

Solving directly two point boundary value problems using direct multistep method.

ABSTRACT

In this paper we consider solving directly two point boundary value problems (BVPs) for second-order ordinary differential equations (ODEs). We are concerned with solving this problem using multistep method in term of backward difference formula and approximating the solutions with the shooting method. Most of the existence researches involved BVPs will reduce the problem to a system of first order ODEs. This approach is very well established but it obviously will enlarge the system of first order equations. However, the direct multistep method in this paper will be utilised to obtain a series solution of the initial value problems directly without reducing to first order equations. The numerical results show that the proposed method with shooting method can produce good results.

Keyword: Backward difference formula; boundary value problem; shooting method