

# Mathematics Council NEWSLETTER

The Alberta Teachers' Association

Volume 10

Number 1

October 1991

## From the Editor

Teaching children mathematics involves much more than teaching them the basic facts. Their early experience with mathematics does much to determine their future attitudes toward, and achievement in, mathematics. The following statement, developed by the Instructional Issues Advisory Committee and approved by the NCTM Board of Directors, does an excellent job of outlining what a comprehensive early childhood mathematics program should involve.

### **NCTM Position Statement: Early Childhood Mathematics**

The National Council of Teachers of Mathematics believes that early childhood mathematics education for young children aged three to eight should be developmentally appropriate. With developmentally-appropriate instructional practices, the mathematics learning environment takes into account the social, emotional, physical and intellectual needs of young children. Because young children actively construct knowledge, instruction should concentrate on facilitating learning through exploration and interaction with materials and people. In early childhood mathematics, how and when the curriculum is taught is as important as what is taught. Thus endorsing a developmental philosophy for early childhood mathematics education suggests reorganizing classroom practices around the child as a whole rather than allowing materials and rigid time lines to dictate instruction. Furthermore, early childhood mathematics instruction should foster a positive environment, provide equal access for all children, and take into account cultural and ethnic diversity.



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EDMONTON, ALBERTA T5K 0L2

The NCTM thus recommends developmentally-appropriate curriculum and evaluation guidelines for early childhood mathematics instruction that aim to

- \* acknowledge and build on children's accumulated knowledge including children's experiences, language, and relevant real-world contexts;
- \* incorporate active and interactive learning. Children's understanding develops as they explore, investigate and discuss mathematical concepts. Physical and mental interactions with the environment, including materials and other people, give children opportunities to construct, modify and integrate their ideas;
- \* offer opportunities for children to develop and expand language acquisition while structuring, restructuring and connecting mathematical understandings. Concepts should be repeatedly experienced through concrete, visual, verbal and pictorial formats. Gradually, children should be encouraged to translate and record their experiences in more abstract representations;
- \* be concept and problem-solving oriented. The classroom environment should provide for the regular study of mathematics, focusing on the development and integration of mathematical thinking, reasoning and understanding, and on relationships, through concrete problem-solving experiences. Mathematical concepts should be integrated with other subject areas, making use of natural connections wherever they occur;
- \* develop children's confidence in their mathematical abilities. Varied instructional strategies, meaningful child-related contexts, and opportunities for active participation in the learning process encourage children to become capable mathematical thinkers and to believe in themselves as such;
- \* include ongoing assessment. Teachers should make instructional decisions based on the progress of the children in their classroom. The latter is determined through formal and informal assessment of each child's pattern of growth. Evaluation strategies such as observations, interviews and portfolios give evidence of children's thinking processes and their understanding of concepts.

The NCTM recommends that those who produce, select and purchase children's mathematics curriculum materials support developmentally-appropriate early childhood mathematics programs. Guidelines for early childhood mathematics education encourage a child-centred approach to instruction. Preference should be given to mathematical learning environments that support active participation where children learn through observation, exploration, verbalization, and hands-on experiences. The focus of instruction should be on the continuous development of mathematical processes and language through activities that gradually increase in difficulty, complexity and challenge as children develop understanding and skills. Developmentally-appropriate early childhood mathematics instruction should meet the needs of individual students at different stages of readiness by considering the influences of cultural backgrounds, previous experience, learning styles and cognitive abilities.

# Upcoming Events

## MCATA Annual Conference

October 31-November 2, 1991  
Edmonton Inn, Edmonton

Please see the attached registration form for more information on this conference, which should prove exciting and worthwhile. We hope to arrange a local P.D. day for November 1, to allow many teachers to attend.

## 1992 NCTM Annual Conference

Plan to attend the 1992 NCTM Annual Conference to be held in Nashville, Tennessee, on April 1-4, 1992. NCTM annual conferences offer excellent sessions and the opportunity to meet fellow math educators from around the world.

