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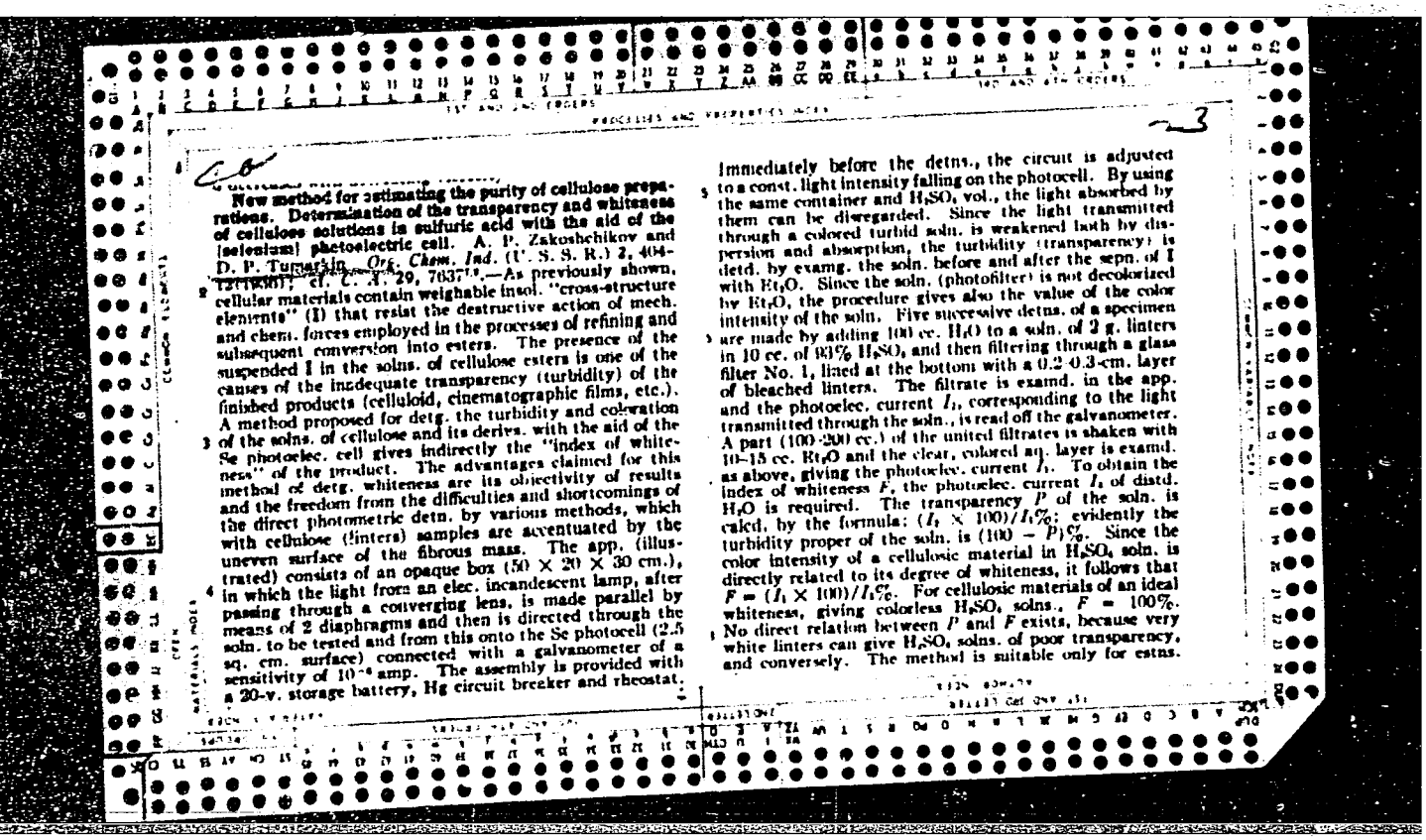

New method for estimating the purity of cellulose preparations. Determination of the transparency and whiteness of cellulose solutions in sulfuric acid with the aid of the [selenium] photoelectric cell. A. P. Zakoshchikov and D. P. Tumarkin. *Org. Chem. Ind.* (U. S. S. R.) 2, 404–[illegible]. Cf. *C. A.* 29, 7637[illegible].—As previously shown, cellular materials contain weighable insol. "cross-structure elements" (I) that resist the destructive action of mech. and chem. forces employed in the processes of refining and subsequent conversion into esters. The presence of the suspended I in the solns. of cellulose esters is one of the causes of the inadequate transparency (turbidity) of the finished products (celluloid, cinematographic films, etc.). A method proposed for detg. the turbidity and coloration of the solns. of cellulose and its derivs. with the aid of the Se photoelec. cell gives indirectly the "index of whiteness" of the product. The advantages claimed for this method of detg. whiteness are its objectivity of results and the freedom from the difficulties and shortcomings of the direct photometric detn. by various methods, which with cellulose (linters) samples are accentuated by the uneven surface of the fibrous mass. The app. (illustrated) consists of an opaque box (50 × 20 × 30 cm.), in which the light from an elec. incandescent lamp, after passing through a converging lens, is made parallel by means of 2 diaphragms and then is directed through the soln. to be tested and from this onto the Se photocell (2.5 sq. cm. surface) connected with a galvanometer of a sensitivity of 10^{-6} amp. The assembly is provided with a 20-v. storage battery, Hg circuit breaker and rheostat. Immediately before the detns., the circuit is adjusted to a const. light intensity falling on the photocell. By using the same container and H_2SO_4 vol., the light absorbed by them can be disregarded. Since the light transmitted through a colored turbid soln. is weakened both by dispersion and absorption, the turbidity (transparency) is detd. by examg. the soln. before and after the sepn. of I with Et_2O. Since the soln. (photofilter) is not decolorized by Et_2O, the procedure gives also the value of the color intensity of the soln. Five successive detns. of a specimen are made by adding 100 cc. H_2O to a soln. of 2 g. linters in 10 cc. of 83% H_2SO_4 and then filtering through a glass filter No. 1, lined at the bottom with a 0.2–0.3-cm. layer of bleached linters. The filtrate is examd. in the app. and the photoelec. current I_1, corresponding to the light transmitted through the soln., is read off the galvanometer. A part (100–200 cc.) of the united filtrates is shaken with 10–15 cc. Et_2O and the clear, colored aq. layer is examd. as above, giving the photoelec. current I_2. To obtain the index of whiteness F, the photoelec. current I_3 of distd. H_2O is required. The transparency P of the soln. is calcd. by the formula: $(I_2 \times 100)/I_3\%$; evidently the turbidity proper of the soln. is $(100 - P)\%$. Since the color intensity of a cellulosic material in H_2SO_4 soln. is directly related to its degree of whiteness, it follows that $F = (I_1 \times 100)/I_3\%$. For cellulosic materials of an ideal whiteness, giving colorless H_2SO_4 solns., $F = 100\%$. No direct relation between P and F exists, because very white linters can give H_2SO_4 solns. of poor transparency, and conversely. The method is suitable only for estns.

