1989

Washington

Community

College

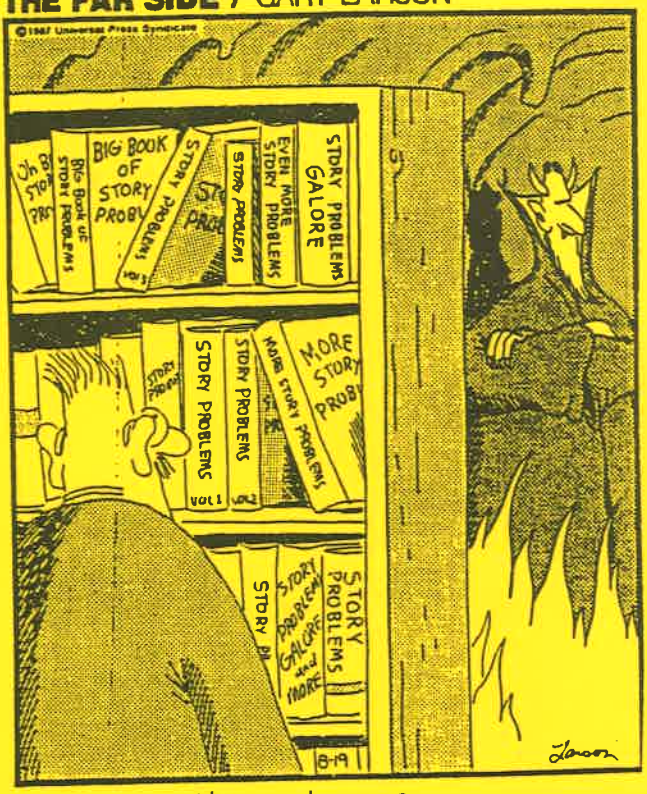
Mathematics

Retreat

Campbell's Resort
Lake Chelan

April 20 – 22

THE FAR SIDE / GARY LARSON



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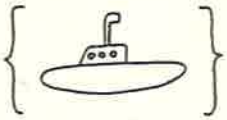
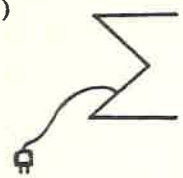
TRIVIA MATHEMATICA

Play alone or play as a group.
Win a book for your personal collection or school library.
Prizes will be awarded at lunch on Saturday.

1. Besides his Rule, what else is L'Hopital famous for?
2. Where was Georg Cantor when he died?
3. Who is "the father of fractals?"
4. V - E + F = ?
5. What is Underwood Dudley's Erdös number?
6. What calculus book was used by Jaime Escalante's class in the motion picture "Stand and Deliver?"
7. Who wrote *"Beauty is the first test; there is no permanent place in the world for ugly mathematics."* ?
8. Name two Fields Medalists.
9. Translate. (Each Rebus represents the name of a mathematical obj

(a) 

(b) 

10. Identify.

(a) 

(b) 

ANSWER SHEET

Tear out this page.
Turn in your answers at breakfast on Saturday.

Name _____ School _____

1. _____

2. _____

3. _____

4. _____ 5. _____

6. _____

7. _____

8. _____ _____

9. (a) _____ (b) _____

10. (a) _____ (b) _____

TIE-BREAKER: (scored subjectively in case of tie)
If mathematicians were in charge of the movie industry, they might produce films like "Raiders of the Lost Arctan." If mathematicians controlled the paperback novel business, what title might we look forward to on the best seller lists?

Notes

SCHEDULE OF EVENTS

Thursday, April 20

5:00 - 7:00 pm	Registration (dinner on your own)
7:00 - 8:30 pm	Talks (Ballroom 3)
9:00 - ?:00 pm	Hospitality (River Room) Movie: "Stand and Deliver" (Auxiliary Conference Center) Videotapes: For All Practical Purposes (Edmunds Room)

Friday, April 21

8:00 - 9:15 am	Continental Breakfast (Ballroom 1)
9:30 - 11:00 am	Talks (Ballrooms 2 and 3)
11:30 - 12:45 am	Lunch (Auxiliary Conference Center)
1:00 - 4:30 pm	Afternoon Talks (Ballrooms 1, 2, and 3)
6:00 - 7:00 pm	No host cocktails (Ballroom foyer)
7:00 - 9:00 pm	BANQUET (Ballroom) + **"Mathematical Cranks"** by Underwood Dudley
9:00 - ?:00 pm	"Stand and Deliver" (Ballroom 3) For All Practical Purposes (Edmunds Room) applied probability

