Ratio Monotonicity of Polynomials Derived from Nondecreasing Sequences

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Abstract: The ratio monotonicity of a polynomial is a stronger property than log-concavity. Let P(x) be a polynomial with nonnegative and nondecreasing coefficients. We prove the ratio monotone property of P(x + 1), which leads to the log-concavity of P(x + c) for any c $\geqslant$ 1 due to Llamas and Martínez-Bernal. As a consequence, we obtain the ratio monotonicity of the Boros-Moll polynomials obtained by Chen and Xia without resorting to the recurrence relations of the coefficients.

AMS Classification: 05A20, 33F10

Keywords: log-concavity, ratio monotonicity, Boros-Moll polynomials.

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