

On construction of solutions of linear fractional differential equations with constant coefficients

M.B.BORIKHANOV ¹, B.Kh.TURMETOV ²

¹ *Department of Mathematics, Akhmet Yasawi University, Turkestan, Kazakhstan*

E-mail: meeir0808@gmail.com

² *Institute of Mathematics and Mathematical Modeling, Kazakhstan*

E-mail: turmetovbh@mail.ru

Abstract: One of the effective methods for finding exact solutions of differential equations is the method based on the operator representation of solutions. The essence of this method is to construct a series, whose members are the relevant iteration operators acting to some classes of sufficiently smooth functions. This method is widely used in the papers of Bondarenko [1] for construction of solutions of differential equations of the integer order. In this paper, the operator method is applied to construct solutions of linear differential equations with constant coefficients and generalized Riemann-Liouville fractional derivative of order α and type γ . Then fundamental solutions are used to obtain the unique solution of the Cauchy problem.

Keywords: Linear fractional differential equations with constant coefficients, Riemann-Liouville derivatives, fundamental solutions, Cauchy problem

2010 Mathematics Subject Classification: 26A33, 34A08

REFERENCES

- [1] Bondarenko, B. A. , “Operator Algorithms in Differential Equations”, *Tashkent, "FAN" Publishers*, 1984, In Russian.