of whiteness of refined cellulose products; the accuracy is better than 1%. The method was used in exptl. study of the factors detg. the transparency and whiteness of linters and that of nitrocellulose (II) and cellulose acetate (III). The results show that the transparency (turbidity) of II and III is directly related to that of the refined linters used in the production. Transparency tests and chem. analysis reveal that the transparency of Soviet refined linters is directly related to the contents of fats and waxes and inversely to the wetability of linters. A direct relation exists between the degree and variability of transparency of finished linters and that of the age of crude linters, which varies from 38% for green to 68% for matured linters. The transparency is fundamentally detd. by the condition of alk. steeping and is independent of the degree and method of bleaching. The transparency of bleached sulfite pulp is nearly equal to that of high-grade linters; it is suitable for conversion into II. The index of whiteness of different samples varies considerably less than the transparency, but is for linters of different mills less const. than the transparency. The transparency and whiteness of American (Hercules Powder Company) refined linters is greater than that of Soviet products; it is 88-90 and 99.0%, resp. Chas. Blanc

BURKEYEV, Sergey Ivanovich, inzh. [deceased]; KAZHDAN, Boris Khaymovich, inzh.; OTRESHKO, A.I., prof., doktor tekhn. nauk, retsenzent; IVIANSKIY, A.M., dots., kand. tekhn. nauk, retsenzent; TUMARKIN, D.M., inzh., nauchnyy red.; GLOTOVA, L.V., red. izd-va; SHERSTNEVA, N.V., tekhn. red.

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(Insulation (Heat)) (Dampness in buildings) (Heating)

NIKOL'SKIY, V.N., kand.tekhn.nauk; TUMARKIN, D.M., inzh., nauchnyy red.; GORYACHEVA, T.V., red.izd-va; VORONIN, K.P., tekhn.red.; BOROVNEV, N.K., tekhn.red.

[Soundproofing and architectural acoustics] Voprosy zvukoizoliatsii i arkhitekturnoi akustiki. Pod red. V.N.Nikol'skogo. Moskva, Gos.izd-vo lit-ry po stroit., arkhit. i stroit.materialam, 1959. 154 p. (MIRA 12:7)

1. Akademiya stroitel'stva i arkhitektury SSSR. Institut stroitel'noy fiziki i ograzhdayushchikh konstruktsiy.
(Soundproofing)

USSR.

Tumarkin, G. C. Approximation of fun[illegible] by rational fractions with poles given [illegible]

[illegible]

Let $a_k(z)$ be the Blaschke product with zeros A_k

[illegible]

The function $g(z)$ is subharmonic and not identically [illegible]

[illegible]

R_k lie in $A_k \cup B_k$ is complete in [illegible] if and only if S_k [illegible] $T_k \to \infty$ as $k \to \infty$. The author states Theorem 1. Suppose [illegible]

The function [illegible] belongs to the closure of [illegible] if and only if $f(e^{i\theta})$ is the boundary function of [illegible] $f(z) = g(z)/(B(z)\phi(z))$, where $g(z)$ is regular and bounded in $|z| < 1$. Theorem 2. If [illegible] the [illegible] If [illegible]

[illegible]

AUTHORS: Butt, Yu. M., Rashkovich, L. N., Tumarkina, G. N. SOV/156-58-3-46/52

TITLE: The Interaction of Silicon Dioxide With Aluminate, Alumoferrite and Calciumferrite in the Process of Hydrothermal Treatment (Vzaimodeystviye kremnezema s alyuminatom, alyumoferritom i ferritom kal'tsiya v protsesse gidrotermal'noy obrabotki)

PERIODICAL: Nauchnyye doklady vysshey shkoly, Khimiya i khimicheskaya tekhnologiya, 1958, Nr 3, pp. 580 - 583 (USSR)

ABSTRACT: The results of the investigations on the interaction of silicon dioxide with non-silicate materials of portland cement clinker under hydrothermal treatment are given. Synthetically produced samples of C_3A, Ca, C_4AF, C_2F and finely ground quartz sand were used as starting materials. The chemical and thermographic analyses showed that in the reaction of silicon dioxide with C_3A the compound C_3AH_6 is formed. The chemical composition of this compound is the following: 3 CaO . Al_2O_3 . 2,1 SiO_2 1,8 H_2O. The amount of silicon dioxide bound by C_3A is considerable; e.g. after a sample of 50% sand had been at 16 atmospheres excess

Card 1/3

pressure for 100 hours half of the silicon introduced was bound. The hydrothermal treatment of calcium ferrite at 8 atmospheres excess pressure and 16 atmospheres excess pressure leads to a complete hydrolysis of calcium ferrite with the formation of $Ca(OH)_2$ and unhydrous hematite. Sand added to C_2F is bound violently. In a sample of 30% sand after 10 hours at 16 atm. excess pressure almost the entire amount of silicon dioxide is chemically bound. In the hydrothermal treatment of calcium aluminium, ferrite calcium oxide as well as hematite are formed. The thermographic analyses showed that in this sample a certain amount of hydrated aluminium ferrite was always formed in addition to the $Ca(OH)_2$ and Fe_2O_3. There are 1 figure, 1 table, and 2 references, which are Soviet.

ASSOCIATION: Kafedra tekhnologii tsementnogo proizvodstva Moskovskogo khimiko-tekhnologicheskogo instituta im. D. I. Mendeleyeva (Chair of Cement Production Technology at the Moscow Chemical and Technological Institute imeni D. I. Mendeleyev)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001757420019-5"

[illegible] converges" Generalizations to unbounded [illegible]

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001757420019-5"

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001757420019-5"

TUMARKIN, G.T.; HAVINSON, S.I.

Classes of analytic functions in the fields of multiple connections.
Analele mat 17 no.1:67-94 Ja-Mr '63.

TUMARKIN, G. Ts.

TUMARKIN, G. Ts. -- "Approximation on the Average of Complex-Indicated Functions" Sub 20 Nov 52, Moscow Oblast Pedagogical Inst. (Dissertation for the Degree of Candidate in Physicomathematical Sciences).

SO: Vechernaya Moskva January-December 1952

USSR/Mathematics - Convergence Conditions 11 Apr 52

"Conditions Governing the Convergence of the Boundary Values of a Sequence of Analytical Functions," G. Ts. Tumarkin, Vladimirsk State Pedagogic Inst imeni Lebedev-Polyanskiy

"Dok Ak Nauk SSSR" Vol LXXXIII, No 5, pp 655-658

Indicates certain classes of sequences of analytical functions for which the fulfillment of one of the 2 familiar conditions (i.e., convergence with respect to measure) and uniform convergence of the sequence of these functions within region G of

218T57

USSR/Mathematics - Convergence Conditions (Contd) 11 Apr 52

definition are the conditions necessary and sufficient for convergence in measure in set e of sequence ($f_n(z)$). Submitted by Acad M. V. Keldysh 9 Feb 52.

218T57

TUMARKIN, G. Ts.

TUMARKIN, G. TS.

