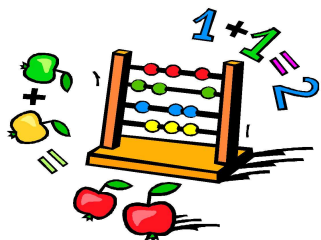# WASHINGTON STATE COMMUNITY COLLEGE

# Mathematics Conference

## May 5 - 7, 2005

## 37TH ANNUAL
## SHILO INN, OCEAN SHORES
## WASHINGTON

# Program Highlights

*All highlight events take place in the ballroom*

| Thursday | Event |
|---|---|
| 7:30pm | **Mark Jacobs**<br>*Mathematics Education in South Africa*<br>Cape Technikon, Cape Town, South Africa |
| 8:45pm | Social Hosted by *Brooks Cole* |

| Friday | Event |
|---|---|
| 7:15 – 8:30am | Breakfast Buffet |
| 11:30 – 1:00pm | Lunch Buffet<br>(Ice Breaker due at 1 pm at the registration table) |
| 6:00 – 7:00pm | Dinner Banquet |
| 7:00pm | **Dr. Robert Devaney**<br>*Chaos Games and Fractal Movies*<br>Boston University, Massachusetts |
| 8:15 pm | Social Co-hosted by *Addison Wesley* and *Houghton Mifflin*<br><br>(Puzzle contest due at the registration table at 8:15 pm) |

| Saturday | Event |
|---|---|
| 7:30 – 8:30am | Breakfast Buffet and Awards |

# Conference Schedule

| Date | Time | Event |
|---|---|---|
| **Thursday, May 5, 2005** | 7:30 – 8:30 pm | Mark Jacobs, South Africa |
| | | Opening Speaker |
| | 8:45 – 10:30 pm | Hosted Social and Ice Breaker |
| **Friday, May 6, 2005** | 7:15 – 8: 30 am | Breakfast Buffet |
| | 8:30 – 9:15 am | Session I |
| | 9:30 – 10:15 am | Session II |
| | 10:30 – 11:15 am | Session III |
| | 11:30 – 1:00 pm | Lunch Buffet |
| | 1:15 – 2:30 pm | Session IV |
| | 2:45 – 4:00 pm | Session V |
| | 4:00 – 4:15 pm | Beverage Break |
| | 4:10 – 6:00 pm | Discussion Groups/Activities |
| | 6:00 – 7:00 pm | Dinner Buffet |
| | 7:00 – 8:00 pm | Dr. Robert Devaney, Boston, MA |
| | | Keynote Speaker |
| | 8:15 – 10:30 pm | Hosted Social |
| **Saturday, May 7, 2005** | 7:30 – 8:30 am | Breakfast Buffet |
| | 8:15 – 8:30 am | Awards |
| | 8:45 –10:00 am | Session VI |
| | 10:15 – 11:00 am | Session VII |
| | 10:00 – 11:00 am | Checkout and Departure |

# Invited Speakers

## Thursday Evening Speaker – Mark Jacobs, South Africa

Mark Jacobs joins us from Cape Town, South Africa. He is currently an Engineering faculty member and Mathematics Lecturer teaching mathematics to engineering students in a tertiary institution called the Cape Technikon. He earned his Master's in Science in Mathematics Education from the Institute of Education, University of London, and has BAs in Mathematics and English Literature from the University of Cape Town. His prior experience includes ten years of teaching mathematics in high school and eight years at LEAF College of Commerce and Engineering as the Mathematics Department Chair and Director of Student Affairs.
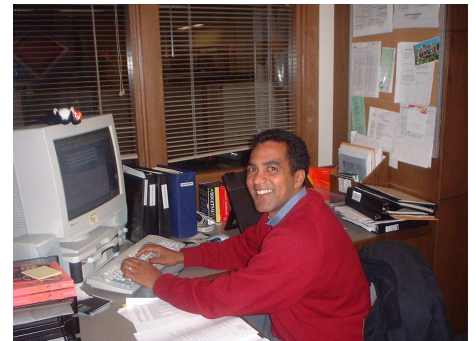
Mark will speak about the state of mathematics education in South Africa, with special reference to a mathematical literacy program they are starting this year.

## Friday Evening Banquet Speaker – Dr. Bob Devaney, Boston, MA

A native of Methuen, Massachusetts, Professor Robert L. Devaney is currently Professor of Mathematics at Boston University.  He received his PhD from the University of California at Berkeley in 1973 under the direction of Stephen Smale.  He taught at Northwestern University and Tufts University before joining Boston University in 1980.

