R Delaware

5th Annual Greater Kansas City

MATHEMATICS TECHNOLOGY EXPO

October 6-7, 1995
at Kansas City Kansas Community College

Schedule of Events and Abstracts

Registration
Auditorium Lobby: Friday 8:00 a.m. - 11:30 a.m.
"Central Area": Friday 11:30 a.m. - 2:30 p.m. and Saturday 8:00 a.m. - 1:30 p.m.

Continental Breakfast
A complimentary continental breakfast is available Friday in the Lobby, and on Saturday in the "Central Area."

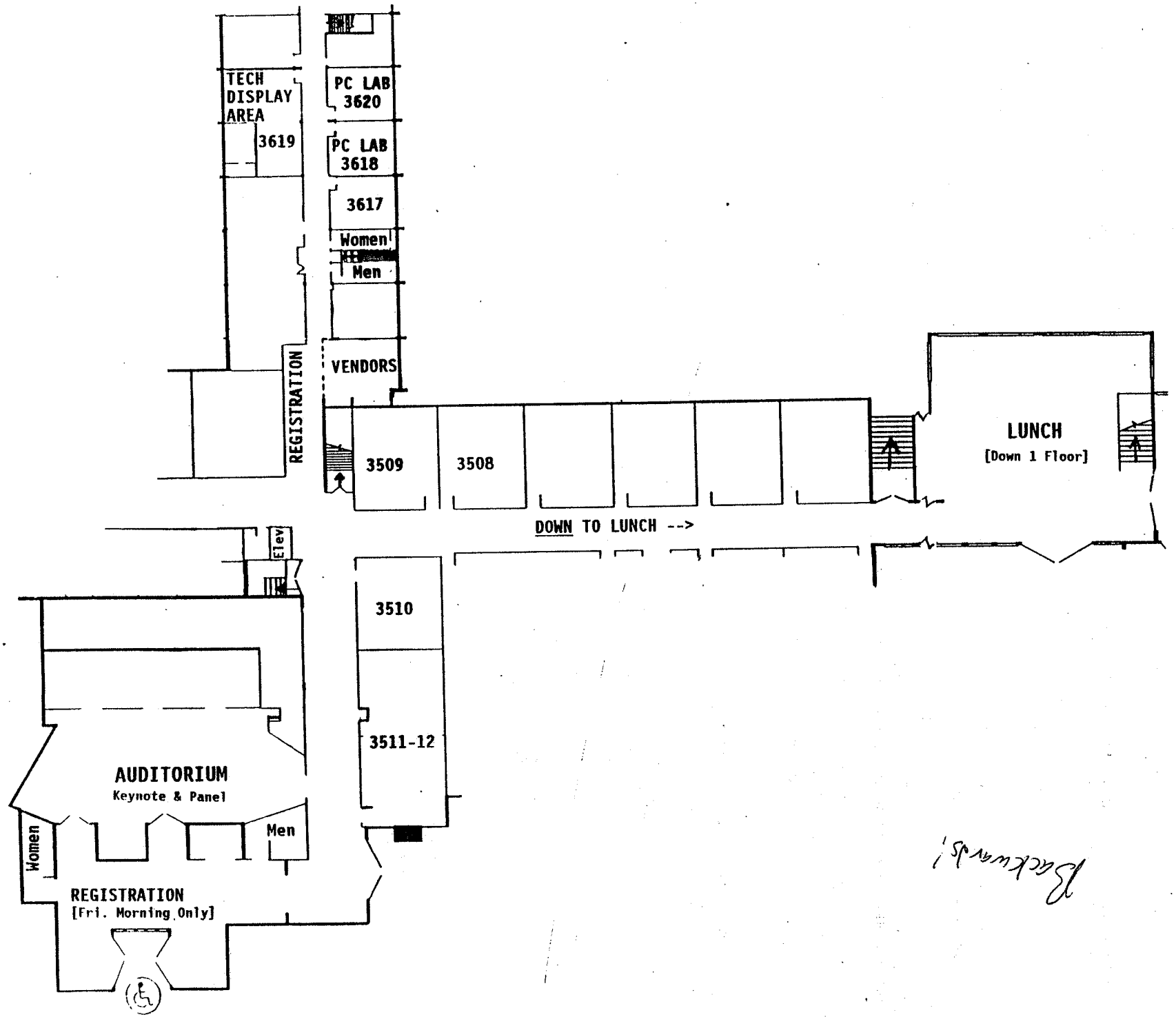
Lunches
Lunch is available both Friday and Saturday for those that have prepaid.
Friday's lunch consists of sandwiches, salad, fruit and dessert. Saturday's lunch is a variety of pizza and salad.
A few extra meals are available. If you wish to purchase one, check at the registration table on the availability.

