JUN 21 1988

Mathematics Council NEWSLETTER

The Alberta Teachers' Association

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ISSN 0823-117

Volume 6 Number 4 June 1988

From the Editor

by Art Jorgensen

As another school year draws to a close, it is time to reflect on the past and look ahead to the future.

The school year has been busy and exciting. The MCATA annual conference held last fall in Calgary was successful because of the efforts of many people. So successful, in fact, that the MCATA membership rose to over 700, the highest on record. The executive hopes that all the members have found their involvement to be rewarding and that they will renew their memberships.

Next fall's conference is already being planned. To date, approximately 50 speakers have agreed to make presentations in over 80 sessions. The conference will be held at the Edmonton Inn from November 3 to 5, 1988. See you there!

Attached to this newsletter is a nomination form for Mathematics Educator of the Year. If you know of someone who deserves recognition, then please complete the form and send it to Bob Michie.

Remember, the speakers' list is available from Dick Kopan. I am certain that you will find someone to present a workshop on mathematics education.

NCTM's "Curriculum and Evaluation Standards for School Mathematics" is probably one of the most important documents relating to mathematics education. This document should chart the direction for mathematics education into the next century. Copies of the working draft are available from the NCTM, 1906 Association Drive, Reston, Virginia, 22091 United States.

I wish you all the very best for the summer. May you return to school rested, full of enthusiasm and ready for the most important job of all: teaching our children.

Behold! Your Age Revealed

by Boyd Henry

Few people realize how inextricably bound they are to the calendar. To prove my point, try the following exercise. You can use a calculator or, if you think that you are mathematically inclined, use a pencil and paper.

1. Begin by writing down this year.
2. Add the number of days in September.
3. Subtract the number of months in a year.
4. Subtract the year you were born.
5. Multiply by the number of years in two and one half decades.
6. Subtract the number of days in an ordinary year.
7. Multiply by the number of months with 30 days.
8. Subtract the number of days in a leap year.
9. Add the number of months in two years.
10. Multiply by the number of years in a half century.
11. Add the number of weeks in a year.
12. Multiply by the number of months that begin with M.
13. Add this year.
14. Divide by the number of months that have four or five letters in their spelling (you may have a decimal in your answer).
15. Divide by the number of months that do not have R in their spelling.
16. Add the number of months in a half year.
17. Divide by the number of years in a quarter century.
18. Divide by the number of hours in 1,500 minutes.

Behold! Your answer should be a mixed decimal. To the left of the decimal point is your age on your birthday this year. To the right of the decimal point is this year.

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Solving an Infinitely Nested Radical

by Martin H. Badke

Mathematics is fascinating, especially when a complex expression is reduced to a simple value. Such is the case with an infinitely nested radical like

$$x = \sqrt{2+\sqrt{2+\sqrt{2+\sqrt{2+}}}} \ldots$$

First, work from the bottom in layer and look for a pattern.

For example, $x_1 = \sqrt{2} = 1.414$

$x_2 = \sqrt{2+\sqrt{2}} = 1.848$

$x_3 = \sqrt{2+\sqrt{2+\sqrt{2+}}} = 1.962$

$x_4 = \sqrt{2+\sqrt{2+\sqrt{2+\sqrt{2+}}}} = 1.990$

X = 2 was confirmed by inspection and by rounding error on my calculator. This method is practical for students who are comfortable working with square roots and calculators. The method can also be used as a simple computer program using iteration because it converges quickly. "Brute force" would be an apt description of this method. A simpler approach is available but requires a foundation in quadratic equations.

If $x = \sqrt{2+\sqrt{2+\sqrt{2+}}} \ldots$ then we can square both sides to remove the outermost root sign:

$$x^2 = 2 + \sqrt{2+\sqrt{2+}} \ldots$$

The final term is <u>still</u> a string of infinitely nested radicals, which allows us to substitute in x.

$$x = 2 + x$$
$$x - x - 2 = 0$$
$$(x - 2)\ (x + 1) = 0$$
$$x = 2 \quad x = -1$$

The first solution (x = 2) was no surprise, but it took me a moment to see how x = -1 could result from my first method. I shall leave that to the reader.

Two variations that you might try to solve are

$$x = \sqrt{2\sqrt{2\sqrt{2\sqrt{2}}}} \ldots$$

$$x = \sqrt{2-\sqrt{2-\sqrt{2-\sqrt{2-}}}} \ldots$$

What's New?

Suggested Readings

Succeed with Math: Every Student's Guide to Conquering Math Anxiety by Sheila Tobias is designed to help students overcome their anxiety about math. The book costs $12.95 and is available from the College Board, 45 Columbia Avenue, New York, NY, 10023 United States. Telephone: (212) 713-8000.

The National Research Council recently issued a report entitled Education and Learning to Think by Lauren Resnick. The 62-page book defines higher-order skills, places them in a historical perspective and surveys current efforts to teach them. Problems of assessment and teaching strategies are also examined. To order, send $6.50 (cheque, VISA, MasterCard or American Express accepted) to the National Academy Press, 2101 Constitution Avenue, NW, Washington, DC 20418 United States.

