MATHEMATICS

Chairman: P. D. EDWARDS, Ball State Teachers College

Cora Hennel, Indiana University, was elected chairman of the section for 1940.

ABSTRACTS

A simple interpolation method for unsmooth curves. C. LANCZOS, Purdue University.—If the values y_0, y_1, y_2, . . ., y_n of a function $y = f(x)$, observed at the points $x = 0, 1, 2, 3, \ldots, n$, are so unsmooth that their difference table does not converge toward zero, the ordinary interpolation method by means of powers becomes illusory. In this case an expansion into a Fourier series will be more adapted to the nature of the problem. A definite solution of the interpolation problem may be obtained if the Fourier series has a sufficiently rapid convergence, *viz.*, if the number of coefficients practically present in the expansion does not exceed the number $n + 1$ of the given data. In order to satisfy this condition we at first construct the function $\phi(x) = f(x) - (\alpha + \beta x)$, where the constants α and β are determined by the conditions that $\phi(0)$ and $\phi(n)$ shall be 0. We then define $\phi(-x) = -\phi(x)$ and expand $\phi(x)$ into a Fourier series between the limits $x = -n$ and $x = +n$. The construction guarantees the continuity of function and first derivative, and, therefore, sufficient convergence will be achieved for a satisfactory interpolation, provided that n is not too small. The resulting formula follows:

$$f(x) = \alpha + \beta\, x + \frac{\sin \pi x}{n} \sum_{k=-n}^{n} \frac{(-1)^k \quad \Phi(k)}{\sin \dfrac{x-k}{n} \pi}$$

This formula is well adapted to easy numerical computation.

Cubic hypersurfaces symmetric with respect to hyperplanes of a linear system. D. R. SHREVE, Purdue University.—This is a generalization of a paper by Edgardo Ciani, "Sulle superficie algebriche simmetriche," giving a short account of cubic hypersurfaces symmetric with respect to hyperplanes of a pencil, of a net, and of a web, in projective space S_r. The configuration of generalized Eckardt points is considered in detail.

New materials and equipment in mathematics. INEZ MORRIS, Indiana State Teachers College.—A bibliography of equipment and books and magazine articles published during the past year, accompanied by an exhibit of these materials, was prepared. A discussion of these materials included reasons for the type of organization used in the bibliography, the need of teachers for familiarity with the newest materials in mathematics and in related fields, the values of such a bibliography to the busy teacher, an analysis of the relationship of the 1938-1939 texts to current educational trends, and a brief review and evaluation of several outstanding publications.

On the Dirichlet problem for the equation of the vibrating string. RICHARD J. DUFFIN, Purdue University.—This paper gives a partial answer to the question of the solution being uniquely determined inside the contour if the value of a solution of the wave equation is given on a closed contour. It is shown that the answer hinges on whether or not a certain number defined by the particular contour under consideration is rational or irrational.

Suggestions for the conduct of mathematics clubs. MURET NUGENT, Indiana State Teachers College.—By title.