Technology Display Area - A Hands-On Opportunity, Room 3619
Friday 10:30 a.m. - 4:00 p.m., and Saturday 8:00 a.m. - 4:00 p.m.
Calculators (Casio, HP, Sharp, TI) & displays of mathematics software (Cabri, Converge, Derive, Excel, Geometer's Sketchpad, Green Globs, Gyrographics, Maple, Mathematica, Matlab, MPP, Microcalc, QuatroPro, Ubasic, U. of AZ)

Textbook, Hardware, Software Vendors - "Central Area"
Friday 10:30 a.m. - 4:00 p.m. and Saturday 8:00 a.m. - 2:00 p.m.
Addison Wesley, Business Media Inc., ITP, MathWare, McGraw Hill, Prentice Hall, Saunders/Harcourt Brace,Wiley

NOTE: The Technology Display Area and the Vendor Area are both open all day Friday after the keynote, and all day Saturday.

Each hour that the Technology Display Area is open, it will be staffed by at least one of the members of the 1995 EXPO Planning Committee. You will find their names and areas of expertise listed under each session.


TECH DISPLAY AREA
3619
PC LAB 3620
PC LAB 3618
3617
Women
Men
VENDORS
REGISTRATION
3509
3508
LUNCH
[Down 1 Floor]
DOWN TO LUNCH -->
Elev
3510
3511-12
AUDITORIUM
Keynote & Panel
Women
Men
REGISTRATION
[Fri. Morning Only]

Welcome and Introductions

9:00 a.m., Friday
Auditorium

Libby Holmgren, 1995 EXPO Planning Committee Chair, Johnson County Community College, Overland Park, KS
Tom Burke, President of Kansas City Kansas Community College, Kansas City, KS

Keynote Address

Mathematical Proof in the Age of the Computer
Keith Devlin, Saint Mary's College of California, Moraga, CA

Editor of the MAA Newsletter Focus and the "Computers and Mathematics" column from AMS Notices; author of Mathematics, the New Golden Age, and All the Math That's Fit to Print

As mathematicians integrate computers more and more into their teaching and research, how will this affect the nature of mathematics? In particular, will the mathematician of the future have a different understanding of what constitutes a valid proof in mathematics?

SESSION 1
10:30 a.m. - 11:20 a.m., Friday

1A. 
Room 3509

EXPO Showcase*: *Comparisons of the TI-82, the Sharp EL-9300C, and the new HP 38G
Andrew Bennett, Kansas State University, Manhattan, KS; Richard Delaware, University of Missouri - KC, Kansas City, MO; Bob Adams, University of Kansas, Lawrence, KS

This session is presented by members of the 1995 Math EXPO Planning Committee to showcase new technology and to compare it with existing technology. This year we concentrate on graphics calculators. We will not present a keystroke oriented tutorial, and aspects of calculators common to all scientific and graphics calculators will not be discussed, except in passing. Instead, new, different, or unique aspects of the calculators will be highlighted and compared. For further information about these calculators, we recommend the Technology Display Area in Room 3619, open and staffed throughout the EXPO, as well as the Calculator Comparison Chart in your EXPO packet.

