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Roman A. Zatorsky

To the 70th anniversary

Professor Roman Zatorsky was born on April 8, 1953 to a family of a teacher in the Vydyniv village of the Snyatynsky district, Ivano-Frankivsk region. In 1969, he was enrolled in the Physics and Mathematics School of Ivano-Frankivsk Pedagogical Institute named after Vasyl Stefanyk. After graduation, he began teaching mathematics at Petrankivska Secondary School, Rozhnyativ District, Ivano-Frankivsk region. Being an enthusiastic mathematician, Roman Zatorsky combined his teaching with research.

Thus, he solved the problem of the number of Jung's standard tables by reducing the Frame-Robinson-Thrall hook formula to the Vandermonde determinant. Also, he found the number of all trajectories with allowed movements, $mot(\leftarrow, \uparrow)$, on Ferre graphs. Well-known experts in combinatorics B. S. Stechkin and V. I. Bolshakov were consultants of his first research. These research results were published in 1986 in "Combinatorial Analysis". In 1998, after 25 years of a successful and honored teaching career, Roman Zatorsky retired from his schoolteacher position. From 2000 to 2002, he had worked as a senior lecturer in the Department of Fundamental Disciplines at the Kolomyia Institute of Natural Resources Management.

In April 2003, Taras Shevchenko Kiev National University awarded Roman Zatorsky with a Ph.D. in Mathematics. His thesis "Application of paradeterminants and parapermanents to solving problems of combinatorial analysis" was written under supervision of Professor O. G. Ganyushkin. In November 2012, at the Institute of Mathematics of the National Academy of Sciences of Ukraine, Roman Zatorsky defended his D.Sc. thesis "Application of the calculation of triangular matrices to combinatorial analysis and number theory", which was developed with the consultations of Professor Rostislav Grigorchuk (A&M University, USA).

From 2003 to 2006, Roman Zatorsky worked as a senior lecturer in the Department of Algebra and Geometry at the School of Mathematics and Informatics of the Vasyl Stefanyk Precarpathian National University, and in June 2006, he became an associate professor in said department. From 2013 to 2021, he worked as the head of the Department of Differential Equations and Applied Mathematics at this school, and from 2021 to the present, he has been working as a Professor in the Department of Mathematics, Informatics, and Teaching Methods.

Roman Zatorsky is an author of 77 articles. He authored and coauthored three monographs and several manuals for students. He supervised two Ph.D. theses. He developed the calculus of triangular matrices (tables), in which new functions, namely the paradeterminant and parapermanent

of triangular tables, were introduced. These functions are based on ordered partitions of natural numbers, thanks to what they were found numerous applications in discrete mathematics, number theory, combinatorial analysis, and graph theory. He constructed a commutative product for triangular matrices (tables), which can have interesting applications in the theory of abelian groups and commutative semigroups. Representations of these structures in triangular tables can serve as good means of classifying them.

Such great masters as Euler, Jacobi, Poincare, Dirichlet, Hermit, Minkovsky, and Ukrainian mathematicians Skorobagatko and Syavavko were engaged in the research of the generalization of continued fractions. Using the functions of triangular tables, Roman Zatorsky, in 2010, constructed recurring fractions that allow one to develop analogs of periodic chain fractions. Thus, one-periodic recurring fractions of the k-th order are representations, maximal in modulo, of the roots of the corresponding algebraic equations of the k-th order. In 1971, L. Bernstein showed that finding the fundamental units of the field $\mathbb{Q}(\sqrt[n]{m})$ is related to the solution of n-dimensional generalizations of Pell's Diophantine equation. In this regard, B. N. Delaunay, D. K. Fadeev, and H. Wada built tables of fundamental units for cubic fields. Roman Zatorsky constructed some parameterizations for finding units of n-dimensional Diophantine Pell equations for $n = 3; 5; 7; 9; 11$. It is well-known that Reiser's and Binet-Cauchy algorithms for calculating the permanent of a square matrix are exponential algorithms. Nowadays, it has already been proven that the problem of calculating the permanent of a square matrix is an NP-complete problem. In 2009, R. A. Zatorsky and V. E. Tarakanov proved that the Hessenberg matrices are the matrices with the maximum number of non-zero elements for which the Polya transformation still exists (i.e., it is possible to reduce the calculation of the permanent of these matrices to the determinant of the transformed matrices).

Roman Zatorsky is a very caring person and a great friend who is always ready to help and support his friends and colleagues. He is a beloved

husband, father, and grandfather. He has three children, ten grandchildren, and even a great-granddaughter.

The editorial board of the journal and the signatories sincerely congratulate Professor Roman Zatorsky on his anniversary and wish him good health and new creative achievements.

O. D. Artemovych, O. O. Bezushchak, V. M. Bondarenko,
R. I. Grigorchuk, L. A. Kurdachenko, T. D. Lukashova,
A. S. Oliynyk, B. V. Oliynyk, A. P. Petravchuk,
I. V. Protasov, O. O. Pypka, M. M. Semko, S. V. Sharyn,
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