

THE REGULAR MEETING OF THE IOWA SECTION,  
MATHEMATICAL ASSOCIATION OF AMERICA

The 59th regular meeting of the Iowa Section of the MAA was held at the University of Iowa, Iowa City, on April 28, 1972. Chairman George Peglar presided. Total attendance was 58, including 42 members of the association.

During the business meeting, following the program and Governor Hogg's report, the following motions were passed:

- (1) The Iowa Section is not in favor of Section dues.
- (2) The Iowa Section is in favor of graduated dues, according to rank.
- (3) The Iowa Section have an articulation committee appointed by the chairman.
- (4) The Iowa Section continue the Visiting Lecture Program within the section area on a volunteer basis.
- (5) The Iowa Section adopt the revised By-Laws which had been previously circulated (a copy of which is attached to this report).

The following officers were elected:

Chairman: Joseph Hoffert, Drake University, Des Moines.  
Chairman-elect: Donald Bailey, Cornell College, Mt. Vernon.  
Secretary-Treasurer: B.E. Gillam, Drake University, Des Moines.

The following contributed papers and invited address completed the program.

Differentiable Integrals and Discontinuous Integrands. George Bridgman, Waverly.

One version of the Fundamental Theorem of Calculus states that if  $f$  is Riemann integrable on  $[a, b]$ , if  $f$  is continuous at  $x_0$ , and if  $F(x) = \int_a^x f(t) dt$ , then  $F'(x_0)$  exists and equals  $f(x_0)$ . This paper discusses the differentiability of the integral  $F$  at a point  $x_0$  where the integrand  $f$  is discontinuous. If  $f$  has a removable discontinuity,  $F'(x_0)$  does not exist. If the discontinuity is neither type, then  $F'(x_0)$  may or may not exist, and this paper presents examples illustrating each possibility.

Some Binomial Identities of Convolutional Type. Arnold Adelberg, Grinnell.

The Vandermonde Convolutional Formula and other related binomial identities can be derived via elementary properties of polynomials. Extending this method and using techniques like those used in the Calculus of Finite Differences, a system of polynomials whose coefficients involve the Stirling numbers of both kinds can be developed.

Unbounded Multipliers and Divergent Series. Alexander Kleiner, Des Moines.

Let  $A$  be a regular matrix method of summation. The series  $\sum_k u_k$  is summed by  $A$  if the sequence of partial sums of  $\sum_k u_k$  is summed by  $A$ .  
Theorem If  $A$  is a regular matrix method of summation and  $\sum_k u_k$  is a divergent series with bounded partial sums which is summed by  $A$  then there exists an unbounded sequence  $\{\lambda_k\}$  such that  $\sum \lambda_k u_k$  is summed by  $A$ . An example is also given to show that the result is not necessarily true for all series summed by  $A$ .

A Program For Anyone Who Needs to Use Statistics. Greg Larson, LeMars.

A Fortran program to process and analyze statistical data is presented in a manner that the uninitiated may understand. Several examples are presented to show the simplicity of the system.

Factors Associated With Instructor Effectiveness in Calculus. Henry Kepner, Iowa City.

An Iowa study of factors related to instructor effectiveness in first semester calculus based on criterion test with a skills subtest and a concepts subtest. No differences in instructor effectiveness were found on manipulative skills. On concepts, instructors with MA+45 or more had greater adjusted students achievement than instructors with only an MA (.05). A similar result was found for instructors with 70 or more graduate hours in mathematics over those with 10-29 hours (.05). Instructors with 6-9 years of college teaching were more effective on concepts than those with 20 or more years (.05). Instructors whose interests included research were more effective on concepts than those with only a teaching interest (.01). No differences based on the number of articles published or the type of institution were found.

Ghosts of Departed Quantities. Invited address. Lynn Steen, Northfield, Minnesota.

The deepest and most abiding questions in the history of mathematics are rooted in the problem of defining the real line. Despite a consensus achieved 100 years ago by Dedekind, Weierstrass and their colleagues, contemporary mathematics harbors several quite different models for the real line--some with infinitesimals, some that fail to satisfy the continuum hypothesis, and some that are defined by strict construction. The forces which influenced these many models have also molded modern mathematics, so the evolution of the models for the real line serves as a microcosm of the essential processes of mathematics.