1B.
Room 3510

Chaos in Fixed Point Analysis
Douglas A. Swan, Morningside College, Sioux City, IA

This project introduces attracting and repelling fixed points, basins of attraction for attractors, and cobwebs which diverge by chaotic oscillation. It is designed to be open-ended and to take students 6 - 12 hours to complete. It is intended for a team of two to four students but can be assigned individually. The concepts are developed by using Derive interactively. Coding for special programs in Derive including the plotting of cobwebs is included.
Presider:Nic LaHue, Penn Valley Community College, Kansas City, MO

1C.
Room 3617

Using the TI-85 as a Programming Base in Numerical Analysis
Don Tosh, Evangel College, Springfield, MO

Can the TI-85 be successfully used as a programming platform? The presenter offered an introductory numerical analysis course in the Spring of 1995 to math majors and pre-engineers using the TI-85 as the programming base. The course has been taught in the past using Pascal, FORTRAN, BASIC, and APL. He

will discuss his experiences in the class, both pros and cons, but the answer to the initial question above is an enthusiastic "Yes!"
Presider: Ken Eichman, Metropolitan Community Colleges Blue Springs Campus, Blue Springs, MO

1D. Room 3511-3512

Using the TI-85 to Teach Algebra
Willard Parker, Kansas State University, Manhattan, KS; Sue Lamon, Marquette University, Milwaukee, WI

We will explore the ways in which technology has shifted the emphasis of the algebra course away from symbolic manipulation toward conceptual understanding and mathematical modeling. We will discuss NCTM, AMATYC, and MAA recommendations for changes in the teaching of Algebra and ways of using graphing and symbolic manipulation technology to implement those recommendations. In particular, we will illustrate ways in which the TI-85 can affect the content and pedagogy of high school and college algebra courses.
Presider: David Ewing, Central Missouri State University, Warrensburg, MO

Room 3619

Technology Display Area
1995 EXPO Committee member present for reference:
Carl Anderson (TI-82, TI85, Derive, and Converge)

SESSION 2
11:30 a.m. - 12:30 p.m., Friday

Auditorium

PANEL DISCUSSION: ***What is Technology Doing to College Algebra?***
Moderator: Steven Wilson, Johnson County Community College, Overland Park, KS
Panelists: Keith Devlin, Saint Mary's College of California, Moraga, CA
~~John Errante, St. Teresa's Academy, Kansas City, MO~~
~~Carolyn~~ Neptune, Johnson County Community College, Overland Park, KS
Marian VanVleet, Saint Mary College, Leavenworth, KS

Room 3619

Technology Display Area
1995 EXPO Committee member present for reference:
Nic LaHue (TI-85, Converge, Derive, Excel, Geometer's Sketchpad, Quatro Pro, University of AZ. software)

12:30 p.m. - 1:30 p.m.

Downstairs Area

LUNCH (for those who have prepaid)

Room 3619

Technology Display Area
1995 EXPO Committee members present for reference:
Bob Adams (HP 48G, Mathematica);
Richard Delaware (TI-82, TI-92, Sharp, HP 48G, Derive, and University of Arizona software)

SESSION 3
1:30 p.m. - 2:20 p.m., Friday

3A. Room 3509

Back by popular demand: Active Learning in a Math Resource Center
Libby Holmgren, Math Resource Center Supervisor, Johnson County Comm. College, Overland Park, KS

This presentation will describe the Math Resource Center at JCCC and how it is used by the students (from Fundamentals of Math through Differential Equations). One of the best aspects of the center is that it offers students a place to get together to work on math - whether or not they seek assistance. It is exciting to see the

interaction between the students as they discuss mathematics. The center is free to any JCCC math student on a drop-in basis. Available to students for use in the center are: free peer tutoring, videotapes, solutions manuals, group study sessions and rooms, and computer programs. This presentation will include the planning of the physical layout, tutor qualifications and hiring, resources available, the electronic log-in, slides of the MRC in action, and more. Handouts will be available covering various aspects of the center. As a point of reference, nearly 3000 individual students used the center during the spring of 1995, for a total of 26,000 hours.
*Presider:*David Ewing, Central Missouri State University, Warrensburg, MO