Professor Devaney's main area of research is dynamical systems, primarily complex analytic dynamics, but also including more general ideas about chaotic dynamical systems.  He has delivered over 1,200 invited lectures on dynamical systems and related topics and has also been the "Chaos Consultant" for several theaters' presentations of Tom Stoppard's play Arcadia.

# Human Diversity Icebreaker

Get the signature of someone registered at this conference who…
If the signature is unreadable, please print the name below it.
(Due at the registration table by 1pm Friday)

**Rules:** 1) The person you find cannot be from your school or organization (except for 25). 2) Don't yell across the room. Go talk to people. 3) You must have a different name for each question.

1. _____ can fold origami animals.

2. _____ has played cricket.

3. _____ has at least 5 siblings.

4. _____ has a tattoo.

5. _____ has piloted an aircraft.

6. _____ has climbed a mountain at least 10,000 feet tall.

7. _____ has eaten fried grasshoppers, frog legs, snakes, or snails.

8. _____ has never flown.

9. _____ has seen a human birth in person, other than their own children's'.

10. _____ saw the aurora borealis.

11. _____ can juggle.

12. _____ speaks three languages.

13. _____ served in the military.

14. _____ can name all of Disney's seven dwarves.

15. _____ collects rare coins.

16. _____ plays the cello.

17. _____ can touch his/her nose with the tip of his/her tongue.

18. _____ has at least three college degrees (bachelor's, master's, etc…).

19. _____ has at least 5 children.

20. _____ has met a famous scientist or mathematician in person.

21. _____ has been north of the Arctic Circle.

22. _____ has been south of the Equator.

23. _____ doesn't own a television.

24. _____ has three living grandparents.

25. _____ shares a birthday with someone else at this conference.

26. _____ has been to at least fifteen countries outside the United States.

27. _____ has a degree in a field other than mathematics or education.

28. _____ owns a pet other than a bird, cat, dog, or fish.

29. _____ has a published book that has sold at least 100 copies.

# Social Events

| Thursday | Event |
| --- | --- |

8:45 to 10:30pm   Social Hosted by Brooks Cole

| Friday | Event |
| --- | --- |

4:15 to 5:45 pm   Come fly a kite on the beach! Bring your own kite, or purchase one for $5 (cash only). Meet on the beach. Prizes available.

4:15 to 5:45 pm   The annual basketball game (See Ed Morris for location).

8:15 – 10:30 pm   Social co-hosted by Addison Wesley and Houghton Mifflin.

During the social hours, come play games or listen to music! Events will be in different rooms but very close, so you can enjoy both. Bring your favorite game to play, or sing and listen to karaoke in the hotel lounge. Musicians are welcome! Guitar, piano, drums, and harmonica players are most needed.
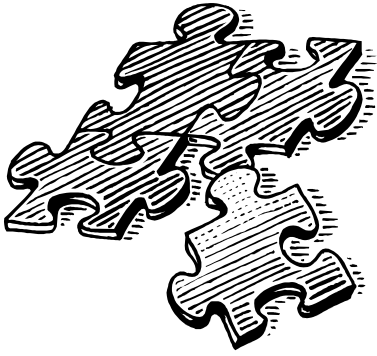
# 2005 Puzzle Contest

Show your work and/or explain your reasoning.

Due Friday at 8:15 p.m. at the registration table.

1. Chicken Problem:
   a. If a chicken and a half can lay an egg and a half in a day and a half, how long does it take a chicken to lay an egg?
   b. If *x* chickens can lay *y* eggs in *z* days, how long does it take *w* chickens to lay *v* eggs?

2. The Painting Cubes problem as given by Lewis Carroll is as follows: *You want to paint a set of cubes with six colors such that each face is a different color. How many unique cubes are there?*

3. Place the natural numbers 1 through 9 in this honeycomb in each of the following three ways (this calls for three separate solutions):
   a. So that no two adjacent hexagons contain consecutive numbers or numbers whose English language names have the same number of letters.

   b. So that no two adjacent hexagons sum to a number divisible by 4 or 5.

   c. So that for any given hexagon, the sum of the numbers in the adjacent hexagons will be a multiple of that hexagon's number.

4. There are 22 gloves in a drawer: five pairs of red gloves, four pairs of blue gloves, and two pairs of yellow gloves. If the lights are out and you must select the gloves in the dark, how many must you choose to ensure that you have at least one matching pair?

