

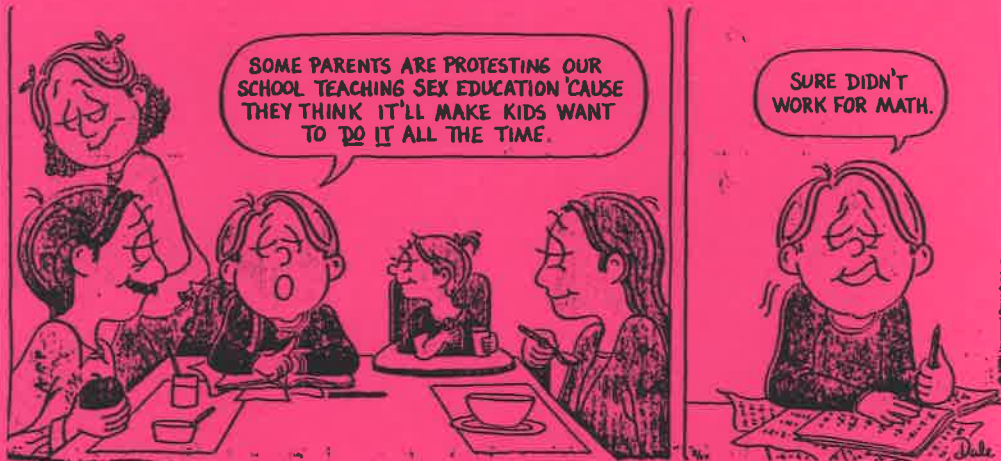
**1991**  
**Washington**  
**Community**  
**College**  
**Mathematics**  
**Conference**

**Campbell's Resort**  
**Lake Chelan**

**April 18<sup>th</sup>-20<sup>th</sup>**

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Host Colleges:  
*Pierce College*  
*Tacoma Community College*

## Participants in this year's conference

### Bellevue CC

Marilyn Anderson  
Kathy Curnutt  
Larry Curnutt  
Susan Granlund  
Berthe Habib  
Dale Hoffman  
Worku Molla  
Rose Pugh  
Tom Pugh  
Peter Ratener  
Laurence Raybois  
Jim Relf  
Judie Relf  
David Stacy

### Big Bend CC

Stephen Lane  
Margaret Lane  
Donna Brown  
Michael Kreuger  
Barbara Whitney

### Central Washington U

Mike Hardy  
Stephen Hinthorne  
Jan Rizzuti  
Joyce White

### Clark College

Paul Casillas  
Louise Hoover  
Adam Jackson  
Wes Orser  
Bruce Ransom  
Tom Reifenrath  
Mike Greenwood  
Dennis Watson

### Columbia Basin CC

Curtis Crawford  
Cahs Jok-ef  
Paul Meier  
Gary Olson  
Jerry Selvig  
Trueman Tucker  
Shirley Tucker  
Sharon Schwenk

### Eastern Washington U

Yves Nievergelt

### Everett CC

Nancy Spears  
Larry Baxter

### Gonzaga

Gail Nord

### Green River CC

Donald Alexander  
David Bender  
Don Hallstone  
Phil Heft  
Larry Larson  
Laura Moore-Mueller  
Nanette Im  
Allen Mauney  
Douglas Peterson  
Mary Ann Peterson

### Highline CC

Diana Bender  
Ronald Burke  
Karen Frank  
Torgeir Haugland  
Mrs. Torgeir Haugland  
Brian Hogan  
Ed Morris  
Ed Newell  
Richard Plagge  
Joe Wilcox  
Marilyn Koshlap (SCC, Ed.CC)

## Participants (Continued)

### North Seattle CC

Barbara Poole  
Ruth Pool  
Vickey Ringen  
Harry Watts  
Barbara Dyer  
Earl Hamilton  
Eduard Krajnik  
Robert Tighe