3B. ***Using MATLAB to Learn Sampling Distribution***
Room 3510 Noah Rhee, University of Missouri at Kansas City, Kansas City, MO

Using MATLAB, the presenter will demonstrate how the mean and the variance of the sample mean random variable are related to the mean and variance of the underlying random variable from which the random sample is generated. He will also demonstrate how the sample distribution can be approximated by a normal distribution.
Presider: Nic LaHue, Penn Valley Community College, Kansas City, MO

3C. ***Is Graphing Equations with a Calculator Too Easy? Try Writing Equations from Graphs!***
Room 3617 Steven J. Wilson, Johnson County Community College, Overland Park, KS

Graphing calculators have sometimes made sketching the graph of a function trivial. Yet we still want students to understand the connections between polynomial or rational function graphs and their equations. This presentation will focus on how an equation of a polynomial or rational function can be derived from a sketch of the graph. When doing such problems, students must add mathematical thinking to their calculator viewing, since the calculator alone cannot handle this problem.
Presider: Ken Eichman, Metropolitan Community Colleges Blue Springs Campus, Blue Springs, MO

3D. ***EXPO Showcase: Comparison between the HP 48G and the new TI-92***
Room 3511-3512 Bob Adams, University of Kansas, Lawrence, KS;
Richard Delaware, University of Missouri at Kansas City, Kansas City, MO

This session is presented by members of the 1995 Math EXPO Planning Committee to showcase new technology and to compare it with existing technology. This year we concentrate on graphics calculators. We will not present a keystroke oriented tutorial, and aspects of calculators common to all scientific and graphics calculators will not be discussed, except in passing. Instead, new, different, or unique aspects of the calculators will be highlighted and compared. For further information about these calculators, we recommend the Technology Display Area in Room 3619, open and staffed throughout the EXPO, as well as the Calculator Comparison Chart in your EXPO packet.

Room 3619 Technology Display Area
1995 EXPO Committee member present for reference:
Carl Anderson (TI-82, TI85, Derive, and Converge)

SESSION 4
2:30 p.m. - 3:30 p.m., Friday

4A. ***The Talk George Boole Might Have Given***
Room 3508 Keith Devlin, Saint Mary's College of California, Moraga, CA

Exactly 150 years ago this year, George Boole successfully applied mathematics to human thought processes, publishing his findings in 1847 in the pamphlet "The Mathematical Analysis of Logic". What would Boole have lectured on had he been at EXPO 95 in Kansas City? In this talk, the presenter will give his version of the talk he thinks Boole would have given today.

Presider: Richard Delaware, University of Missouri at Kansas City, Kansas City, MO

4B. Room 3509 ***Using Writing and Graphing Calculators to Teach College Algebra***
Sue King, Kansas Newman College, Wichita, KS

The use of graphing calculators and paper writing has helped solve some frustrating problems that most instructors of mathematics grapple with. This session will share how the incorporation of graphing calculators and paper writing is used in College Algebra math classes to enhance student understanding, challenge students to solve real-life application problems, and develop student abilities to think, read and write mathematically. Assignments will be shared as well as methods of testing and grading. This could easily be transferred to other math classes including Trigonometry and Calculus.
Presider: Vena Long, Coalition of Missouri Mathematics, University of Missouri at Kansas City, K.C.,MO

4C. Room 3510 ***Using Computers and Cooperative Learning in the Teaching of Abstract Algebra***
Steve Nimmo, Morningside College, Sioux City, IA

This talk will detail how Abstract Algebra was taught at Morningside College this past semester using a supplemental lab manual and a computer program designed for group theory.
Presider: Marian VanVleet, Saint Mary College, Leavenworth, KS