USSR/Mathematics - Complex Value Functions 1 May 52

"Approximation on the Average of Complex-Value Functions," G. Ts. Tumarkin, Vladimir State Pedagogic Inst imeni P. I. Lebedev-Polyanskiy

"Dok Ak Nauk SSSR" Vol LXXXIV, No 1, pp 21-24

Extends the cases of A. N. Kolmogorov and M. G. Kreyn ($p=2$) to any value of p, in connection with theorems on linear normed space and subject average:

$$\left[\int_0^{2\pi} |f(t)|^p ds(t)\right]^{1/p},$$

where s(t) is a nondecreasing function of bounded variation and f(t) is a complex-value function. Submitted by Acad A. N. Kolmogorov 10 Mar 52.

224T77

Tumarkin, G. Ts.

USSR/ Mathematics - Analytical functions

Card 1/1 Pub. 22 - 11/47

Authors : Tumarkin, G. Ts.

Title : Conditions for convergence of boundary values of a series of analytical functions utilizing the convergence of modules

Periodical : Dok. AN SSSR 98/5, 739-741, Oct 11, 1954

Abstract : Certain classes of analytical functions for which the uniform series convergence and the convergence in accordance with the number of moduli of boundary values appear to be the conditions necessary and sufficient for the convergence in accordance with a certain series (sequence), are analyzed. An example of the practical application of such analytical functions, in the case of series convergence, is presented. Three USSR references (1927-1952).

Institution : ...

Presented by: Academician A. N. Kolmogorov, July 1, 1954

TUMARKIN, G. Ts.

USSR/Mathematics

Card 1/1 : Pub. 22 - 7/44

Authors : Tumarkin, G. Ts.

Title : Approximation of functions by rational fractions with beforehand given poles

Periodical : Dok. AN SSSR 98/6, 909-912, October 21, 1954

Abstract : Approximation of analytical functions by sequences of rational fractions with beforehand given poles (defined) of the

$$R_k(Z) = \frac{c_0 z^p + c_1 z^{p-1} + \cdots + c_p}{(z-\alpha_{kn1})(z-\alpha_{kn2})\cdots(z-\alpha_{kn_p})}$$

form is suggested. The possibility of such approximations is proved by the theorems presented. Six references (1935-1952).

Institution : .....

Presented by: Academician A. N. Kolmogorov, June 1, 1954

TUMARKIN, G. Ts.

SUBJECT USSR/MATHEMATICS/Theory of functions CARD 1/1 PG - 83
AUTHOR TUMARKIN G.C.
TITLE On the uniform convergence of certain sequences of functions.
PERIODICAL Doklady Akad. Nauk 105, 1151-1154.(1955)
reviewed 6/1956

The author gives the following completion to the theorem of Khintchine-Ostrowski: If the $f_n(z)$, being holomorphic in the unit-circle, verify

$$\int_0^{2\pi} \log^+ \left| f_n(r\, e^{i\theta}) \right| d\theta \leq C, \qquad 0 < r < 1,$$

and if the limit values $f_n(e^{i\theta})$ converge on a set E of positive measure, then there exists a partial sequence which converges uniformly on a domain the closure of which cantains a perfect part P of E with mes P > mes E - ε.

INSTITUTION: Ordzonikidze Inst. of geology, Moscow.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001757420019-5"

Card 1/2 Pub. 22 - 7/54

Authors : Tumarkin, G. Ts.

Title : On sequences of meromorphic functions with uniformly bounded areas of Riemann surfaces over a sphere

Periodical : Dok. AN SSSR 106/2, [illegible], Jan 11, 1956

Abstract : A series of lemmas and theorems are proved for the purpose of establishing the relationship between the convergence of the [illegible] and the convergence of the [illegible] inside of the circle $|z|<1$; here, [illegible] is a sequence of limiting values of the meromorphic [illegible] $|z|<1$, and the [illegible] is a sequence [illegible] $|z|<1$ [illegible] $\ldots$

Institution : Moscow Geological Research Institute imeni Sergo Ordzhonikidze

Presented by: Academician A. N. Kolmogorov, September 20, 1955

Dok. AN SSSR 106/2, [illegible], Jan [illegible], 1956

Abstract : where A(f) is an area of a Riemannian surface on which the function f(z) maps the circle | z |< 1 . Five USSR references (1926-1955).

MARKUSHEVICH, Aleksey Ivanovich; TIKHONOVA, E.P., redaktor; TUMARKIN, G.Ts. redaktor; NEGRIMOVSKAYA, R.A., tekhnicheskiy redaktor

[Short course in the theory of analytic functions] Kratkii kurs teorii analiticheskikh funktsii. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1957. 335 p. (MLRA 10:5)
(Functions, Analytic)

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001757420019-5"

TUMARKIN, G. Ts.

AUTHOR: Tumarkin, G.Ts. 39-1-5/5

TITLE: Mean approximations to functions on rectifiable arcs. (Priblizheniye v srednem funktsiy na spryamlyayemykh krivykh)

PERIODICAL: "Matematicheskiy Sbornik" (Mathematical Symposium), 1957, Vol.42 (84), No.1, pp. 79-128 (U.S.S.R.)

ABSTRACT: The functions considered are complex. In the first chapter is considered a mean, weighted approximation to functions f(t) defined on the segment $(o, 2\pi)$ of the real axis by linear combinations of the system $\{e^{int}\}$ $(n = 0,1,2,\ldots)$. Let $\sigma(t)$ be a non-vanishing function of bounded variation in $(o, 2\pi)$. If f(t) belongs to $L^p(d\sigma; o, 2\pi)$ $(p > 0)$, a sequence $\{\Pi_k (e^{it})\}$ of linear combinations of a system $\{e^{int}\}$:

$$\Pi(e^{it}) = c_0 + c_1 e^{it} + \ldots + c_n e^{int}$$

Card 1/6 can be found such that:

Mean approximations to functions on rectifiable arcs. (Cont.)

$$\lim_{k\to\infty} \int_0^{2\pi} \left| f(t) - \prod_k (e^{it}) \right|^p d\sigma(t) = 0 ,$$

then it is said that $f(t)$ belongs to the closure of a linear segment of a system $\{e^{int}\}$ in $L^p(d\sigma;\ o,\ 2\pi)$. Kolmogorov (8) and Kreyn (10) for $p = 2$ and Akhiezer (1),(2) for $p \geq 1$ have proved that the necessary and sufficient condition for the closure of the system $\{e^{int}\}$ in $L^p(d\sigma;\ o,\ 2\pi)$ is that:

$$\int_0^{2\pi} \ln \sigma'(t)dt = -\infty .$$

It is proved in this paper that this condition is necessary and sufficient if the closure of the system is true for any $p > 0$.

Card 2/6 The closure of the linear segment of a system $\{e^{int}\}$ in

Mean approximations to functions on rectifiable arcs. (Cont.)

spaces $L^p(d\sigma;\ o,\ 2\pi)$ in which the system is not closed and so for which:

$$\int_0^{2\pi} \ln \sigma'(t)dt > -\infty$$

is also studied. If $F(e^{it}) = f(t)$ the interval $(o,\ 2\pi)$ is transformed into the unit circle and the question becomes that of determining the properties of $F(e^{it})$ defined in the unit circle for which there is a set of polynomials $\{\Pi_k(e^{it})\}$ of such that:

$$\lim_{k\to\infty} \int_0^{2\pi} \left|F(e^{it}) - \Pi_k(e^{it})\right|^p d\sigma(t) = 0\ ,$$

where $\sigma(t)$ satisfies:

$$\int_0^{2\pi} \ln \sigma'(t)dt > -\infty\ .$$

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Mean approximations to functions on rectifiable arcs. (Cont.)