5. Five squares are arranged as shown. Show that the area of the center square is equal to that of the shaded triangle.
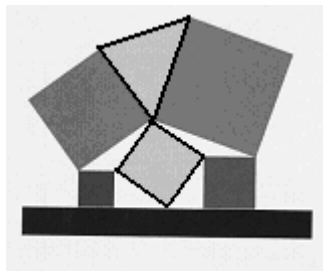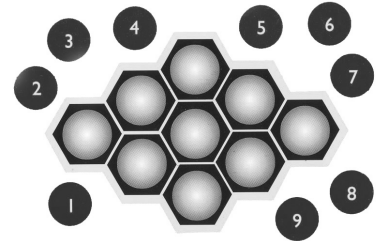
6. 220 and 284 are not perfect numbers, but there is a hidden relationship between them. What is it? Are there other such number pairs?

7. Knight's tour:  A knight can travel in "L" shapes around a chess board.  A knight's tour is a path that has the knight visit each square exactly once and return to the starting square.  Consider square boards of size $1\times1$, $2\times2$, $3\times3$, …, $8\times8$.  On which boards is a knight's tour possible?  Bonus:  Find a tour on the boards where it is possible.

8. Consider two intersecting circles as shown.  How do you find the longest line segment connecting two points on the two intersecting circles that passes through the point *A*?
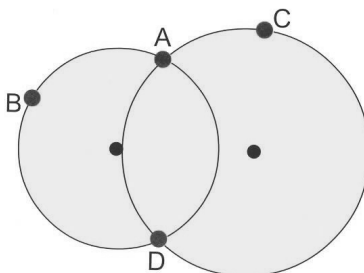


9. Mary and her husband attended a dinner party with four other couples.  When they arrived, there were handshakes between some of the people.  No one shook hands with his or her spouse.  Mary noticed that each of the other nine people shook hands with a different number of people.  How many times did Mary's husband shake hands?

10. Alice's Multiplication Tables: "Oh dear, how puzzling it all is!  I'll try if I know all the things I used to know.  Let me see: four times five is twelve, and four times six is thirteen, and four times seven is – oh dear!  I shall never get to twenty at that rate!"  Why couldn't Alice get to twenty at her present rate?

11. Eleven major nations on Earth have staked out territory on Mars for colonization.  There is one region for each nation.  To help keep political distinctions clear, the nations insist that maps of Mars depict colonies in the same color used for mother countries on Earth maps.  Using the same color for regions that have the same number, fill in both maps so that no neighboring regions share a color.  What is the minimum number of colors needed?
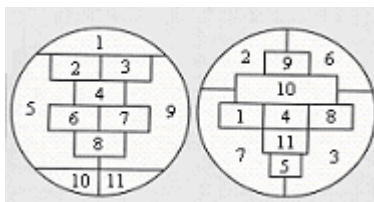


12. Three identical equilateral triangles are inscribed with circles as shown.  Which case provides the circles with the largest total area?

   a. An in-circle (the largest circle that can be inscribed in the triangle) and two smaller inscribed circles.

   b. Three identical circles of the largest size possible.

   c. One large circle and two smaller ones.
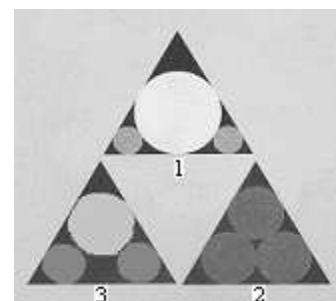
# Workshop Abstracts

Abstracts (in alphabetical order by presenter's last name) as given by presenters

**Jared Abwawo**
Highline Community College
***Wavelets - The story of a mathematical technique in the making.***
Wavelets were developed independently in the fields of mathematics, quantum physics, electrical engineering, and seismic geology. Interchanges between these fields during the last twenty years have led to many new wavelet applications such as image and video processing, turbulence, human vision, broadband physics, finance, speech and audio processing, biomedical imaging, radar, and earthquake prediction. In my presentation, I will introduce wavelets to a non-technical person outside the field of digital processing. I will give you a brief history of wavelets beginning with Fourier, state properties and other special aspects of wavelets, and finish with some interesting applications such as image compression, musical tones, and de-noising noisy data.

**Emmanuel Addo**
Green River Community College
***All You Need To Know About π***
It is undisputed fact that pi has received unlimited praise for centuries. The mystery of this well known constant is the fact that its exactness lies in inexactness. The use of the symbol as well as significance of the pi cannot be over emphasized. In this presentation, I intend to give a brief history of Pi including the analysis and the numerical calculations of pi up to date. I will give examples of formulas in the world of science and mathematics that are associated with pi and proceed to explain how pi has led to the expansion of the number system. Then I will show a simplified version of the proof of the irrationality of pi. I will state some roles that pi plays in the measurements and its practical contribution to technology. I then conclude with certain helpful suggestions that will make the formulas containing pi more elegant and clear.

