integrals.

there is given a study of Carleman's ... (the results

[pp. 115–128] a study is presented of ... (representation of integral operators with Carleman kernels (representation of any bounded operator in L^2; properties of Carleman ... functions, integral representations of Carleman ...

$$Af = \int_a^b K(s,t)f(t)dt$$

... is completely continuous and $K(s,t)$ is

Math. Soc. Colloquium Publ. ...

Source: Mathematical Reviews, Vol 10 No. 7

ABSTRACT [illegible]

[illegible]

spans C, if there exists a sequence of polynomials $P_n(x$ [illegible]

AKHIYEZER, N.I.

Applied Mechanics Reviews, V. 7 Mar. 1954 Theoretical and Experimental Methods

7-15-54 LL

(1) Math 2

693. Akhiezer, N. I., Elements of the theory of elliptic functions [Elementi teorii ellipticheskikh funktsii], Moscow-Leningrad, Gosud. Izdat. Tekh.-Teor. Lit., 1948, 201 pp.

Reading of this book presupposes fundamentals of analysis of a real and complex variable. The work is divided into 10 chapters and two appendixes, but only sections I, III–VI are of immediate importance for technical applications. Chapters VIII and X contain considerable advanced facts.

First section is introductory in nature, explaining fundamental concepts and definitions (periods of single-valued analytic functions, Weierstrass p-transcendents, theta functions, etc.). Third chapter presents a brief theory of elliptic integrals and of Weierstrass functions. Sections IV–VI contain a more detailed treatise of the theta and elliptic functions.

Of technical importance is section VIII, explaining the role of elliptic functions in conformal mapping. Reader's attention is called especially to chapter X containing many facts of applied mathematics.

There are numerous fundamental problems in techniques which require good knowledge of the subject in question, such as theory of pendulum, elliptic filters, many questions about motion of a solid with only one fixed point, important facts of the theory of girders, etc. As for more advanced problems, we mention at least the idea of elliptic coordinates and the Lamé equation.

Akhiezer's book informs about all these facts. In a clear and vivid presentation, without cumbersome constructions and superfluous theory, it directly attacks the kernel of the subject. Engineers and physicists will find this fine work well worth reading.

V. Vodička, Czechoslovakia

AKHIYEZER, N.I.

AKHIYEZER, N.I.

AKHIYEZER, N. I.

USSR/Academy of Sciences
Sciences

Jun 49

"Meeting of the Presidium on 5 May 1949" 2 pp

"Vest Ak Nauk SSSR" No 6

A. S. Popov medal for 1949 was awarded to Acad B. A. Vvedenskiy for outstanding work in radio physics and radio engineering. V. V. Dokuchayev medal for 1948 was awarded posthumously to Prof S. A. Zakharov for his works on soil conservation. P. L. Chebyshev prize (20,000 rubles) for 1948 was awarded to N. I. Akhiyezer, Acad Sci USSR, for his book, "Lectures on the Theory of Approximation." A. D. Arkhangel'skiy prize(10,000 rubles) was awarded to Ye. N. Shchukins Sr Sci Collaborator, Inst of Geol Sci, for the work "Tertiary Continental Deposits on the Northern Urals."

PA 54/49T2

AKHIYEZER, N.I.

Source: Mathematical Reviews Vol. 10, No. 10

AKHIYEZER, N.I.

Ahiezer N. I. et al

AKHIYEZER, N. I.

USSR/Mathematics - Approximations Jan/Feb 51

"Works of Academician S. N. Bernshteyn on the Constructive Theory of Functions (on the Occasion of his 70th Birthday)," N. I. Akhiyezer

"Uspekhi Matemat Nauk" Vol VI, No 1 (41), pp 3-67

Main headings: best approximation by polynomials; problems of interpolation; inequalities for polynomials and trigonometric sums; extremal properties of entire (integral) transcendental functions of finite degree; best approximation on the entire axis by means of integral transcendental functions of finite degree; phenomenon of interference; best

177T51

LC

USSR/Mathematics - Approximations (Contd) Jan/Feb 51

weighed approximation on the entire axis by means of polynomials; least deviation from zero and orthogonal polynomials; quadrature formulas; analytic functions in real region. Lists 58 works of Bernshteyn.

177T51

LC

AKHIYEZER, N. I.

1951

USSR/Mathematics - Approximation, Inequalities   Sep/Oct 51

"Integral Functions of Finite Degree That Deviate the Least From Zero," N. I. Akhiyezer, Khar'kov

"Matemat Sbor" Vol 31 (73), No 2, pp 415-438

Investigates subject problem for the case where the polynomial passes over into an integral (entire) transcendental function, when the problem becomes somewhat complicated. Submitted 18 Apr 52.

226T81

AKHIYEZER, ~~N.N.~~ N.I.

USSR/Mathematics - Majorants Jul/Aug 52

"Entire (Integral) Transcendental Finite-Power Functions Possessing a Majorant on a Sequence of Real Points," N. N. Akhiyezer

"Iz Ak Nauk SSSR, Ser Matemat" Vol XVI, No 4, pp 353-364

Demonstrates 2 theorems governing the dependence of the growth of a finite-power entire function along the real axis upon its growth along a certain finite sequence of real points. Cites Cartwright, "On Certain Integral Functions of Order One," Quar J of Math, Oxford Series, 7, 1936, 46-55' Agmon,

219T68

"Functions of Exponential Type in an Angle and Singularities of Taylor Series," Trans Amer Math Soc, 70, 3, 1951; Paley and Wiener, "Fourier Transforms in the Complex Domain," New York, 1934. Also cites Soviet mathematicians V. A. Marchenko (1950); S. N. Bernshteyn (1948); and previous works. Submitted by Acad S. N. Bernshteyn, 13 Jan 52.

219T68

SR/Mathematics - Complex-Variable Functions (Entire) Sep/Oct 52

A Family of Entire Functions of Finite Power and a hebyshev Problem," N. I. Akhiyezer

Iz Ak Nauk SSSR, Ser Matemat" Vol 16, No 5, p 459-468

States that in order to solve certain extremal problems in the class of entire (integral functions, entire functions of finite power are required whose graph possesses a certain sinusoidal form, described

226T70

in the article. Author constructs and investigates a family of such functions. Gives one application. Submitted by Acad S. N. Bernshteyn 25 Feb 52. Cites 3 references, all by Bernshteyn, 1926; 1946; 1949.

226T70

AKHIYEZER, N. I.

AKHIYEZER, N. I.

"Entire Functions of the Finite Order Least Deviating from Zero," Mat. sbor., 31, No.2, 1952

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100610008-5"

AKHIYEZER, N. I.

USSR/Mathematics - Trigonometric Series

"A Generalization of Trigonometric Conjugate Series," O. I. Babakova, Khar'kov Polytech Inst im Lenin

DAN SSSR, Vol 91, No 6, pp 1241-1244, 1953

Introduces the two functions $A F(t) \sim \sum_{k=1}^{\infty} \frac{1+h^{2k}}{1-h^{k}} (a_k \sin kt - b_k \cos kt)$ and $B_h F(t) \sim \sum_{k=1}^{\infty} \frac{1-k^{2k}}{1+h^{2k}} (b_k \cos kt + a_k \sin kt)$, which are the generalized conjugates, of the 1st and2nd kind, of the function $F(t) \sim$

$a_0 + \sum_{k=1}^{\infty} (a_k \cos kt \quad b_k \sin kt)$, where h is an arbitrary number $(0 \leq h \leq 1)$. Shows that A_h and B_h are singular integral operators which transform $F(t)$ into $\tilde{F}(t)$. Obtains results of use in approximations (cf. N. I. Akhiyezer, Leksii po Teorii Approksimatsii, 1947). Presented by Acad S. N. Bernshteyn 19 Jun 53.

[illegible] and [illegible]

[illegible] weight [illegible]

[illegible] of moments [illegible]

AKHIYEZER, N.I.

Ahiezer, N. I. On weak weight functions

integer not less than 2L ... are the points in a

AKHIYEZER, N. I.

[illegible]

Ahiezer, N. I. On best weighted approximation on the whole axis by means of [illegible]

[illegible]

Bernstein [illegible]

(1949); these Rev. 11, 23 [illegible]

p there is an entire function Φ_p [illegible] of exponential type $q = q(p)$ such that if g [illegible] and $|g(x)| \leq \Phi(x)$ for all [illegible] $y \leq 0$. Measure [illegible] norm [illegible] continuous [illegible] ponential type p. Let [illegible] set [defined by the author, Mat. [illegible] 438 (1952); these Rev. 14, 45 [illegible] of zeros of a real entire function [illegible] for which $\lim y\Phi_p(iy)$ [illegible] $G_p(x)$ is that entire function [illegible] least from $f(x)$ in the specified norm.

