

An approximate solution of two dimensional nonlinear Volterra integral equation using Newton-Kantorovich method

ABSTRACT

This paper studies the method for establishing an approximate solution of nonlinear two dimensional Volterra integral equations (NLTD-VIE). The Newton-Kantorovich (NK) suppositions are employed to modify NLTD-VIE to the sequence of linear two dimensional Volterra integral equation (LTD-VIE). The properties of the two dimensional Gauss-Legendre (GL) quadrature formula are used to abridge the sequence of LTD-VIE to the solution of the linear algebraic system. The existence and uniqueness of the approximate solution is demonstrated, and an illustrative example is provided to show the precision and authenticity of the method.

Keyword: Newton-Kantorovich method; Nonlinear operator; Two dimensional Volterra integral equation; Two dimensional Gauss-Legendre formula