Special Multiplicative Operators for the Solution of ODE –
Invariants and Representations

Zenonas Navickas¹, Tadas Telksnys², Minvydas Ragulskis²,*

¹Department of Applied Mathematics, Kaunas University of Technology, Kaunas, Lithuania.
²Research Group for Mathematical and Numerical Analysis of Dynamical Systems, Kaunas University of Technology, Kaunas, Lithuania.

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Abstract

The generalized multiplicative operator of differentiation is introduced in this paper. It is shown that the
generalized multiplicative operator can be expressed as a product of two noncommutative but multiplicative
operators, though the generalized multiplicative operator is not an exponential operator itself. The
generalized multiplicative operator is effectively exploited for the construction of solutions to nonlinear ordinary
differential equations through formal transformations of invariants and representations of initial conditions. The
concept of the generalized multiplicative operator provides the insight into the algebraic structure of solutions to
nonlinear ordinary differential equations which cannot be identified using conventional exponential operators.

Keywords: ordinary differential equation, multiplicative operator, invariant

References


* Corresponding author. E-mail address: minvydas.ragulskis@ktu.lt
Tel.: +37069822456; Fax: +37037330446