### Olympic College

Ann Brackebusch  
Mike Dodge  
Heidi Weiss-Green  
Jim Green  
Carson Hollingsworth  
Glenlee James  
Scott Niven

### Peninsula College

Kent Brauning  
Marjorie Lindberg

### Pierce College

Dr. John VanDruff  
Pat Davis  
Tom Davis  
Jim Erickson  
Deb Falcioni  
Mike Lamka  
Chris Lamka  
Randy Leifson  
Tom Jepsen  
Barb Jepsen  
Diane Downie  
Sally Glover

### Portland CC

Dick Clark

### Spokane CC

Chip Abrams  
Bob Branch  
Susan Dimick  
Kamilia Nemri  
Mary Lou Zinke

### Seattle Central CC

Dick Benson  
John Lacoste

### Seattle University

Mary Ehlers  
Wynne Guy  
Janet Mills  
Carl Swenson  
Donna Sylvester  
Andre Yandl  
Shirley Yandl

### Shoreline CC

Shannon Flynn  
Preston Gramling  
Helen Hancock  
Betty Hawkins  
Sarah Leyden  
Mark Parker  
Steve Perry  
Holly Runyan  
Larry Runyan  
Judy Sanderman  
Jay Yancey

### Skagit Valley College

Phil Green  
Dick Huffman  
Elizabeth Huffman  
Tina Schaffner  
Chuck Stevens

### South Seattle CC

Marjie Vittum-Jones  
Larry Vittum-Jones  
Dave Hemme

### Spokane Falls CC

Penny Coffman  
Kialynn Glubrecht  
Barbara Harras  
Gus Harras  
Curtiss Humphrey  
Meyer Louie  
Nick Nickoloff  
Van Stahley  
Jean Vrechek

## Participants (Continued)

### Tacoma CC

Karen Clark  
Ed Zimmerman  
Anne Hafer  
Greg Schwartz  
Robert Tan  
Allan Tarp

### U of Puget Sound

Rosemary Hirschfelder

### Walla Walla CC

Eric Schultz  
Susan Poston

### Washington State U

Michael J Kallaher  
Jim Jordan  
Jack Robertson  
Sam Saunders

### Wenatchee Valley College

Anne Gardner  
Mike Lavinder

### Western Washington U

Brian Smith  
James Duemmel  
Susan Blondell Kaplan  
Richard Levin  
Norm Lindquist  
John Reay  
Donna Fields Rochon  
Maryann Firpo  
Don Chalice  
Beth Wood

### Whatcom CC

Liz Cunningham  
Doug Mooers  
Jane Shelly

### Yakima Valley CC

Carolyn Gregory  
Roger Knobel  
Ellena Knobel  
Ben Mayo  
Susan Mayo  
Larry Ozanich

*We are sorry that, due to a back injury, Ivan Niven is unable to deliver the Thursday evening address as scheduled. We wish him a speedy recovery!*

*We are fortunate and pleased to announce that Yves Nievergelt from Eastern Washington University will be our speaker Thursday in Dr. Niven's absence.*

## SCHEDULE OF EVENTS

### Thursday, April 18

- 4:00-7:00pm Registration (dinner on your own)
- 7:00-8:00pm Address by Yves Nievergelt (Ballroom 2)  
**"Solving Quadratics on Your Calculators: Real Methods, Real Applications, and Real Surprises!"**  
Bring your Calculators!
- 8:00-?:00pm Hospitality and applied probability

### Friday, April 19

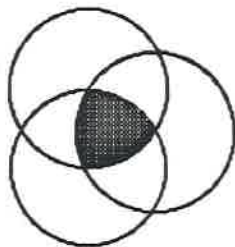
- 7:30-8:30am Breakfast
- 9:00-11:00am Talks (Ballrooms 1, 2, and 3)
- 11:30-12:30pm Lunch
- 1:00-4:35pm Afternoon Talks (Ballrooms 1, 2, and 3)
- 4:45-5:35pm **WAMATYC Meeting**
- 6:30-7:30pm No host cocktails
- 7:30-9:00pm **BANQUET and KEYNOTE ADDRESS**  
**"The Entry Level in Mathematics: A Quiet Revolution"**  
by Dr. Lester Senechal
- 9:00-?:00pm Hospitality and applied probability

