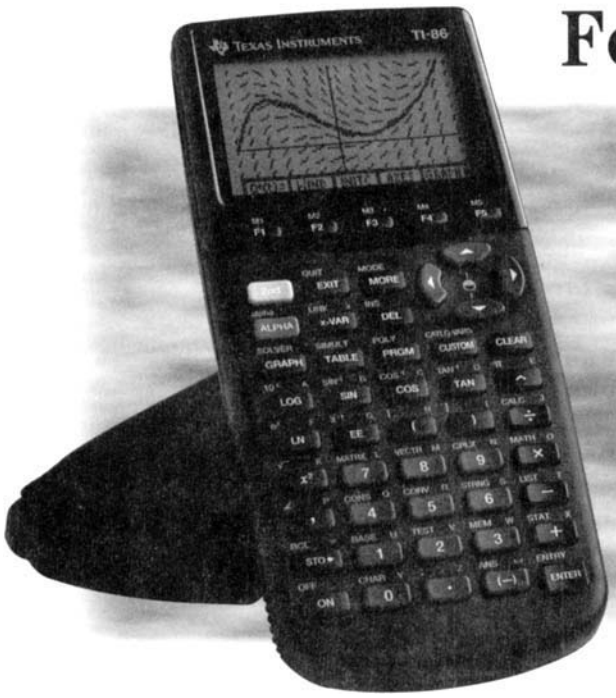

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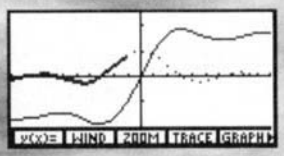

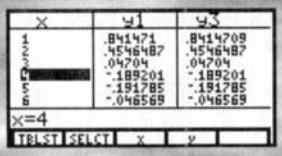

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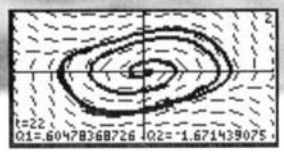

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