ABACUS

A PUBLICATION OF THE
ONTARIO ASSOCIATION for MATHEMATICS EDUCATION

OAME

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Ontario Association for Mathematics Education

Conference Co-chairmen

H. A. ALLEN
Faculty of Education
Queen's University

W. G ANGLIN
Ministry of Education
Kingston

Presentations, Workshops and Educational Displays will be held for:

Elementary and Secondary Schools
Faculties of Education
Universities
Community Colleges

PLAN NOW TO ATTEND

MAY 10, 11, 12, 1974

Quotes From Exeter

"The ideas should be born in the student's mind and the teacher should act only as a midwife"

— Socrates

[Liberally translated by George Polya at last year's Exeter Conference]

YOUR MEMBERSHIP IN OAME INCLUDES

THE ABACUS YOU CAN COUNT ON IT!

WRITE TO THE SECRETARY TREASURER

For other upcoming items of interest see inside back cover.

1973 - 74 EXECUTIVE

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FROM THE EXECUTIVE OF OAME

In order to share the expertise available within OAME, the executive requests that you complete and return the form on pages 7 and 8. This will enable you to make known the good ideas you have developed and provide resource contacts for others having interests in the same areas.

**At the bottoms of pages of this issue are items denoted by a pair of asterisks. These are statements from various OAME members in response to the question: "As you are involved in Mathematics education, what does Mathematics mean to you?" Send your reactions to these statements to Don Attridge, 1 Southdale Drive, Markham, Ontario.

The nominating committee of OAME wishes your assistance in continuing to find those among our membership with the interests and strengths of providing leadership in our association. The president-elect is John Egsgard from Twinlakes S.S. Orilla. Would you assist by sending in the names for vice-president, executive and council. (Clip the form at bottom of page 2.)

FROM THE EDITOR

- Copies of newsletters from other Mathematics Associations are much appreciated and you will note that from time to time we have borrowed items and given you credit. Samples of the Abacus are sent to a different list of our counterparts each issue and, we trust, meet with similar interest.

- Biofeedback is proving to be a most interesting way of treating physical problems through self-development. Students need good positive feedback to assist them in developing healthy attitudes and practical approaches to mathematics. Send in your ideas to promote such feedback in our classrooms.

SEND YOUR MATH GAME, puzzles, class activities, book reviews, ideas to:
The ABACUS EDITOR
c/o CITY MATH CENTRE
C.C. CARROTHERS SCHOOL
360 CHIPPENDALE CRESCENT
LONDON, ONTARIO

ABACUS ITEMS MAY BE REPRINTED WITHOUT FORMALITY EXCEPT CUSTOMARY ACKNOWLEDGEMENTS

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I, _____, nominate the following for Positions on the Council of the Ontario Association for Mathematics Education:

For Vice-Presicent: _____

For Executive: _____

_____

For Council: _____

_____

RETURN TO: D.C. Attridge, 1 Southdale Drive, Markham, Ontario

FOOTBALL POKER by S.G. Bell

OBJECTIVE - The student adds directed numbers (integers)

MATERIALS - 1 card deck, 1 playing field, 1 paper clip (per student pair)

Football poker is a card game that utilizes the gains and losses of football to introduce addition of directed numbers. Gains are represented by black cards, losses by red cards. Students find the net gain or loss resulting from a series of cards or 'downs' taken together. The game is played on a diagram of a football field, with a paper clip or some other device being used to mark the position of the ball.

The game involves two players, one taking the part of a CFL team, the other the part of an NFL team. Since Canadian and American rules differ, new rules must be decided upon. A compromise is reached by having the first quarter played under the CFL rule of three downs to make ten yards, the second quarter under the NFL's four down rules, and the second half under a five down rule. The Americans are so confident, they agree to play on a CFL size field.