### Saturday, April 20

- 7:30-8:30am Breakfast
- 9:00-11:35am Talks
- 11:35-12:00 Checkout
- 12:00-1:00pm Lunch

## Entertainment for your spare moments. . .

1. A man places his beer glass on the bar 3 times to produce the set of triple rings shown here. He does it carefully so that each circle passes through the center of the other two. The bartender thinks the area of mutual overlap (shaded) is less than one-fourth of the area of the circle, but the customer says the overlap is more than one-fourth. Who is right?



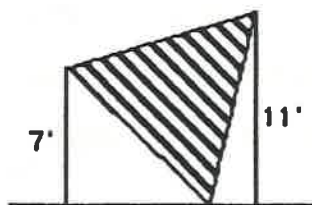
2. Add parentheses to the following expression to make it true:  
 $5 - 2 \times 1 + 4 + 6 = 5$

3. Can you find a four digit square number such that the first two digits represent a number one greater than the number represented by the last two digits? (5857 is a non-square number satisfying this property).

4. What two digit integer satisfies the condition that the square of the cube root of the integer is equal to the sum of its digits?

5. A woman's age is the square root of the year her grandmother was born in the nineteenth century. How old is the woman?

6. A large flag in the shape of an equilateral triangle is suspended by two of its corners from the tops of two vertical poles, one 7 feet tall and the other 11 feet tall. The third corner of the flag just touches the ground. What are the exact dimensions of the flag?



7. Do there exist positive integers  $x$  and  $y$  which satisfy the equation:  
 $x^2 - y^2 = 48$  ?

In general, for what type of positive integer  $n$  does  $x^2 - y^2 = n$  have at least one solution?

8. What magic square of order 3 using nine distinct primes (don't count 1 as a prime) has the lowest constant?

9. Can you find a 10 digit autobiographical number? The first digit of an autobiographical number tells the number of zeros in the number, the second digit tells the number of ones, the third digit tells the number of 2's, the fourth digit tells the number of 3's and so on.

**Answers available at lunch on Saturday**

## A FABLE: Maluva and Alissi

*The Story of Two Newcomers to the Town of Calculus*

By: Emilio O. Roxin; University of Rhode Island

### Fable

Once upon a time two young ladies, Maluva and Alissi, came to the town called Calculus. This is a section of the greater city of Mathematics, and people had warned them that this is a particularly confusing town. Many people who had arrived very enthusiastic, could not find their ways around and, frustrated, finally gave up and left town.

Maluva was strongly determined to succeed. She was going to learn her ways through the town. For example, in order to learn how to go from her dorm to class, she concentrated in memorizing the clearly essential information: she had to walk 325 steps south, then 253 steps west, then 129 steps in diagonal (south-west) and finally 86 steps north. It was not easy to remember all of that, but fortunately she had a very good instructor, who helped her to walk this same path 50 times. In order to stick to the strictly necessary information and avoid overburdening her memory with additional unnecessary information, like the color of the adjacent buildings or the existence of trees and bushes nearby, she always walked blindfolded.

After repeated exercising, she succeeded in learning her way to class and also to the cafeteria. But there were too many routes to memorize: to the grocery store, to the bus station, to a nice restaurant, to the bookstore, and so on. It was overwhelming! A lot of times she ended in a wrong place, which could be quite embarrassing on occasions. Finally she gave up: Calculus was too complicated for her.