## “Catch 30” and “Catch 31”

“Catch 30” and “Catch 31” are appearing on ACCESS Network this fall. The dates are

“Catch 30”	Wednesdays, 11:30 a.m.	November 6-December 11 March 25-April 29
	Thursdays, 3:00 p.m.	September 12-October 17 January 30-March 5
“Catch 31”	Mondays, 3:00 p.m.	September 23-January 6 February 10-May 25

## “Catch 30”

Polynomial, exponential and logarithmic functions, arithmetic and geometric sequences and series, permutations and combinations, probability and statistics . . . these are some of the more difficult concepts tackled in the ACCESS Network instruction series “Catch 30.”

Designed for Grade 12, the content of this series of six mathematics video programs is based on the Alberta Math 30 curriculum and focuses on the more difficult concepts of the course, to aid students' conceptual understanding.

The programs are each 28:50 long and provide a variety of visual learning options. The concepts are presented in conventional classroom style by two teacher-presenters, and reinforced by means of sophisticated video graphics. The lessons are then reviewed in sequence by a narrator to reinforce the processes and the concepts covered.

The young program host presents historical information, real-life applications and problems that illustrate and use the math concepts.

#### **Program 1: Polynomial Functions**

Introducing the concept of polynomial functions, this program examines the general shapes of third and fourth degree polynomial functions and their characteristic graphs, as well as functions having complex zeros and zeros of two and three multiplicities, and their graphs. Finally, it investigates a procedure for determining the defining equation of a function from its graph.

#### **Program 2: Exponential and Logarithmic Functions**

In this program, the characteristic shapes of the exponential and logarithmic functions are examined and their similarities are compared. Problems involving exponential growth and exponential decay are examined. As well, problems involving logarithmic equations are solved by applying the properties and laws of logarithms.

#### **Program 3: Arithmetic Sequences and Series**

This program introduces the concepts and applications of sequences and series, and examines arithmetic sequences and series in detail. Terms of a sequence are defined by functions and recursive formulae, and are symbolized by sigma notation. Formulae for arithmetic sequences and series are developed and used to solve problems.

#### **Program 4: Geometric Sequences and Series**

In this program, the concepts and applications of geometric sequences and series are examined. The general-term formulae for geometric sequences and the sum formulae for geometric series are developed and applied to problems.

#### **Program 5: Permutations and Combinations**

This program develops the concepts and applications of the fundamental counting principle, permutations and combinations. The similarities and differences between permutations (arrangements) and combinations (selections) are examined in detail, together with applications of combinations including Pascal's triangle, the binomial theorem, and problems involving probability.

#### **Program 6: Statistics**

This program reviews measures of central tendencies, mean, median and mode, and measures of dispersion, range and standard deviation. The concepts of z-scores, the standard normal curve, confidence intervals, and problems involving bivariate data and scatterplots are developed and solved.

## **“Catch 31”**

ACCESS Network's 16-part video series "Catch 31" is designed to help students enrolled in Math 31 grasp the more difficult concepts in the curriculum. The series will assist distance learners and classroom students requiring additional insight into key concepts. These programs are 28:50 long and focus on the following areas:

Program 1: **Introducing Calculus and Vectors**

Program 2: **The Derivative by First Principles and the Power Rule**

Program 3: **The Chain Rule**

Program 4: **The Product and Quotient Rule**

Program 5: **Problems and Graph Sketching**

Program 6: **Maxima and Minima**

- Program 7: **Motion: Distance, Velocity and Acceleration**
- Program 8: **Derivatives and Relations**
- Program 9: **Related Rates**
- Program 10: **Integration**
- Program 11: **Areas Under or Between Curves**
- Program 12: **Vectors**
- Program 13: **Geometric Vectors**
- Program 14: **Algebraic Vectors**
- Program 15: **Dot Product and Projections**
- Program 16: **Resolution of Vectors**

Presented by three teachers and an enthusiastic host, the series features a variety of presentation styles and includes electronic graphics. To order "Catch 31," contact

In Alberta:

ACCESS Network  
Media Resource Centre  
295 Midpark Way SE  
Calgary, Alberta T2X 2A8

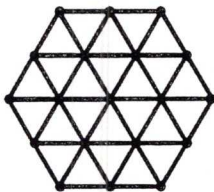
Outside Alberta:

ACCESS Network  
Program Services  
295 Midpark Way SE  
Calgary, Alberta T2X 2A8

Phone: 256-1100 Fax: 256-6837 Toll-free: 1-800-352-8293

## A Problem to Solve

by John J. Apalategui



Given:

1. There are 19 points of intersection in this figure.
2. There are also 15 lines: 6 lines with 3 points, 6 lines with 4 points, and 3 lines with 5 points.

