МІЖНАРОДНА КОНФЕРЕНЦІЯ
З ТЕОРІЇ НАБЛИЖЕННЯ ФУНКЦІЙ ТА ЇЇ ЗАСТОСУВАНЬ, ПРИСВЯЧЕНА ПАМ'ЯТІ В.К. ДЗЯДИКА

26 - 31, Травень, 1999, Київ

INTERNATIONAL CONFERENCE
ON APPROXIMATION THEORY AND ITS APPLICATIONS DEDICATED TO THE MEMORY OF V. K. DZJADYK

May, 26 - 31, 1999, Kyiv

Київ 1999

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Some Estimates of Special Classes of Integrals

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We study the integrals $\int_a^b f(t)\exp(i|\ln rt|^\sigma)\,dt$ and obtain asymptotic formula for these functions of nonregular growth. This is a pecular kind of the theory asymptotic expansions. In particular, we get asymptotic formulae for different entire functions of nonregular growth. Asymptotic formulas for Levin-Pfluger entire functions of completely regular growth are well-known [1]. Our formulas allow to find limiting Azarin's [2] sets for some subharmonic functions. The kernel $\exp(i|\ln rt|^\sigma)$ contains arbitrary parameter $\sigma > 0$. The intergals for $\sigma \in (0,1), \sigma = 1, \sigma > 1$ essentiaily differ. Our arguments can apply to more general kernels. We give a new variant of the classic lemma of Riemann and Lebesgue from the theory of the transformation of Fourier. Among other results it is the following.

Theorem. *Let $f(t)$ be an entire function with positive zeros and counting function of zeros* $n(t) = \left[t^\rho(a_0 + a_1\cos\lambda\ln t + b_1\sin\lambda\ln t)\right]$. *Then the limiting Azarin's set* $\mathrm{Fr}f$ *of* f *is defined as follows* $\mathrm{Fr}f = \left\{\left(a_0\frac{\cos\rho(\pi-\theta)}{\sin\rho\pi} + A(\lambda,\theta)\cos\varphi + B(\lambda,\theta)\sin\varphi\right)r^\rho : 0 \le \varphi \le 2\pi\right\}$. $\equiv$ The functions $A(\lambda,\theta)$ and $B(\lambda,\theta)$ are demonstrated.

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Expansion of Appell Hypergeometric Function f_3 by Branched Continued Fractions

Manzij Lesia

A continued fraction is an efective tools for the approximation of the analitic functions, in particular hypergeometric. In the end of the XIX century Appell defined four hypergeometric functions of two variables: F_1, F_2, F_3 and F_4. These functions were obtained and investigated by the Appell by means of two-dimension power series.

We constructed some expansion for the ratio of the Appell hypergeometric functions into the branched continued fractions and investigated them. Now we illustrate our main results on the example of F_3.

Malyutina, T. I. Some estimates of special classes of integrals [Text] / T. I. Malyutina // Міжнародна конференція з теорії наближення функцій та її застосувань, присвячена пам'яті В. К. Дзядика (26-31 травня 1999 р.). - Київ, 1999. - С. 55.