

Implicit solution of 1d nonlinear porous medium equation using the four-point newton-EGMSOR iterative method

ABSTRACT

The numerical method can be a good choice in solving nonlinear partial differential equations (PDEs) due to the difficulty in finding the analytical solution. Porous medium equation (PME) is one of the nonlinear PDEs which exists in many realistic problems. This paper proposes a four-point Newton-EGMSOR (4-Newton-EGMSOR) iterative method in solving 1D nonlinear PME. The reliability of the 4-Newton-EGMSOR iterative method in computing approximate solutions for several selected PME problems is shown with comparison to 4-Newton-EGSOR, 4-Newton-EG and Newton-Gauss-Seidel methods. Numerical results showed that the proposed method is superior in terms of the number of iterations and computational time compared to the other three tested iterative methods.