Solving Higher Order Differential Equations

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Abstract

There are a variety of methods that can be used for solving Ordinary Differential Equations (ODEs). These methods include variation of parameters, Hamiltonian methods, Variational methods, Euler method, first order integrating factor among others, and different numerical methods, including Machine Learning. It is apparent that first order integrating factor can only be used for first order differential equations while other methods are able to solve higher order differential equations. This presentation aims to show how we can apply integrating factor to higher order differential equations, such as second order differential equations, third order differential equations, and even $n-th$ order differential equations. The presentation will include finding solutions to higher order differential equations, constructing higher order differential equations, and real life applications. Examples will be presented and discussed.

Keywords: Differential Equations, Ricatti Equations, Integrating Factor, Machine Learning

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