

## Contributed Papers

Saturday, November 1, 2003

SAT - C24  
Pine Valley  
9:00 AM

### GENERATING PYTHAGOREAN TRIPLES

Constance Edwards, Bin Zheng, *Coastal Carolina University*

A Pythagorean triple is a set of three positive integers  $a$ ,  $b$ , and  $c$  for which  $a^2 + b^2 = c^2$ . This talk will show you how to program a calculator to generate Pythagorean triples.

Before Calculus

SAT - C25  
Pine Valley  
9:20 AM

### CAN WE REALLY TRUST THE RESULTS PRODUCED BY STATISTICAL SOFTWARE?

Lloyd R. Jaisingh, *Morehead State University*

A simulation study will be presented to test for the normality assumption of the sampling distribution for a sample proportion. Results for normality tests from MINITAB and SPSS will illustrate why we should be very cautious of such results. Instructors of elementary statistics will benefit significantly from this presentation.

Before Calculus

SAT - C26  
Pine Valley  
9:40 AM

### USING GEOMETER'S SKETCHPAD™ TO DISCOVER THE SHAPE OF A HEADLIGHT OR SATELLITE DISH

Tom Zerger, Garry Johns, *Saginaw Valley State University*

In this activity, students generate the shape of (the cross-section of) a satellite dish. Geometer's Sketchpad™ not only allows students to create parallel lines and angles of reflection, but it plots points almost instantaneously so that students can see the parabola being formed. Extensions will also be discussed.

Before Calculus

SAT - C27  
Pine Valley  
10:00 AM

### GEOMETER'S SKETCHPAD AND POWERPOINT: INVOLVING ART IN PROJECTS BY PRE-SERVICE HIGH SCHOOL TEACHERS

Vesna Kilibarda, Mary Lee, Nicole Nigh, Larry Ray Hautzinger, *Indiana University Northwest*

We present group projects created in geometry classes by pre-services high school teachers using Geometer's Sketchpad and PowerPoint. A group of students explores models of real projective plane by studying perspective drawing. Another group explores tessellations of the Euclidean plane in Escher's art.

Before Calculus

SAT - C28  
Pine Valley  
10:20 AM

### USING COMPUTER BASE SUPPORT MATERIALS IN A FIRST THEORY-BASED COURSE FOR MATHEMATICS MAJORS

Edward Conjura, *The College of New Jersey*

Media such as Mathematica notebooks and Java applets can be used even in courses that involve logic, set theory and formal proofs in order to provide additional means for producing student understanding. Examples of such will be discussed and demonstrated.

Multimedia

SAT - C29  
Pine Valley  
10:40 AM

### MATHCAD'S PROGRAM FUNCTION AND APPLICATION IN TEACHING OF MATH

De Ting Wu, *Morehouse College*

In this presentation, MathCad's programming function will be introduced and some applications in the teaching of differential equations and numerical analysis will be illustrated.

Internet/Distance Learning/Web-Assisted Instruction

SAT - C30  
Pine Valley  
11:00 AM

### USING GEOMETER'S SKETCHPAD™ TO LEARN CONJECTURE-MAKING IN AN INVESTIGATIVE GEOMETRY COURSE

Ward Canfield, *National - Louis University*

An example will be given of how a problem set was worked into a lesson plan using Sketchpad™ to illustrate the idea of conjecture in geometry. Examples of student work will be discussed.

Internet/Distance Learning/Web-Assisted Instruction

## Contributed Papers

Saturday, November 1, 2003

SAT - C31  
Pine Valley  
11:20 AM

### TEACHING CALCULUS USING LiveMath™

Kumara Jayasuriya, *Indiana University East*

It is shown how LiveMath™ a computer algebra system can be used in teaching elementary algebra and differential and integral calculus. The students can perform numerous computer experiments to grasp the concepts of calculus. It will be seen how LiveMath™ forms a natural teaching aid for classroom demonstrations and student investigation.

**Multimedia**

SAT - C32  
Pine Valley  
11:40 AM

### NEW TRICKS FOR OLD DOGS: SYMBOLIC COMPUTATION ON THE TI-8X, WHERE $2 \leq X \leq 6$

Darryl K. Nester, *Bluffton College*

TI-82, -83, -85 or -86 calculators may not be able to perform all of the functions of calculators like the -89 or -92, but they can (with no or minimal programming) be used to expand (some) polynomials, divide rational functions, and even do some trigonometric expansions.

**Before Calculus**

*C33 CANCELLED*

SAT - C34  
Pine Valley  
12:20 PM

### USING EXCEL SPREADSHEET TO UNDERSTAND THE LIMITING VALUE OF A SEQUENCE

Nesan Sriskanda, *Claflin University*

Problems involving sequences and series are rarely common in science and mathematics subjects. For students to determine the convergence or divergence of a sequence is confusing. This confusion can be solved numerically and graphically using the application of Excel spreadsheet techniques. Students can visualize the limiting value of a sequence in the Excel worksheet and their understanding is enhanced.

**Before Calculus**

SAT - C35  
Pine Valley  
12:40 PM

### ENCODING WITH FRACTALS: REALIZING THE POTENTIAL OF BASIN BOUNDARIES

Bart Stewart, *United States Military Academy*

While solutions to the polynomial  $P(X) = 0$  may seem trivial, their solution paths are not! Different root-finding techniques generate different solution paths. And in the complex plane, these paths generate fascinating images with unique fractal geometries! With such a geometry, rudimentary encoding can occur.