Problem:

Assign values from 1 through 19 to the 19 points (without duplication), so that the sums of the points on each of the 15 lines are equal.

Send your solution, with the mathematical method you used, to the author at

6032 Stone Circle  
Huntington Beach  
CA 92647 USA

Good luck!

# Number Detective

by Bob Watson

Elementary Mathematics/Science & GATE Coordinator, St. James-Assiniboia School Division No. 2, Winnipeg

Use "sticky notes" to make a collection of numbers, for example, 85, 76, 123. (The numbers you choose will depend on the children's level of development.)

With the class seated, attach a number to each student's back. They will be detectives, and by asking questions will find out what number is on their backs.

## The Rules

1. Only ask questions that require a yes/no answer.
2. Ask each question of a different person.
3. Record the number of questions it takes to get your answer.

## An Example

- \* Is my number greater than 50?
- \* Is my number less than 125?
- \* Does my number have two digits?
- \* Is the number in the 10s place a 3?

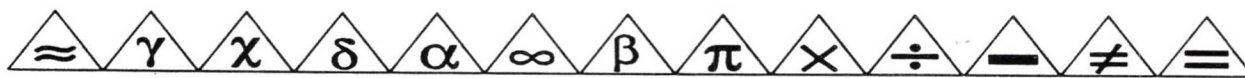
## *delta-K*

### Contributions Wanted!

The editors of delta-K invite submissions of manuscripts on any topic that they think will be of interest to readers. Any well-written article will be considered for publication. Contact the editors for more information or submit your typewritten, double-spaced copy to:

Craig Loewen  
414 25 Street  
Lethbridge T1J 3P3  
Res. 327-8765  
Bus. 329-2396

John Percevault  
2510 22 Avenue S  
Lethbridge T1K 1J5  
Res. 328-1259



# Delegate's Report of the 1991 NCTM Annual Conference

by Bob Hart, President

It was my privilege to be the MCATA delegate to the 69th NCTM annual meeting held in New Orleans, April 17-20, 1991. The theme of the conference was "The NCTM Standards: New Dimensions in Leadership."

Resolutions discussed and passed included:

1. That the NCTM promote the development of a bank of sample assessment activities for classroom use, reflecting the Standards' philosophy of real-life applications in a problem-solving context.
2. That the NCTM reimburse substitute time for any classroom teacher serving as an NCTM member.
3. That the NCTM research and publish a position paper that encourages the educational, business and legislative communities to provide the support necessary for teachers to participate in professional activities as members and leaders.

The conference program featured 750 sessions, many of which were workshops or MAPS (math action planning sessions). These sessions dealt with topics from the Curriculum and Evaluation Standards. The participants worked in teams designing classroom activities for a particular topic at a specific grade level.

Much emphasis was placed on reading and writing in math, on statistics, on probability, and on graphing activities. Many sessions focused on the use of manipulatives, technology and calculators.

I noted the following important events:

- \* The International Conference of Mathematics Education-7 (ICME-7) will be held at the Université Laval, Québec, during August 16-23, 1992. Registration brochures are available from:  
ICME-7 Congress  
Université Laval  
Québec, Québec  
G1K 7P4
- \* The 70th NCTM annual meeting will be held in Nashville, Tennessee, on April 1-4, 1992.
- \* The next NCTM regional will be held in Montréal, on August 23-25, 1992.



# The Right Angle

by Florence Glanfield

Examination Manager, Mathematics 30

Welcome to the 1991-92 school year! Hope you had a great summer!

## Senior High Mathematics

By now, you should have received the May 1991 version of the Mathematics 30 and 31 courses of studies, the Mathematics 30/33 Interim Teacher Resource Manual (mailed in June), and the supplement (mailed in September). If you have not received the supplement to the Teacher Resource Manual, please contact the Curriculum Branch at the phone number below. The supplement provides you with information on the Mathematics 30 unit Quadratic Relations.

The Mathematics 30 Bulletin is in the mail to schools right now. It provides information on the 1992 series of Mathematics 30 Diploma examinations. Its special feature is the inclusion of both Curriculum and Assessment standards. The Curriculum Standards attempt to clarify the intent of the curriculum for students who achieve 50 percent in Mathematics 30 and for those who achieve 80 percent. The Assessment Standards use the Curriculum Standards to provide examples of what students can do if they achieve 50 percent in Mathematics 30. I believe they will assist in implementation of the Mathematics 30 course. The plan is to establish exam standards for the other high school mathematics courses.

