

# Telescoping Decomposition Method for Solving First Order Nonlinear Differential Equations 1

## Abstract

(TDM) is a new iterative method to obtain numerical and analytical solutions for first order nonlinear differential equations. The method is a modified form of the well-known Adomian Decomposition Method (ADM) where the Adomian polynomials have not to be calculating. The (TDM) is easier to apply and offers better accuracy than the (ADM). Also, it can be applied to other systems where the (ADM) does not work. The (TDM) is proved to be convergent to the exact solution while it is not the case in the (ADM). The idea of the (TDM) can be developed to deal with various types of functional equations, as well. Keywords: IVP's; (ADM) MSC: 34A12; 49M27