On the solutions of nonlinear higher-order boundary value problems by using differential transformation method and adomian decomposition method.

ABSTRACT

We study higher-order boundary value problems (HOBVP) for higher-order nonlinear differential equation. We make comparison among differential transformation method (DTM), Adomian decomposition method (ADM), and exact solutions. We provide several examples in order to compare our results. We extend and prove a theorem for nonlinear differential equations by using the DTM. The numerical examples show that the DTM is a good method compared to the ADM since it is effective, uses less time in computation, easy to implement and achieve high accuracy. In addition, DTM has many advantages compared to ADM since the calculation of Adomian polynomial is tedious. From the numerical results, DTM is suitable to apply for nonlinear problems.

Keyword: Differential transform method; Nonlinear higher-order boundary value; Adomian decomposition method.