Saturday, April 22

7:30 - 8:15 am	Breakfast Buffet (Dining Room)
8:30 - 11:30 am	Talks (Ballrooms 1, 2, and 3)
12:00 - 1:15 pm	Lunch (Auxiliary Conference Center)
1:30 - ?:00 pm	WAMATYC meeting

Thursday Evening

Ballroom 3

7:00 – 7:40 pm	"Numeration as a Precursor to Writing" David Stacy, BCC
7:50 – 8:30 pm	"Problem Solving: A Useful Tool in Everyday Life" Gail Nord, GU
9:00 pm	"Stand and Deliver" movie and For All Practical Purposes videos + applied probability practice

Friday Morning

	Ballroom 2	Ballroom 3
9:30 – 10:00 am	"Strategies for Success with Developmental Classes" David Hemme, SCCC	"Another Look at the Countability of the Rationals" Andre Yandl, SU
10:30 – 11:00 am	"Effective Student Placement Testing" Stephen Hinthorne, CWU	"Oddities About Triangular Numbers" James Jordan, WSU

Friday Afternoon

	Ballroom 1	Ballroom 2	Ballroom 3
1:00 – 1:45 pm	"The Mathematical Modeling of a Slash Burn" Phil Heft, GRCC	"Limit Cycles in First Order D.E.s" Susan Gardsbane, WWU	"Working a Straight Line Through Rough Terrain" Dick Clark, PCC
2:00 – 2:45 pm	"Dollar–Cost Averaging: Does It Really Work?" Elmar Zemgalis, HCC	"For What n is $a^n \cong a \pmod n$, $\forall a$?" Martin Haines, OC	"Calculus for a New Century: A Report" Dale Hoffman, BCC
3:00 – 3:45 pm	"The Largest Pyramidal Box" Larry Larson, GRCC	"Highly Composite Numbers" John Reay, WWU	"An Exceptional Class For Exceptional Students" Dorothy Crepin, CC

East-West Room (upstairs)

4:00 – 4:30 pm	"What's Happening At The U of W?" Casper Curjel, UW

Saturday Morning

	Ballroom 1	Ballroom 2	Ballroom 3
8:30 –9:15 am	"A Computer Algorithm for Solving Alphametics" Mark Parker, ShCC	"Mathematics Competitions" Jim Relf, BCC	"Applications of Linear Algebra" Rich Levin, WWU
9:30 – 10:15 am	"Mathematical Computer Graphics" Yves Nievergelt, EWU	"The Normal to the Curve Represented by the Equation if $y = x + \sin(xy)$ then dy/dx; or What Happened saturday, March 12, 1988." Louis Leithold, PU	"Tic–Tac–Toe in Higher Dimensions" Norm Lindquist, WWU
10:45 – 11:30 am		"Multivariable Calculus — Some Points of View" Casper Curjel, UW	"Monsters, Dragons, and Chaos" Dave Hiestand, Boeing

ABSTRACTS

(alphabetical by presenter)

CLARK, Dick. Portland Community College

"Working a Straight Line Through Rough Terrain"

1:00 - 1:45 Friday Ballroom 3

Too often we teach integrated topics as isolated entities. The real number line is an ideal thread to weave through freshman and sophomore mathematics. Exploiting the critical point concept in this context can reduce fear and frustration.

CREPIN, Dorothy. Clark College

"An Exceptional Class for Exceptional Students"

3:00 - 3:45 Friday Ballroom 3

Novel experiences with a class of anxious math avoiders. Material from pre-algebra through intermediate algebra was covered in three quarters. A multi-faceted approach proved effective -- video tapes, group activities, personal journals, frequent class evaluations, exercises to alleviate anxiety, innovative testing procedures.

CURJEL, Casper. University of Washington

"What's Happening at the U of W?"

4:00 - 4:30 Friday East-West Room

An informal discussion of the U of W's changes in calculus, linear algebra, and differential equations curricula. What they are, and how they're working.

