GENERALIZATIONS OF THE CAUCHY AND FUJIWARA BOUNDS FOR PRODUCTS OF ZEROS OF A POLYNOMIAL

RAJESH PEREIRA† AND MOHAMMAD ALI VALI‡

Abstract. The Cauchy bound is one of the best known upper bounds for the modulus of the zeros of a polynomial. The Fujiwara bound is another useful upper bound for the modulus of the zeros of a polynomial. In this paper, compound matrices are used to derive a generalization of both the Cauchy bound and the Fujiwara bound. This generalization yields upper bounds for the modulus of the product of m zeros of the polynomial.

Key words. Zeros of polynomials, Inequalities, Cauchy bound, Companion matrix, Compound matrix.

AMS subject classifications. 15A18, 26D05, 26C10, 30C15.

†Department of Mathematics and Statistics, University of Guelph, Guelph, Ontario N1G 2W1 (pereirar@uoguelph.ca). Supported by NSERC grant 400500.
‡Department of Applied Mathematics, Faculty of Mathematics and Computer, Shahid Bahonar University of Kerman, Kerman, Iran (mohamadali.35@yahoo.com).