**Laura Bracken and Ed Miller**
Lewis-Clark State College
***Skill Quizzes Revisited, with Data***
A few years back we talked about one aspect of our new strategy for increasing success rates in developmental and introductory math classes which we called "mastery skill quizzes." We've got some data now and reflections on implementation, particularly as our developmental enrollment as grown and we rely increasingly on adjunct instructors.

**Bob Branch** (Wenatchee Valley Community College) **- Nancy DeVerse** (Grays Harbor Community College)
Common Course Numbering Committee
***A Discussion of Common Courses in the Mathematics discipline***
The Common Course Numbering Committee is identifying courses that are common among the Community and Technical Colleges in Washington. We will present the background for this project and lead a discussion about Math courses that may be common.

**Helen Burn**
Highline Community College
***Assumptions About Student Learning in Calls for Reform of Introductory Courses***
My presentation focuses on assumptions about the relationship between procedural and conceptual knowledge and about the transfer of knowledge that are implicit in calls for reform of introductory college mathematics courses (non-remedial courses below the level of calculus). I will also explore the extent to which these assumptions are grounded in the literature on student learning in mathematics. The calls for reform include AMATYC's *Crossroads in Mathematics* (1995/2005), MAA's *Curriculum Guide* 2004, and NRC's *Transforming Undergraduate Education in Science, Mathematics, Engineering and Technology* (1999).

**Angi Caster and Erik Scott**
Highline Community College
### *Quantitative Reasoning in (and outside of) Math Classes*
Two Highline Community College instructors, Erik Scott (Math), and Angi Caster (Writing), will discuss strategies for enhancing the reasoning abilities of all students. This presentation will include activities you can share with your students and colleagues, as well as discussion of ideas (process theory, Bloom's Taxonomy) that facilitate thinking about how to develop higher-level reasoning.


**Cal Clawson**
Bellevue Community College
### *Reforming Mathematics Teaching in WA State*
The system of teaching mathematics in Washington State is broken.
Problem #1: Student Un-preparedness; 48% of the classes we teach are developmental. Proposal #1: Increase the State requirement for high school graduation to 4 credits of mathematics, up from 2 units.
Problem #2: Teacher Inefficiency: the present college system is a two-class system of part-time and full-time teachers.  Both groups are inefficient. Proposal #2: Replace the current college two-class system with a single class teacher system.
Problem #3: Classroom Model Inefficiency:  The current model results is many students spending time in class relearning subjects they already know while the class progresses too fast for the students who have not learned the material. Proposal #3: Substitute a modular system of teaching mathematics where the computer schedules classes, matching the needs of students and the needs of instructors


**Jacqueline Coomes**
Eastern Washington University
### *Tutoring that improves learning*
Whether students are coming to your office for individual help or going to the Math Lab for help from tutors, there are often tensions between the help they expect and the help that fosters understanding. This session features discussion of the factors that impede or support learning and specific tools for helping students learn. Includes many examples from experience.


**Branko Curgus**
Western Washington University
### *An Exceptional Exponential Function*
In this talk I shall show that a standard calculus problem of finding the best view of a painting (or the Statue of Liberty) appears on graphs of exponential functions. Surprisingly, the exponential function with the ``best view'' is not the one with the base $e$. Along the way, we shall discover the importance of the Lambert $W$ function, which might soon gain the status of an elementary function. My talk is a unique opportunity to learn about the Lambert $W$ function and be ahead of the curve.


**Mike Daniel**
Peninsula College
### *Unique Experiences--Unique Friendships*
Mike Daniel served as Peninsula College's 2004 Faculty Exchange to Guilin University of Electronic Technology (GUET) in Guilin, China. In this presentation, Mike will share some of his teaching experiences and adventures with a pictorial tour of the time he spent in China. He was at GUET for 116 days and taught over 200 students in eight different classes. He will discuss how an American mathematics professor prepared himself to teach Conversational English and writing to Chinese students in China. During his semester there he managed to study Chinese Calligraphy and to audit (observe) a Calculus class. The Chinese professor and students spoke little or no English; however, the text was written in English. In class the math students would feverishly exercise their electronic Chinese/English dictionaries in attempts to understand the textbook material. In addition, Mike was able to do some traveling and hiking in the local area.

**Shusen Ding**
Seattle University
***Improved Hӧlder Inequality and Integrability of Jacobians***
In this talk, we first prove the generalized Hӧlder inequality using the elementary properties of logarithmic functions. Then, we study the global integrability of Jacobians of composite mappings. Finally, we use examples to show the integrability exponent of Jacobians is the best possible.

