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THE MAY MEETING OF THE INDIANA SECTION

The thirty-third annual meeting of the Indiana Section of the Mathematical Association of America was held jointly with the Indiana Council of Teachers of Mathematics at Wabash College, Crawfordsville, Indiana, on May 5, 1956. Professor R. O. Virts of Central High School and the Purdue University Center at Fort Wayne, Chairman of the Section, presided at the general session and at the sectional meetings of the Association which followed.

Professor K. O. May, Chairman of the Mathematics Department of Carleton College, guest speaker for the hour lecture, addressed the general session on the topic, "A Modern Introduction to Mathematics."

There were 133 in attendance including 51 members of the Association.

The following officers were elected: Chairman, Professor C. H. Brumfiel, Ball State Teachers College; Vice-Chairman, Professor C. B. Gass, DePauw University; Secretary-Treasurer, Professor J. C. Polley, Wabash College.

Professor P. D. Edwards, Chairman of the Committee on Awards, reported that five Association medals had been awarded during the year for high mathematical achievement in the Indiana Science Talent Search.

The following short papers were presented:

1. *Non-linear recurrence relations for classical orthogonal polynomials*, by Professor M. S. Webster, Purdue University.

Some of the known and some new non-linear relations involving Hermite, generalized Laguerre, and ultraspherical polynomials were given. A typical proof was presented showing that such a relation essentially characterizes polynomials of the type given.

2. *A geometry experiment*, by Professor C. F. Brumfiel, Ball State Teachers College, and Professor M. E. Shanks, Purdue University, presented by Professor Shanks.

The purpose of this paper was to call the attention of college teachers to shortcomings in high school geometry texts and to encourage the writing of better texts. Defects in Euclid's geometry have long been known but current texts do not remove these flaws. In fact, they add errors of their own. Besides being incomplete, these texts are lacking in logic and give as postulates what are really theorems or definitions. A critique of Euclid's postulates was given and Hilbert's postulates were described briefly. A modified version of Hilbert's postulates was described, a version which is being taught at the Burris High School in Muncie, Indiana in a course for which the textual material has been prepared by the authors of the paper.

3. *Discontinuities for the classroom*, by Professor H. L. Hunzeker, DePauw University.

Graphical illustrations of discontinuous functions for classroom use were obtained from considering common machines as mathematical systems.

4. *An operator identity for* $(D^2+a^2)y=f(x)$, by Professor R. E. MacKenzie, Indiana University, introduced by Professor H. E. Wolfe.

A solution of the differential equation $(D^2+a^2)y=f(x)$ by quadratures was effected by means of an operator identity using trigonometric functions.

5. *On a function defined by means of an infinite radical*, by Professor G. N. Wollan and Mr. D. M. Mesner, Purdue University Center, Fort Wayne, presented by Professor Wollan.

If $0<x\leqq 1$, then x has a non-terminating binary representation $x=a_1a_2\cdots a_n\cdots$. Let $\alpha_n=(-1)^{a_n}$ and $f_n(x)=\sqrt{k+\alpha_1\sqrt{k+\alpha_2\sqrt{k+\cdots+\alpha_n\sqrt{k}}}}$, $n=1, 2, 3, \cdots$, and let I denote the interval $0<x\leqq 1$. When $k>2+\sqrt{2}$, then $\lim_{n\to\infty} f_n(x)$ exists and is real for every x in I and this defines a function $f(x)=\lim_{n\to\infty} f_n(x)$. This function is discontinuous at every point in I having a terminating binary representation and is continuous elsewhere in I. The function is not monotone in any sub-interval of I and yet has a derivative equal to zero at each point of a dense set of points of I and has a left derivative equal to zero at every point of discontinuity.

J. C. POLLEY, *Secretary*

THE MAY MEETING OF THE MARYLAND-DISTRICT OF COLUMBIA-VIRGINIA SECTION

The spring meeting of the Maryland-District of Columbia-Virginia Section of the Mathematical Association of America was held at the U. S. Naval Academy, Annapolis, Maryland, on May 5, 1956. Professor F. E. Johnston, Chairman of the Section, presided at the morning and afternoon sessions.

There were 99 persons in attendance, including 75 members of the Association.

The following officers were elected to serve for a period of one year: Chairman Professor R. C. Yates, College of William and Mary; Vice-Chairmen, Professor J. E. Freund, Virginia Polytechnic Institute and Professor D. B. Lloyd, District of Columbia Teachers College; Secretary, Professor R. P. Bailey, U. S. Naval Academy; Treasurer, Professor T. W. Moore, U. S. Naval Academy.

The following papers were presented.

1. *The coloring of maps*, by Professor R. W. Rector, U. S. Naval Academy.

The speaker presented a historical survey of the four color problem with particular attention to the method of Birkhoff and Lewis for constrained chromatic polynomials for the n-ring. Certain steps were indicated leading to the solution of the constrained chromatic polynomials of the seven-ring.

2. *Aliquot sequences (preliminary report)*, by Mr. G. A. Paxson, U. S. Army, Fort Meade, Maryland.

Let $S(n)=\sum_{d|n} d$, $0<d<n$. $S(n)$ is called the sum of the *aliquot parts* of n. Put $S^0(n)=n$, $S^1(n)=S(n)$, and $S^{k+1}(n)=S(S^k(n))$. The infinite sequence n, $S(n)$, $S^2(n)$, $\cdots$ is called the *aliquot sequence* with leader n.

A sequence is *eventually periodic* if any term of the sequence recurs.

Conjecture: Every sequence is eventually periodic. Every sequence examined for this property, except a few, displayed it upon computation of a sufficient number of terms. The few involve terms of great size, rendering continued hand computation impracticable. All sequences with leaders $n\leqq 10{,}000$ are being computed until discovered to be periodic or until a term with more than 20 digits is reached. Computation is being done on the IBM Type 650 Magnetic Drum Data-Processing Machine at the Watson Scientific Computing Laboratory, 612 West 116th Street, New York, New York.