ABSTRACTS OF PAPERS

SUBMITTED FOR PRESENTATION TO THE SOCIETY

The following papers have been submitted to the Secretary and the Associate Secretaries of the Society for presentation at meetings of the Society. They are numbered serially throughout this volume. Cross-references to them in the reports of the meetings will give the number of this volume, the number of this issue, and the serial number of the abstract.

191. Professor J. L. Walsh: *On the convergence and overconvergence of sequences of polynomials of best approximation.*

In the study of the convergence of sequences of polynomials of best approximation in the sense of least pth powers ($p>0$) to a function analytic on a given closed limited point set as measured by various integrals with non-negative norm functions, characteristic results on overconvergence (i.e., proof of greatest geometric degree of convergence) can be established if the norm function and some negative power of it are integrable. If approximation is measured by a line integral over some rectifiable Jordan curve or finite set of rectifiable Jordan curves or arcs C, it is sufficient if the norm function is integrable, and if on each closed subset of C containing no point of a given reducible set of C some negative power is integrable. (Received March 17, 1934.)

192. Professor J. L. Walsh: *On interpolation by polynomials.*

The following theorem is an extension of results due to Kalmár and Fekete. *Let C be a closed limited point set of the z-plane whose complement K is connected and possesses a Green's function with pole at infinity. Let $w=\Phi(z)$, $\Phi'(\infty)=1$, map K conformally (not necessarily uniformly) onto $|w|>r$. Let the points $\beta_1^{(n)}, \beta_2^{(n)}, \cdots, \beta^{(n)}_{n+1}$ $(n=0, 1, 2, \cdots)$ have no limit point exterior to C. If $f(z)$ is analytic on C, and if $p_n(z)$ is the polynomial of degree n which interpolates to $f(z)$ in the points $\beta_k^{(n)}$, then equivalent necessary and sufficient conditions that $p_n(z)$ converge to $f(z)$ uniformly on C for every such $f(z)$ are $\lim_{n\to\infty}|(z=\beta_1^{(n)})\cdot(z-\beta_2^{(n)})\cdots(z-\beta^{(n)}_{n+1})^{1/(n+1)}=|\Phi(z)|$ in K, $\lim_{n\to\infty}[\max|(z-\beta_1^{(n)})(z-\beta_2^{(n)})\cdots(z-\beta_{n+1}^{(n)})|$, z on $C]^{1/(n+1)}=r$. If these conditions are satisfied, the polynomial $p_n(z)$ converges to $f(z)$ on C with the greatest geometric degree of convergence, as does the polynomial $P_n(z)$ of degree n found by interpolation to $f(z)$ in the first $n+1$ of the points $\beta_1^{(0)}, \beta_1^{(1)}, \beta_2^{(1)}, \beta_1^{(2)}, \beta_2^{(2)}, \beta_3^{(2)}, \beta_1^{(3)}, \cdots$. The polynomial $P_n(z)$ is the sum of the first $n+1$ terms of a series of interpolation.* (Received March 17, 1934.)