CURJEL, Casper. University of Washington

"Multivariable Calculus -- Some Points of View"

10:45 - 11:30 Saturday Ballroom 2

In multivariable calculus even solid students have difficulties working problems that are moderately different from those done in class. It cannot all be the students' fault. This is a report on attempts to restructure some of the material and its presentation.

DUDLEY, Underwood. DePauw University

"Mathematical Cranks"

8:00 - 9:00 pm Friday Ballroom

When mathematical cranks are mentioned, most people think only of angle trisectors, circle squarers, and perhaps provers of Fermat's Last Theorem, and dismiss them with, "Oh, those nuts" or something similar. This is too narrow a view. Mathematical cranks are of all sorts and they attack an amazing variety of problems (and non-problems). This talk aims to give a survey of this rich and little-known field.

GARDSBANE, Susan. Western Washington University
"Limit Cycles in First Order Differential Equations"
1:00 - 1:45 Friday Ballroom 2
Hilbert's 16th problem asks for the number and position of limit cycles of first order differential equations. A summary of recent research on the problem, examples, and some surprising results for differential equations of degree two.

HAINES, Martin. Olympic College
"For What n is a^n = a(mod n), for all a?"
2:00 - 2:45 Friday Ballroom 2
Prime numbers have this property. We'll see which composite numbers do. It will be truly elementary, with an almost incidental bit of group theory. The significance is dubious! Teaser: n = 1729 = 7x13x19 is such a value.

HEFT, Phil. Green River Community College
"The Mathematical Modeling of a Slash Burn"
1:00 - 1:45 Friday Ballroom 1
The forest service sometimes hangs instruments over a slash burn to get data on temperature, vertical velocities of the air, and the combustive products produced. The intensity of the fire can then be modeled as a function of time.

HEMME, David. Seattle Central Community College
"Strategies for Success with Developmental Classes"
9:30 - 10:00 Friday Ballroom 2
Overcoming anxiety. Ideas that work with remedial, technical, and lab courses.

HIESTAND, David. Boeing Company
"Monsters, Dragons and Chaos"
10:45 - 11:30 Saturday Ballroom 3
A non-technical discussion of fractals and their use in landscapes, image compression, and chaos theory. This computer slideshow-like presentation includes dramatic pictures of the Mandelbrot Set, Julia sets, and chaotic dynamic systems.

HINTHORNE, Stephen. Central Washington University
"Effective Student Placement Testing"
10:30 - 11:00 Friday Ballroom 2
How do we effectively ensure correct placement in the mathematics curriculum for incoming, first-time and transfer students? How do the present tests measure up? Do students who pass succeed?

HOFFMAN, Dale. Bellevue Community College
"Calculus for a New Century: A Report":
2:00 - 2:45 Friday Ballroom 3
What's all the fuss? Who's trying what? What are the early results? Where is it going? This is a report by an attendee at the Calculus for a New Century Conference (November, 1987) and the MAA-AMS Winter Meeting (January, 1989).

JORDAN, James. Washington State University
"Oddities About Triangular Numbers"
10:30 - 11:00 Friday Ballroom 3
When represented in odd bases, triangular numbers (1,3,6,10,15,....) have many interesting properties. For example, in base twenty-five, the numbers represented by 3, 33, 333, 3333, ... are all triangular numbers.

LARSON, Larry. Green River Community College
"The Largest Pyramidal Box"
3:00 - 3:45 Friday Ballroom 1
Maximizing the volume of the frustrum of the pyramid formed by removing wedge-shaped pieces from the corners of a square and folding up the sides.

LEITHOLD, Louis. Harper & Row ,Inc./Pepperdine University
"The Normal to the Curve Represented by the Equation if $y = x + \sin(xy)$ then dy/dx; or What Happened Saturday, March 12, 1988."
9:30 - 10:15 Saturday Ballroom 2
This is the actual title! I did not make a typing error. The title will make sense when you hear the presentation.

LEVIN, Richard. Western Washington University
"Applications of Linear Algebra"
8:30 - 9:15 Saturday Ballroom 3
Some interesting applications of linear algebra which can be used to motivate the study of this subject. Cubic splines, partial differential equations, and systems of non-linear equations.

LINDQUIST, Norm. Western Washington University
"Tic-Tac-Toe in Higher Dimensions"
9:30 - 10:15 Saturday Ballroom 3
Using the game of tic-tac-toe as a model for higher dimensions. The participants will learn how to play 4-dimensional tic-tac-toe.