Alissi, on the other hand, was of a much less serious nature. To the dismay of her instructor, she did not even intend to memorize the number of steps of her walks. Neither did she use the standard blindfold that students need for learning, and was always curious, looking at the different buildings, trees and bushes nearby and everything else not related to her walk. Sometimes she walked dead-end alleys, in order to find out where they were leading to even if this was obviously superfluous.

Curiously, Alissi succeeded in learning how to walk from one place to another. She even found it easy and amusing. It was obvious that she was particularly gifted; she must have had some very special genes.

### Thursday Evening

Ballroom 2

7:00 - 8:00	<p><i>"Solving Quadratics on Your Calculators: Real Methods, Real Applications, and Real Surprises"</i> Yves Nievergelt, EWU <b>Bring your calculators along!</b></p>
8:00	<p>Hospitality Room and Applied Probability</p>

### Friday Morning

Ballroom 1

Ballroom 2

Ballroom 3

9:00 - 9:50	<p><i>"Mathematical Connections-The Mathematics of Harmony"</i> Stephen Hinthorne CWU</p>	<p><i>"Calculus, MathCad, and Modeling"</i>  Stephen Lane BBCC</p>	
10:10 - 11:00	<p><i>"Linear Algebra and Calculus-Is All Mathematics Some Aspect of L A?"</i>  Larry Runyan SCC</p>	<p><i>"Alan Turing and his place in the Mathematical Kaleidoscope"</i>  Sam C. Saunders WSU</p>	<p><i>"Calculus with the HP Calculators-A report on the Oregon State NSF Project"</i> Donnie Hallstone and Laura Moore-Mueller GRCC</p>

### Friday Afternoon

Ballroom 1

Ballroom 2

Ballroom 3

1:00 - 1:50	<p><i>"Equilateral Triangles 1 House of Representatives 0"</i> Jack M. Robertson, WSU</p>	<p><i>"The Crown Method for Matrices"</i>  Louise Hoover, CC</p>	<p><i>"The HP48SX, Just Another Calculator?"</i>  Eric Schultz, WWCC</p>
2:00 - 2:50	<p><i>"Pythagorean Triangles and Perfect Boxes"</i> James Jordan, WSU</p>	<p><i>"Polygonal Numbers"</i>  Gail Nord, GU</p>	<p><i>"The Latest News on Mathematica"</i> Carl Swenson, SU</p>
3:10 - 4:00	<p><i>"Writing as a learning tool in math classes"</i>  Robert Branch, SCC</p>	<p><i>"Is a High-Efficiency Furnace Worth the Price?"</i>  Eric Schultz, WWCC</p>	<p><i>"Using <del>interactive</del> Computer Software and Contextual Problems in the Teaching of Precalculus Mathematics"</i> Jan Rizutti, CWU</p>
4:10 - 4:35	<p><i>"Derivation of some Familiar Sums by Finite Differences"</i> Mike Parker, ShCC</p>	<p><i>"2-Distance Sets; An Application of Elementary Linear Algebra"</i> John Reay, WWU</p>	<p><i>"Painting Across the Curriculum"</i>  Holly Runyan, ShCC</p>
4:45 - 5:35	<p><b>WAMATYC Meeting</b> Ballroom 3</p>		

### Saturday Morning

Ballroom 1

Ballroom 2

Ballroom 3

9:00 - 9:50	<p><i>"Wavelets, the wave of the future"</i>  Yves Nievergelt, EWU</p>	<p><i>"A special purpose spreadsheet for elementary linear algebra courses"</i> James Duemmel, WWU</p>	<p><i>"Some Mathematical Gems and Possibly Some Dirt Clods"</i> Paul Casillas, CC</p>
10:10 - 10:35	<p><i>"Strategies for Success with Remedial/ Developmental Classes"</i> David Hemme, HCC</p>	<p><i>"WSU's New Mathematics Requirement for all Students"</i> Michael J. Kallaher, WSU</p>	<p><i>"Fractals for Pre-Calculus Students"</i> Mike Hardy and Joyce White, CWU</p>
10:45 - 11:35	<p><i>"Newton's Method and Iteration"</i>  Richard Plagge, HCC</p>	<p><i>"Computer Experimentation in Entry Level Mathematics"</i> Dr. Lester Senechal</p>	<p><i>"Generating Fractals using the Collage Theorem"</i>  Don Chalice, WWU</p>