**Before Calculus**

SAT - C36  
Pine Valley  
1:00 PM

### STATISTICS FOR BIOLOGY WITH EXCEL

Ahlam Tannouri, Sam Tannouri, *Morgan State University*

The teaching of an introductory statistics course for biology majors introduces the students to the appropriate methods of data analysis used in biology and medicine, and provides them with the basic skills to better design their experiments and make predictions. Study cases from biology and medicine using Excel are presented.

**Before Calculus**

SAT - C37  
Pine Valley  
1:20 PM

### THE CUBIC AND QUARTIC EQUATIONS IN INTERMEDIATE ALGEBRA COURSES

Jay Villanueva, *Florida Memorial College*

Patterned after the quadratic formula, solutions to the cubic and quartic equations are presented, as introduced by Renaissance mathematicians. This is a satisfying exercise in elementary analysis and shows our students the need for higher study, such as in abstract algebra. Examples are provided.

**Before Calculus**

## Contributed Papers

Saturday, November 1, 2003

### MATHSKILLS

Harry Gretton, Neil Challis, *Sheffield Hallam University*

SAT – C38  
Pine Valley  
1:40 PM

We present some of our exciting and current experiences in the evolution of our mathematics degree at Sheffield Hallam University to address the issues and needs of mathematical skills now and for the future.

**Pedagogy/Research/Assessment**

### MATH IN NON-WESTERN SOCIETIES USING GEOMETER'S SKETCHPAD™

Osman Yurekli, *Ithaca College*

SAT – C39  
Pine Valley  
2:00 PM

The goal of my course, titled Math From ASATca, is to view mathematics more broadly and to appreciate its varied roles in people's lives throughout the world. The course studies geometrical ideas in ASATcan artifacts and discovers mathematical ideas in these using Geometer's Sketchpad. The presenter will use Geometer's Sketchpad™ to create various decorative designs and proofs of the Pythagorean Theorem.

**Before Calculus**

### CALCULUS IN SEVERAL VARIABLES WITH DERIVE

Eduardo Estrada Kassir, *Pontificia Universidad Javeriana, Colombia*

SAT – C40  
Pine Valley  
2:20 PM

The main objective is to build functions that allow the student to understand the most important concepts seen in the classroom. The purpose of these functions is to make the course CALCULUS IN SEVERAL VARIABLES more interesting, intuitive, and pertinent, allowing the students to explore some new calculation ideas.

**Calculus**

### USING GEOMETER'S SKETCHPAD IN COLLEGE GEOMETRY

Bob Tilidetzke, *Charleston Southern University*

SAT – C41  
Pine Valley  
2:40 PM

Four labs that study transformations of the plane via Sketchpad will be discussed. Topics include composition and commutativity of transformations.

**Beyond Calculus**

### MAPLE DOES NUMERICAL APPROXIMATIONS OF AREA UNDER CURVES. ARE YOU READY WITH THE CURRENT TECHNOLOGY TO GENERATE SOME NUMBERS IN FRONT OF THE ENGINEERING MAJORS?

Somasundaram Velummylum, *Claffin University*

SAT - C42  
Pine Valley  
3:00 PM

Mathematics and engineering majors learn calculus in the same integral calculus class after the mastery of differential calculus. Mathematics majors are mostly convinced with proofs while the engineering majors want some numbers in front of them to convince their conclusions. We will illustrate this situation using some numerical approximations of areas under a curve.

**Calculus**

### QUALITATIVE CONSIDERATIONS OF SOME DIFFERENTIAL EQUATIONS

Gerardo Tole Galvis, *Pontificia Universidad Javeriana, Colombia*

SAT - C43  
Pine Valley  
3:20 PM

Some linear differential equations of second order are analyzed with variable coefficients as well as other non-linear equations. Some examples are presented to illustrate the deep differences that can appear. Next, the form is shown in the oscillator mass-spring. This presentation allows the professors to integrate Maple™ into qualitative analysis.

**Beyond Calculus**

### MATHEMATICAL MODELING, GAUSS-JORDAN, AND TI-83

Markus Pomper, *Indiana University East*

SAT - C44  
Pine Valley  
3:40 PM

How can handheld technology be incorporated in Finite Mathematics, an entry-level course for non-math majors? The discussion will center on comparing two groups of students, one of which was required to use a TI-83 calculator. Differences in performance between the two groups will be explored.

**Pedagogy/Research/Assessment**

## Contributed Papers

Saturday, November 1, 2003

### GETTING STUDENTS STARTED ON THE RIGHT TRACK: PLACEMENT TESTING

Kevin Ferland, Lisa Lister, Robert Montante, *Bloomsburg University*

SAT - C45  
Pine Valley  
4:00 PM

Math and science majors often feel they need to jump into calculus as soon as possible. For many, this is a mistake. At Bloomsburg University, we have implemented a placement exam and in this talk, we will discuss the results of this exam and adjustments our Department has had to make since its implementation.

---

**Pedagogy/Research/Assessment**

### TEACHING MATHEMATICS ONLINE

Iris Moche, *Southeastern University*

SAT - C46  
Pine Valley  
4:20 PM

An investigation of issues involved in teaching Operations Research online

---

**Pedagogy/Research/Assessment**

### TECHNOLOGY-SUPPORTED INQUIRY-BASED LEARNING IN COLLEGIATE MATHEMATICS

Hamide Dogan-Dunlap, *University of Texas at El Paso*

SAT - C47  
Pine Valley  
4:40 PM

We discuss how Mathematica® activities are implemented in a college mathematics course to support and provide inquiry-based learning. Students' comments, instructor's experiences and course material will be used to discuss issues that have occurred while integrating technology.

---

**Pedagogy/Research/Assessment**