**Tevian Dray**
Oregon State University
***Bridging the Gap between Mathematics and the Physical Sciences***
The key to bridging the gap between mathematics and the physical sciences is geometric reasoning. Using open-ended group activities developed as part of the NSF-funded Vector Calculus Bridge Project at Oregon State University, this Workshop discusses how to teach geometric reasoning, emphasizing vectors and vector calculus, but also discussing applications to such areas as linear algebra and trigonometry. The materials developed by the Bridge Project have been used successfully by several instructors at a variety of institutions. More information on this project is available online at http://www.math.oregonstate.edu/bridge

**Christie Gilliland -** Green River Community College, **Rob Farinelli -** Community College of Allegheny County**, Mike Kenyon -** Yakima Valley Community College, **Beverly Parnell -** Yakima Valley Community College**, Doug Mooers -** Whatcom Community College
***AMATYC and WAMATYC: What are they? How can I get involved?***
Mathematics professional organizations are an important element in the field of professional development. AMATYC (American Mathematical Association of Two Year Colleges) and WAMATYC (Washington Mathematical Association of Two Year Colleges) are the two professional organizations dedicated to representing and serving the needs of two-year college mathematics educators. AMATYC is the national organization with WAMATYC being our local state affiliate. This session, led by some of the leaders of these organizations, will explore ways that you can become involved in these organizations and answer any questions that you might have about these organizations. Those of you who are already involved are encouraged to come and share your experiences as well.

**Allen (Gregg) Harbaugh**
University of Washington (College of Ed.)
***Math for the Liberal Arts: Moving away from the Textbook***
Few courses permit math instructors as much latitude in choosing core concepts & learning outcomes as does the math class for liberal arts students. This presentation will discuss the rewards (and challenges) associated with an innovative approach that incorporated various books from the popular scientific literature for the avocational mathematician and lay scientist. This course was taught without a textbook, and the various assessment tools and alternative educational resources will be presented. Course objectives and learning outcomes will be discussed for this particular course and for such courses in general. Alternate versions of this course model will be presented for those instructors that are interested in incorporating similar concepts into their own classes. This will be a great presentation for those instructors interested in incorporating math classes into learning communities and coordinated study programs.

**Allen (Gregg) Harbaugh**
University of Washington (College of Ed.)
***The Gap Between Self-Efficacy & Achievement***
Have you ever had students that consistently berate themselves because of their poor math ability when you know that they are doing well in your course? Or, have you ever had students that insist they are more than capable of doing the assignments in your class in spite of the fact they fail every assignment? In this session, a model will be presented that associates student ability/achievement and perceived self-efficacy. Research from related fields of motivation, epistemology, affect and personality development will also be presented.

**David Himes**
North Seattle Community College
***Basic Color Manipulation with Mathematica***
In this discussion, we'll begin with the basics of the file structure of JPEG's and talk about importing and exporting these files to and from Mathematica. We'll eventually get down to the pixel level and talk about subtle and not-so-subtle manipulation of these pictures and how to create our own custom graphics filters with a startling amount of control over the picture.

**Kayana Hoagland**
South Puget Sound Community College
***Geoboard Activities for Elementary Algebra***
Participants will explore two or more activities on the geoboard which relate to elementary algebra topics. The topics covered include irrational numbers, Pythagorean Theorem, Area of a triangle, triangle vocabulary, logic, problem solving, developing linear equations through Pick's Theorem, and reducing radicals. All activities include writing about mathematics. Handouts will be provided. Classroom tested at the community college level.

**John House** (State Board) **and Erik Scott** (Highline Community College)
***One Giant Leap for MATHkind: New College Readiness Math Standards Officially Launched!***
With over 150 cross-sector math and non-math educators and content experts involved in more than 200 hours of standards development since June '04, the seemingly impossible has been achieved: consensus around the new College Readiness Math Standards. Despite this notable accomplishment, the difficult work has now just begun. Implementation. Professional development. Marketing/Communication. These three key tasks of the Transition Mathematics Project will demand the concerted effort of the broader math community. Please join us to learn more about the standards development process, our next steps and how you can take the next leap with us.

**Pete Kaslik, Terry Meerdink,  and Colette Bailey**
Puget Sound Early College (Highline Community College)
***Puget Sound Early College: A High School and College Collaboration***
Puget Sound Early College is a cohort based program for high school juniors and seniors who are also attempting to earn their Associates Degree. It was started by Highline Community College in fall 2004. The student body has 55 students with math abilities ranging from Algebra to Calculus. This presentation will focus on our approach to meeting the mathematical needs of these students as well as the effort to integrate math and statistics into the curriculum. It will include some of the things we tried, problems we encountered, and things we learned.