Rules will be discussed only for the second half of the game, on which there are five downs. They can easily be inferred for the first and second quarters, the only difference lying in the number of downs. Only four of the five downs may be used to make the ten yards required for a first down. The fifth must be used to punt. On a punt the ball travels 30 yards and there is a change in possession. The player losing possession shuffles the deck and deals four downs to his opponent. If the ball lands in the end zone on a punt, a score of one point is made and the opponent receives possession on his 25 yard line. A player dealt four downs finds the net gain or loss resulting and moves the football accordingly. If there is a net gain of ten or more yards, the player receives another hand of four downs from the top of the deck. Otherwise, the player must use his/her fifth down and punt. A touchdown is made when the ball is advanced into the end zone and is worth seven points. A kick-off occurs either after a touchdown, or at the beginning of the game, or at the beginning of the second half. Who receives at the beginning of the game is decided by a draw from the deck - high card wins. The player not receiving at the beginning of the game receives at the beginning of the second half. A player receiving a kick-off is given the ball on his 30 yard line and dealt a hand of four downs. Note that since the wind factor is negligible, the teams have decided not to bother changing ends at the quarter. To add interst to the game, a black face card counts as a pass completion of 15 yards, while a red face card counts as a fumble and results in immediate loss of the ball. The jokers may be added to the deck and given special designations, such as a touchdown run or an interception. Also, if a player notices his/her opponent make an error in finding the net gain or loss, the player is entitled to charge the opponent a penalty in which any gain in the play is wiped out and a 10 yard loss substituted. In such a situation the opponent retains possession and is given first down over again, but this time has 20 yards to go. He/she receives four new cards from the top of the deck.

**"Mathematics is the rock upon which the art and sciences of the world rest"

D.C. Smith

FOOTBALL POKER

FOOTBALL POKER RULES

I Card Values

Each card counts as one down.

1. Black card (other than a face card) – gain equal to the value of the card.
2. Red card (other than a face card) – loss equal to the value of the card.
3. Black face card – pass completion of 15 yards.
4. Red face card – fumble and immediate loss of the ball.

II Kick-Offs

Player receiving the kick-off is:

1. given the ball on his/her 30 yard line.
2. dealt a hand of downs.

III Punts

1. The ball travels 30 yards.
2. Possession changes.
3. The receiver is dealt a hand of downs.

IV Advancement of the Ball

1. The ball is moved according to the net gain or loss in the hand.
2. If there is a net gain of 10 or more yards, possession is retained and a new hand of downs received.
3. If there is a net gain of less than 10 yards or a net loss, the player must punt.

