

Approximation by half Bernstein polynomials

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Abstract

This paper defines and studies the half Bernstein polynomials to approximate functions in $C[0,1]$. The pointwise convergence in ordinary approximation is given for these polynomials. Also, the order of approximation, the Voronovskaya-type asymptotic theorem and the error estimate are introduced. Finally, to show the ability convergence of these polynomials we provide some examples to approximate these polynomials to test functions and compare numerical results with the results corresponding to classical Bernstein polynomials.

Subject Classification: 41A10, 41A25, 41A36.

Keywords: Linear positive operators, Ordinary approximation, Order of approximation, Modulus of continuity, Bernstein sequence.

1. Introduction

In 1912 Bernstein introduced a sequence in proof of Weierstrass theorem [1]. This sequence is known as the classical Bernstein polynomials.

Some studies have introduced modifications or generalizations for the classical Bernstein polynomials to accelerate the order of this sequence, we refer to [2, 3, 5, 6,7,8]. For $\vartheta \in [0 + \sigma, 1 - \sigma] \subset [0,1]$, where $\sigma > 0$ is very small real value and $g \in C[0 + \sigma, 1 - \sigma]$ the half terms of the classical Bernstein polynomials define as

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