Szegö (24), (25), Smirnov (16),(17) and Korovkin (9) have studied this problem for the case $p = 2$. Smirnov and Korovkin indicated a wide class of functions, analytic in a domain bounded by a rectifiable curve, whose values could be approximated to in the mean with any given accuracy for $p = 2$. For theorem 23, a full solution is given and the necessary and sufficient conditions that $f(t)$ should belong to the closure of a linear segment of the system $\{e^{int}\}$ in $L^p(d\sigma;\ o,\ 2\pi)$ for any positive p and $\sigma(t)$ satisfying condition:

$$\int_0^{2\pi} \ln \sigma'(t)dt > -\infty$$

are indicated.

The behaviour of the sequence $\{\Pi_k(e^{it})\}$ in $|z|<1$ which approximates to $F(e^{it})$ arbitrarily well in the metric of $L^p(d\sigma;\ o,\ 2\pi)$, assuming only that the sequence satisfies:

Card 4/6

Mean approximations to functions on rectifiable arcs. (Cont.)

$$\lim_{k\to\infty} \int_0^{2\pi} \left| F(e^{it}) - \Pi_k(e^{it}) \right|^p d\sigma(t) = 0 ,$$

is discussed for $\sigma(t)$ satisfying:

$$\int_0^{2\pi} \ln \sigma'(t)dt = -\infty ,$$

and

$$\int_0^{2\pi} \ln \sigma'(t)dt > -\infty .$$

Chapter II is devoted to mean, weighted approximations by polynomials to complex functions defined on a rectifiable Jordan curve γ. The case of an open curve has been solved by Markushevich (13), so attention is directed only on the case of a closed curve. The questions solved are similar to those

Mean approximations to functions on rectifiable arcs. (Cont.)

of Chapter I. Using the results of Chapter I, there is a complete investigation of a closure of a linear segment of the system $\{\zeta^n\}$ in $L^p(d\sigma; \gamma)$ for $p > 0$ (ζ replaces e^{it}). In Chapter III is studied the mean approximation to a complex function defined on the real axis. A full investigation is given of the closure of a linear segment of the system $\{e^{iax}\}$ (a any positive number) in $L^p(d\sigma; -\infty, +\infty)$ for $p > 0$.

There are 31 references, 28 of which are Slavic.

SUBMITTED: March 27, 1956.

AVAILABLE: Library of Congress

Card 6/6

TUMARKIN, G.TS.

The behavior near the boundary of a region of certain sequences of derivatives of analytic functions converging uniformly within the region. Dokl. AN SSSR 114 no.3:502-505 My '57. (MLRA 10:8)

1. Predstavleno akademikom M.A. Lavrent'yevym.
(Functions, Analytic)

TUMARKIN, G.TS.

Conditions for the existence of an analytic majorant of a family of analytic functions. Izv. AN Arm. SSR. Ser. fiz.-mat. nauk 17 no.6:3-25 '64. (MIRA 18:3)

1. Moskovskiy geologorazvedochnyy institut im. S.Ordzhonikidze.

TUMARKIN, G.TS.

Converging sequences of Bliashke's products. Sib. mat. zhur. 5 no.1:201-233 Ja-F '64. (MIRA 17:7)

TUMARKIN, G.TS.

Conditions for uniform convergence and for the convergence of boundary values of analytic and meromorphic functions with uniformly bounded characteristics. Sib. mat. zhur. 5 no. 2: 387-417 Mr-Ap '64. (MIRA 17:5)

TUMARKIN, G.TS.

Properties of analytic functions representable by Cauchy-Stieltjes and Cauchy-Lebesgue type integrals. Izv. AN Arm.SSR.Ser.fiz.-mat. nauk 16 no.5:23-45 '63. (MIRA 16:11)

1. Moskovskiy geologorazvedochnyy institut.

TUMARKIN, G.TS.

One sufficient condition for a limiting domain to belong to class S. Vest. LGU 17 no.13:47-55 '62. (MIRA 15:7)
(Functions, Analytic)

TUMARKIN, G.TS.

Conditions of the average convergence of boundary values of the sequence of analytic functions. Trudy MGRI 36:154-174 '59.
(MIRA 15:5)

(Functions, Analytic)

MARKUSHEVICH, Aleksey Ivanovich; TIKHONOVA, E.P., red.; TUMARKIN, G.TS., red.; BRUDNO, K.F., tekhn. red.

[Brief course in the theory of analytic functions] Kratkii kurs teorii analiticheskikh funktsii. Izd.2., stereotipnoe. Moskva, Gos. izd-vo fiziko-matem. lit-ry, 1961. 335 p. (MIRA 15:2)

(Functions, Analytic)

TUMARKIN, G. Ts.

Doc Phys-Math Sci - (diss) "Boundary properties of sequential analytic functions." Leningrad, 1961. 30 pp; (Leningrad Order of Lenin State Univ imeni A. A. Zhdanov); 180 copies; price not given; list of author's works on pp 29-30 (22 entries); (KL, 6-61 sup, 191)

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B112/B202

16.3000

AUTHOR: Tumarkin, G. Ts.

TITLE: Series expansion of analytical functions with respect to fractions with a given amount of poles

PERIODICAL: Izvestiya Akademii nauk Armyanskoy SSR. Seriya fiziko-matematicheskikh nauk, v. 14, no. 1, 1961, 9-31

TEXT: M. M. Dzhrbashyan studied the series expansion of analytical functions $f(z)$ with respect to certain rational functions $M_n(z)$, generalized Faber's polynomials, in simply connected domains G which are bounded by rectifiable Jordan curves γ. He demonstrated that each function $f(z)$ analytical in G and steady in $\overline{G}$ can be expanded into a series

$$f(z) = \sum_{n=0}^{\infty} C_n M_n(z)$$

uniformly convergent in the interior of G, if the given sequence $\{\alpha_j\}$ of the poles of $\{M_n(z)\}$ distributed on γ satisfies the condition

Card 1/3

Series expansion of analytical...

$$\sum_{j=1}^{+\infty} \left\{ 1 - \frac{1}{|\psi(\alpha_j)|} \right\} = +\infty \qquad (1) .$$

The function occurring therein conformly maps the complementary domain G^- of G into the exterior of the unit circle with point ∞ as fixed point. To obtain a rectifiable Jordan curve as the boundary γ of G, the inverse function φ of ψ must, according to Dzhrbashyan, fulfill the condition: $\lim_{r \to 1+0} \int_0^{2\pi} \left| \varphi^r(re^{i\vartheta}) \right|^2 d\vartheta < \infty$. The author attempts to demonstrate that a system $\{M_n^*(z)\}$ of rational functions with poles in the points α_j, very similar to the system $\{M_n(z)\}$ of Dzhrbashyan, forms the basis of a much larger space of analytical functions than the space spanned by $\{M_n(z)\}$; he also attempts to prove the necessity of condition (1) for the series expansion of any function of the classes concerned, among others, also

Card 2/3

Series expansion of analytical... S/022/61/014/001/002/010
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of the Smirnov class, according to rational functions (Dzhrbashyan only proved that condition (1) is sufficient). The author extends his results to any finitely connected domain with rectifiable boundary. Already G. S. Kocharyan used the results obtained by Dzhrbashyan to multiply connected domains, however, not so generally as the author. Finally, some remarks are made on the behavior of the series expansions at the domain boundaries. There are 6 references: 5 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Moskovskiy Geologorazvedochnyy Institut im. S. Ordzhonikidze (Moscow Geological Prospecting Institute imeni S. Ordzhonikidze)

SUBMITTED: October 12, 1960

Card 3/3

TUMARKIN, G. I.s.

