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Asymptotic Expansion of the Krawtchouk Polynomials and their Zeros

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Abstract. Let $K_n^N(x; p, q)$ be the Krawtchouk polynomials and $\mu = N/n$. An asymptotic expansion is derived for $K_n^N(x; p, q)$, when x is a fixed number. This expansion holds uniformly for μ in $[1, \infty)$, and is given in terms of the confluent hypergeometric functions. Asymptotic approximations are also obtained for the zeros of $K_n^N(x; p, q)$ in various cases depending on the values of p, q and μ .

Keywords. Krawtchouk polynomials, asymptotic expansions, confluent hypergeometric functions, zeros.

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