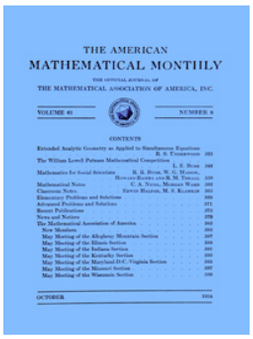

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The May Meeting of the Indiana Section

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in terms of continuity, differentiability, and integrability. Relations between circular, hyperbolic, and parabolic functions are pointed out in terms of the particular parameters involved.

A. WAYNE MCGAUGHEY, *Secretary*

THE MAY MEETING OF THE INDIANA SECTION

The thirty-first annual meeting of the Indiana Section of the Mathematical Association of America was held at Rose Polytechnic Institute, Terre Haute, Indiana, on May 8, 1954. Two sessions were held at which Professor C. P. Sousley of Rose Polytechnic Institute, Chairman of the Section, presided.

There were fifty-one in attendance including the following thirty-six members of the Association:

H. W. Alexander, W. C. Arnold, A. P. Boblett, Stanley Bolks, G. E. Carscallen, W. W. Chambers, K. W. Crain, D. E. Deal, M. W. DeJonge, W. E. Edington, P. D. Edwards, R. E. Ekstrom, H. E. H. Greenleaf, J. R. Hadley, J. W. Hamblen, Ralph Hull, E. L. Klinger, L. H. Lange, G. T. Miller, Vera T. Morris, P. A. Nurnberger, Gloria Olive, T. P. Palmer, J. C. Polley, Tibor Rado, R. M. Ross, A. R. Schmidt, M. E. Shanks, W. O. Shriner, Aubrey H. Smith, C. P. Sousley, Anna K. Suter, R. O. Virts, M. S. Webster, K. P. Williams, G. N. Wollan.

The following officers were elected: Chairman, Professor H. W. Alexander, Earlham College; Vice-Chairman, Mr. R. O. Virts, Central High School, Fort Wayne, Indiana.

Professor P. D. Edwards of Ball State Teachers College reported that the Committee on Awards had awarded Association medals to five high school seniors on the basis of excellence in mathematics demonstrated in the Indiana Science Talent Search competition.

Professor Edwards also reported on the results of a study of mathematical preparation for college in Indiana, Michigan, and Illinois in which he, representing the Indiana Section, had collaborated with Professor P. S. Jones of the University of Michigan and Professor B. E. Meserve of the University of Illinois. A report on the study had been published under the heading, "Mathematical Preparation for College," in *The Mathematics Teacher*, Vol. XLV, May, 1952.

In accordance with a recent suggestion of the Board of Governors that the Section Governor be made an officer of the Section, the Constitution was amended so as to include the Section Governor as a member of the Executive Committee.

Professor L. H. Lange reported on the mathematics competition for undergraduate students in Indiana schools which has been sponsored in recent years by Valparaiso University. Following the discussion, and in part on his suggestion, a motion was passed instructing the chairman to appoint a committee to study the value of, need for, and interest in such a competition, and consider the desirability that the Section assume its sponsorship.

The following papers were presented:

1. *Global structure of the family of integral curves of differential equations*, by

Professor M. E. Shanks, Purdue University.

The speaker discussed, in an intuitive way, the problem of topologizing the integral curves of the system $\dot{x}=f(x, y)$, $\dot{y}=g(x, y)$. When the domain of the functions f and g is a closed rectangle containing no critical point of the system, then the natural topology on the integral curves gives a dendrite. Some special curves were considered and the fact noted that the presence of limit cycles renders such topologization impossible. Mention was made of the recent work of L. Markus, in which the notion of separatrix is fundamental, and its relation to the above problem.

2. *A note on the triangular inequality*, by Professor Gloria Olive, Anderson College.

The triangular inequality was discussed from the standpoint of the various mathematical topics it can motivate in an undergraduate seminar on this subject. The inequality was taken from one-dimensional real space into Hilbert space; on the way, a brief geometrically motivated proof, readily extended to n-dimensional space, was presented.

3. *An algebraic proof of the central limit theorem*, by Professor H. W. Alexander, Earlham College.

The usual proof of the central limit theorem is based on the use of moment generating functions, a device which properly belongs in graduate mathematics. The present proof makes use of the multinomial theorem, and in this connection introduces the idea of *similar terms*, that is, terms which have the same exponents in a different order. Expressions are obtained for the higher moments of the quantity $Y_n=n^{-1/2}(X_1+X_2+\cdots+X_n)$, where $X_1, X_2, \cdots, X_n$ are from a common population with zero mean. The moments are shown to approach those of the normal distribution as $n\to\infty$.

4. *Continuity and discontinuity in analysis and geometry*, by Professor Tibor Rado, Ohio State University. (By invitation.)

Professor Rado discussed a series of examples of discontinuous functions and functionals, selected from various areas in analysis and geometry, which may be used in the classroom to throw more light upon the concept of continuity itself.

5. *An application of geometric series with two ratios*, by Professor L. H. Lange, Valparaiso University.

A geometric series with two ratios converges under certain conditions and the problem of finding these conditions and the resulting sum was solved by the author subsequent to its statement by F. Watkins as E 981 in this MONTHLY. He had found, and here discussed, an application of this type of series to a problem of obscure origin: that about the bird which flies back and forth between two cars which are following a crash course. Even when generalized this problem has a trivial solution and he is searching for an application to a problem not admitting the trivial solution.

6. *Nomography from the similar triangle viewpoint*, by Professor T. P. Palmer, Rose Polytechnic Institute.

The determinantal method of proof usually employed to establish the validity of nomographic techniques obscures the simplicity of the basic ideas in the usual alignment charts. This paper develops the parallel-line type, the concurrent-line type, and the N type, employing nothing more advanced than the properties of similar triangles. It also develops the two-parallel-line-and-one-curve type, in this case with the aid of elementary analytic geometry. The improved simplicity should render nomographic methods accessible to many who have previously avoided them.

J. C. POLLEY, *Secretary*