APPROVED FOR RELEASE: 03/14/2001 CIA-RDP86-00513R001757420019-5"

~~66(1)~~ 11.3000

AUTHOR: Tumarkin, G. Ts.

SOV/20-129-1-10/64

TITLE: Sequences of Blaschke Products

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 1, pp 40-43 (USSR)

ABSTRACT: Let the Blaschke product $b_k(z)$ have infinitely many zeros $\{\alpha_{kj}\}$, $b_k(0) \neq 0$. Let the sequence $\{b_k(z)\}$ converge uniformly in $|z|<1$ to the limit function $B(z)$. The author proposes several criteria which permit to judge on the properties of $B(z)$ from the situation of the α_{kj}, e.g.:

Theorem 5: In order that $B(z)$ is again a Blaschke product it is necessary and sufficient that 1) the number of zeros of $b_k(z)$ is uniformly bounded in every circle $|z|<r$, $0<r<1$, 2) to every $\varepsilon>0$ there exists an $R=R(\varepsilon)$, $0<R<1$ so that the sum $\sum_{|\alpha_{kj}|>R} (1-|\alpha_{kj}|)<\varepsilon$ for all k, $k=1,2,\ldots$.

Theorem 6: Out of every $b_k(z)$ some factors can be removed so that the sequence of the new products $\{\tilde{b}_k(z)\}$ in $|z|<1$ converges.

Card 1/2

Sequences of Blaschke Products SOV/20-129-1-10/64

uniformly to $e^{i\gamma}\mathfrak{B}(z)$, where γ is real and $\mathfrak{B}(z)$ is an arbitrary given function analytic in $|z|$ for which $|\mathfrak{B}(z)| \leq 1$. Six theorems are formulated altogether.

There are 4 references, 2 of which are Soviet, 1 French, and 1 Polish.

ASSOCIATION: Moskovskiy geologorazvedochnyy institut imeni S.Ordzhonikidze (Moscow Institute for Geological Surveying imeni S.Ordzhonikidze)

PRESENTED: June 25, 1959, by I.N.Vekua, Academician.

SUBMITTED: June 25, 1959

Card 2/2

66727

~~16(1)~~ 16.3000 SOV/20-129-2-12/66

AUTHOR: Tumarkin, G.Ts.

TITLE: Convergence of Sequences of Analytic and Meromorphic Functions

PERIODICAL: Doklady Akademii nauk SSSR,1959,Vol 129,Nr 2,pp 280-283(USSR)

ABSTRACT: Theorem 1: In order that the sequence $\{f_k(z)\}$ of the analytic functions in $|z|<1$, with

(1) $\int_0^{2\pi} \ln^+ |f_k(re^{i\theta})|\, d\theta \leqslant C, \quad 0<r<1, \quad k=1,2,\ldots$

converges uniformly to $H(z)\equiv 0$, it is necessary and sufficient that $\lim_{k\to\infty}\left\{\sum_j (1-|\alpha_{kj}|) - \lim_{r\to 1}\int_0^{2\pi} \ln|f_k(re^{i\theta})|\, d\theta\right\} = \infty$, where α_{kj} are the zeros of $f_k(z)$.

Theorem 2: In order that $\{f_k(z)\}$, where $f_k(z)$ are analytic in $|z|<1$ and satisfy (1), converges to $f(z)\not\equiv 0$, it is necessary and sufficient that: I. an arbitrarily small neighborhood of a point of accumulation α_j of the $\{\alpha_{kj}\}$ contains,

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Convergence of Sequences of Analytic and Meromorphic Functions

from a certain j, the same number n_j of zeros of the functions $f_k(z)$.

II. The sequence $\{\operatorname{Arg} f_k(z_o)\}$ converges at least in one z_o with $|z_o| < 1$.

III. $\lim\limits_{k\to\infty} \left\{\pi \sum\limits_j (1-|\alpha_{kj}|^2) - \lim\limits_{r\to 1} \int\limits_o^{2\pi} \ln|f_k(re^{i\theta})|\,d\theta\right\}$ exists.

IV. The sequence $\left\{\int\limits_o^\theta \psi_k^*(t)dt\right\}$ on $(0,2\pi)$ converges with respect to measure, where

(2) $$\psi_k(t) = \lim_{r\to o} \int_o^t \ln|f_k(re^{i\varphi})|\,d\varphi - \pi \sum_{o<\arg\alpha_{kj}<t} (1-|\alpha_{kj}|^2)$$

and $\psi_k^*(t)$ arises from $\psi_k(t)$ by normalization: by addition of a constant and variation of the value in the points of discontinuity the author determines $\psi_k^*(t)$ which satisfies the conditions

Card 2/4

Convergence of Sequences of Analytic and Meromorphic Functions

(2') $\int_0^{2\pi} \psi_k^*(t)dt=0$, $\psi_k^*(t)=\frac{\psi_k^*(t-0)+\psi_k^*(t+0)}{2}$, $\psi_k^*(0)+\psi_k^*(2\pi)=$

$=\psi_k^*(+0)+\psi_k^*(2\pi-0)$.