4D. Room 3617 ***Workshop: Chemical Equations, Curve Fitting, and Transformations with Mathematica and the TI-85***
Brian Balman, Johnson County Community College, Overland Park, KS

Precalculus courses often include matrix operations and row reduction, but rarely show how powerful these tools are beyond the classroom. This presentation will focus on using matrices to balance chemical equations, fit curves to given data, and transform figures represented with matrices. Transformations will include size changes, rotations, reflections, and translations. *Mathematica* demonstration. Hands-on TI-85.
Presider: Kay Weiss, Kansas City Kansas Community College, Kansas City, KS

Room 3619 Technology Display Area
1995 EXPO Committee members present for reference:
David Ewing (TI-82, CBL, Derive, and Geometer's Sketchpad);
Libby Holmgren (TI-82, TI-85, Derive, and Mathematica)

3:30 p.m. - 4:00 p.m., Friday

Room 3619 Technology Display Area
1995 EXPO Committee members present for reference:
Bob Adams (HP 48G, and Mathematica);
Kay Weiss (Sharp, and Derive)

Saturday, October 7, 1995

8:00 a.m. - 9:00 a.m., Saturday

Room 3619 Technology Display Area
1995 EXPO Committee members present for reference:
Bob Adams (HP 48G, and Mathematica);
Mike Brown (Derive, and Mathematica);
Nic LaHue (TI-85, Converge, Derive, Excel, Geometer's Sketchpad, QuatroPro, University of AZ. software)

SESSION 5
9:00 a.m. - 9:50 a.m., Saturday

5A. Room 3509

Technology and Testing: Using Content and Analytical Testing Methods

Julane Crabtree, Johnson County Community College, Overland Park, KS

As we prepare our students for the future, they must use more critical thinking skills as well as becoming comfortable with technology in their jobs. The use of technology in the classroom has caused the command "Solve for x" to become more and more obsolete. It is now extremely important that we, as mathematics educators, ask ourselves the question, "What is it we wish to test?" Questions in procedural knowledge need now be coupled with questions in the area of content. How is this accomplished? Through an interactive method of teaching, combined with the use of technology, students can be prepared to critically plan problem solving strategies, write enlightening papers, complete projects and work collaboratively. the evaluative process can then be focused on the procedural and analytical knowledge gleaned from the subject matter. In order to do this, varied methods of evaluation must be used. This talk will focus on analytical questions coupled with technology which are tested in both group and individual settings.

Presider: Jean Johnson, Baker University, Baldwin City, KS

5B. Room 3510

Derive Visualizations - What You Might Not Know You Can Do!

Richard Delaware, University of Missouri at Kansas City, Kansas City, MO

This talk is for intermediate to advanced Derive users. The presenter will demonstrate Derive's function creation and programming abilities, showing how to automate:

- Translations and rotations of graphs
- Simultaneous plotting of graphs
- Shading between (and under) curves
- The "Web" plot for functions
- Riemann rectangles for integration
- Physics calculations (e.g. conservation of momentum)
- Some advanced analysis graphs and explorations
- Pascal's triangle
- Create your own customized Derive command menus
  (Make commands invisible, or even in another language.)

These techniques were either created by the speaker, or gathered from sources such as the Derive User Group, the International Derive Journal, the Derive Bulletin Board, etc. The speaker will provide line-by-line handouts of all these techniques.

Presider: Carl Anderson, Johnson County Community College, Overland Park, KS

5C. Room 3617

Computer Based Technical Calculus

Samuel Lynch, Southwest Missouri State University, Springfield, MO

The presentation will report on innovations in the instruction of Technical Calculus (differential and integral calculus with applications in the natural sciences) at Southwest Missouri State University. Included will be:

- incorporation of the DERIVE computer algebra system,
- the introduction of a writing component,
- increased focus on problem-solving strategies, and
- encouragement of group study.