As an illustration the author [illegible] calculates an explicit [illegible] to the function [illegible] Bernstein [illegible] same Dokl. [illegible] 8, 20 [illegible]

AKHIYEZER, N.I.

USSR/Mathematics

Card : 1/1

Authors : Akhiezer, N. I.

Title : About one generalization of the Fourier transformation and the Wiener-Paley theorem

Periodical : Dokl. AN SSSR, 96, Ed. 5, 889 - 892, June 1954

Abstract : A generalization, described in the article, is connected with the transition from the L^2 space to the L^2_φ space with a scalar product of the $(f, g) = \int_{-\infty}^{\infty} f(x)\overline{g(x)} \frac{dx}{\varphi(x)}$,

where $\varphi(x) \geq 1$ $(\varphi(0) = 1)$ is a whole transcendent function of null order all roots of which are within the band of a finite width between $-A < R < A$. The generalization was accomplished with the help of 2 theorems, proof of which are presented.

Institution : ....

Presented by : Acadendcian, S. N. Bernshteyn, April 10, 1954

AKHIYEZER, N.I.

USSR/Mathematics - Integrals

Card 1/1 Pub. 22 - 3/48

Authors : Akhiezer, N. I.

Title : About certain connected (twin) integral equations

Periodical : Dok. AN SSSR 98/3, 333-336, Sep 21, 1954

Abstract : Description of a simple pair of integral equations and their usefulness in solving many complex boundary problems of mathematical physics is presented. Certain complex boundary problems of the theory of the logarithmic potential for semi-spaces, which can be reduced to trigonometric connected (twin) equations, are listed. This report establishes the formal ratios of such equations but does not analyze the conditions for their applicability. Four references: 3-USSR and 1-USA (1948-1954).

Institution : The V. I. Lenin Polytechnicum, Kharkov

Presented by : Academician S. N. Bernshteyn, June 21, 1954

AKHIYEZER, N.I.; LANDKOF, N.S., redaktor; LIMANOVA, M.I., tekhnicheskiy redaktor

[Academician S.N. Bernshtein and his work on a constructive theory of functions] Akademik S.N. Bernshtein i ego raboty po konstruktivnoi teorii funktsii. Khar'kov Izd-vo Khar'kovskogo gos.univ. im. A.M. Gor'kogo, 1955. 110 p. (MLRA 8:10)
(Bernshtein, Sergei Natonovich, 1880-) (Functions)

AKHIYEZER, N.I.

BERNSHTEYN, Sergey Natanovich,akademik; AKHIYEZER, N.I.,redaktor;
CHERNYSHENKO, Ya.T.tekhnicheskiy redaktor

[Analytical nature of solutions of elliptical differential equations] Analiticheskaia priroda reshenii differentsial'nykh uravnenii ellipticheskogo tipa. Red. i kommentarii N.I. Akhiezera. Khar'kov, Izd-vo Khar'kovskogo gos. univ. im. A.M. Gor'kogo, 1956. 93 p. (MLRA 10:5)
(Differential equations, Partial)

AKHIYEZER, N.I.

SUBJECT USSR/MATHEMATICS/Theory of approximations CARD 1/1 PG - 421
AUTHOR ACHIEZER N.I.
TITLE On weighted approximations of continuous functions by polynomials on the whole number line.
PERIODICAL Uspechi mat. Nauk 11, 4, 3-43 (1956)
reviewed 12/1956

The problem of the weighted approximation by polynomials was firstly formulated by Bernštejn in 1924. Since that time this problem was treated by several authors. But only in the last years papers of Hall, Pollard, Mergeljan etc. were published which form a certain closing of the whole question. This induces the author to give a detailed closed representation of the problem. Some proofs (e.g. that of Pollard) are replaced by simpler ones which follow from known results of the author.

AKHIYEZER, N.I.

The Kharkov Mathematical Society. Uch.zap.KHGU 65:31-39 '56.
(MIRA 10:7)

(Kharkov--Mathematics--Societies)

AKHIYEZER, N.I.

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1465
AUTHOR ACHIEZER,N.I., ACHIEZER,A.N.
TITLE On the Problem of the Diffraction of Electromagnetic Waves at a Circular Opening in a Plane Screen.
PERIODICAL Dokl.Akad.Nauk, 109, fasc. 1, 53-56 (1956)
Issued: 9 / 1956 reviewed: 11 / 1956

The present work applies the results obtained by N.I.ACHIEZER, Dokl.Akad.Nauk, 98, No 3 (1954) to a diffraction problem. One of these results relates to the integral equations:

$$\int_0^\infty C(\lambda)J_m(\lambda r)\lambda^{m+1}d\lambda = 0 \ (r>a), \quad \int_0^\infty C(\lambda)J_m(\lambda r)\lambda^{m+1}\frac{d\lambda}{\gamma} = F(r)r^m \ (0<r<a) \qquad (1)$$

Here $m(\geqslant 0)$ is a whole number, $k\geqslant 0$, the radical $\gamma = \sqrt{\lambda^2-k^2}$ is positive at $\lambda^2>k^2$ and at $0<\lambda^2<k^2$ it has a negative imaginary part, $F(r)(0\leqslant r\leqslant a)$ is an assumed smooth function. The required function $C(\lambda)$ must satisfy the condition (2) $\int_0^\infty |C(\lambda)\lambda^m|^p\lambda\, d\lambda < \infty$. The solution of the system of equations (1) has the form: $C(\lambda) = \sqrt{\frac{2}{\pi}}\int_0^a g(t)\cos(t\gamma)dt$, where $g(t)$ is determined from the following integral equation with real symmetrical kernel:

AKHIYEZER, N.I.; YEFIMOV, N.V.

Boris IAkovlevich Levin; on the occasion of his 50th birthday.
Usp.mat.nauk 12 no.2(74):237-242 Mr-Ap '57. (MIRA 10:7)
(Levin, Boris Iakovlevich, 1906-)

AKHIYEZER, N.I

AUTHOR AKHIYEZER, A., AKHIYEZER, N., LYBARSKIY, G., PA - 281e

TITLE Effective Boundary Condition on the Sueface of Multiplying and Slowing down Medium.
(Effektivnoye granichnoye usloviye na poverkhnosti razdela mul'tiplitsituyushchey i zamedlyayushchey sred - Russian)

PERIODICAL Zhurnal Tekhn. Fiz., 1957, Vol 27, Nr 4, pp 822-829, (U.S.S.R.)
Received 5/1957 Reviewed 6/1957

ABSTRACT The effectiv boundary condition at the boundary of the multiplicatory- and the slowing down medium are obtained for the case in which the slowing down characteristics of both media are the same. It is assumed that the multiplicatory medium fills the right half-space $(x>0)$ whilst the left half-space is filled by the slower-down (x-great distances from the flat boundary). As the dimensions of the multiplicatory medium are infinite, whilst a steady problem is present, the multiplicatory factor of the neutrons is assumed to be equal to one in the case of the determination of the effective boundary conditions. The equation for the slowing-down process of the fast neutons is set up and is then taken as a diffusion equation and reduced to the form of an integral-differential equation with a difference as kernel. The problem consists in finding an asymptotic representation of $f(\xi)$ with $\xi \gg 1$. $\xi = \frac{x}{L_+}$, where L_+ is the diffusion length of the neutrons with $x>0$. The problem is solved by applying a method resembling that of Viner-Gopf. In an appendix the exact computation is carried out. (With 3 citations from Slav publications)

Card 1/2

Effeetive Beundary Canditiem en the Surface ef Multiplyimg and Slewimg Dewm Medium. PA- 281e

ASSOCIATION FTI ef the Acadeny ef Sciemee ef the Ukrainiam SSR, Charkew, (FTI AN USSR, Kharkev)

PRESENTED BY

SUBMITTED 1.1e.1956

AVAILABLE Library ef Cengress

Card 2/2

AKHIYEZER, N.I.