Several people work in mathematics education at Alberta Education. If you have specific inquiries about course development, resource availability or examination development, or require general information, please do not hesitate to contact one of the following people:

### Curriculum Branch

Elementary Mathematics - Mary Anne Nissen 427-2984  
Secondary Mathematics - Hugh Sanders 427-2984

### Student Evaluation Branch

Grades 3, 6, 9 Achievement - Nola Aitken 427-0010  
Mathematics 30 - Florence Glanfield 427-2948

### Language Services Branch

Ghiselaine Lavergne 427-2940

### Grande Prairie Regional

Cindy Meagher (office) 538-5130

### Edmonton Regional

Dick Daly, Art Peddicord (office) 427-2952

### Red Deer Regional

Ron Babiuk (office) 340-5262

### Calgary Regional

Pat McLaughlin (office) 297-6353

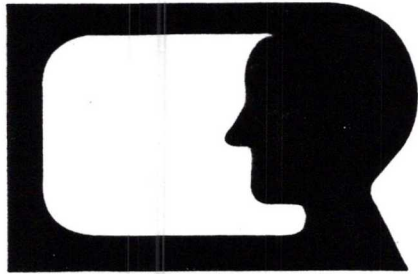
### Lethbridge Regional

Gary Hill (office) 381-5243

If you require additional information, please contact Florence Glanfield at 427-2948 or Fax 422-4200.



## Media Literacy Conference Features International Speakers



*Survival Skills in the Nineties*, a unique conference on media and information literacy, will feature keynote speakers from Canada, the United States and Great Britain.

The conference will be held in Edmonton at the University of Alberta on **November 1 and 2, 1991**. *Survival Skills in the Nineties* will examine the effects of media and information technologies.

The latest speaker to be confirmed for the conference is **Cary Bazalgette** from London, England. She is the deputy director of education for the British Film Institute and will provide the wrap-up address. She will comment reflectively on the conference and place it in the perspective of the British experience which, for 20 years, has integrated media education in schools and universities.

Other keynote speakers:

- **John Pungente**, from Ontario, highly regarded in Canada for his work in media literacy, will provide a keynote address on "New Directions in Media Literacy Education." He has studied media literacy internationally with respect to its implications for curriculum design.
- **Vicki Hancock**, of the Association for Supervision and Curriculum Development, will come from Virginia to present a keynote address defining media and information literacy. She will describe the critical skills needed for survival in the '90s.
- **Robert Kubey**, of Rutgers University in New Jersey, will deliver a keynote session on "How Viewing Shapes Everyday Life: The Case for Media Education." He will address problems with television and suggest how audiences can gain more from the media.
- **Rick Gruneau**, a professor at Simon Fraser University, B.C., will introduce concepts of applying media literacy skills in active and constructive ways.

In addition, concurrent sessions during the conference will relate to media, technology and education. Computers, culture, television and global issues will be among the topics discussed. Living in the '90s means more than just being able to read and write. Survival skills in the '90s demand that we learn how to cope with a variety of media and information technologies. High-speed information delivery and immediate access to information demand new skills of learners. New tools of communication have given new power to the users.

The conference is sponsored by the University of Alberta Chapter of Phi Delta Kappa as well as by several co-sponsors and educational organizations in Alberta. For conference registration and details, contact:

**Media Literacy Conference**  
c/o Karen McAmmond  
324 Weber Way  
Edmonton, AB T6M 2H3

**For information**, contact conference chair **Wayne Blair** at (403) 427-8225 (Edmonton) or program co-chair **Holly Slavik** at (403) 495-6411 (Edmonton) during the work week. The advance registration fee (before **October 9**) is only \$95. On-site registration (space permitting) is \$125. Early sign-up is highly recommended as conference registration is limited to 230. **To register**, mail a cheque made payable to Phi Delta Kappa, U of A chapter, to the above address.