**ABSTRACTS**  
(alphabetical by presenter)

- BRANCH, Robert.** Spokane Community College  
**"Writing as a Learning Tool in Math Classes"**  
 3:10-4:00 Friday Ballroom 1  
 An opportunity for us to share our experiences with having our students write. What kinds of papers work best?
- CASILLAS, Paul.** Clark College  
**"Some Mathematical Gems and Possibly Some Dirt Clods"**  
 9:00-9:50 Saturday Ballroom 3  
 Some interesting problems, puzzles, results, trivia and open questions from the community college mathematics curriculum.
- CHALICE, Donald.** Western Washington University  
**"Generating Fractals using the Collage Theorem"**  
 10:45-11:35 Saturday Ballroom 3  
 In this talk we show how to generate various fractals iteratively using the Collage Theorem of Barnsley. A short introduction to affine maps and dimension will also be presented.
- DUEMMEL, James.** Western Washington University  
**"A special purpose spreadsheet for elementary linear algebra courses"**  
 9:00-9:50 Saturday Ballroom 2  
 A demonstration of an easy to use "spreadsheet" written to be used in beginning linear algebra courses. The spreadsheet is menu-driven with plentiful help available on screen. Student manuals should not be necessary.
- HALLSTONE, Donnie/MOORE-MUELLER, Laura.**  
 Green River Community College  
**"Calculus with the HP calculators-A report on the Oregon State NSF Project"**  
 10:10-11:00 Friday Ballroom 3  
 We would like to report on our participation in the Oregon State NSF Calculus Project. We were one of the pilot testing schools teaching calculus where each student was issued an HP 28S calculator.
- HARDY, Mike/WHITE, Joyce.** Central Washington University  
**"Fractals for Pre-Calculus Students"**  
 10:10-10:35 Saturday Ballroom 3  
 An introduction to the Mandelbrot set for motivation and enrichment purposes. This material has been successfully presented to students in Pre-Calculus and Intermediate Algebra classes at C.W.U.
- HEMME, David J.** South Seattle Community College, (HCC, ShCC)  
**"Strategies for Success with Remedial/Developmental Classes"**  
 10:10-10:35 Saturday Ballroom 1  
 Overcoming anxiety. Ideas that work with remedial, technical, and lab courses.
- HINTHORNE, Stephen.** Central Washington University  
**"Mathematical Connections-The Mathematics of Harmony"**  
 9:00-9:50 Friday Ballroom 1  
 The talk describes some of the tuning systems in music and the mathematics behind them. Also the theory of consonance and how the ear hears musical sounds is investigated mathematically.
- HOOVER, Louise.** Clark College  
**"The Crown Method for Matrices"**  
 1:00-1:50 Friday Ballroom 2  
 This modified elimination, all integer method for matrices and the simplex tableau is a revelation to me, and a boon to students. Take it back to your classrooms.
- LANE, Stephen.** Big Bend Community College  
**"Calculus, MathCad, and Modeling"**  
 9:00-9:50 Friday Ballroom 2  
 Using MathCad software to model calculus applications. Using the computer for more than drill and skill exercises or as an algebraic manipulator.
- JORDAN, James H.** Washington State University  
**"Pythagorean triangles and Perfect Boxes"**  
 2:00-2:50 Friday Ballroom 1  
 In an attempt to discover a perfect box, seven related Pythagorean Triangles are necessary. The search led to several interesting aspects of Pythagorean Triangles. Some will be mentioned.
- KELLAHER, Michael J.** Washington State University  
**"WSU's New Mathematics Requirement for All Students"**  
 10:10-10:35 Saturday Ballroom 2  
 Discussion of WSU's mathematics general education requirement, which is effective for all students beginning August 16, 1991.
- NIEVERGELT, Yves.** Eastern Washington University  
**"Solving Quadratics on Your Calculators: Real Methods, Real Applications, and Real Surprises"**  
 7:00-8:00 pm Thursday Ballroom 2  
 The usual quadratic formula suits theory well, but it exhibits unacceptable sensitivity to rounding errors in calculators and computers. The talk will present the numerical analyst's alternate formula, tricks for extended precision with calculators, and real applications.