NIEVERGELT, Yves. Eastern Washington University
"Mathematical Computer Graphics (not necessarily on the HP-28S)"
9:30 - 10:15 Saturday Ballroom 1
This is a preview of a minicourse to be given in June at MIT. (1) 3D-graphics in calculus; (2) fractals from precalculus through analysis; (3) cubic splines in linear algebra. This show demonstrates theory, exercises for students, and supercalculator programs.

NORD, Gail. Gonzaga University
"Problem Solving: A Useful Tool in Everyday Life"
7:50 - 8:30 Thursday Ballroom 3
We will examine the Tower of Hanoi, an integer path problem, and a checkerboard problem. We will examine the tools of subgoaling, proof by contradiction, and working backwards.

PARKER, Mark. Shoreline Community College
"A Computer Algorithm for Solving Alphametics"
8:30 - 9:15 Saturday Ballroom 1
An algorithm, implemented in Apple Pascal, for solving the word addition problems that appear often in the daily newspaper. How the basic algorithm can be helped along in the most difficult problem types.

REAY, John. Western Washington University
"Highly Composite Numbers"
3:00 - 3:45 Friday Ballroom 2
Intuitively, an integer is highly composite if it has 'lots' of divisors. To give small integers a fair chance, we say that n is highly composite if it has more divisors than any smaller positive integer. How many HCN's are there? Is there an efficient algorithm for identifying HCN's? Come help answer these and other interesting questions about HCN's.

RELF, Jim. Bellevue Community College
"Mathematics Competitions"
8:30 - 9:15 Saturday Ballroom 2
What is the NATIONAL STUDENT MATHEMATICS LEAGUE, and how do you get involved? Participating in AMATYC sponsored math competitions has inspired a surprising amount of student enthusiasm and some entertaining professional development for the faculty. Examples of typical test questions will be presented.

STACY, David. Bellevue Community College
"Numeration as a Precursor to Writing"
7:00 - 7:40 **Thursday** **Ballroom 3**
Recent investigation has serendipitously revealed that early counting with "tokens" evolved into the pictographic writing of the Sumerians.

YANDL, Andre. Seattle University
"Another Look at the Countability of the Rationals"
9:30 - 10:00 **Friday** **Ballroom 3**
We derive a closed formula which defines a 1-1 function from $I \times I$ onto I.

ZEMGALIS, Elmar. Highline Community College
"Dollar-cost Averaging: Does It Really Work?"
2:00 - 2:45 **Friday** **Ballroom 1**
Investment counsellors advocate dollar-cost averaging as an investment strategy. A mathematical analysis of their claims leads to some rather difficult, novel, and intriguing conjectures involving inequalities and multiple integrals.

A VERY BRIEF HISTORY OF THE WASHINGTON COMMUNITY COLLEGE MATHEMATICS RETREAT

YEAR	HOST	LOCATION
1989	Bellevue Community College	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	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	?	?
1972	?	?
1971	?	?
1970	Spokane Falls Community College	Snoqualmie Pass
1969	Green River Community College	?
1968	?	?
1967	?	?

1966 The first Washington Community College Mathematics retreat was organiaed by **Phil Heft, Larry Larson, Jim Relf,** and **John VanDruff.** 33 participants met at the "lodge" at **Ashford** with sleeping bags. The cost was $16.68 per person.

??? Do you see any errors in this chronology? Can you fill in any of the blanks? Hand or mail your corrections and additions to Larry Curnutt, Bellevue Community College.

Notes

Members of the mathematics faculty at Bellevue Community College have enjoyed organizing the 1989 Washington Community College Mathematics Retreat for you. Even more, we enjoy passing the responsibility on to_____?_____for 1990.

We would like to extend special thanks to our guests

UNDERWOOD DUDLEY and
LOUIS LEITHOLD

for their contributions to this conference; to

HARPER & ROW PUBLISHERS

for underwriting Professor Leithold's participation; to

MCGRAW-HILL BOOK COMPANY and
JOHN WILEY & SONS

for donating some of the prizes for the trivia game; and to

ALL OF YOU

for your good company and continued support of this little gathering (going on twenty-five years, now!).

See you next spring at _____?_____.