



ISSN: 1889-3066

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Web site: jja.ujaen.es

Jaen J. Approx. 1(1) (2009), 111–143

Jaen Journal

on Approximation

On differentiation formulæ for Chebyshevian Bernstein and B-spline bases

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Abstract

Differentiation formulæ for Chebyshevian Bernstein bases do exist, which generalise the classical ones for Bernstein polynomials. We show how they are connected with blossoming and we derive from them interesting equalities concerning the equivalent of the so-called Greville abscissæ. We also consider the case of Chebyshevian B-spline bases.

Keywords: Extended Chebyshev spaces, Bernstein bases, B-spline bases, blossoming.

MSC: Primary 65D17; Secondary .

§1. Introduction

Given two real numbers $a < b$, and given any integer $n \geq 0$, let B_0^n, \dots, B_n^n denote the Bernstein polynomials of degree n relative to (a, b) , i.e.,

$$B_k^n(x) := \binom{n}{k} \left(\frac{x-a}{b-a} \right)^k \left(\frac{b-x}{b-a} \right)^{n-k}, \quad x \in \mathbb{R}, 0 \leq k \leq n. \quad (1.1)$$

Communicated by

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Received

September 2, 2008

Accepted

November 13, 2008