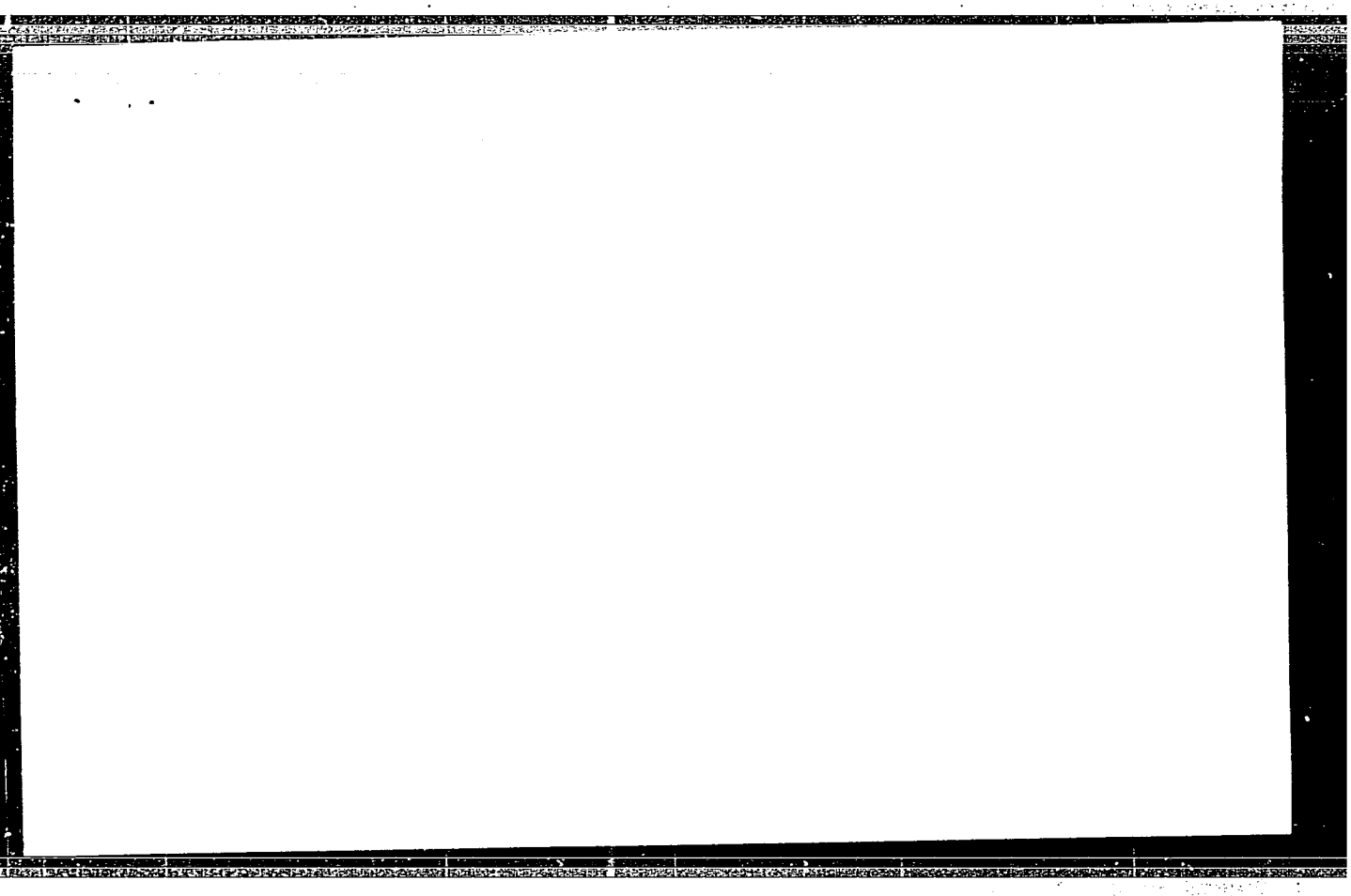
If these conditions are satisfied, then it is $f(z)=\lim_{k\to\infty} f_k(z)=$ $= e^{i\gamma} b(z)\exp\frac{1}{2\pi}\int_0^{2\pi}\frac{e^{i\theta}+z}{e^{i\theta}-z}\,a\,\psi^*(\rho)$, where γ is a real number, $b(z)$ Blaschke product with the zeros α_j and $\psi^*(\theta)$ is defined by

$$\lim_{k\to\infty}\int_0^{\theta}\psi_k^*(t)dt=\int_0^{\theta}\left[\psi^*(t)-\pi\sum_{0<\arg\alpha_j\leq t}(1-|\alpha_j|^2)\right]dt$$

$$\lim_{k\to\infty}\left[\psi_k^*(2\pi)-\psi_k^*(0)\right]=\psi^*(2\pi)-\psi^*(0)-\pi\sum_j(1-|\alpha_j|^2).$$

Theorem 3 contains a simplified condition IV for functions uniformly bounded in $|z|<1$.
Theorem 4 is an extension of theorem 2 to sequences of meromorphic functions with uniformly bounded characteristics.

Card 3/4



TUMARKIN, G. Ts.

16(0) PHASE I BOOK EXPLOITATION SOV/3177

Matematika v SSSR za sorok let, 1917-1957. Tom 1: Obzornyye stat'i (Mathematics in the USSR for Forty Years, 1917-1957. Vol 1: Review Articles) Moscow, Fizmatgiz, 1959. 1002 p. 5,500 copies printed.

Eds: A. G. Kurosh, (Chief Ed.), V. I. Bityutskov, Yu. G. Bokhanskiy, Ye. B. Dynkin, O. Yu. Shilova, and A. P. Yushkevich; Ed. (Inside book): A. F. Lapko; Tech. Ed.: S. N. Akhlamov.

PURPOSE: This book is intended for mathematicians and historians of mathematics interested in Soviet contributions to the field.

COVERAGE: This book is Volume I of a major 2-volume work on the history of Soviet mathematics. Volume I surveys the chief contributions made by Soviet mathematicians during the period 1947-1957; Volume II will contain a bibliography of major works since 1917 and biographic sketches of some of the leading mathematicians. This work follows the tradition set by two earlier works: Matematika v SSSR za piatnadtsat' let (Mathematics in the USSR for 15 Years) and Matematika v SSSR za tridtsat' let (Mathematics in the USSR for 30 Years). The book is divided into the major divisions of the field, i.e., algebra, topology, theory of probabilities, functional analysis, etc., and contributions and outstanding problems in each discussed. A listing of some 1400 Soviet mathematicians is included with references to their contributions in the field.

TUMARKIN, G.TS.; KHAVINSON, S.Ya. (Moskva)

Studying the properties of extremum functions by using duality correlations in extremum problems for classes of analytic function in multiply connected domains. Mat.sbor. 46 no.2:195-228 O '58. (MIRA 11:12)

(Function, Analytic)

16(1)

AUTHORS: Tumarkin, G.Ts., Khavinson, S.Ya.

SOV/42-14-3-13/22

TITLE: Mutual Orthogonality of the Boundary Values of Some Classes of Analytic Functions in Multiply Connected Domains

PERIODICAL: Uspekhi matematicheskikh nauk, 1959, Vol 14, Nr 3, pp 173 - 180 (USSR)

ABSTRACT: Let the boundary Γ of the n-times connected domain G consist of n rectificable Jordan curves $\gamma_1, \ldots, \gamma_n$. Two function classes K_1 and K_2 defined on Γ are called mutually orthogonal, if for $\alpha(\zeta) \in K_1$ and $f(\zeta) \in K_2$ it is always $\int_\Gamma \alpha(\zeta) f(\zeta) d\zeta = 0$, and if furthermore from the orthogonality of a function to the class K_1 (or K_2) it follows that it belongs to K_2 (or K_1). Let the class $E_p(G)$ consist of the functions $\alpha(z)$ for which it is $\overline{\lim_{j\to\infty}} \int_{\Gamma^j} |\alpha(z)|^p |dz| < \infty$, where $\{\Gamma^j\}$ converges to Γ; $\Gamma^j \subset G$.

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Theorem: The classes $E_p(\Gamma)$ and $E_q(\Gamma)$ are mutually orthogonal, $p>1$, $q>1$, $\frac{1}{p}+\frac{1}{q}=1$.