Presider: Wayne Martin, Kansas City Kansas Community College, Kansas City, KS

5D. Room 3620

Back by popular demand: Teaching Geometry with Computers: Part I

David Ewing, Central Missouri State University, Warrensburg, MO

This demonstration/workshop (with emphasis on demonstration) is for the instructor who has little experience in using technology to teach geometry. Participants will primarily use "Geometer's SketchPad™." No previous skill with the software will be expected. Participants will develop lessons exploring planar figures,

their definitions and properties, for 5th grade through the first course in College Geometry. (Part II follows at 2 p.m.)
Presider: Claudia Schaible, Hyman Brand Hebrew Academy, Overland Park, KS

Room 3619 Technology Display Area
1995 EXPO Committee member present for reference:
Bob Adams (HP 48G, and Mathematica)

SESSION 6
10:00 a.m. - 10:50 a.m., Saturday

6A. Room 3509 ***EXPO Showcase*: *Comparisons of the TI-81, the TI-82, and the TI-85***
Carl Anderson and Libby Holmgren, Johnson County Community College, Overland Park, KS

This session is presented by members of the 1995 Math EXPO Planning Committee to showcase new technology and to compare it with existing technology. This year we concentrate on graphics calculators. We will not present a keystroke oriented tutorial, and aspects of calculators common to all scientific and graphics calculators will not be discussed, except in passing. Instead, new, different, or unique aspects of the calculators will be highlighted and compared. For further information about these calculators, we recommend the Technology Display Area in Room 3619, open and staffed throughout the EXPO, as well as the Calculator Comparison Chart in your EXPO packet.

6B. Room 3511-3512 ***Invited Speaker*: *Simple, Powerful Software for Math Teachers . . . All Math Teachers***
Jerry Glynn, MathWare, Urbana, IL

Responsible observers have stated that fewer than 10% of math teachers (high school and college) are making consistent use of reform curriculum and/or technology. The speaker will present software which is so simple to use that you don't need a workshop every year and which is so inexpensive that we can all afford it. The program is "Graphs, Graphs, Graphs" and it runs on all Windows machines. It makes beautiful 2D and 3D graphs- zoom, trace (yes, 3D trace), real time animation, print and copy to clipboard. Will it have any effect? Only time will tell.
Presider: Richard Delaware, University of Missouri at Kansas City, Kansas City, MO

Room 3619 Technology Display Area
1995 EXPO Committee member present for reference:
Mike Brown (Derive and Mathematica)

SESSION 7
11:00 a.m. - 11:50 a.m., Saturday

7A. Room 3509 ***College Algebra Can Be Effectively Taught Using Technology***
Nancy H. Olson, Johnson County Community College, Overland Park, KS

There is so much controversy regarding the use of technology in this course. I would like to share ways to use the calculator as a tool and not as a replacement for learning the basic techniques and concepts of College Algebra. There are creative ways to use the technology to enhance understanding and there are destructive ways to use the technology to disrupt and impede understanding. I hope to demonstrate the difference and how to implement the former and avoid the latter.
Presider: Carl Anderson, Johnson County Community College, Overland Park, KS

7B. Room 3510 ***The Mathematics of Multimedia***
Andrew Bennett, Kansas State University, Manhattan, KS

Our students are becoming familiar with computers that show pretty pictures and play music. They are not familiar with the fact that computers represent all those sounds and pictures with numbers. In order to fit more sounds and pictures in less space, multimedia developers use techniques that rely on finding patterns in these numbers, primarily using trigonometry and discrete mathematics. The mathematics of multimedia offers wonderful opportunities to tie school mathematics to students' lives.
Presider: Libby Holmgren, Johnson County Community College, Overland Park, KS

7C. ***Interactive Computer Simulation with MAPLE - the Fundamental Concepts of Calculus***
Room 3617 Dennis Sentilles, University of Missouri - Columbia, Columbia, MO