**NIEVERGELT** (continued)

**"Wavelets, the Wave of the Future"**

9:00-9:50 Saturday Ballroom 1

In such applications as seismology and signal and image processing, mathematical wavelets may surpass trigonometric series.

**NORD, Gail.** Gonzaga University

**"Polygonal Numbers"**

2:00-2:50 Friday Ballroom 2

Application of triangular numbers and the formulation of equations/formulas of polygonal numbers will be explored (handouts).

**PARKER, Mark.** Shoreline Community College

**"Derivation of some Familiar Sums by Finite Differences"**

4:10-4:35 Friday Ballroom 1

Finite Difference methods can be used to derive such formulas as

$$\sum_{i=1}^n i = \frac{n(n+1)}{2} \text{ and } \sum_{i=1}^n i^2 = \frac{n(n+1)(2n+1)}{6} \text{ and others. The same methods can be}$$

used to find the generating function for certain sequences.

**PLAGGE, Richard.** Highline Community College

**"Newton's Method and Iteration"**

10:45-11:35 Saturday Ballroom 1

An examination of a special problem which occurred in a calculus class. Looking at attracting and repelling fixed points.

**REAY, John.** Western Washington University

**"2-Distance Sets; An Application of Elementary Linear Algebra"**

4:10-4:35 Friday Ballroom 2

Suppose the distance between any 2 points of  $S \subset \mathbb{R}^n$  is one of two fixed real numbers. Then  $|S| \leq (n+1)(n+4)/2$ . The proof uses most of the facts taught in elementary linear algebra, and makes a good last-day lecture.

**RIZZUTI, Jan.** Central Washington University

**"Using Interactive Computer Software and Contextual Problems in the Teaching of Precalculus Mathematics"**

3:10-4:00 Friday Ballroom 3

Results of a classroom based study will be presented. The role of contextual problems and an interactive software program for the Macintosh, FUNCTION PROBE ©, on students' understanding of "functions" will be discussed. Suggestions for teaching "functions" will be made.

**ROBERTSON, Jack M.** Washington State University

**"Equilateral Triangles: 1- House of Representatives: 0"**

1:00-1:50 Friday Ballroom 1

The apportionment problem is a geometry problem, and the properties of the stately equilateral triangle dictate that no apportionment method will be without its problems!

**RUNYAN, Holly.** Shoreline Community College/Woodinville High School

**"Painting Across the Curriculum"**

4:10-4:35 Friday Ballroom 3

A slide show of math research projects that resulted in three painted murals in the math wing-"The History of Mathematics", "The History of Computers", and "A Gallery of Famous Problems".

**RUNYAN, Larry.** Shoreline Community College

**"Linear Algebra and Calculus-Is All Mathematics Some Aspect of L.A.?"**

10:10-11:00 Friday Ballroom 1

We naturally apply linear algebra to linear regression. Our students can build on this least-squares, best-fit approach to apply linear algebra to Fourier series, Taylor and Legendre polynomials.

**SAUNDERS, Sam C.** Washington State University

**"Alan Turing and his place in the Mathematical Kaleidoscope"**

10:10-11:00 Friday Ballroom 2

The importance of Alan Turing at Bletchly Park in WWII with its decipherment of the German enigma machine, his solution to Hilbert's Entscheidungs problem with his elegant (Turing) machine and his seminal contributions to the theory of computing followed by his tragic death, will be recounted as an illustrative lecture from the class of WSU on persons and ideas in mathematics.