Sturm - Louiville's equation on a semiaxis. Uch. zap. KHGU 135:44-52 '64. (MIRA 17:10)

AKHIYEZER, N.I., prof. (Khar'kov)

Theory of dual integral equations. Uch.zap.KHGU 80:5-31 '57. (MIRA 12:11)

(Integral equations)

AKHIYEZER, N.I. prof. (Khar'kov); SHCHERBINA, V.A. (Khar'kov)

Conversion of certain singular integrals. Uch.zap.KHGU 80: 191-198 '57. (MIRA 12:11)

(Integrals)

AKHIYEZER, N.I., prof. (Khar'kov); GLAZMAN, I.M. (Khar'kov)

Certain classes of continuous functions generating Hermite-positive kernels. Uch.zap.KHGU 80:205-217 '57. (MIRA 12:11)

(Functions, Continuous)

20-5-1/54

AUTHOR: Akhiyezer, N.I. and Levin, B.Ya.

TITLE: Inequalities for Derivatives Which are Analogous to S.N. Bernshteyn's Inequality (Neravenstva dlya proizvodnykh, analogichnyye neravenstvu S.N. Bernshteyna)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 117, Nr 5, pp. 735-738 (USSR)

ABSTRACT: Let E be a perfect set of points on the real axis of the z-plane with positive harmonic measure. Let G be the complement of E , in the z-plane. The domains arising from the semiplane $\mathrm{Im}\,\zeta > 0$, from the quadrant $\mathrm{Im}\,\zeta > 0$, $\mathrm{Re}\,\zeta > 0$ or from the semistrip $\mathrm{Im}\,\zeta > 0$, $\alpha < \mathrm{Re}\,\zeta < \beta$ by an arbitrary number of rectilinear sections beginning on the basis of the domain and being perpendicular to it, are denoted as domains of the type A and B and C respectively.

Theorem: The upper semiplane $\mathrm{Im}\, z > 0$ can always be mapped conformally on a certain domain Δ of the type A,B,C so that E transforms into the basis of Δ.

The continuations of the mapping function onto G lead (with the aid of the principle of symmetry) to a function $\varphi(z)$ which is generally multivalent. Let be $\omega(z) = e^{-i\varphi(z)}$. Let

Card 1/3 $\overline{\lim\limits_{|z|\to\infty, z\in G}} \frac{\ln f^{*}(z)}{|z|}$ denote the degree of f(z) in G , where

Inequalities for Derivatives Which are Analogous to S.N. Bernshteyn's Inequality 20-5-1/54

in which $f'(x)$ and $\omega'(x)$ exist, it holds

$$|f'(x)| \leqslant \sigma |\omega'(x)| .$$

The inequality is rigorous which is proved by the function

$$f_0(z) = c_1 [\omega(z)]^{\sigma} + c_2 [\omega(z)]^{-\sigma} \qquad (|c_1| + |c_2| = 1)$$

If E consists of intervals only, then the totality of the extremum functions is depleted by the functions of the type $f_0(z)$.

Then several special cases are considered (for special E). 3 Soviet and 1 foreign references are quoted.

ASSOCIATION: State University imeni A.M. Gor'kiy, Kharkov (Khar'kovskiy gosudarstvennyy universitet imeni A.M. Gor'kogo)

PRESENTED: By S.N. **Bernshteyn,** Academician, 20 June 1957

SUBMITTED: 20 June 1957

AVAILABLE: Library of Congress

Card 3/3

AKHIYEZER, N., Prof., ul Frunze 17, Kv. 23, Kharkov

"Moment Problems,"
paper submitted for Eleventh Intl Congress of Mathematicians, Edinburgh, Scotland, 14-21 Aug 58.

paper presented

AKhiyEZER, A.I.

21.1700

S/058/60/000/02/13/023

Translation from: Referativnyy zhurnal, Fizika, 1960, No. 2, p. 73, # 3070

AUTHORS: Akhiyezer, A. I., Akhiyezer, N. I., Lyubarskiy, G. Ya.

TITLE: The Effective Boundary Condition on the Interface of a Multiplying and Moderating Medium

PERIODICAL: Tr. Sessii AN UkrSSR po mirn. ispol'zovaniyu atomn. energii. Kiyev, AN UkrSSR, 1958, pp. 107-115

TEXT: The distribution of thermal neutrons in a multiplying medium is described by the diffusion equation: $\Delta N_+ + N_+/\lambda^2 = 0$, where $\lambda = L_+/\sqrt{K-1}$, L_+ is the diffusion length, K is the coefficient of multiplication. In a certain region near the boundary of the multiplying medium with a reflector, Equation (1) is not applicable and yields an incorrect expression for N_+. If dimensions of the multiplying medium surpass the thickness of this layer considerably and if the distribution of the neutrons near the boundary is without interest, Equation (1) can be used for solving boundary problems by introducing the effective boundary condition which compensates the incorrectness of the shape of the curve N_+ (x, y, z) near the boundary. In the general case of a boundary of arbitrary shape this condition can be expressed in the form

Card 1/2

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S/058/60/000/02/13/023

The Effective Boundary Condition on the Interface of a Multiplying and Moderating Medium

$\partial N_+/\partial \nu = -(b_\infty/a_\infty)\, xN_+/L_+$, where ν is the direction of the inner normal to the boundary surface, a_∞ and b_∞ are coefficients which are chosen in such a way that the asymptotic bahavior of N_+ should coincide with that obtained from the solution of the kinetic equation. An infinitely extended medium is considered which is divided by the plane $x = 0$ into two parts: the left semi-infinite space filled with the moderator, and the right one filled with the multiplying medium. The moderating properties of both media are considered to be equal and $K = 1$. The density n of the superthermal neutrons formed as a result of the moderation of fast neutrons is expressed by the authors in conformity with the age theory. H is assumed that neutrons with an initial energy (age $\tau = 0$) are distributed according to the law $n(x,0) = \varepsilon N_+(x)$ at $x > 0$, $n(x,0) = 0$ at $X < 0$ (ε is a certain coefficient). Then the densities of thermal neutrons in the left and right semi-infinite spaces N_- and N_+ satisfy a system of integro-differential equations of the second order: $d^2N_\pm/dx^2 = \beta_\pm^2 N_\pm - (\varepsilon\gamma/2\sqrt{\pi\tau_0})\, I$, $I = \int_0^\infty N_+(x')\, \exp[-(x-x')^2/4\tau_0]\, dx'$. Applying a method close to Wiener-Hopf's method the authors succeeded in finding the ratio a_∞/b_∞ in the form of quadratures; for small τ/L_+ ratios a simple analytical expression was found. In the appendix the mathematical apparatus used is applied to a more general integro-differential equation.

Card 2/2

A. Ya. Temkin

16(1)

AUTHORS: Akhiyezer, N.I., Myshkis, A.D. SOV/42-14-3-19/22

TITLE: Mathematical Life at Khar'kov in the Last Years

PERIODICAL: Uspekhi matematicheskikh nauk, 1959, Vol 14, Nr 3, pp 215 - 220 (USSR)

ABSTRACT: The authors present a list of the lectures given in the scientific section of the Khar'kov Mathematical Society from 1956 (the survey of M.N. Marcheyskiy contains the lectures up to 1955, see Istoriko - Matematicheskiye Issledovaniya, 1956, Nr 2, pp 613 - 666). Lectures were given by the following scientists : M.D. Dol'berg, N.I. Akhiyezer, Ya.P. Blank, B.Ya. Levin, A.D. Myshkis, A.Ya. Povzner, Z.S. Agranovich, V.A. Marchenko, I.Ye. Ogiyevetskiy (Dnepropetrovsk), S.G. Kreyn (Voronezh), M.A. Krasnosel'skiy (Voronezh), N.S. Landkof, M.S. Livshits, A.V. Pogorelov, B.V. Gnedenko (Kiyev), V.M. Glushkov, M.G. Kreyn, F.S. Rofe-Beketov, I.V. Sukharevskiy, V.E. Abolinš (Riga), T.M. Karaseva, and Yu.P. Ginzburg (Odessa).

On June 6, 1957 (on the occasion of the 100-th birthday of A.M. Lyapunov) there took place a festive meeting,
At the end of October 1957 an outward session of the Mathematical Section of the Physico-Mathematical Department of the

Card 1/2

Mathematical Life at Khar'kov in the Last Years SOV/42-14-3-19/22

Academy of Sciences of the Ukrainskaya SSR took place on the occasion of the 40-th anniversary of the October revolution. Lectures were given among others by G.N. Savin, B.L. German, Yu.I. Lyubich, Yu.M. Berezanskiy, I.M. Rapoport.
From November 12 - 16, 1957 there took place an extended seminary on mathematical physics at the Khar'kov University with participation of the Khar'kov Mathematical Society. Lectures were given among others by: M.I. Vishik (Moscow), S.L. Sobolev (Moscow), S.K. Godunov (Moscow), S.G. Mikhlin (Leningrad), O.A. Oleynik (Moscow), G.Ye.Shilov (Moscow), G.Ya. Lyubarskiy (Khar'kov), K.I. Babenko (Moscow), I.M. Gel'fand (Moscow), N.D. Vvedenskaya (Moscow), T.D. Venttsel' (Moscow), S.L. Kamenomostskaya (Moscow), Ye.S. Sabinina (Moscow), M.Sh. Birman (Leningrad), O.A. Ladyzhenskaya (Leningrad), I.I. Vorovich (Rostov), A.I. Koshelev (Leningrad), I.M. Glazman (Khar'kov), Yu.L. Daletskiy (Kiyev), I.S. Kats (Kiyev), B.M. Levitan (Moscow), I.S. Sargsyan (Yerevan), M.V. Lomonosov (Khar'kov), and L.D. Faddeyev (Leningrad).