Five further theorems are given which are partly generalizations of well-known results to multiply connected domains, partly special cases of former results of Tamarkin, partly strengthenings of the theorems of Penez [Ref 9].
The author mentions : V.I. Smirnov, M.V. Keldysh and M.A. Lavrent'yev.
There are 10 references, 8 of which are Soviet, and 2 American.

SUBMITTED: April 8, 1957

Card 2/2

20-114-3-14/60

AUTHOR: Tumarkin, G. Ts.

TITLE: On the Behavior of the Derivatives of Some Sequences of Analytical Functions, Uniformly Converging Within a Domain Near the Boundary (O povedenii vblizi granitsy proizvodnykh nekotorykh ravnomerno skhodyashchikhsya vnutri oblasti posledovatel'nostey analiticheskikh funktsiy)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 114, Nr 3, pp. 502-505 (USSR)

ABSTRACT: The present report uses a theorem derived in an earlier paper by the author and various results found by other authors as well in studying the problems mentioned in the title. The author here examines the sequence $\{f_n(z)\}$ of the functions analytical in the domain $|z|<1$ each of which has the angular boundary values $f_n(e^{i\theta})$ on the set E. Let $f(z)$ be a function analytical in $|z|<1$ which also has angular boundary values on E. First two corollaries are given and then the following theorem: The sequence $\{f_n(z)\}$ of the functions analytical in $|z|<1$ satisfies the conditions of Khinchin-Ostrovskiy and the initially mentioned theorem of the author. Then a sub-

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On the Behavior of the Derivatives of Some Sequences of Analytical Functions, Uniformly Converging Within a Domain Near the Boundary

sequence $\left\{f_{n_k}(z)\right\}$ can be selected from $\left\{f_n(z)\right\}$ for which the following is valid: 1) The uniform convergence in every domain $\Omega_{\theta,\alpha}$ with the vertex in almost all points $e^{i\theta} \in E$ and with any angle α, $0<\alpha<\pi$ at the vertex applies. 2) For each of the mentioned domains

$$\lim_{n_k \to \infty} \iint_{\Omega_{\theta,\alpha}} \left|f'(z) - f'_{n_k}(z)\right|^2 d\omega = 0,$$

where $f(z) = \lim_{n\to\infty} f_n(z)$. Then the proof of this theorem, another theorem and altogether 3 corollaries are given. The results obtained here may easily be transferred from the circle to domains which are bounded by extensible curves. They can also be generalized to sequences of meromorphic curves. There are 10 references, 4 of which are Slavic.

PRESENTED: December 11, 1956, by M. A. Lavrent'yev, Member of the Academy

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20-114-3-14/60

On the Behavior of the Derivatives of Some Sequences of Analytical Functions, Uniformly Converging Within a Domain Near the Boundary

SUBMITTED: May 5, 1956

Card 3/3

20-114-4-9/63

AUTHOR: Tumarkin, G. Ts.

TITLE: On Simultaneous Approximation in the Mean of Complex-Valued Functions Given Along Several Curves (Ob odnovremennom priblizhenii v srednem kompleksnoznachnykh funktsiy, zadannykh na neskol'kikh konturakh)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 114, Nr 4, pp. 710-713 (USSR)

ABSTRACT: The following may be assumed: γ be a closed Jordans' extensible curve, s - the length of the arc γ^s of a certain point ζ_0, ... $\sigma(s)$ - a nondecreasing function with restricted variation at $0 \leqslant s \leqslant 1$. The author here investigates the space $L^p(d\sigma, \gamma), p > 0$ of the complex-valent functions $f(\zeta)$ defined on γ, for which $\int |f(\zeta)|^p d\sigma(s) < \infty$ applies. The present paper especially assumes the existence of a G-n-dimensional domain which is limited by n closed extensible curves $\gamma_1 \ldots\ldots \gamma_n$. For reasons of accuracy the author considers G a finite domain and γ_1 an exterior contour. The total limit of G is denoted by Γ. For each one of the curves γ_i, i=1,2...n the spaces $L^p(d\sigma_i, \gamma_i)$. are defined. The author first investigates the approximation

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On Simultaneous Approximation in the Mean of Complex-Valued Functions Given Along Several Closed Curves 20-114-4-9/63

of the functions in the metric $L^p(d\sigma, \Gamma)$ by the sequences $\{T_k(\xi)\}$ of the polynomials of ξ. Two respective theorems are given. With the help of these two theorems the problem of the approximation of the polynomials of functions which are defined on a complicated contour Γ can be fully studied. The author here contents himself with formulating a theorem on the adequate condition for the closed state of the system $\{\xi^m\}$, $m=0,1,2,\ldots$ Next, the author investigates the problem which can be approximated to functions $f(\xi)$ defined on Γ in the metric $L^p(d\sigma, \Gamma)$ by the sequences of the boundary values of the analytical functions in the closed-in domain G. Next, theorems analogous to the theorems mentioned above for multiply connected domains are given. By means of the theorems given here the problem of the approximation of the boundary values $f(\xi)$ of the functions analytical in the domain G and belonging to the classes E_δ, $\delta > 0$ can be investigated. There are 6 references, 3 of which are Slavic.

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On Simultaneous Approximation in the Mean of Complex-Valued Funotions Given Along Several Closed Curves 20-114-4-9/63

ASSOCIATION: Moscow Geological Prospecting Institute imeni S. Ordzhonikidze (Moskovskiy geologo-razvedochnyy institut im. S. Ordzhonikidze)

PRESENTED: December 11, 1956, by M.A. Lavrent'yev, Member of the Academy

SUBMITTED: May 5, 1956

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AUTHOR: Tumarkin, G.Ts. and Khavinson, S.Ya. 20-119-2-5/60

TITLE: The Properties of the Extremum Functions in Extremum Problems for Some Classes of Analytic Functions With a Weighted Metric (Svoystva ekstremal'nykh funktsiy v ekstremal'nykh zadachakh dlya nekotorykh klassov analiticheskikh funktsiy s vzveshennoy metrikoy)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol 119, Nr 2, pp 215-218 (USSR)

ABSTRACT: As it is well-known, there exists a duality between the linear extremum problem and the problem of the best approximation in the conjugate space. In the present paper the authors formulate several relations of duality for different classes of analytic functions, where the assumptions are very general. As special cases there result numerous well-known results of the authors and others. There are 14 references, 9 of which are Soviet, 3 American, and 2 English.

PRESENTED: September 6, 1957, by M.A.Lavrent'yev, Academician

SUBMITTED: August 20, 1957

AVAILABLE:

Card 1/1

AUTHOR: Tumarkin, G.Ts. and Khavinson, S.Ya. SOV/38-22-3-5/9

TITLE: Analytic Functions in Multiply Connected Domains of the Class of V.I.Smirnov (Class S) (Analiticheskiye funktsii v mnogosvyaznykh oblastyakh klassa V.I. Smirnova (klassa S))

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya matematicheskaya, 1958, Vol 22, Nr 3, pp 379-386 (USSR)

ABSTRACT: A. According to Smirnov [Ref 1] a finite simply connected domain G belongs to the class S, if $\ln|\varphi'(w)|$, where $\varphi(w)$ is the conformal mapping of the circle $|w|<1$ onto G, is representable by the Poisson integral :

$$\ln\left|\varphi'(re^{i\alpha})\right| = \frac{1}{2\pi}\int_0^{2\pi} \frac{1-r^2}{1+r^2-2r\cos(\theta-\alpha)} \ln\left|\varphi'(e^{i\theta})\right| d\theta .$$

B. If G is n-fold connected, then $G \in S$ is usually defined [Ref 3-5] by the condition that $G_i \in S$ for all i, where G_i is the simply connected domain which contains G and which is bounded by the component γ_i of the boundary Γ of G.

