THE NUMBER OF ZEROS OF A POLYNOMIAL IN A DISK

ROBERT GARDNER AND BRETT SHIELDS

Abstract. In this paper, we put restrictions on the coefficients of polynomials and give bounds concerning the number of zeros in a specific region. Our results generalize a number of previously known theorems, as well as implying a number of new corollaries with hypotheses concerning monotonicity of the real and imaginary parts of the coefficients.

REFERENCES

[1] A. AZIZ AND Q. G. MOHAMMAD, *On the Zeros of a Certain Class of Polynomials and Related Entire Functions*, Journal of Mathematical Analysis and Applications, **75** (1980), 495–502.
[2] K. K. DEWAN, *Extremal Properties and Coefficient Estimates for Polynomials with Restricted Zeros and on Location of Zeros of Polynomials*, Ph.D. Thesis, Indian Institutes of Technology, Delhi, 1980.
[3] K. K. DEWAN AND M. BIDKHAM, *On the Eneström-Kakeya Theorem*, Journal of Mathematical Analysis and Applications, **180** (1993), 29–36.
[4] R. B. GARDNER AND N. K. GOVIL, *On the Location of the Zeros of a Polynomial*, Journal of Approximation Theory, **78** (2) (1994), 286–292.
[5] N. K. GOVIL AND Q. I. RAHMAN, *On the Eneström-Kakeya Theorem*, Tôhoku Mathematics Journal, **20** (1968), 126–136.
[6] G. V. MILOVANOVIĆ, D. S. MITRINOVIĆ, AND TH. M. RASSIAS, *Topics in Polynomials: Extremal Problems, Inequalities, Zeros*, Singapore: World Scientific Publishing, 1994.
[7] Q. G. MOHAMMAD, *On the Zeros of the Polynomials*, American Mathematical Monthly, **72** (6) (1965), 631–633.
[8] M. S. PUKHTA, *On the Zeros of a Polynomial*, Applied Mathematics, **2** (2011), 1356–1358.
[9] Q. I. RAHMAN AND G. SCHMEISSER, *Analytic Theory of Polynomials*, Oxford: Clarendon Press, 2002.
[10] E. C. TITCHMARSH, *The Theory of Functions*, 2nd Edition, Oxford University Press, London, 1939.

© ELEMENT, Zagreb
Paper JCA-03-15

Journal of Classical Analysis
www.ele-math.com
jca@ele-math.com