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# MATHEMATICS: A Meaningful Mosaic

Mathematics Council of  
The Alberta Teachers' Association

## ANNUAL CONFERENCE

Edmonton Inn, Edmonton, Alberta  
October 31 - November 2, 1991

### Keynote Address

Don Fraser, University of Toronto

Elementary—Junior High—Senior High

- |  |  |
|--|--|
| <input type="checkbox"/> 50 sessions   | <input type="checkbox"/> Meet colleagues and discuss ideas with your peers in the hospitality suite  |
| <input type="checkbox"/> 20 workshops  | <input type="checkbox"/> Wine and cheese following Thursday evening's keynote address  |
| <input type="checkbox"/> Preview the latest resource materials and instructional aids                        | <input type="checkbox"/> Friday night "Beach Party"—dinner and dance, activities, prizes, contests, surf simulator, beach attire appropriate |
| <input type="checkbox"/> "Take It and Use It"—featuring cooperative learning, hands-on, and learning centres |  |

### Conference Co-chairs

Bryan A. Quinn, 6 Greenhill Street, St. Albert, Alberta T8N 2B4 (403)460-7733  
C. Marie Hauk, 315 Dechene Road, Edmonton, Alberta T6M 1W3 (403)487-8841

## Program

### Thursday, October 31

1830-2030	Registration
1930-2000	Welcome and Annual General Meeting
2000	Keynote Address by Don Fraser
	Wine and Cheese following Keynote Address

### Friday, November 1

0800-1600	Registration
0830-1600	Workshops and Sessions
0830-1600	Exhibits and "Take It and Use It"
1730-1830	Reception (no-host bar)
1830-2400	Dinner and Beach Party

### Saturday, November 2

0800-0900	Registration
0830-1430	Exhibits and "Take It and Use It"
0830-1600	Workshops and Sessions

## Socials

Wine and Cheese Reception (Thursday evening)

Hospitality Suite

No-Host Reception (Friday evening)

Dinner and Beach Party (Friday evening)—includes dinner, dancing, games and prizes, surf simulator, beach attire optional

## Exhibits

See the newest instructional aids and resource materials  
NCTM materials

## "Take It and Use It"

Something for all to take and use

- cooperative learning
- hands-on
- learning centres

## Program Overview

### Some of Our Speakers

Jeff Bisanz	Barry Onslow
Don Fraser	David Pimm
Tom Kieren	Yvonne Pothier
Barbara Morrison	Jan and Barry Scully
James Muldowney	Katherine Wilson
Mary Anne Nissen	

### Topics

- Mathematical Chaos in the Math Class
- Cross-Cultural Assessment
- Fractals
- Writing to Learn Mathematics
- Chaos for Beginners
- Relational Understanding
- Cooperative and Active Learning
- Logo Communication
- NCTM "Standards"
- Mathematical Literacy
- Language and Learning in Math
- Using Discussion to Build Meaning
- Graphs on Calculators
- Thinking on Your Feet
- Computer Simulations
- Round-Table Discussions
- Group Discussions

## Accommodation

Special conference rates have been arranged with the Edmonton Inn.

single and double	\$66	Rates do not include
triple	\$76	accommodation tax
quadruple	\$86	and GST.

Please make your own arrangements for accommodation with the hotel. Request the Mathematics Council conference rate.

To make reservations call 1-800-661-7264 (toll free), or write to the Edmonton Inn at 11830 Kingsway Avenue, Edmonton, AB T5G 0X5.

## Registration

Full registration includes workshops, sessions, wine and cheese reception on Thursday, and GST.

MCATA Member	Before October 1	\$75	<input type="checkbox"/>	Non-MCATA members add:	
	After October 1	\$85	<input type="checkbox"/>	Regular Membership	\$25 <input type="checkbox"/>
Student Member		\$25	<input type="checkbox"/>	Affiliate Membership	\$30 <input type="checkbox"/>
Friday Beach Party ticket(s) _____ @		\$25	<input type="checkbox"/>	Student Membership	\$5 <input type="checkbox"/>

Cancellation Fee \$15

Name: \_\_\_\_\_

Address: \_\_\_\_\_ Postal Code \_\_\_\_\_

School: \_\_\_\_\_

Phone: \_\_\_\_\_ (home) \_\_\_\_\_ (school) Teacher Certificate No. \_\_\_\_\_

Make cheques payable to: Mathematics Council, ATA

Mail registration to: Conference Centre, Room 103, Lister Hall, University of Alberta, Edmonton T6G 2H6