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An extremal problem for Bernstein Polynomials

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Let $n \in N^*$ be a fixed natural number, and $B_n : C[0,1] \to \Pi_n$ be the Bernstein operator,

$$(B_n f)(x) = \sum_{k=0}^{n} \binom{n}{k} x^k (1-x)^{n-k} f(\frac{k}{n}) \quad .$$

For every $f \in C[0,1]$ we denote by V_f the set of all functions g such that

$$g(\frac{k}{n}) = f(\frac{k}{n}) \quad , \quad k = 0, 1, \ldots, n.$$

Problem. *Find*

$$\inf_{g \ \in V_f} \|B_n f - g\| \quad ,$$

where $\|\cdot\|$ *is the uniform norm on* $[0,1]$.