**Steve Kinholt and Joyce Hammer**
Green River Community College
***Math for Elementary Teachers -Discussion and Sharing Session***
This session will be conducted in a roundtable format. If you currently teach math content courses for future elementary teachers come and share information about your course and bring copies of a favorite activity. If you are thinking of teaching such a course come and learn what others are doing. We will also discuss the proposed math requirements related to a new statewide AAT (Associate of Arts in Teaching)for elementary teachers.

**Susan Landgraf**
Highline Community College
***Poetry Anywhere -- Even Math Class***
Simone Weil wrote that "If we concentrate our attention on trying to solve a problem of geometry, and if at the end of an hour we are no nearer to doing so than at the beginning, we have, nevertheless, been making progress each minute of that hour in another more mysterious dimension. Without our knowing or feeling it, this apparently barren effort has brought more light into the soul." What if we brought more light into the problem by offering another view? Think about the speed of light and pizza, story problems, and poetry together and how that might help a student "see" from a new, enlightening perspective. In this workshop we'll begin with a poetry exercise related to story problems; then we'll translate a poem into a mathematical equation and discuss the results.

**David Lippman**
Pierce College
***Online Resources for Graphing, Calculators, and More***
Several free online resources I've developed will be highlighted, including a 3D graphing utility, calculator tutorials, stats tools, and online math typesetting tools.

**Sasha Malinsky**
Bellevue Community College
***Mathematics: Language and Experience***
Parabolas are widely familiar. They appear in the study of conic sections in ancient Greece. Intermediate Algebra students see them as graphs of some of the first non-linear relationships that they encounter. In Physics they are in the vocabulary of ballistics modeling. In this talk, the parabola is the thread that ties the problems being examined. In one of these, a mathematical proposition that is stated in physical terms is explored with algebra, trigonometry and just a touch of calculus. This leads to an insight into some physics. Components of the exploration might be suitable as a lab exercise for early physics and calculus students. The other problem is a search for the proof of the parabola's physical property, usually treated in a calculus course, in the terms of older mathematics.

**Ben Mayo**, **Beverly Parnell, and Mike Kenyon**
A subset of the YVCC College Algebra assessment team
Yakima Valley Community College
***Mid-Program Assessment: College Algebra***
As part of YVCC's mid-program assessment plan, the math department has been developing and implementing a plan over the last several years to assess student learning outcomes in our college algebra course. We have developed nine types of problems which, between them, test each of our established objectives for the course; three of these items, or all nine, depending on the stage of the assessment process, are then included in the final exam for each section of the course. We will discuss how we developed the problems and the rubrics we use to score them, the scoring process, and, most importantly, what we feel we have learned (and continue to learn) from the process and how it improves our teaching.

**Yves Nievergelt**
Eastern Washington University
***Rounding Answers in Math Homework, Test, Papers***
"Various beliefs on how to round answers conflict between faculty from various departments and end users. The workshop will present case studies and allow you to draft guidelines. OFT RAISED QUESTION: How much accuracy do the data deserve? Noon-6pm Thursday, 2.25 hours Friday pm, 1 hour Saturday am. OPTION: participants may earn 1 graduate credit for $40. "

| Session | Dolphin A/B Floor 2 | Dolphin C Floor 2 | Whale A Floor 3 |
|---|---|---|---|
| **I Friday 8:30-9:15** | Potpouri<br><br>Yandl | Mid-program Assessment: College Algebra<br><br>Mayo, Parnell, Kenyon | Bipolar Coordinates?<br><br>Plagge |
| **II Friday 9:30-10:15** | All You Need to Know about $\pi$.<br><br>Addo | Assumptions about Student Learning Calls for Reform of Introductory Courses<br><br>Burn | Wavelets – The Story of a Mathematical Technique in the Making<br><br>Abwawo |
| **III Friday 10:30-11:15** | AMATYC and WAMATYC:  What are They? How can I get Involved?<br><br>Gilliland, Farinelli, Kenyon, Parnell | Applying Developmental Math to Music<br><br>Ursin | Improved Holder Inequality and Integrability of Jacobians<br><br>Ding |
| **IV Friday 1:15-2:30** | An Exceptional Exponential Function<br><br>Curgus | Math: Language and Experience<br><br>Malinsky | Stellations, Augmentations, and Cumulations<br><br>Webber |
| **V Friday 2:45-4:00** | Using an Emulator to Assist in Teaching Mathematics<br><br>Whitfield, Fukaya | Unique Experiences – Unique Friendships<br><br>Daniel | Reforming Mathematics The Eureka! Experience – Instructional Techniques that Encourage it<br><br>Tussy |
| **VI Saturday 8:45-10:00** | Bridging the gap between Mathematics and the Physical Sciences<br><br>Dray | The TI-Navigator System: Instant Feedback in a Connected Classroom<br><br>Riopel | Paradoxes of Conditional Probability<br><br>Nord |
| **VII Saturday 10:15-11:00** | The Magnetic Field of the Human Brain and Calculus<br><br>Rafie | Tutoring that Improves Learning<br><br>Coomes | Skill Quizzes Revisited, with Data<br><br>Bracken, Miller |

