

Explicit and implicit 3-point block methods for solving special second order ordinary differential equations directly.

ABSTRACT

This paper focused mainly on deriving explicit and implicit 3-point block methods of constant step size using linear difference operator for solving special second order ordinary differential equations (ODEs). The methods compute the solutions of the ODEs at three points simultaneously. Regions of stability for both the explicit and implicit block methods are presented. A standard set of problems are solved using the new methods and the numerical results are compared when the same set of problems are solved using existing methods. The results suggest a significant improvement in efficiency of the new methods in terms of number of steps and accuracy.

Keyword: Initial value problems; Linear difference operator; Block method.