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8. Analysis

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On the Approximation of the Functions by Algebraic Polynomials

Our report contains some recent results on the asymptotic behavior of the best L_1-approximation of the certain classes of the functions by algebraic polynomials. Also we will touch some questions on the pointwise approximation by algebraic polynomials of the functions which are fractional integrals of bounded functions. Let $W^r,\ r>0$, be the class of functions f represented in the form

$$f(x)=\frac{1}{\Gamma(r)}\int_{-1}^{1}(x-t)_+^{r-1}\phi(t)dt+P(x),$$

where $\Gamma(r)$ is the Euler gamma function, $|\phi(t)|\leq 1$ almost everywhere. Then for any $f\in W^r$ the inequality

$$|f(x)-P_n(x)|\leq\frac{K_r}{n^r}(\sqrt{1-x^2})^r+O\left(\frac{\ln n}{n^{r+1}}(\sqrt{1-x^2}+1/n)^{r-1}\right)$$

holds, where r is an integer and K_r is Favard constant.

1. Motornyi V. P. and Motornaya O. V., The best approximation of the classes of differentiable functions by algebraic polynomials in the average, Proceedings of the Steklov Institute of Mathematics **210** (1995), 171–188.

2. Motornyi V. P. and Motornaya O. V. On the best approximation of the classes W^rH^α by algebraic polynomials in L_1, East J. Approx., 1995, **1**(1995), 309–339.