



# **Mathematics for Gifted Students**

A joint publication of Mathematics Council and Gifted and Talented Education Council of The Alberta Teachers' Association

Guest Editor, Andy Liu

#### Acknowledgements

The guest editor wishes to thank Alvin Baragar of the University of Alberta, Vasile Bratu of Ecole J. H. Picard, Eugene Czajkowsky of McNally Composite High School, Graham Denham of the University of Alberta, Robert Frizzell of Old Scona Academic High School, Lorne Lindenberg of Harry Ainlay Composite High School and Eugene Wasylyk of Ross Sheppard Composite High School for refereeing articles; staff of The Alberta Teachers' Association for handling the technical production of this issue, especially Marian Allison for editorial services, Lil Fletcher for typesetting and Terry Ho for design and graphics; Professor John B. Percevault, editor of *delta-k*, for full cooperation and Dr. Carolyn Yewchuk, editor of *AGATE*, for everything.



JOURNAL OF THE MATHEMATICS COUNCIL OF THE ALBERTA TEACHERS' ASSOCIATION



#### Volume 27, Number 3

### April 1989

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#### ISSN 0319-8367

*delta-k* is published by The Alberta Teachers' Association (ATA) for the Mathematics Council (MCATA). Editor: John B. Percevault, 2510 22 Avenue South, Lethbridge, Alberta T1K 1J5. Editorial and production services: Central Word Services staff, ATA. Copyright © 1989 The Alberta Teachers' Association, 11010 142 Street, Edmonton, Alberta T5N 2R1. Reproduction in whole or in part without prior written consent of the ATA is prohibited. Opinions expressed are not necessarily those of the Council or of the Association. Please address correspondence to the editor. *delta-k* is indexed in the *Canadian Education Index*.

Copies of this publication are being distributed to members of the Mathematics Council and the Gifted and Talented Education Council. Additional copies are available to members and others at \$7.00 per copy. Address requests to The Alberta Teachers' Association.

## **About the Contributors**

Doris Schattschneider holds a Ph.D. in mathematics from Yale University and is professor of mathematics at Moravian College, Bethlehem, Pennsylvania, where she has taught for the last 20 years. An advocate for geometry, she has lectured widely and written several articles—on polyhedra, tiling problems, interaction of geometry and art and the work of the Dutch artist, M.C. Escher. Her popular book, *M.C. Escher Kaleidoscycles*, was recently republished by Pomegranate Artbooks, California.

Kathy Jones, a Hungarian-born inventor, is the president and chief executive officer of Kadon Enterprises, Inc., a company which produces top quality mathematical games and puzzles. Her background is in philosophy and commercial arts. Before venturing into her own business, she was a ballroom dance instructor and competition dancer. She is a member of the Imperial Society (London) of Teachers of Dancing. She regards artistic expression, whether through dance movement or mathematical symmetry, as a way of creating order and harmony amid the apparent chaos and discord of the world. Her game and puzzle designs are a celebration of the mind's ability to see beauty in the systems and structures of both nature and the mind's own creations. She is the inventor of "Lemma," a logical system-building game and the developer of many combinatorial puzzle sets.

Tony Gardiner combines research in combinatorics and group theory with a wider interest in mathematics, in its history and in how human beings—young and old—make the subject their own. His three books, *Infinite Processes* (Springer), *Discovering Mathematics* (Oxford) and *Mathematical Puzzling* (Oxford), reflect this breadth of interest. He has worked with many groups of interested youngsters and is currently establishing a national mathematics competition which is aimed at 30 percent of the fourteen-year-olds in the United Kingdom.

Mogens Esrom Larsen was born in 1942, graduated from the University of Copenhagen in 1965 and has been an associate professor of the department of mathematics there since, except for one year, 1969-70, when he visited the Massachusetts Institute of Technology. His interests cover most of mathematics, including functions of several complex variables, differential equations, finite groups and Rubik's cubes, pre-Euclidean history of mathematics, numerical analysis and the teaching and applications of modern mathematics. He writes a monthly problem column on popular science, where pentominoes frequently appear, for a Scandinavian journal. A game enthusiast, he was the founder of the Copenhagen Go Club in 1972.

Jan van de Craats was born in 1944 and received his Ph.D. in mathematics (numerical analysis) from Leiden University. Since graduation, his interests have shifted to geometry, problem solving and recreational mathematics. From 1973 to 1985, he was a member of the jury of the International Mathematical Olympiad and leader or deputy leader of the Dutch I.M.O. team. He trained the team by correspondence. He has been professor of mathematics at the Royal Military Academy in Breda since 1983.

Andy Liu (guest editor) is associate professor of mathematics at the University of Alberta. He obtained his doctor of philosophy degree and a professional diploma in elementary education from the University of Alberta in 1976 and has been a member of the faculty since 1980. His research interests are combinatorics, geometry and mathematical recreations. His ongoing professional activities include serving on the Alberta High School Mathematics Competition Board (since 1981) and editing its newsletter, *Postulate*, and involvement with the Edmonton Junior High Mathematics Contest (from 1983). Since 1986 he has been co-director of a year-round training program (by correspondence) for prospective members of the Canadian I.M.O. team.