Card 2/2

BERNSHTEYN, S.N.; AKHIYEZER, N.I., red.; KOLMOGOROV, A.N., red.; PETROVSKIY, I.G., red.; RYVKIN, A.Z., red.izd-va; VIDENSKIY, V.S., red.izd-va; MARKOVICH, S.G., tekhn.red.

[Collected works] Sobranie sochinenii. Moskva, Izd-vo Akad. nauk SSSR. Vol.3. [Differential equations, calculus of variations and geometry (1903-1947)] Differentsial'nye uravneniia, variatsionnoe ischislenie i geometriia (1903-1947). 1960. 438 p. (MIRA 13:8)

(Differential equations) (Calculus of variations) (Geometry)

AKhIYEZER, N.I.

PHASE I BOOK EXPLOITATION SOV/[illegible]

Issledovaniya po sovremennym problemam teorii funktsiy kompleksnogo [illegible]; sbornik statey (Investigation of Modern Problems in the Theory of [illegible] Variables; Collection of Articles) Moscow, Fizmatgiz, 196[illegible]. [illegible] p. 3,000 copies printed.

Ed. (Title page): A. I. Markushevich; Eds. (Inside book): [illegible] S. Ya. Khavinson; Tech. Ed.: N. Ya. [illegible]

PURPOSE: This book is intended for specialists in the theory of [illegible] complex variable. It may also be used by [illegible] scientific workers, and specialists in other fields of [illegible]

COVERAGE: The book contains 43 papers originally read at the [illegible] Conference on the Theory of Functions of a Complex Variable held at [illegible] University from May 23 to June 7 1957. [illegible] in the modern theory of functions and its applications. The book is divided into 7 parts. The first part discusses the [illegible] of [illegible], power series, boundary and extremal properties. The second part discusses entire functions and interpolation and approximation problems. The third part discusses functions of many complex variables. The fourth part discusses conformal mappings and boundary-value problems. The fifth part discusses Riemann surfaces and the theory of distribution of values. The sixth part discusses generalized analytic functions, and the seventh part discusses miscellaneous problems. No personalities are mentioned. References accompany each article.

TABLE OF CONTENTS:

(15)

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AUTHOR: Akhiyezer, N.I. SOV/20-130-2-1/69

TITLE: Polynomials Orthogonal on a Circular Arc

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 130, Nr 2, pp 247 - 250 (USSR)

ABSTRACT: The author considers asymptotic properties of polynomials of n-th degree $\varphi_n(z)$ which are orthogonal with the weight function $w(\theta) > 0$ on the given arc $l(\alpha \leq \theta \leq 2\pi - \alpha, \alpha > 0)$ of the unit circle $z = e^{i\theta}$. Let D be the z-plane cut along l. Let

$$t(\theta) = \frac{1}{\sin\frac{\theta}{2}} w(\theta) \sqrt{\cos^2 \frac{\alpha}{2} - \cos^2 \frac{\theta}{2}}.$$

Let $g(z) = g(z,t)$ be an analytic function regular in D and different from zero, $g(\infty) > 0$ and $|g(e^{i\theta})|^2 = \frac{1}{t(\theta)}$, where $t(\theta)$ is a given continuous, positive function.

Theorem 1 : If $t(\theta)$, $\alpha \leq \theta \leq 2\pi - \alpha$ is continuous and positive,

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then for $n \to \infty$ it holds

$$(5)\quad \varphi_n(z) \sim \frac{\sqrt{(z+1)^2 - 4\gamma^2 z} + z - 1 - 2\sin\frac{\alpha}{2}}{2\sqrt{1+\sin\frac{\alpha}{2}}\,(z-1)} \left\{ \frac{z+1+\sqrt{(z+1)^2 - 4\gamma^2 z}}{2\gamma} \right\}^n g(z;t)$$

uniformly in each closed domain lying in D. Here it is

$\gamma = \cos\frac{\alpha}{2}$.

Theorem 2 gives the asymptotic behavior of $\varphi_n(z)$, if $t(\theta) > 0$ for certain $\delta > 0$, $k > 0$ satisfies the condition

$|t(\theta + h) - t(\theta)| \cdot |\ln h|^{1+\delta} < k \quad (\alpha \leq \theta < \theta + h \leq 2\pi - \alpha)$

Chebyshev and Ya.L. Geronimus are mentioned.

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In such a case, when $n \to \infty$, $\varphi_n(e^{i\theta})$ will be uniform over the entire arc 1. To prove this theorem a function $s_0(\theta)$ must be introduced:

$$s_0(\theta) = \Omega(e^{i\omega})\,\Omega(e^{-i\omega}),$$

where

$$\Omega(v) = A \prod_{k=1}^{2q} (v - c_k)/[(v-\beta)(v+\beta)]^{2q}.$$

It is then possible to prove that

$$\varphi_m(e^{i\theta}) - \frac{a_{mm}}{b_{mm}}\psi_m(e^{i\theta}) = O(1)\left|\ln\frac{1}{m}\right|^{\delta}.$$

Analyzing the polynomials $\psi_n(z)$ orthogonal on arc 1 it is possible to prove that in a most general case, for $n > n_\Omega$, these polynomials satisfy the equation

$$\gamma y_{n+2} = (z+1)\,y_{n+1} - \gamma z y_n.$$

There are 4 references, 2 Soviet, 1 German, 1 French.

ASSOCIATION: Gor'kiy State University of Khar'kov (Khar'kovskiy gosudarstvennyy universitet imeni A. M. Gor'kogo)

SUBMITTED: September 23, 1959 Card 3/3

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S/020/60/134/001/022/038 XX
C111/C222

AUTHOR: Akhiyezer, N.I.

TITLE: Orthogonal Polynomials on Several Intervals

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 1, pp. 9 - 12

TEXT: Let the weight be different from zero only in the points of the intervals (E) $[-1, \alpha_1]$, $[\beta_1, \alpha_2]$, ..., $[\beta_\varrho, 1]$ $(-1 < \alpha_1 < \beta_1 < \ldots < \alpha_\varrho < \beta_\varrho < 1)$ and let it have one of the forms

$$(1) \quad \frac{S(x)}{\sqrt{-R(x)}} \cdot \frac{1}{t(x)}, \quad \frac{\sqrt{-R(x)}}{S(x)} \cdot \frac{1}{t(x)} \quad (x \in E),$$

where t is a positively continuous function of $x \in E$ and $S(x) = (x-\alpha_1)(x-\alpha_2)\ldots(x-\alpha_\varrho)$; $R(x) = (x+1)(x-\alpha_1)(x-\beta_1)\ldots(x-\beta_\varrho)(x-1)$.

Let

$T_n(x;t) = x^n + \ldots$; $U_n(x;t) = x^n + \ldots$

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be the polynomials orthogonal with respect to the weights (1).
Let the domain $\mathcal{O}\!\!\!/$ arise from the complex z-plane by cutting it along the lines (E). Let F be a two-sheeted Riemannian surface connected along the lines (E) and the ramification points of which are the endpoints of the lines E.
Lemma: Let P(x) and Q(x) be even polynomials being positive for $x \in E$. Let $a_1, \ldots, a_p$ be the zeros of P(x); $b_1, \ldots, b_q$ ($q > \varrho$, $q \gg p$) the zeros of Q(x).
Let

$$(3)\quad \int\limits_E \frac{S(x)}{\sqrt{-R(x)}} \frac{\ln P(x)}{x - \alpha_j} dx = \int\limits_E \frac{S(x)}{\sqrt{-R(x)}} \frac{\ln Q(x)}{x - \alpha_j} dx \quad (j = 1, 2, \ldots, \varrho)$$

Then there exists a rational function $f(z, \sqrt{R(z)})$ the single zeros of which on F are the $b_1, \ldots, b_q$ and the single poles on F are the $a_1, \ldots, a_p$ and ∞, where the last pole is a pole of order $(q - p)$.
It is shown that for determining the $T_n(x; P)$, $U_{n-1}(z; P)$, it is sufficient to construct a rational function $p(z, \sqrt{R(z)})$ having a pole of n-th order

in ∞', ϱ poles of first order in $\alpha_1, \ldots, \alpha_\varrho$, a zero of (n-p)-th order in ∞ and p simple zeros in $a_1, \ldots, a_p$ (∞ and ∞' are points corresponding to the two sheets of F).