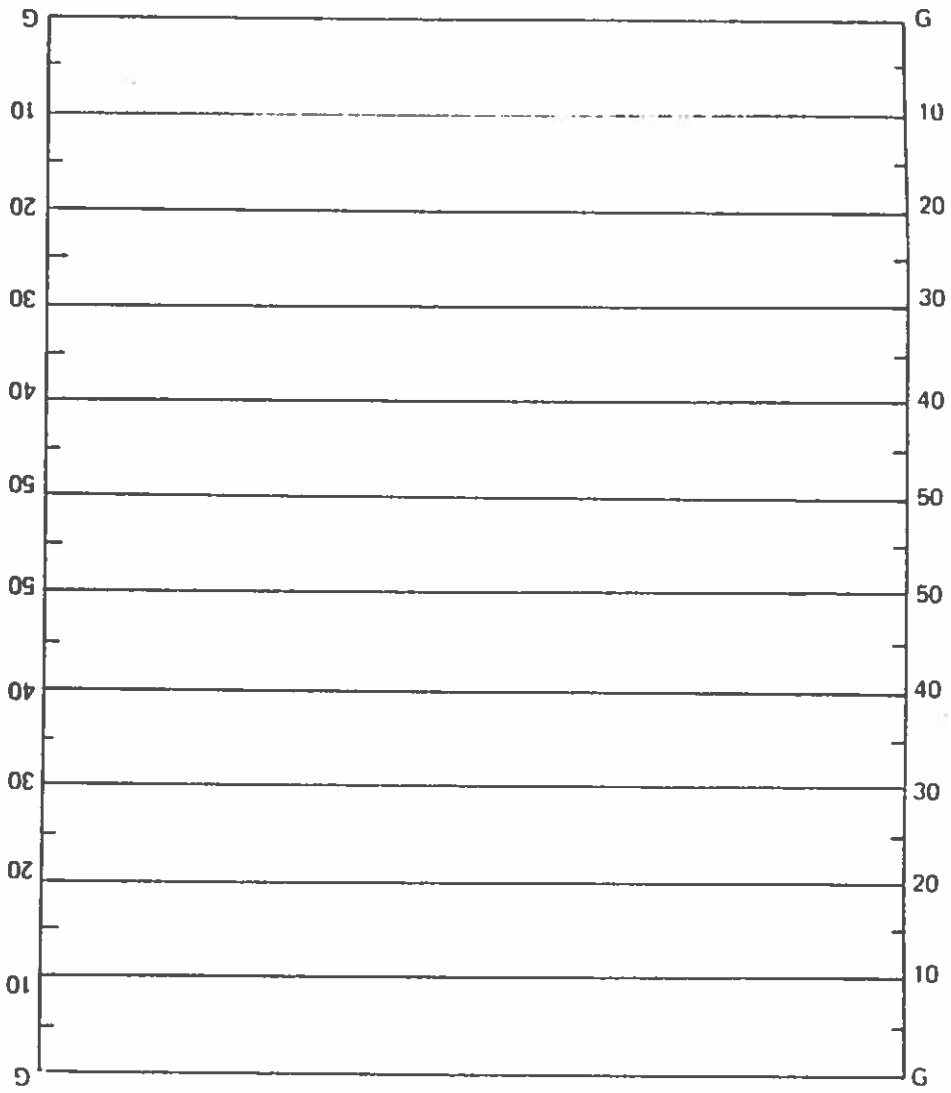
V Scoring

1. If the ball lands in the end zone on a punt, a score of one point results.
2. If the ball is otherwise advanced into the end zone, a touchdown or seven point score is made.

VI Penalties

If a player notices his/her opponent make a mistake in finding the net gain or loss, the player can charge the opponent with a 10 yard penalty. On a penalty:

1. possession is retained.
2. first down is given over again, but this time with 20 yards to go. Four new cards are dealt from the top of the deck.



FIBONACCI NIM

This game, which was invented by Robert E. Gaskell, begins with a pile of n counters. Players take turns removing the counters subject to the following rules.

At least one counter must be taken on each play.

The first player may not take the entire pile.

There-after each player may remove all the remaining counters but a player may never take more than twice the number of counters his opponent took on the last play.

The person who takes the last counter wins.

As you might expect the name Fibonacci Nim suggests that the winning strategy is associated with the Fibonacci sequence. Can you determine a winning strategy?

Reference: Scientific American-Mathematical Games - March, 1969.

SOLUTION TO LOGIC PUZZLE

* COUPLES	JIM THOMPSON	BOB SMITH	BILL JONES	TOM WILLIAMS	HARRY BROWN
MARY	✓	X (4)	X (1)	X (2)	X (1)
JANE	X	X	✓	X	X
JUNE	X	X (4)	X (4)	X (3)	✓
HELEN	X	X	X (6)	✓	X
SALLY	X	✓	X (5)	X (5)	X

* PLACE	JIM MARY T	BOB SALLY S	BILL JANE J	TOM HELEN W	HARRY JUNE B
SEATTLE	✓ By elimination	X	X	X	X
ATLANTA	X	X	✓ (6)	X	X
BOSTON	X	X	X	✓ (6)	X
SAN DIEGO	X	✓ (3)	X	X	X
DETROIT	X (2)	X	X	X	✓ (1)

**Nearly all great, philosophers who left (or are leaving) imprints on humanity were either mathematicians or students of mathematics.

KRYPTO

A card game which can be used effectively to provide drill in the fundamental operations of addition, subtraction, multiplication and division.

The Krypto deck contains 52 cards of the following denominations:

numbers 1 to 10; 3 of each
numbers 11 to 17; 2 of each
numbers 18 to 25; 1 of each

The game may be played with any number of players or by teams of players following these simple rules. The deck is shuffled and 6 cards are dealt face up. A seventh card is then turned up and the player (team) who first combines all of the 6 original cards dealt using the four operations (+, -, x, ÷) to produce the number on the seventh card is the winner. In the classroom these numbers can be recorded on the blackboard or an overhead and teams can combine their skills to produce a winner.

SAMPLE GAME:

6 cards dealt are: 5, 3, 15, 1, 16, 4.
seventh card: 6.

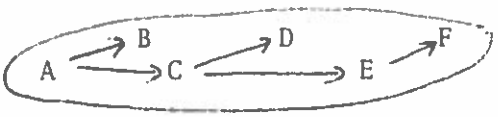
Solutions: (1) $1 + \frac{15}{3x5} + \frac{16}{4} = 6$

(11) $16 + 5 + 3 + 1 - 15 - 4 = 25 - 19 = 6$

(111) similar to (11) but produced by a different line of reasoning.
$16 - (15 - 5) + (3 + 1 - 4) = 16 - 10 + 0 = 6$

Last Issue's Cover Riddle

I met a girl last year	$(10x + y) + 1$
Her age I can't remember	$10y + x = 3x$
But the digits reversed	$10y - 2 = 0$
Were thrice the first.	$5y - x = 0$ Try digits 1 to 9
How old is she?	$x = 5$ $y = 1$ She is 52



" ⟶ " "is a daughter of"
D is A's grandfather.