Using MAPLE's word processing and Quick-Time movie capabilities, along with minimal use of its computational capabilities, it is possible to design electronic assignments that have the student interact with the machine in a cognitive, rather than a procedural, way. The "limit process" may be seen in ways here-to-fore impossible and meaningful applications can be convincingly simulated.
Presider: Bob Adams, University of Kansas, Lawrence, KS

11:00 a.m. - 12:30 a.m., Saturday

7D. ***Workshop: College and High School Instructors Discuss Successful and Unsuccessful Strategies***
Room 3511-3512 Facilitator - Donna Krichiver, Johnson County Community College, Overland Park, KS

The purpose of this workshop is to provide teachers of college and high school students an opportunity to share ideas on teaching mathematics. This can include discussion concerning the use of technology in the math classroom. Because we have many common interests and many of our courses have similar objectives, we can benefit by sharing ideas that we have found to be successful as well as unsuccessful. This session will consist of 3 break-out groups after the initial get-together:

TECHNIQUES - Sharing successful strategies in the teaching of algebra
MOTIVATION - Motivating the unmotivated and dealing with math anxiety
APPLICATIONS - "Real world" applications in the teaching of mathematics

Attendees are encouraged to share teaching techniques, to discuss strategies and to participate. The room is available during lunch and the following hour as well if participants wish to continue beyond the stated time.

Room 3619 Technology Display Area
1995 EXPO Committee member present for reference:
Ken Eichman (TI-82, Derive, Excel, and University of AZ. software)

LUNCH in the Downstairs Area
12:00 p.m. - 1:00 p.m.

Room 3619 Technology Display Area
1995 EXPO Committee member present for reference:
David Ewing (TI-82, CBL, Derive, Geometer's Sketchpad)

SESSION 8
1:00 p.m. - 1:50 p.m., Saturday

8A. ***Projects for Algebra***
Room 3509 Suzanne Blair and Carol Lucas, University of Kansas, Lawrence, KS

Projects have been used in both high schools and colleges to teach mathematics effectively. Not only is it important to use different teaching methods to convey mathematical knowledge, but it is important to assess these methods appropriately. Examples of projects include locating the center of the population, estimating

the cost of a postage stamp in the year 2001, and maximizing the volume of a box given the dimensions of a rectangular piece of cardboard. Tools for teaching, including the TI-82, will be emphasized, and assessment methods, particularly rubrics will be discussed. An opportunity for presenters and participants to share and discuss experiences with projects will be provided.
Presider: John Koelzer, Rockhurst College, Kansas City, MO

8B. 
Room 3510 ***Using the Internet as a Math Resource***
Benny Evans, Oklahoma State University, Stillwater, OK

This talk will show the basic services of the internet including Web servers, e-mail, newsgroups, and list servers. We will look at general reference indices and search engines and then focus on information and materials available for mathematics teachers. The Oklahoma State University Mathematics Education Internet Source will be introduced and its services reviewed.
Presider: Steve Chaippari, Avila College, Kansas City, MO

8C. ***Stars of the Small Screen: Producing Math Videos***
Room 3617 Mary Rack and Jean Harpst, Johnson County Community College, Overland Park, KS

The presenters recently wrote and appeared in a series of 30 half-hour videos for the course, "A Survey of Mathematics." They will discuss what went right and what they would do differently if given another chance - plentiful examples of each variety.
Presider: Jean Johnson, Baker University, Baldwin City, KS

Room 3619 Technology Display Area
1995 EXPO Committee member present for reference:
Nic LaHue (TI-85, Converge, Derive, Excel, Geometer's Sketchpad, QuatroPro, University of AZ. software)

SESSION 9
2:00 p.m. - 2:50 p.m., Saturday

9A. ***Science and Math Applied to Related Technology - SMART***
Room 3617 John M. Errante and Jessie Thompson, St. Teresa's Academy, Kansas City, MO