Theorem: If P(x) and Q(x) are polynomials which satisfy the conditions of the lemma, where the degree q of $Q(x) \leq$ degree n of P(x), then for $z \in \mathcal{O}\!\!\!/$ it holds:

$$(5)\quad \frac{T_n(z;Q) + \frac{\sqrt{R(z)}}{S(z)} U_{n-1}(z;Q)}{T_n(z;P) + \frac{\sqrt{R(z)}}{S(z)} U_{n-1}(z;P)} = \mathcal{O}\!\!\!/ \left[\frac{Q(x)}{P(x)}\right] A \left[z; \frac{Q(x)}{P(x)}\right]$$

Here

$$\mathcal{O}\!\!\!/ \left[f(x)\right] = \exp\left\{ -\frac{1}{2\pi} \int_E \frac{S(x)}{\sqrt{-R(x)}} \ln f(x)\, dx \right\}$$

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$$A\left[z; f(x)\right] = \exp\left\{\frac{1}{2\pi}\int_E \frac{\sqrt{R(z)}}{\sqrt{-R(x)}}\frac{\ln f(x)}{z-x}dx\right\}$$

The author mentions S.N. Bernshteyn. There are 2 references: 1 Soviet and 1 American.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet imeni A.M. Gor'kogo (Khar'kov State University imeni A.M. Gor'kiy)

PRESENTED: April 18, 1960, by S.N. Bernshteyn, Academician

SUBMITTED: April 15, 1960

Card 4/4

AKHIYEZER, Naum Il'ich; TSLAF, L.Ya., red.; YERMAKOVA, Ye.A., tekhn.red.

[Classical problem of moments and some related problems of analysis] Klassicheskaia problema momentov i nekotorye voprosy analiza sviazannye s neiu. Moskva, Gos.izd-vo fiziko-matem.lit-ry, 1961. 310 p. (MIRA 14:4)

(Moment spaces) (Functional analysis)

AKHIYEZER, N I

Theory of linear operators in Hilbert space, by N.I. Akhiezer and I.M. Glazman. New Yourk, Ungar, 1961-

v.

Translated from the original Russian: Teoriya Lineynykh operatorov v Gil'bertovom prostranstve, Moscow, 1950.

Includes references.

AKHIYEZER, N.I.; PETROVSKIY, I.G.

S.N.Bernshtein's contribution to the theory of differential equations with partial derivatives. Usp. mat. nauk 16 no.2:5-20 Mr-Ap '61. (MIRA 14:5)

(Differential equations, Partial)

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S/044/62/000/006/004/127
B112/B104

16.4400

AUTHOR: Akhiyezer, N. I.

TITLE: Certain inversion formulas

PERIODICAL: Referativnyy zhurnal. Matematika, no. 6, 1962, 10, abstract 6B58 (Uch. zap. Khar'kovsk. un-t, 1961, 115, Zap. Matem. otd. Fiz-matem. fak. i Khar-kovsk. matem. o-va, v. 27, ser. 4, 91 - 95)

TEXT: $\varphi(t)$ $(t \geqslant 0)$ is assumed to be a continuously differentiable function which increases monotonically and without limitation when $t \to \infty$. Two pairs of functions $\omega_i(x,\mu)$ and $\vartheta_i(x,\mu)$ $(i=1, 2)$ are introduced with the aid of the formulas

$$\omega_1(x,\mu) = (\sqrt{2/\pi}/\Gamma(\alpha)) \int_0^x \cos \mu t \, (\varphi'(x)/(\varphi(x) - \varphi(t))^{1-\alpha}) dt$$

(in the expression defining the function $\omega_2(x,\mu)$, $\sin \mu t$ is written instead of $\cos \mu t$),

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Certain inversion formulas

$$\theta_1(x,\mu) = (\sqrt{2/\pi}/\Gamma(1-\alpha))\int_x^\infty \sin\mu t\,(\mu/(\varphi(t)-\varphi(x))^\alpha)\,dt$$

(in the expression defining the function $\theta_2(x,\mu)$, $\cos\mu t$ is written instead of $\sin\mu t$). The following general inversion formulas are then valid:

$$g(\mu) = \int_0^\infty f(x)\omega_i(x,\mu)dx \qquad (i = 1, 2) \qquad (1)$$

$$f(x) = \int_0^\infty g(\mu)\,\theta_i(x,\mu)d\mu$$

The author suspects that in general it may be impossible to obtain conditions for the applicability of formulas (1), and that, therefore, they have to be determined separately in each case. Assuming adequate conditions for the function $\varphi(t)$, several known and new inversion formulas can be obtained from formulas (1). Writing $\varphi(x) = x$, the author obtains the pair of

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Certain inversion formulas

inversion formulas

$$h(\mu) = (\sqrt{2/\pi}) \int_0^\infty f(x) C_\alpha(\mu x) dx,$$

$$f(x) = (\sqrt{2/\pi}) \int_0^\infty h(\mu) \cos(\mu x - \pi\alpha/2) d\mu, \qquad (2)$$

where $C_\alpha(t) = \Gamma^{-1}(\alpha) \int_0^t (\cos z/(t-z)^{1-\alpha}) dz$ is Jung's function of order α.

Formulas (2) are valid for $0 \leq \alpha < 2$. For $\psi(x) = x^2$ Hankel's formulas with cylindrical functions are obtained. As further special cases the author obtains the formulas derived by Hardy in 1925 and a pair of inversion formulas with generalized Legendre functions. [Abstracter's note: Complete translation.]

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S/020/61/138/004/001/023
C111/C333

AUTHORS: Akhiyezer, N.I.,
Tomchuk, Yu. Ya.

TITLE: On the theory of orthogonal polynomials over several intervals

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 138, no.4, 1961, 743-746

TEXT: The paper is a continuation of a paper of N.I. Akhiyezer (Ref.1: DAN, 134, no.1(1960)) and deals with the investigation of polynomials which are orthogonal on the interval system E

$$[-1, \alpha_1], \quad [\beta_1, \alpha_2], \quad \ldots, \quad [\beta_\varsigma, 1].$$

Let $\mathfrak{G}$ denote the z-plane which is cut open along E, $\mathfrak{G}'$ a second sample of $\mathfrak{G}$, $\mathfrak{F}$ the Riemannian surface formed by $\mathfrak{G}$ and $\mathfrak{G}'$, c -- point of $\mathfrak{G}$, c' the subjacent point of $\mathfrak{G}'$, $S(z) = (z - \alpha_1)(z - \alpha_2) \ldots (z - \alpha_\varsigma)$, $\sqrt{R(z)} = \sqrt{(z+1)(z-\alpha_1)(z-\beta_1)\ldots(z-1)}$. Let $T_n(x;t)$, $U_n(x;t)$ be polynomials of n-th degree with coefficients 1 for the highest terms which

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which are orthogonal relative to the weights $\frac{S(x)}{\sqrt{-R(x)}} \frac{1}{t(x)}, \frac{\sqrt{-R(x)}}{S(x)} \frac{1}{t(x)}$ $(x \in E)$.

In (Ref. 1) the function $p(z,\sqrt{R(z)}) = T_n(z;P) - \frac{\sqrt{R(z)}}{S(z)} U_{n+1}(z;P)$ was considered, where $P(z)$ is a polynomial of even degree $p < n$ which is positive on E. It was shown that all poles and all zeros except ϱ distinguished ones are known in advance. Now it is assumed that $P(z)$ is positive on $[-1, +1]$. Then the distinguished zeros of $p(z,\sqrt{R(z)})$ lie in the intervals $[\alpha_k, \beta_k]$ each. Let $\gamma_1, \gamma_2, \dots, \gamma_\lambda$ be the zeros on $\mathfrak{F}$ and $\gamma'_{\lambda+1}, \gamma'_{\lambda+2}, \dots, \gamma'_\varrho$ the zeros on $\mathfrak{F}'$. Let $a_1, a_2, \dots a_p$ be points of $\mathfrak{F}$ in which $P(z)$ vanishes.