Fifty-six "make it-take it" ideas are included in a new publication from the Mathematics Council of The Alberta Teachers' Association. Edited by William Bober and John Percevault, the book includes everything from simple addition and subtraction to topics in algebra and geometry. To order your copy of Math Monograph No. 9, send $6 to The Alberta Teachers' Association, 11010 142 Street, Edmonton, Alberta T5N 2R1.

Courses

Teaching Secondary School Mathematics (ED CI 468) will be offered from July 4 to 22 by the Department of Secondary Education, University of Alberta. For information, contact the Registrar's office at 432-3113, or the Special Sessions office at 432-3753.

Junior High School Mathematics Workshop (Education 4053) will be offered from August 2 to 12 by the University of Lethbridge. The workshop is designed for those teachers who will be implementing the new junior high school mathematics program.

For information contact John Percevault at (403) 329-2250 (office) or 328-1259 (home), or Dr. E.E. Falkenberg at (403) 429-2441.

Resource people include John Percevault (course coordinator), Arthur Jorgensen, Marlo Steed, Hank Boer, Mary-Jo Maas and Craig Loewen.

The rationale for the program, problem solving issues relating to thinking skills and the language of mathematics will be explored. Estimation, alternate approaches, technology and application will be related to the following content areas: number systems and operations, ratio and proportion, measurement and geometry, data management and algebra.

Registration: The workshop may be taken as a credit course or as a general interest course.

Credit: This option is available to participants who wish to receive credit towards a university degree. Persons choosing this option must meet University of Lethbridge admission criteria and register with the Registrar's Office. Fee: $132 covers athletic, students' union and admission fees (as applicable).

Noncredit: This option is available to participants who do not wish to pursue university credit. Admission criteria do not apply; register with the Division of Continuing Education. Fee: $150

To register, please contact the Summer School Office, Division of Continuing Education, The University of Lethbridge, 4401 University Drive, Lethbridge, Alberta T1K 3M4. Telephone: (403) 329-2248

Computation: Sum Line-Up

The following is an excellent idea for engaging students in an action math activity. Reprinted from Arithmetic Teacher, December 1987, page 40. From the file of Jennifer Michaels, 611 South Park Avenue, Highland Park, New Jersey 08904, United States.

Materials
- sixty-three 27 x 16 cm cards on which the digits 0-20 are written
- two cards on which a "+" sign is written
- one card on which an "=" sign is written
- two cards on which a "-" sign is written

Procedure
Give each student a card. Mark on the floor ___ + ___ = ___. Place students with the "+" and "=" cards in their spots. The teacher gives an addition problem. Students holding the cards place themselves in the appropriate spots. After all the children have completed the example, the one holding the correct answer moves to complete the mathematical sentence.

Variations
1. Very young students can use concrete objects for computation.
2. Draw ___ + ___ = ___ + ___ on the floor. Call out two addends, like 2 and 5. The students move into position; the two students with 2 and 5 complete the sentence to get 2 + 5 = 5 + 2.
3. Use the format just described, but use different numbers on the right side, such as 2 + 5 = 3 + 4.
4. Use other operations besides addition.

Canada to Host 1992 Mathematics Congress

by John C. Egsgard

Editor's Note: John Egsgard is a mathematics teacher at Patrick Fogarty Secondary School, Orillia, Ontario.

Canada has been selected to host the Seventh International Congress for Mathematics Education, (ICME-7). This Congress will take place in Quebec City at Laval University in August 1992. Previous congresses were held in Lyons, France (1969), Exeter, United Kingdom (1972), Karlsruhe, West Germany (1976), Berkeley, United States (1980), Adelaide, Australia (1984) and Budapest, Hungary (1988).

In Quebec City, between 2,000 and 3,000 mathematics educators will gather to discuss the state of mathematics education worldwide, to share relevant mathematical educational research and to consider recommendations for the future.

ICMEs have a unique international atmosphere. Each country views the dynamics of the mathematics classroom differently, educates its teachers differently and values mathematical educational research differently. Thus, the congresses provide teachers (from kindergarten to university) with a forum for discussion and for sharing ideas with colleagues and with educators involved in educational research.

I have attended all six congresses and have found them worthwhile. I met teachers from all over the world, shared information with them and returned to school with ideas that worked in other countries.

Many teachers from the host country assist in organizing and running the congress. In this way, the congresses are similar to provincial meetings; success depends in large measure on the volunteers from the schools. For this reason, the Mathematics Council's help in publicizing the congress would be greatly appreciated. In addition to publicizing the congress, I encourage the Mathematics Council to send representatives to the congress. I am certain that many Albertan teachers will contribute to its success.

Cook: "Do you want me to cut this pizza into six or eight pieces?"
Customer: "You'd better make it six . . . I don't think I can eat eight pieces!"

. . . . . .

A father was examining his son's report card. "One thing is definitely in your favor," he announced. "With this report card, you couldn't be cheating."

Mathematics Educator of the Year
Nomination Form

Nominee's Name: _____ Phone: _____

Home Address: _____

School Address: _____

Present Position: _____

_____

_____

_____

_____

_____

Nominated by: _____ Phone: _____

Address: _____

Date: _____

The award will be presented at the annual MCATA conference.

Mail nomination form before September 11, 1988, to:

Bob Michie
Chairperson,
Award Selection Committee
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