**Mathematics is the science that yields the best opportunity to observe the working of the mind and has the advantage that by cultivating the habit of method of reasoning which can be applied afterwards to the study of any subject and can guide us in pursuit of life objects.
Condorcet

**The only avenue towards wisdom is freedom in presence of knowledge ... freedom and discipline (of thought) are two essentials of education.

A.N. Whitehead

O.A.M.E. RESOURCE PERSONNEL

DATE _____

NAME _____ DEGREES _____

BUSINESS ADDRESS _____ BUSINESS PHONE _____

HOME ADDRESS _____ HOME PHONE _____

PAST TEACHING EXPERIENCE (SCHOOL AND/OR POSITION)	APPROX. NO. OF YEARS	GRADES (COURSES) TAUGHT

PRESENT POSITION AND DUTIES _____

INVOLVEMENT IN FOLLOWING COMMUNITY, PROFESSIONAL ORGANIZATIONS _____

CURRICULUM — HAVE YOU			PLEASE CHECK		
1. Developed a new course recently?			_____	LEVEL	_____
2. Developed a new unit for a course recently?			_____	LEVEL	_____
3. Developed a unit for advanced pupils?			_____	LEVEL	_____
4. Developed a unit for slower students?			_____	LEVEL	_____
5. Developed an integrated unit?			_____	LEVEL	_____
6. Developed an interesting teaching approach to a topic?	_____	TOPIC	_____	LEVEL	_____
7. Developed teacher background material for a topic?	_____	TOPIC	_____	LEVEL	_____
8. Been involved in a research project concerning children learning mathematics?	_____	TOPIC	_____	LEVEL	_____
9. Been involved in a research project involving methods of teaching?	_____	TOPIC	_____	LEVEL	_____
10. Developed material for a unit of a program?	_____	TOPIC	_____	LEVEL	_____
11. Developed specific materials for slower students?	_____	TOPIC	_____	LEVEL	_____
12. Developed specific materials for brighter students?	_____	TOPIC	_____	LEVEL	_____
13. Developed diagnostic testing material for a unit?	_____	TOPIC	_____	LEVEL	_____

For the above curriculum interest items that you have checked, are you interested in (a) conducting a workshop (b) giving a one-hour seminar (c) giving a 10-15 minute presentation? If so, please state the numbers of the interest item in the type of activity where you feel you could be helpful. (OVER)

WORKSHOP(S)	ONE HOUR SEMINAR(S)	10-15 MINUTE TALKS(S)

MEDIA — HAVE YOU RECENTLY

14. Reviewed a textbook? _____ LEVEL _____ TEXT _____
15. Reviewed support material? _____ LEVEL _____ TEXT _____
16. Reviewed math articles in magazine/newspaper? _____ LEVEL _____ TEXT _____
17. Written a mathematical article in a journal? _____ LEVEL _____ TEXT _____

REVIEWING — ARE YOU INTERESTED IN

18. Reviwing textbooks? _____ LEVEL _____
19. Reviewing support material? _____ LEVEL _____
20. Reviwing math articles in a journal? _____ LEVEL _____

ADMINISTRATION — HAVE YOU RECENTLY

21. Helped to organize a workshop? _____ WHAT GROUP _____
22. Helped to organize a professional development program? _____ WHAT GROUP _____
23. Served on a panel concerning mathematics? _____ TOPIC _____
24. Been a speaker on a mathematical topic? _____ TOPIC _____

OTHER: ARE YOU INTERESTED IN ANY OTHER ASPECT OF MATHEMATICS EDUCATION?
PLEASE STATE _____

CAN YOU OFFER ANY ASSISTANCE TO MATHEMATICS EDUCATION AS

25. A speaker _____ TOPIC _____
26. A demonstration teacher? _____ TOPIC _____
27. A panel member? _____ TOPIC _____
28. A writer of an article? _____ TOPIC _____
29. A workshop leader? _____ TOPIC _____
30. A resource contact? _____ TOPIC _____

Please Return to: L. Auckland,
Arthur Voaden S.S.,
41 Flora Street,
St. Thomas, Ontario

Education

Whom, then, do I call educated? First, those who manage well the circumstances which they encounter day by day, who possess a judgment which is accurate in meeting occasions as they arise, and rarely misses the expedient course of action. Next, those who are decent and honorable in their intercourse with all men bearing easily and good-naturedly, that which is unpleasant or offensive in others, and being themselves as agreeable and reasonable to their associates as is humanly-possible to be; Furthermore, those who hold their pleasures always under control, bearing up under them bravely and in a manner worthy of our common nature; Finally, and most important of all, those who are not spoiled by their successes, who do not desert their true-selves, but hold their ground steadfastly, as wise and sober minded men, rejoicing no more in the good things which have come to them through chance than in those which through their own nature and intelligence are theirs since birth. Those who have a character which is in accord, not with one of these things, but with all of them, these I maintain are educated and whole men, possessed of all the virtues of a man.