Let denote

$$h(z) = \exp\left\{\int_1^z \frac{M(z)}{\sqrt{R(z)}}dz\right\},\quad h(z;c) = \exp\left\{\int_1^z \left[\frac{\sqrt{R(z)}+\sqrt{R(c)}}{z-c} + M_c(z)\right]\frac{dz}{2\sqrt{R(z)}}\right\},$$

where c - - finite point of $\mathfrak{F}$ and $M(z)$, $M_c(z)$ - - polynomials of ϱ-th

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degree with coefficients 1 for z^{ϱ}. The coefficients of $M(z)$, $M_c(z)$ are determined from the demand that the functions $h(z)$, $h(z;c)$ have on $\mathcal{E}$ a unique modulus. For a positive continuous $\varphi(x)$ $(x \in E)$ let denote :

$$\mathcal{G}[\varphi(x)] = \exp\left\{ \frac{1}{\pi} \int_E \frac{M(x)}{\sqrt{-R(x)}} \ln\varphi(x)dx \right\},$$

where $\sqrt{-R(x)}$ is positive in $(B_{\varrho}, 1)$. Then it holds the representation

$$p(z,\sqrt{R(z)}) = \frac{A}{[h(z)]^n} \prod_{j=1}^{\varrho} h(z;a_j)\left[\prod_{k=1}^{\varrho} h(z;\alpha_k)\right]^{-1} \prod_{k=1} h(z;\gamma_k) \prod_{i=\lambda+1}^{\varrho} h(z;\gamma_k^i) \quad (1)$$

where $A = 2\tau^n \mathcal{G}\left[\sqrt{\frac{P(1)}{P(x)}}\right]\Gamma^*(\gamma_1,\gamma_2,\ldots,\gamma_{\varrho})$, $\tau = \lim_{z\to\infty} \frac{z}{h(z)}$ is the transfinite diameter of E, and where a finite constant $L > 1$ exists such that $\frac{1}{L} < \Gamma^*(\gamma_1,\ldots,\gamma_{\varrho}) < L$. From (1) it follows that for every $x \in E$ and $n > p$:

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$$\left|\sqrt{s(x)}\; T_n(x;P)\right| < C\sqrt{P(x)}\,\sqrt{N_n[P]}$$

where C only depends on E and $N_n[P] = 2\tau^{2n}\mathcal{G}\left[\frac{1}{P(x)}\right]\Gamma(\gamma_1,\gamma_2,\ldots,\gamma_3)$,
where $\frac{1}{L} < \Gamma < L$.

Theorem 1 : If the positive function $t(x)$ $(x\in E)$ is continuously differentiable and if the modulus of continuity $\omega_1(\delta)$ of its first derivative satisfies the condition

$$\lim_{n\to\infty}\omega_1\left(\frac{1}{n}\right)\ln n = 0$$

then for all sufficiently large n and every $x\in E$ it holds

$$\left|\sqrt{S(x)}\; T_n(x,t)\right| < C\tau^n\sqrt{t(x)}\,\mathcal{G}\left[1/\sqrt{t(x)}\right] , \qquad (4)$$

where C is a constant depending only on E.
Theorem 2 : Assume that the positive function $t(x)$ $(x\in E)$ possesses a continuous second derivative, the modulus of continuity of which satisfies

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the condition $\lim_{n\to\infty} \omega_2\left(\frac{1}{n}\right) \ln n = 0$. Let P(x) be a positive polynomial on $[-1, +1]$ of even degree, where

$$\int_E \ln t(x) \frac{x^k\,dx}{\sqrt{-R(x)}} = \int_E \ln P(x) \frac{x^k\,dx}{\sqrt{-R(x)}} \qquad (k = 0,1,2,\ldots, \varsigma - 1).$$

In this case for $n \to \infty$ it holds uniformly on E the asymptotic relation

$$\frac{T_n(x;\ t)}{\sqrt{t(x)}\,\sqrt{N_n^*[t]}} \sim$$

$$\sim \frac{1}{\sqrt{P(x)}\,\sqrt{N_n[P]}} \left\{ T_n(x;P)\cos\psi(x) - \frac{\sqrt{-R(x)}}{S(x)} U_{n-1}(x;P)\sin\psi(x) \right\}$$

where

$$N_n^*[t] = N_n[P]\,\mathcal{G}\,[P(x)/t(x)]$$

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and for $n \to \infty$

$$N_n^*[t] \sim N_n[t] = \frac{1}{\pi} \int_E [T_n(x;t)]^2 \frac{S(x)}{\sqrt{-R(x)}} \frac{dx}{t(x)} ,$$

while $\psi(x)$ is given by

$$\psi(x) = \frac{1}{2\pi} \text{ V.P.} \int_E \frac{\sqrt{-R(x)}}{\sqrt{-R(\xi)}} \frac{\ln\frac{t(\xi)}{P(\xi)}}{x - \xi} d\xi$$

A.F. Timan is mentioned in the paper. There are 2 Soviet-bloc references and 1 non-Soviet-bloc reference. The reference to English-language publication reads as follows: G. Szegö, Orthogonal polynomials, 1939.

ASSOCIATION : Kharkovskiy gosudarstvennyy universitet imeni A.M.Gor'kogo (Khar'kov State University imeni A.M. Gor'kiy)

PRESENTED: January 21, 1961, by S.N. Bernshteyn, Academician

SUBMITTED: January 19, 1961

Card 6/6

AKHIYEZER, N.I.

Continual analogs of orthogonal polynomials on a system of intervals. Dokl. AN SSSR 141 no.2:263-266 N '61. (MIRA 14:11)

1. Fiziko-tekhnicheskiy institut nizkikh temperatur AN USSR. Predstavleno akademikom S.N.Bernshteynom.
(Polynomials)

32297
S/020/61/141/004/001/019
C111/C222

16.2600

AUTHOR: Akhiyezer, N.I.

TITLE: A continual analogue of polynomials orthogonal on a circular arc

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 141, no. 4, 1961, 769 - 772

TEXT: The continual analogue of polynomials being orthogonal on a circular arc is a family P(x,y) continuous in x ($\geqslant 0$) of entire transcendent functions of finite degree of λ ; this family is obtained with the aid of a "continual" orthogonalizing of the family $e^{it\lambda}$, where the parameter t varies only on the non-negative real values. The following properties are characteristic : a) $P(0, \lambda) = 1$; b) for $x > 0$, $P(x, \lambda)$ is an entire function of degree x which is bounded in Im $\lambda \geqslant 0$ and for which it holds $\lim\limits_{|\lambda| \to \infty} P(x, \lambda) e^{-ix\lambda} = 1$ (Im $\lambda \leqslant 0$) ; c) there exists a non-decreasing function $\sigma(\lambda)$ $(-\infty < \lambda < \infty)$ for which 1) it holds :

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$$\int_{-\infty}^{\infty} \frac{d\sigma(\lambda)}{1+\lambda^2} < \infty \qquad (1)$$

and 2) for every continuous finite f(x) $(x \geqslant 0)$ it holds

$$\int_0^{\infty} |f(x)|^2 dx = \int_{-\infty}^{\infty} \left| \int_0^{\infty} f(x)P(x,\lambda)dx \right|^2 d\sigma(\lambda) \quad . \qquad (2)$$

Let E be the real axis of the λ -plane with the exception of the interval (-1, 1) and $\sigma(\lambda)$ be an absolutely continuous distribution function with

$$\sigma'(\lambda) = \frac{1}{2\pi} \sqrt{\frac{\lambda+1}{\lambda-1}} \quad (\lambda \in E) \quad ; \quad \sigma'(\lambda) = 0 \quad (-1 < \lambda < 1) \quad .$$

With the aid of (Ref. 2 : N.I. Akhiyezer. DAN, 134, no. 1 (1960)) and (Ref. 2 : N.I. Akhiyezer. DAN, 141, no. 2 (1961)) one finds

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$$P(x, \lambda) = \frac{1}{2}\left(1 + \sqrt{\frac{\lambda - 1}{\lambda + 1}}\right) e^{\frac{1}{2} ix(\lambda + \sqrt{\lambda^2 - 1})} + \frac{1}{2}\left(1 - \sqrt{\frac{\lambda - 1}{\lambda + 1}}\right) e^{\frac{1}{2} ix(\lambda - \sqrt{\lambda^2 - 1})} .$$

Let furthermore $\varphi(z) = \int_0^\infty f(x) e^{ixz} dx$ and $F(\lambda) = \int_0^\infty f(x) P(x, \lambda) dx$.

