THE REGULAR MEETING OF THE IOWA SECTION
MATHEMATICAL ASSOCIATION OF AMERICA

The 61st regular meeting of the Iowa Section, MAA, was held at Upper Iowa University, Fayette, Iowa, on April 19, 1974. Chairman Donald Bailey presided. Total attendance was 33, including 32 members of the section and one visitor from the Kansas section.

Following the invited address, Ramsey Theory and the Problem of Eccentric Hosts by Seymour Schuster, Carleton College, and Governor Hogg's report, the business meeting was held. A progress report on the Visiting Lecture Program conducted by the Section was given by Chairman Bailey, and by general consent it was agreed that we should continue the program. Attendance and ways to increase participation in the section affairs were discussed, but no definitive action was taken.

Lawrence Hart, Loras College, Dubuque, Iowa was elected as Chairman-Elect.

The following contributed papers completed the program:

1. Isoderivative Curves, George Bridgman, Waverly.

   For a one-parameter family of curve, we define an isoderivative curve to be a curve connecting all those points where any member of the family has its derivative equal to a fixed value, V. Isoderivative curves for the family $y = C x^r$, $(r \neq 0)$, have the form $y = Vx/r$; for the family $y = e^{Cx}$, the form is $Vx = y\ln(y)$; and for the family $y = Cf(x)$, where $f(x)$ represents any differentiable function, the isoderivative curve equation is $y = Vf(x)/f'(x)$.

   We also solve the reverse problem of finding a family of differentiable curves $y = Cf(x)$ having a given equation $y = Vg(x)$ as its isoderivative curve. The solution is $y = C e^{\int 1/g(x)\,dx}$.

2. A Mean Value Theorem For Integrals. Donal Bailey, Mt. Vernon

   The classical mean value theorem for integrals is usually stated as follows:

   If the function f is continuous on [a,b] then there exists $z \in [a,b]$ such that $\int_a^b f(x)dx = f(z)(b - a)$.

   The standard proof uses the following three facts, all of which are consequences of continuity of f on [a,b].

   (1) f is integrable on [a,b] (and hence bounded).
   (2) f satisfies the intermediate value property on [a,b].
   (3) f assumes its maximum and minimum values on [a,b].

   In this paper we show by means of a category argument that the proof need not use condition (3) and hence a stronger theorem holds.

3. A Simplified Proof of Bezout's Theorem. Arnold Adelberg, Grinnell.

Bezout's theorem, concerning the number of intersections of n hypersurfaces in projective n-space, is one of the keystones of classical algebraic geometry. Traditionally, it was proved by projective methods. An alternate approach that has been used is to give a purely algebraic statement of the theorem that involves the calculation of the dimension of a certain vector space, and to derive the result by using extensive machinery of homological algebra. The procedure we have followed is closely related to the second approach, but is more explicit and elementary than usual, and involves consideration of some exact sequences that arise naturally. A by-product is a proof that the normality of a sequence of polynomials and their homogenizations can be deduced from the normality of its sequence of highest forms.

4. A Small College Cooperative Seminar. E. T. Hill, Mt. Vernon.

For the past two years the departments of Mathematics at Coe and Cornell have been holding a weekly seminar. The participants feel that it is necessary for teachers of mathematics to also be mathematicians. The involvement of two departments in regular scheduled sessions makes it less likely that the press of committee work and other duties will preempt the time scheduled for doing mathematics. Some difficulties have come up, but we feel the program is a success and highly recommend this format to other groups.

Respectfully submitted,

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