

Loewy decomposition of linear differential equations

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Abstrak

The central subject of the book is the generalization of Loewy's decomposition, originally introduced by him for linear ordinary differential equations, to linear partial differential equations. Equations for a single function in two independent variables of order two or three are comprehensively discussed. A complete list of possible solution types is given. Various ad hoc results available in the literature are obtained algorithmically. The border of decidability for generating a Loewy decomposition are explicitly stated. The methods applied may be generalized in an obvious way to equations of higher order, in more variables or systems of such equations.