Theorem 1 : If $F(\lambda)$ is measurable and $\int_E |F(\lambda)|^2 \sqrt{\frac{\lambda + 1}{\lambda - 1}} d\lambda < \infty$ then it holds

$$F(\lambda) = \int_0^\infty f(x) \left\{ \frac{1}{2}\left(1 + \sqrt{\frac{\lambda - 1}{\lambda + 1}}\right) e^{\frac{1}{2} ix(\lambda + \sqrt{\lambda^2 - 1})} + \frac{1}{2}\left(1 - \sqrt{\frac{\lambda - 1}{\lambda + 1}}\right) e^{\frac{1}{2} ix(\lambda - \sqrt{\lambda^2 - 1})} \right\} dx ,$$

$$\frac{1}{2\pi} \int_E |F(\lambda)|^2 \sqrt{\frac{\lambda + 1}{\lambda - 1}} d\lambda = \int_0^\infty |f(x)|^2 dx .$$

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Let $\mathfrak{F}$ be the Riemannian surface consisting of two models ($\mathfrak{G}$, $\mathfrak{G}^*$) of the λ -plane which is out along $(-\infty, -1)$ and $(1, \infty)$ and joined together cross-wise (cf. Ref. 2,3).

Lemma : Every polynomial $\Omega(\lambda)$ positive on E can be represented uniquely in the form

$$\Omega(\lambda) = \omega(\lambda)\omega^*(\lambda),$$

where $\omega(\lambda) = \sum_{k=-n}^{n} a_k(\lambda + \sqrt{\lambda^2-1})^k$, $\omega^*(\lambda) = \sum_{k=-n}^{n} a_k(\lambda - \sqrt{\lambda^2-1})^k$, $a_{-k} = \bar{a}_k$,

where all zeros of $\omega(\lambda)$ on $\mathfrak{G}^*$ and all zeros of $\omega^*(\lambda)$ lie on the sheet $\mathfrak{G}^*$; 2n is the degree of $\Omega(\lambda)$.

The author considers the space L^2_τ, where $\tau(\lambda)$ is absolutely continuous and $\tau'(\lambda) = \frac{1}{\Omega(\lambda)}\sigma'(\lambda)$ so that

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$$\tau'(\lambda) = \frac{1}{2\pi}\frac{1}{\Omega(\lambda)}\sqrt{\frac{\lambda+1}{\lambda-1}} \quad (\lambda \in E) \quad ; \tau'(\lambda) = 0 \quad (-1 < \lambda < 1)$$

where $\Omega(\lambda)$ is a polynomial of degree 2n being positive on E. The author determines its representation according to the lemma and constructs the family of functions

$$Q(x,\lambda) = \frac{1}{2}\left(1+\sqrt{\frac{\lambda-1}{\lambda+1}}\right)\omega(\lambda)\, e^{\frac{1}{2}ix(\lambda+\sqrt{\lambda^2-1})} + \frac{1}{2}\left(1-\sqrt{\frac{\lambda-1}{\lambda+1}}\right)\omega^*(\lambda)\, e^{\frac{1}{2}ix(\lambda-\sqrt{\lambda^2-1})} .$$

For $x \geqslant 0$, $Q(x,\lambda)$ is integral in λ and of degree x. The author considers polynomials $Q_k(\lambda)$ of degree $k = 0,1,2,\dots,n-1$, being orthogonally normalized in L^2_τ.

Theorem 2 : $F(\lambda)$ $(\lambda \in E)$ belongs to L^2_τ then and only then if it admits the representation

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$$F(\lambda) = \sum_{k=o}^{n-1} c_k Q_k(\lambda) + \int_0^{\infty} f(x)\, Q(x,\lambda)dx \,, \qquad f(x) \in L^2(0,\infty) \,. \tag{6}$$

Here it holds

$$\int_E |F(\lambda)|^2 d\tau(\lambda) = \sum_{k=o}^{n-1} |c_k|^2 + \int_0^{\infty} |f(x)|^2\, dx \,.$$

The author mentions M.G. Kreyn. There are 4 Soviet-bloc references.

ASSOCIATION: Fiziko-tekhnicheskiy institut nizkikh temperatur Akademii nauk USSR (Physico-technical Institute of Low Temperatures of the Academy of Sciences Ukr.SSR)

PRESENTED: July 7, 1961, by S.N. Bernshteyn, Academician

SUBMITTED: June 6, 1961

Card 6/6

AKHIYEZER, N.I.; MYSHKIS, A.D.

Mathematics at Kharkov, 1959-1962. Usp. mat. nauk 18 no.3:245-250 My-Je '63. (MIRA 16:10)

L 8441-65 EWT(d) IJP(c)/AFWL/ESD(dp)/RAEM(t) S/0041/64/016/004/0445/0462
ACCESSION NR: AP4048375

AUTHOR: Akhiyezer, N. I. (Khar'kov)

TITLE: A continuous analog of certain theorems on Toeplitz matrices

SOURCE: Ukrainskiy matematicheskiy zhurnal, v. 16, no. 4, 1964, 445-462

TOPIC TAGS: Toeplitz matrix, Fredholm determinant, integral function, integral equation

... considers the Fredholm determinant D (λ; K) as a

AKHIYEZER, N.I.; MARCHENKO, V.A.

Boris Moiseevich Levitan, 1914- ; on his 50th birthday. Usp. mat. nauk 20 no.3:227-234 My-Je '65. (MIRA 18:6)

AKHIYEZER, Naum Il'ich; TSLAF, L.Ya., red.

[Lectures on approximation theory] Lektsii po teorii approksimatsii. Moskva, Nauka, 1965. 407 p. (MIRA 18:8)

L 25655-66 EWT(d)/T/EWP(1) IJP(c)

ACC NR: AM5028588 Monograph UR/ 15 14 B+1

Akhiyezer, Nauk Il'ich 16

Lectures on the theory of approximation (Lektsii po teorii approksimatsii) 2d ed., rev. and enl. Moscow, Izd-vo "Nauka", 1965. 407 p. illus., biblio., index. 10,500 copies printed.

TOPIC TAGS: theory of approximating, theory of functions, functional analysis

PURPOSE AND COVERAGE: This book is the second, revised and enlarged, edition of the same title first published in 1947 which was based on lectures given by the author at Khar'kov University in 1937-1939. The entire first edition was examined and revised. The last section "Supplements and Problems" was completely rewritten in order to take advantage of the newest results obtained by the author and other mathematicians after publication of the first edition. Full proofs are given in some subsections of the last section and statements and literature citations are used in other subsections. Many citations to older books on the theory of functions and functional analysis are omitted in this edition. This book is intended for scientific workers concerned with the theory of functions, mathematics aspirants, instructors in university departments mechanicomathematical and in the physico-mathematical departments of teachers' institutes, also advanced undergraduate mathematics students.

TABLE OF CONTENTS (abridged): 2

Card 1/3 UDC: 517.51

L 25655-66

ACC NR: AM5028588

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L 25855-66

ACC NR: AM5028588

Remarks — 397

Alphabetical index — 404

SUB CODE: /20/ SUBM DATE: 06Jul65/ ORIG REF: 035/ OTHER: 050

Card 3/3

ACC NR: AP6029031 SOURCE CODE: UR/0413/66/000/014/0042/0042

INVENTORS: Klimov, V. V.; Andreyev, A. Ya.; Nakhodnova, A. P.; Kozachenko, V. N.; Akhkozov, Ye. A.; Ivanov, D. G.; Didkovskaya, O. S.; Zvonik, V. A.

ORG: none

TITLE: A method for obtaining a piezoceramic material. Class 21, No. 183812 [announced by Donets Branch of All-Union Scientific Research Institute of Chemical Reagents and of High Purity Chemicals (Donetskiy filial Vsesoyuznogo nauchno-issledovatel'skogo instituta khimicheskikh reaktivov i osobo chistykh khimicheskikh veshchestv)]

SOURCE: Izobret prom obraz tov zn, no. 14, 1966, 42

TOPIC TAGS: piezoelectric ceramic, barium compound, lead compound, calcium compound, titanium compound, sintered alloy

ABSTRACT: This Author Certificate presents a method for obtaining a piezoceramic material from a mixture of barium, lead, calcium, and titanium compounds by sintering this mixture. To lower the temperature of sintering this material, the above compounds are used in the form of nitric acid solutions of barium, lead, calcium, and titanium. This solution is atomized in a stream of air at the temperature of 400—500C. After this, the powder is sintered at the temperature of 800—1000C.