Having piloted this interdisciplinary physics and statistical analysis class, we are prepared to share our trials and tribulations to encourage this interactive discovery approach to understanding science, math and technology. A major focus of this dual-credit elective class was to target a wide range of students and excite them about the relationships between math and science. We began the class with exercises around group dynamics to increase awareness of strengths that each of us brought to the group. Secondarily, as teachers, we wanted to evaluate the effectiveness of a micro computer based lab. Using the scientific method, students wrote formal and informal technical reports for each activity that were evaluated based on a class-developed rubric. Students were required to learn to use features of the Internet also. Periodically, students performed self and peer evaluations of their portfolios. At the end of the semester, students applied the techniques to a research topic of their choosing. We are anxious to share our enthusiasm about this learning environment with other teachers to attempt similar approaches in classrooms.
Presider: Kay Weiss, Kansas City Kansas Community College, Kansas City, KS

2:00 p.m. - 3:30 p.m.

9B. ***Workshop: An Introduction to Derive***
Room 3618 Ken Eichman, MCC Blue Springs Campus, Kansas City, MO

This workshop is for the uninitiated, for those who want to know what Derive can do or how to get started with it. A small amount of time will be used to learn how to configure the program (setting graphics mode,

colors, etc.) and how to load and save files. The majority of the time will be used by the participants to work through a handout which walks them through the following topics: entering expressions, evaluating expressions and modifying expressions by substitution, factoring polynomials, solving algebraic and trigonometric equations, defining and evaluation functions, defining and row-reduction of matrices, graphing functions, plotting points, simple curve fitting, graphing piece-wise continuous functions, and graphing parametric equations.
Presider: Mike Brown, Longview Community College, Lee's Summitt, MO

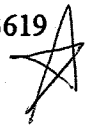
9C. Room 3620 ***Workshop: New! Teaching Geometry with Computers: Part II***
David Ewing, Central Missouri State University, Warrensburg, MO

This workshop is for the instructor who has some experience in using technology to teach geometry especially with "Geometer's SketchPad™." Participants may develop lessons exploring planar figures, their definitions and properties, or may elect to explore/develop lessons on more advanced Euclidean topics and theorems. (Attending Part I held from 9:00 a.m. - 9:50 a.m. should be sufficient to attend this Part II Workshop)
Presider: Marian VanVleet, Saint Mary College, Leavenworth, KS

2:00 p.m. - 3:50 p.m.

9D. Room 3511-3512 ***Workshop: An Integrated Approach to Instruction: Discovery, Collaboration, Technology, Writing, Problem Solving, Alternate Assessment***
Martha Haehl, Maple Woods Community College, Kansas City, MO

The presenter will introduce a classroom model that incorporates collaborative work, writing, graphing calculators, and quizzes. Participants will learn a group process and apply it to discovery exercises. Some exercises involve graphing calculators; some do not. Each group will then develop a collaborative discovery exercise for the classroom.

Room 3619 
Technology Display Area
1995 EXPO Committee members present for reference:
Bob Adams (HP 48G and Mathematica)
Richard Delaware (TI-82, TI-92, Sharp, HP 48G, Derive, and University of AZ. software)

1995 Mathematics Technology EXPO Planning Committee

Libby Holmgren, Chair
Johnson County Community College, Overland Park, KS

Bob Adams
University of Kansas, Lawrence, KS

Carl Anderson
Johnson County Community College, Overland Park, KS

Andy Bennett
Kansas State University, Manhattan, KS

Mike Brown
Longview Community College, Lee's Summitt, MO

Richard Delaware
University of Missouri, Kansas City, MO

Ken Eichman
Blue Springs Campus, Metropolitan Community Colleges, Blue Springs, MO

David Ewing
Central Missouri State University, Warrensburg, MO

Nic LaHue
Penn Valley Community College, Kansas City, MO

Marian VanVleet
Saint Mary College, Leavenworth, KS

Kay Weiss
Kansas City Kansas Community College, Kansas City, KS