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Abstracts of Short Communications and Posters

Section:

8. Analysis

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Polynomial Interpolation and Whitney's Constants
The well-known theorem of H. Whitney states that *For every natural* $n \geq 1$ *and function* $f \in C[a,b]$ *there is an algebraic polynomial* P_{n-1} *and constant* $W(n)$ *such that*

$$|f(x) - P_{n-1}(x)| \leq W(n) \sup_{x, x+nh \in [a,b]} |\Delta_h^n f(x)|, \qquad x \in [a,b].$$

We obtained a simple proof of Whitney's theorem and gave estimates $W(n) \leq 2$ with the use of polynomial $\overline{P}_{n-1}$ "interpolating on the average":

$$\int_a^{a+i(b-a)/n} \big(f(x) - \overline{P}_{n-1}(x)\big)\, dx = 0, \qquad i = 1, \ldots, n.$$

Denote by $\overline{W}(n)$ the best constant for approximation by $\overline{P}_{n-1}$. We conjectured that $\overline{W}(n) = 1$ and have proved this conjecture for $n \leq 4$.