| Whale B<br>Floor 3 | Whale C<br>Floor 3 | Chinook<br>Floor 4 | Session |
|---|---|---|---|
| The Gap Between Self-Efficacy and Achievement<br><br>Harbaugh | Geoboard Activities for Elementary Algebra<br><br>Hoagland | | I<br>Friday<br>8:30-9:15 |
| Mathematics for the Liberal Arts: Moving away from the Textbook<br><br>Harbaugh | | **Poster Presentations**<br>(Chinook C) | II<br>Friday<br>9:30-10:15 |
| Puget Sound Early College: A High School and College Collaboration<br><br>Kaslik, Meerdink, Bailey | Quantitative Reasoning in (and outside of) Math Classes<br><br>Caster, Scott | During session hours. | III<br>Friday<br>10:30-11:15 |
| Math for Elementary Teachers – Discussion and Sharing<br><br>Kinholt, Hammer | A Discussion of Common Courses in the Mathematics Discipline<br><br>Branch, Deverse | **Exhibitors**<br>(Chinook A/B) | IV<br>Friday<br>1:15-2:30 |
| Teaching in Washington State<br><br>Clawson | One Giant Leap for MATHkind: New College Readiness Math Standards Officially Launched<br><br>House, Scott | Friday<br>8 am - 6 pm<br><br>Saturday<br>8 - 10:30 am | V<br>Friday<br>2:45-4:00 |
| Basic Color Manipulation with Mathematica<br><br>Himes | Rounding Answers in Math Homework, Test, Papers<br><br>Nievergelt | | VI<br>Saturday<br>8:45-10:00 |
| Poetry anywhere – Even Math Classes<br><br>Landgraf | Hosting the Washington Community College Math Conference<br><br>Wilson, Lee, Hunter | | VII<br>Saturday<br>10:15-11:00 |

**Gail Nord**
Gonzaga University
***Paradoxes of Conditional Probability***
You won't believe it--the mathematics and your intuition give different answers. We will battle it out to see what is going on here.

**Richard Plagge**
Highline Community College
***Bipolar coordinates?***
An introduction to coordinates using two poles.

**Frank Rafie**
Lake Washington Technical College
***The Magnetic Field of the Human Brain and Calculus***
When it comes to calculus, the students always ask: am I ever going to use this stuff? Well, the answer is yes. In this presentation, an example of how calculus is used in measuring the magnetic field of the human brain in order to pinpoint the correct location of a tumor for surgery purposes. Can we read your dreams using calculus in measuring of the magnetic field and the electric field of your brain?

**Paul Riopel**
Texas Instruments
***The TI-Navigator System: Instant Feedback in a Connected Classroom***
This hands-on session will demonstrate the potential of the TI-Navigator system to support instruction in college Algebra and calculus. The TI-Navigator system uses PC software and Texas Instruments graphing calculators to enable instant and ongoing wireless two-way communication between teachers and students in math and other subject areas. Send and receive data, homework and assessment items. Instantly know your students' understanding and progress. A "must see" session for all levels of users.

**Alan Tussy**
Citrus Community College
***The Eureka! Experience - Instructional Techniques that Encourage it!***
Watch as several of your colleagues participate in an intriguing experiment that explores the relationship between thought and language. Learn about the successive stages that your students go through to assimilate mathematical terms and concepts. Witness the Eureka! experience - that point in the learning process when students confidently claim, "Now I get it!" You'll leave with some specific instructional techniques that help students better speak, write, and think mathematically using the language of algebra.

**Jonny' Ursin**
Western Washington University
***Applying Developmental Math to Music***
Have you ever wondered how to tune your piano? Have you ever wondered what your piano tuner knows about exponents? In this talk I will present the answers to these questions and more!

**William T. Webber**
Whatcom Community College
***Stellations, Augmentations, and Cumulations***
With many math teachers now doing origami there is confusion about the meaning of the word "Stellation." We will attempt to set the record straight. By using many physical models we will discuss the original meanings of the words "stellation," "augmentation" and "cumulation."

**Diane Whitfield and Hideshi Fukaya**
CASIO Education MRD Center
***Using an Emulator to Assist in Teaching Mathematics***
Learn fun new strategies to help your students understand mathematics, and leave with ideas for next week's class. If you have a PC and data projector, you can use the ClassPad Manager software to assist you in teaching and get each student in your class involved in the learning process. In this workshop, you will learn how to create "visual" lessons, using technology, to teach mathematics. You will also learn how to draw geometric figures, dynamically change graphs, create quizzes, review algebraic topics, and more. If you have a laptop, please bring it. If not, we will have handheld ClassPad 300's for you to use. Each participant will be given sample software and activities to work with.

