of treating difference equations is established and can be applied when $b_{ij}(x) \equiv 0$, and also when $p(x)$ is replaced by 0 in (1). The method makes use of analytic implicit functions and a matrix transformation, and the case where $b_{ij}(x) \not\equiv 0$ is made to depend upon the case $b_{ij}(x) \equiv 0$. (Received February 1, 1944.)

149. Otto Szász: *On uniform convergence of trigonometric series.*

This paper contains generalizations of some theorems due to Chaundy and Jolliffe, to Hardy, and to the author. The following are some of the results. The trigonometric series $\sum_1^\infty b_n \sin nt$ is uniformly convergent if $\sum_n^{2n} |b_\nu - b_{\nu+1}| = O(n^{-1})$ and if the sequence nb_n is Abel summable to zero. The power series $\sum_1^\infty c_n z^n$ is uniformly convergent in $|z| \leqq 1$, if $\sum_n^{2n} |c_\nu - c_{\nu+1}| = O(n^{-1})$ and if $\sum c_n$ is Abel summable. The essential part of the proof concerns the point $z = 1$, that is $t = 0$; a device of the Tauberian type is employed. (Received March 18, 1944.)

150. F. A. Valentine: *Contractions in non-euclidean spaces.*

Let $f(x)$ be a function mapping a set S in a metric space M into a set S' in a metric space M', and suppose a contraction of the type $\|f(x_1), f(x_2)\|' \leqq \|x_1, x_2\|$ holds in S and S'. The existence of an extension of the range of definition of such a function so as to preserve a contraction depends upon M and M'. In this article the author shows *the extension exists when $M = M'$ is the n-dimensional hyperbolic* space. The proof used is applied to a metric space which includes both the hyperbolic and the spherical cases. Hence a unification of results is also obtained. (Received February 21, 1944.)

151. S. E. Warschawski: *On conformal mapping of nearly circular regions.*

Generalizing results of L. Bieberbach (Sitzungsberichte, Berliner Akademie, 1923) and of A. R. Marchenko (Bull. Acad. Sci. U.S.S.R. 1935), the author proves the following theorem: Let R be a simply connected region with the properties: (i) R contains the origin $w = 0$ and its boundary lies in the ring $1 \leqq |w| \leqq 1 + \epsilon$, ϵ being a fixed positive number; (ii) there exists a number $\eta \geqq \epsilon$ such that any two points P_1 and P_2 of R of distance less than ϵ can be connected in R by an arc of *diameter* less than η. If $w = f(z)$ maps the circle $|z| < 1$ conformally onto R ($f(0) = 0, f'(0) > 0$) then, for all $|z| < 1$, $|f(z) - z| \leqq B\epsilon \log (1/\epsilon) + 4\eta$, where B is an absolute constant. Analogous results for the derivatives of the mapping function, such as the following, are established. Let C be a simple closed curve $\rho = \rho(\phi)$, $0 \leqq \phi \leqq 2\pi$ (ρ, ϕ polar coordinates), such that $1 \leqq \rho(\phi) \leqq 1 + \epsilon$, $|\rho'/\rho| \leqq \epsilon$, and that $|\rho'(\phi_2)/\rho(\phi_2) - \rho'(\phi_1)/\rho(\phi_1)| \leqq \epsilon |\phi_2 - \phi_1|$, $0 < \epsilon < 1$. If $f(z)$ (normalized as above) maps $|z| < 1$ onto the interior of R, then, for $|z| \leqq 1$, $(A(1+\epsilon^2)^{1/2})^{-1} \leqq |zf'(z)/f(z)| \leqq A(1+\epsilon^2)^{1/2}$ and $|f'(z) - 1| \leqq 5(A\epsilon + A - 1)$, where $A = 4^\epsilon e^{\epsilon^2}$. (Received April 1, 1944.)

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152. Wilfred Kaplan and Max Dresden: *The mechanism of the condensation of gases.*

The criterion previously formulated (see abstract 49-5-158) for the condensation of a gas: namely, that condensation occurs at energy zero, when the topological structure of the energy surface changes, is further explored. It leads to a qualitative picture