

Infinitely differentiable functions represented into Newton interpolating series

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ABSTRACT.

We study infinitely differentiable functions which are representable into a Newton interpolating series at a suitable interpolation sequence with terms in $[0, 1]$. Applications of this series to approximate the solution of boundary value problems for linear systems of differential equations are presented.

REFERENCES

- [1] Davis, P. J., *Interpolation and approximation*, Dover Publication Inc. New York, 1975
- [2] El-Gamel, M., *Sinc-collocation method for solving linear and nonlinear system of second-order boundary value problems*, Applied Mathematics, **3** (2012), 1627–1633
- [3] Groza, G. and Pop, N., *Approximate solution of multipoint boundary value problems for linear differential equations by polynomial functions*, J. Difference Equ. Appl., **14** (2008), No. 12, 1289–1309
- [4] Groza, G. and Pop, N., *A numerical method for solving of the boundary value problems for ordinary differential equations*, Result. Math., **53** (2009), No. 3-4, 295–302
- [5] Groza, G., Khan, S. M. Ali and Pop, N., *Approximate solutions of boundary value problems for ODEs using Newton interpolating series*, Carpathian J. Math., **25** (2009), No. 1, 73–81
- [6] Martin, Y., *Sur les séries d'interpolation*, Ann. Sci. École Norm. Sup., **66** (1949), sér. 3, 311–366
- [7] Nurmuhhammad, A., Muhammad, M. and Mori, M., *SincGalerkin method based on the DE transformation for the boundary value problem of fourth-order ODE*, J. Comput. Appl. Math., **206** (2007), 17–26
- [8] Shidlowksi, A., *Transcendental Numbers*, de Gruyter, 1989

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