**Dusty Wilson, Diana Lee, and Barbara Hunter**
Highline Community College
***Hosting the Washington Community College Math Conference***
Thinking of hosting the conference? Come find out what worked for us, ways to streamline the work, and things not to do!

**Andre L. Yandl**
Seattle University
***Potpourri***
Three proofs without words will be given. Some Fibonacci identities will be used to prove the convergence of a sequence. Finally the relationship between Bernoulli's numbers, Pascal triangle, and formulas for sums of powers of integers will be discussed. A number of interesting problems will be suggested for the participants to share with their better students.

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**The Highline Conference Committee extends a special thanks to:**

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# 2005 Exhibitors

Exhibitors are housed in the Chinook room A.
Exhibit hours are Friday from 8 am to 6 pm and Saturday from 8 am
to 10:30 am

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# Mathematics Conference History

The first Washington State Community Colleges Mathematics Conference and Retreat was held in 1969. The organizers were Phil Heft, Jim Relf, Larry Larson, and John Van Duff. We are told that the per-person cost at the time was $16.68 and that 33 people attended the conference. It was held at "The Lodge" at Ashford where accommodations required sleeping bags. The menu for the first banquet and the name of the first guest speaker remain unsolved mysteries. There are usually a few invited talks, but the bulk of the program is contributed by inspired volunteers. Responsibility for conference planning is passed among the 34 Washington community colleges. There is no particular formula for who hosts when; and there is no set location where the meetings are held. As if by magic, volunteers appear and destination meeting sites are found in the Cascade Mountain corridor, on the Olympic Peninsula, or in the Columbian Gorge. There is a traveling fund that helps the host institution with start-up costs. This year there are over 240 registered participants!

| Year | Conference Host Schools | Location of Conference |
|------|-------------------------|------------------------|
| 1969 | Green River/Highline/Ft. Steilacoom CC's | The Lodge |
| 1970 | Spokane Falls CC | The Lodge |
| 1971 | Everett CC | Snoqualmie Pass |
| 1972 | Everett CC | Snoqualmie Pass |
| 1973 | Seattle Central CC | Snoqualmie Pass |
| 1974 | Green River CC | Lake Wilderness |
| 1975 | Highline CC | Providence Heights |
| 1976 | Bellevue CC | Snoqualmie Pass |
| 1977 | Shoreline CC | Providence Heights |
| 1978 | Edmonds CC | Providence Heights |
| 1979 | Olympic College | Port Ludlow |
| 1980 | Spokane Falls CC | Sun Mountain |
| 1981 | Spokane Falls CC | Sun Mountain |
| 1982 | Highline CC | Lake Chelan |
| 1983 | Olympic College | Port Ludlow |
| 1984 | Green River CC | Alderbrook |
| 1985 | Shoreline CC | Sun Mountain |
| 1986 | North Seattle CC | Alderbrook |
| 1987 | Lower Columbia CC | Alderbrook |
| 1988 | Olympic College | Port Ludlow |
| 1989 | Bellevue CC | Lake Chelan |
| 1990 | Clark College | Alderbrook |
| 1991 | Pierce College & Tacoma CC | Lake Chelan |
| 1992 | Yakima CC | Yakima |
| 1993 | Highline CC | Wenatchee |
| 1994 | South Seattle CC | Silverdale |
| 1995 | Skagit Valley & Whatcom CC | Wenatchee |
| 1996 | Spokane Falls CC & ORMATYC | Skamania Lodge |
| 1997 | Green River CC | Lake Chelan |
| 1998 | Tacoma CC & Big Bend | Lake Chelan |
| 1999 | Edmonds CC | Ocean Shores |
| 2000 | Bellevue CC | Wenatchee |
| 2001 | Peninsula College & ORMATYC | Skamania Lodge |
| 2002 | Clark CC | Yakima |
| 2003 | Spokane CC & North Idaho CC | Wenatchee |
| 2004 | Pierce CC | Yakima |
| 2005 | Highline CC | Ocean Shores |
| 2006 | Olympic College & ORMATYC | Skamania Lodge |
| 2007 | Wenatchee Valley CC | Wenatchee |
| 2008 | ????? | ????? |
| 2009 | ????? | ????? |

# Notes

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# HIGHLINE
## COMMUNITY COLLEGE

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*Cover photograph: Long Beach, Washington courtesy of A. Fitzpatrick*