An Original Pen - Brush Scroll

Socrates - 4th c. 399 BC

While mathematics is not a subject thought of as being involved with human interaction, yet the values of fairness and individual worth can be and indeed must be evident in the attitudes expressed in the math class.
The math teacher's aims as well as including the thorough training of his students in the necessary skills of arithmetic and the development of a mathematical awareness which will stand him in good stead in his chosen future pursuits , must include a recognition of his worth as an individual regardless of his mathematical inadequacies and attempt to imbue him with a self-perpetrating attitude to further math learning.

RACETRACK: A Game From Europe

(1) Make any shape track you wish on a piece of graph paper.

(2) Each player starts with pair his (0,0) where ordered pair has the same meaning as in co-ordinate geometry.

(3) Make your choice of move as an ordered pair
(e.g.) (3,4)
(2,1)
(-1,-3)

graph paper cut to shape similar to this

(4) The restriction on the selection of the ordered pair is that each element may only differ by ONE.

(e.g.) if your last move was (3,3) you have choices (3,4) (3,2) (2,3) (2,4) (2,2) (4,4)

NOTE: SIGN of element is important (-3,4) ⇒ (-2,4), (-4,4) etc., but may not go to (2,4) (4,4) etc.

(5) First across the FINISH LINE is the winner.

(6) Hitting track wall is a loss.

A's (0,0) B's (0,0) etc.

START LINE

FINISH LINE

CHAPTER NEWS - REGION REPORTS

The Regional Conference of the Stormont/Dundas/Glengarry/Prescott/Russell Chapter of OAME will be held in Hawkesbury 20:00 hours, Thursday, 14 March 1974.

Guest Speaker: English Section	Mr. John C. Egsgard Vice-President OAME
Topic:	"What is a Good Math Teacher"
Conferencier Section Francaise:	M. Claude Gaulin Universite Laval

For further details contact: Lucien Lefebvre, 135 Albert Street, Casselman, Ontario

A ONE-DAY CONFERENCE on the Teaching of Statistics and Mathematics for the Social Sciences in the Secondary Schools of Ontario will be held March 18th at Althouse College of Education. The conference is being sponsored jointly by the Secondary School Statistics Project at the University of Western Ontario and the South Western Ontario region of OAME.

The purpose of the conference is to bring together statisticians, mathematicians, and mathematics educators to discuss the state of Statistics and Mathematics for the Social Sciences. Professor J.M. Gani from the Department of Statistics and Probability of the University of Sheffield, England will discuss some of the problems that were encountered when Statistics was introduced into the British seconary school systems. Professor G.R. Rising, Co-author with Dr. F. Mosteller for "Statistics by Example", will talk on the recent joint work of the American Statistical Association and NCTM and the impact this has had on American high school mathematics programs. The Secondary School Statistics Project at Western is developing Statistics teaching materials that are drawn from and illustrate the Ontario and Canadian scene. Discussion of this and other teaching material will be held.

Write: Secondary School Statistics Project
c/o Dept. Applied Math
University of Western Ontario

Register by March 1 ($2.50 including lunch)

—— The York University Metrication Conference, March 6-8 promises to be a good one.

THE GRAND VALLEY MATHEMATICS ASSOCIATION announces a Two-Day Seminar for secondary school teachers on Computer Science - February 27, 28, 29, 1974

Article Credits

Football Poker - by S.G. Bell was from Vector the newsletter/journal of the British Columbia Association of Mathematics Teachers.

Computer Cartoon and Exeter quote from Summation N.Y.A.T.M. Journal.

Fanshawe College - Math Learning Centre Krypto and Fibonacci Nim.

Other articles from London Math Council Memos.

**Any great civilization either ancient or modern had highly developed mathematical systems (or models). -- Most advanced states of today are those whose mathematical education is highly developed, and the so-called, developing nations set a high priority on mathematics education.



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GIVE TO THE
HEART F
DONNEZ
FONDS DU
6
CANADA

THE OAME ABACUS

"MATHEMATICS EDUCATORS
SHARE THEIR IDEAS"

:ck,

.c. P1A 3J2