C. On the other hand A can be also applied for the definition,

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if the mapping onto the circle is replaced by the mapping onto a circular canonical domain and if the Poisson formula is replaced by the Green formula.
The authors show that the definitions B and C are equivalent and simultaneously prove some properties of the analytic functions in multiply connected domains.
There are 12 references, 6 of which are Soviet, 3 French, and 3 American.

PRESENTED: V.I.Smirnov, Academician

SUBMITTED: February 27, 1957

1. Conformal mapping 2. Analytic functions

TUMARKIN, G.TS.; KHAVINSON, S.Ya.

Existence of single-valued analytic functions, having a given modulus of boundary values, in multiply connected domains. Izv. AN SSSR. Ser. mat. 22 no.4:543-562 Jl-Ag '58. (MIRA 11:11)

1. Predstavleno akademikom V.I. Smirnovym.
(Functions, Analytic)

AUTHOR: Tumarkin, G.Ts. and Khavinson, S.Ya. SOV/38-22-4-5/6

TITLE: On the Existence of Unique Analytic Functions With Given Absolute Value of the Boundary Values in Multiply Connected Domains (O sushchestvovanii v mnogosvyaznykh oblastyakh odnoznachnykh analiticheskikh funktsiy s zadannym modulem granichnykh znacheniy)

PERIODICAL: Izvestiya Akademii nauk SSSR,Seriya matematicheskaya,1958, Vol 22, Nr 4, pp 543-562 (USSR)

ABSTRACT: § 1. Fundamental theorem : Let $F(z)$ be a multivalent analytic function with unique absulute value, which possesses no branch points in the n-fold connected domain G. Then there exists a set of at most n - 1 points $z_1,\dots,z_m$, $m \leq n-1$, with the property that

$$F^*(z) = F(z) \exp\left\{-\sum_{k=1}^{m}\left[g(z,z_k) - i\, h(z,z_k)\right]\right\}$$

is unique in G. Here $g(z,z_k)$ is the Green function of G with pole in z_k and $h(z,z_k)$ is the conjugate of $g(z,z_k)$.

§ 2 and 3. Proof with the aid of a special extremum problem.

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On the Existence of Unique Analytic Functions With Given Absolute Value of the Boundary Values in Multiply Connected Domains

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§ 4. Construction of analytic functions, the absolute value of which is identic with a given function almost everywhere on the rectifiable boundary. . § 5. Representation of meromorphic functions with bounded characteristic as a quotient of two bounded functions. § 6. Generalization of the non-rectifiable case. .

There are 26 references, 12 of which are Soviet, 3 Finnish, 7 American, 2 French, 1 English, and 1 Turkish.

PRESENTED: by V.I. Smirnov, Academician

SUBMITTED: April 8, 1957

1. Functions 2. Mathematics

Card 2/2

AUTHORS: Tumarkin, G.Ts., and Khavinson, S.Ya. (Moscow) SOV/39-46-2-4/6

TITLE: The Investigation of Properties of Extremal Functions With the Aid of Duality Relations in Extremal Problems for Analytic Function Classes in Multiply Connected Domains (Issledovaniye svoystv ekstremal'nykh funktsiy s pomoshch'yu sootnosheniy dvoystvennosti v ekstremal'nykh zadachakh dlya klassov analiticheskikh funktsiy v mnogosvyaznykh oblastyakh)

PERIODICAL: Matematicheskiy sbornik, 1958, Vol 46, Nr 2, pp 195-228 (USSR)

ABSTRACT: The linear extremal problem already several times was connected with the problem of the best approximation in the conjugate space. The most general function classes were considered by Khavinson [Ref 14]. The present paper at the one hand is a continuation and on the other hand it is a generalization of [Ref 14]. The authors establish duality relations for analytic function classes in finitely connected domains under final assumptions which can not be improved. That admits a very general investigation of the extremal functions. For a corresponding specialization, the results yield the older results of several authors (e.g. Penez [Ref 20]). For the proofs the authors use essentially the own earlier results [Ref 6,7,8,9,10,11] on analytic function classes in multiply connected domains. The

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The Investigation of Properties of Extremal Functions With the Aid of Duality Relations in Extremal Problems for Analytic Function Classes in Multiply Connected Domains SOV/39-46-2-4/6

paper contains about 40 theorems and lemmas.
There are 23 references, 16 of which are Soviet, 2 English, 4 American, and 1 French.

SUBMITTED: April 8, 1957

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TUMARKIN, G.TS.; KHAVINSON, S.Ya. (Moscow).

Representability conditions of harmonic functions by Green's formula in a multiply connected domain. Mat. sbor. 44 no.2:225-234 F '58. (MIRA 11:5)
(Harmonic functions)

TUMARKIN, G.TS.; KHAVINSON, S.Ya.

Classes of analytic functions in multiply connected domains and representable by using Cauchy's and Green's formulas. Usp.mat.nauk 13 no.2:215-221 Mr-Ap '58. (MIRA 11:4)
(Functions, Analytic)

TUMARKIN, G.TS.; KHAVINSON, S.Ya.

Expansion theorem for class E_p analytic functions in multiply connected domains. Usp.mat.nauk 13 no.2:223-228 Mr-Ap '58. (MIRA 11:4)

(Functions, Analytic)

TUMARKIN, G. Ts.

AUTHOR: Tumarkin, G.Ts. and Khavinson, S.Ya. (Moscow) 39-44-2-5/19

TITLE: Conditions for the Representation of a Harmonic Function by Green's Formula in a Multiply Connected Domain (Usloviya predstavimosti garmonicheskoy funktsii formuloy Grina v mnogosvyaznoy oblasti)

PERIODICAL: Matematicheskiy Sbornik, 1958, Vol 44, Nr 2, pp 225-234 (USSR)

ABSTRACT: Let the n-fold connected domain G be limited by n Jordan curves $\gamma_1 \dots \gamma_n$ (not necessarily rectificable), let be $\Gamma = \bigcup_{i=1}^{n} \gamma_i$. Let $\omega(E,z)$ denote the harmonic measure of the set $E \subset \Gamma$ with respect to G, calculated in the point $z \in G$. Let $t = \beta(z)$ be the conformal mapping of the universal covering surface of G onto $|t| < 1$, furthermore $z = \alpha(t)$ the inverse mapping of $|t| < 1$ onto G.
Theorem: In order that the harmonic function u(z) admits in G the representation

$$u(z) = \int_{\Gamma} u(\zeta) d\omega(z) ,$$

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