

LOCATION OF ZEROS OF CERTAIN POLYNOMIALS IN
ANNULAR REGIONS

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(Received: Apr. 14, 2020 Accepted: May 10, 2021 Published: Aug. 30, 2021)

Abstract: The famous Eneström-Keakeya Theorem states that a polynomial $P(z) = \sum_{i=0}^n a_i z^i$ with real positive coefficients satisfying $0 < a_0 \leq a_1 \leq \dots \leq a_n$ has all its zeros in $|z| \leq 1$. Various generalizations of this result are available in the literature. In this paper we put certain restrictions on the real and imaginary parts of the coefficients of a polynomial and find annular regions containing all the zeros of the polynomial. Our results generalize many results already known in the literature.

Keywords and Phrases: Zeros of polynomial, Eneström-Keakeya theorem.

2020 Mathematics Subject Classification: 12D10, 26C10 30C10, 30C15.

1. Introduction

Finding zeros of a polynomial is a long-standing classical problem [4-8]. Many results are available concerning the location of zeros of a polynomial of a complex variable with complex coefficients. It is an interesting area of research for engineers as well as mathematicians. Here we establish annular regions in which zeros of complex polynomial lie by placing various conditions on the real and imaginary parts of the complex coefficients of a given polynomial. Now we make use of the