

NEW L^q INEQUALITIES FOR POLYNOMIALS

ABDUL AZIZ AND NISAR AHMED RATHER

Abstract. In this paper we establish some new L^q inequalities for polynomials which generalize and refine some results of Szegö, Zygmund, De Bruijn and others.

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REFERENCES

- [1] V. V. ARRESTOV, *On integral inequalities for trigonometric polynomials and their derivatives*, Izv. Akad. Nauk. SSSR., Ser. Mat. **45** (1981), 3–22 [in Russian], English translation: Math. USSR – Izv. **18** (1982), 1–17.
- [2] A. AZIZ, *A new proof and a generalization of a theorem of De Bruijn*, Proc. Amer. Math. Soc. **106** (2) (1989), 345–350.
- [3] ———, *Growth of polynomials whose zeros are within or outside a circle*, Bull. Austral. Math. Soc. **35** (1987), 247–256.
- [4] A. AZIZ AND Q. M. DAWOOD, *Inequalities for a polynomial and its derivative*, J. Approx. Theory **54** (1988), 306–313.
- [5] A. AZIZ AND N. A. RATHER, *L^p inequalities for polynomials*, Glasnik matematički **32** (51) (1997), 39–43.
- [6] T. N. CHAN AND M. A. MALIK, *On Erdős-Lax theorem*, Proc. Indian Acad. Sci. **92** (1983), 191–193.
- [7] N. G. DE BRUIJN, *Inequalities concerning polynomials in the complex domain*, Nederl. Akad. Wetensch. Proc. **50** (1947), 1265–1272; Indag. Math. 9 (1947), 591–598.
- [8] K. K. DEWAN, *Inequalities for a polynomial and its derivative II*, J. Math. Anal. Appl. **190** (1995), 625–629.
- [9] C. FRAPPIER, Q. I. RAHMAN AND ST. RUSCHEWEYH, *New inequalities for polynomials*, Trans. Amer. Math. Soc. **288** (1985), 69–99.
- [10] N. K. GOVIL, *Some inequalities for derivative of polynomials*, J. Approx. Theory **66** (1991), 29–35.
- [11] N. K. GOVIL AND Q. I. RAHMAN, *Functions of exponential type not vanishing in a half-plane and related polynomials*, Trans. Amer. Math. Soc. **137** (1969), 501–517.
- [12] P. D. LAX, *Proof of a conjecture of P. Erdős on the derivative of a polynomial*, Bull. Amer. Math. Soc. **50** (1944), 509–513.
- [13] M. A. MALIK, *On the derivative of a polynomial*, J. London. Math. Soc **1** (1969), 57–80.
- [14] G. V. MILOVANOVIĆ, D. S. MITRINOVICI AND TH. RASSIAS, *Topics in polynomials: extremal properties, inequalities, zeros*, World Scientific Publishing Co., Singapore, 1994.
- [15] G. PÓLYA AND G. SZEGÖ, *Problems and theorems in analysis, Vol. I*, Springer-Verlag, New York, 1972.
- [16] M. A. QAZI, *On the maximum modulus of polynomials*, Proc. Amer. Math. Soc. **115** (1992).
- [17] W. W. ROGOSINSKI, *Extremum problems for polynomials and trigonometrical polynomials*, J. London Math. Soc. **29** (1954), 259–275.
- [18] A. C. SCHAEFFER, *Inequalities of A. Markoff and S. Bernstein for polynomials and related functions*, Bull. Amer. Math. Soc. **47** (1941), 565–579.
- [19] G. SZEGÖ, *Über einen Satz des Herrn Serge Bernstein*, Schriften Koigsberger Gelehrten Gesellschaft **5** (1928), 59–70.
- [20] ———, *Bemerkungen zu einem Satz von J. H. Grace Über die wurzeln algebraischer Gleichungen*, Math. Z. **13** (1922), 28–55.

- [21] A. ZYGMUND, *A remark on conjugate series*, Proc. London Math. Soc. (2) **34** (1932), 392–400.
[22] ———, *Two notes on inequalities*, J. Math. and Phys. **21** (1942), 117–123.