**SCHULTZ, Eric.** Walla Walla Community College

**"The HP48SX, Just Another Calculator?"**

1:00-1:50 Friday Ballroom 3

This presentation will show off the capabilities of the HP-48SX using both the built-in functions of the calculator as well as the added functionality available through the advanced programming features.

**"Is a High-Efficiency Furnace Worth the Price?"**

3:10-4:00 Friday Ballroom 2

A pre-calculus module illustrating non-textbook applications of algebra and some of the potential difficulties of mathematical modeling. The material flows out of the rather unfortunate experience of having to replace the heating system in our newly purchased home.



**SENECHAL, Lester.** Mount Holyoke College and Mathematics Fellow, Institute for Academic Technology, University of North Carolina at Chapel Hill  
**"Entry Level Mathematics: A Quiet Revolution"**

**Keynote address** Friday (dinner) Ballroom 2  
 Applications of mathematics are becoming ever more pervasive, and the computer is playing no small role in extending this applicability. Simultaneously, it has become possible to offer students at the most elementary college level the ability to deal with applied mathematics of a type which just a few years ago was only accessible to graduate students. Here, too, the computer plays a crucial role. Effective ways of incorporating computation into mathematics will be discussed. Computer usage will be seen not as a panacea or as a way of gaining dramatic new efficiencies, but as a way of strengthening the learning process and of giving accessibility to contemporary science.

**"Computer Experimentation in Entry Level Mathematics"**  
 10:45-11:35 Saturday Ballroom 2  
 Computer usage in three areas will be demonstrated: Quantitative reasoning, precalculus, and calculus. Special attention will be given to the role of computer experimentation in mathematics and to the design of laboratory space and appropriate choice of equipment.

**SWENSON, Carl.** Seattle University  
**"The Latest News on Mathematica"**  
 2:00-2:50 Friday Ballroom 3  
 A summary of the new Version 2 Mathematica, demonstration of animations to teach calculus, and an annotated bibliography will be distributed.



## History of the Washington Community College Mathematics Retreat

1991	Pierce College and Tacoma Community College	Lake Chelan
1990	Clark College	Alderbrook
1989	Bellevue Community College	Lake Chelan
1988	Olympic Community College	Port Ludlow
1987	Lower Columbia College	Alderbrook
1986	North Seattle Community College	Alderbrook
1985	Shoreline Community College	Sun Mountain
1984	Green River Community College	Alderbrook
1983	Olympic Community College	Port Ludlow
1982	Highline Community College	Lake Chelan
1981	Spokane Falls Community College	Sun Mountain
1980	Spokane Falls Community College	Sun Mountain
1979	Olympic Community College	Port Ludlow
1978	Edmonds Community College	Providence Heights
1977	Shoreline Community College	Providence Heights
1976	Bellevue Community College	Snoqualmie Pass
1975	Highline Community College	Providence Heights
1974	Shoreline Community College	Lake Wilderness
1973	Seattle Central Community College	Snoqualmie Pass
1972	Everett Community College	Snoqualmie Pass
1971	Everett Community College	Snoqualmie Pass
1970	Spokane Falls Community College	The Lodge
1969	Green River Community College	The Lodge

The first Washington Community College Mathematics Retreat was held in 1969. It was organized by Phil Heft, Larry Larson, Jim Relf, and John Van Druff. 33 participants met at "The Lodge" at Ashford with sleeping bags. The cost was \$16.68 per person.

### Future Retreat Hosts

1992	<i>Yakima Valley Community College</i>
1993	<i>Highline Community College</i>
1994	<i>South Seattle Community College</i>
1995	<i>Skagit Valley Community College and Whatcom Community College</i>

Notes

Notes

CALVIN & HOBBS