SUB CODE: 11/ SUBM DATE: 21May64

Card 1/1 UDC: 621.315.612:537.226.33

YUSUFOV, A.G.; TYLIK, L.N.; AKHLAKOVA, R.

Some anatomical and physiological changes in cuttings during rooting. Fiziol.rast. 12 no.4:732-735 Jl-Ag '65. (MIRA 18:12)

1. Dagestanskiy gosudarstvennyy universitet imeni V.I.Lenina, Makhachkala. Submitted March 9, 1964.

APPROVED FOR RELEASE: 06/05/2000 CIA-RDP86-00513R000100610008-5"

AKHLAMOV, E.A.

Course of anesthesia in relatioı to the system of automatically controlled respiration during lung surgery for tuberculosis. Vest. khir. 93 no.9:101-106 S '64. (MIRA 18:4)

1. Iz Donetskogo oblastnogo protivotuberkuleznogo disnpasera (glavnyy vrach - A.V.Poliyevich).

AKHLEBENINSKIY, B.

Survey of articles dealing with the law of negation published in the "Vestnik" of Leningrad University. Biul.SNO LGU no.1:162-169 '58. (MIRA 13:6)
(Dialectical materialism)

AKHLEBININSKIY, K.S.; BYCHKOV, V.P.; IL'INA, I.A.; KONDRAT'YEV, Yu.I.;
USHAKOV, A.S.

Providing the crew of a spaceship with food of animal origin.
Probl.kosm.biol. 1:145-151 '62. (MIRA 15:12)
(ASTRONAUTS--NUTRITION)

L 14263-66 EWT(1)/FS(v)-3 SCTB DD/RD
ACC NR: AT6003846 SOURCE CODE: UR/2865/65/004/000/0107/0118

AUTHOR: Abakumova, I. A.; Akhlebininskiy, K. S.; Bychkov, V. P.; Demochkina, N. G.; Kondrat'yev, Yu. I.; Ushakov, A. S.

ORG: none

42
41
B+1

TITLE: Some data on the animal link in a closed ecological system 2,44,55

SOURCE: AN SSSR. Otdeleniye biologicheskikh nauk. Problemy kosmicheskoy biologii, v. 4, 1965, 107-118

TOPIC TAGS: closed ecology system, space nutrition, commercial animal, animal husbandry

ABSTRACT: Data on the animal part of a closed ecological system such as might be used in spaceflight (based on unicellular algae, higher plants, animals, and man) are presented. Most of the information concerns chickens and ducks, good choices because they mature fast, produce a sufficient quantity of nutritious food, and have a high yield of meat and eggs per unit of feed. Comparative analysis shows that to produce 1 kg of meat and fat, cattle require approximately twice as much feed, and pigs 1.5 times as much

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feed as broiler chickens. Furthermore, new generations of chickens and ducks are easily raised by incubating fertilized eggs, and their offspring (taken together) weigh more than the offspring of other animals. The meat of chickens and ducks has more protein and is of higher food value than the protein of other animals. Calculations are made of the number of ducks required to provide a cosmonaut with his daily requirement of animal protein (40—45 g), and tables showing turnover of the flock are listed. For instance, it was concluded that 9 Peking ducks (40 days old) will feed a cosmonaut for 1 month. Fifty eggs are needed for food and hatching in the same period. The daily food and water requirement for this duck population is computed, together with the amount of respired CO_2. Analogous comparative data are listed for chickens. Charts of the nutritive content and caloric value of the food produced by chickens and ducks are included.

It is calculated that for 1 kcal of this food, 25.4 kcal of feed is expended for a duck, and 22.2 kcal for a chicken. Of course, the needs of other links in the closed system will determine whether chickens or ducks are finally chosen. Both animals have advantages: ducks, for instance, can be fed a

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higher percentage of green fodder, and they both mature and gain weight faster than chickens. It must be emphasized that these are only preliminary calculations. More information must be collected about these and other animals, and many experiments must be conducted with each in a closed ecological system. Orig. art. has: 9 tables. [ATD PRESS: 4091-F]

SUB CODE: 02, 06 / SUBM DATE: none / ORIG REF: 013 / OTH REF: 002

Card 3/3

AKHLESTINA, M. S.

USSR/Farm Animals. Honey Bee. Q

Abs Jour: Ref. Zhur-Biol., No 4, 1958, 16889.

Author : Akhleatina M.S.
Inst :
Title : Staining of Smears for Nosematosis of Bees. (Okraska mazkov na nozematoz pchel)

Orig Pub: Veterinariya, 1957, No 6, 68.

Abstract: A smear on the slide is stained by one drop of Loeffler's blue or by one percent aqueous solution of methylene blue. The spores of Nosema remain unstained and are well seen in the blue background.

Card : 1/1

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AKHLESTINA, Ye.F.

Mineralogical characteristics of Cretaceous sediments in the southeastern end of the Kerensko-Chembarsk uplift. Uch.zap. 74: 257-260 '60. (MIRA 15:7)
(Kerensko-Chembarsk Upland--Geology, Stratigraphic)
(Kerensko-Chembarsk Upaldn--Mineralogy)

AKHLIBINSKIY, Boris Vladimirovich; KHRALENKO, Nikolay Ivanovich; ZUBEKHIN, P.T., red.; TIKHONOVA, I.M., tekhn.red.

[A marvel of our times] Chudo nashego vremeni; kibernetika i problemy razvitiia. Leningrad, Lenizdat, 1963. 137 p. (MIRA 16:10)

(Cybernetics) (Philosophy)

AKHLIBINSKIY, Boris Vladimirovich; KHRALENKO, Nikolay Ivanovich;
SINYAKOV, Yu.I., red.; PRESNOVA, V.A., tekhn. red.

[... Plus chemicalization]... Plius khimizatsiia. Leningrad, Lenizdat, 1964. 77 p. (MIRA 17:1)
(Chemistry, Technical--Research)
(Agricultural chemistry)

AKHLYNOV, I.Ya.; BASALAYEV, V.N.; DANILENKO, O.T.; ZAKHAROV, A.D.; OL'KHOVSKIY, V.Ye.; YAKOVLEV, V.I.; KUZ'MINA, V.S., red.

[Manual for navigators of fishing fleets; navigation of fishing boats and sea fishery practices] Spravochnik dudovoditelia rybolovnogo flota; promyslovaia navigatsiia i morskaia promyslovaia praktika. Moskva, Pishchevaia promyshlennost', 1965. 194 p. (MIRA 18:9)

1. Glavnoye upravleniye rybnoy promyshlennosti Azovo-Chernomorskogo basseyna (for Basalayev). 2. Polyarnyy nauchno-issledovatel'skiy institut rybnogo khozyaystva i okeanografii (for Danilenko). 3. Murmanskoye vyssheye morekhodnoye uchilishche (for Yakovlev). 4. Gosudarstvennaya inspektsiya bezopasnosti moreplavaniya i portovogo nadzora flota rybnoy promyshlennosti SSSR (for Zakharov).

AKHLYUSTIN, V. K.

"Investigation of the Operation Cycles of Drive Mechanisms of the SE-3-U Excavator." Cand Tech Sci, Sverdlovsk Mining Inst imeni V. V. Vakhrushev, Min Higher Education USSR, Sverdlovsk, 1954. (KL, No 1, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)

SO: Sum. No. 556, 24 Jun 55

BELYKH, Boris Petrovich; dotsent; CHEKANOV, Vasiliy Demidovich, inzh.; AKHLYUSTIN, V.K., kand.tekhn.nauk, retsenzent; PETROV, I.P., dotsent; KULAKOV, S.N., inzh., red.; LUCHKO, Yu.V., red. izd-va; ZEF, Ye.M., tekhn.red.

[Electric engineering in mines] Gornaia elektrotekhnika. Sverdlovsk, Gos. nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, Sverdlovskoe otd-nie, 1958. 575 p. (MIRA 12:1)
(Electricity in mining)

ZIMIN, A.P., dotsent; Prinimali uchastiye: AKHLYUSTIN, V.K., kand.tekhn. nauk; DOBROBORSKIY, G.A., starshiy prepodavatel'; IGUMNOV, Yu.A., assistent; GORSHKOVA, N.G., inzh.

Investigating the performance of industrial specimens of dump skips without skip dump tracks in the general mine hoisting systems; static analysis. Izv.vys.ucheb.zav.; gor.zhur. no.6:115-126 '59. (MIRA 13:4)

1. Sverdlovskiy gornyy institut imeni V.V.Vakhrusheva. Rekomendovana kafedroy gornoy mekhaniki. (Mine hoisting)