Canad. Math. Bull. Vol. **49** (3), 2006 p. 438

Unimodular Roots of Special Littlewood Polynomials

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Abstract. We call $\alpha(z) = a_0 + a_1 z + \cdots + a_{n-1}z^{n-1}$ a Littlewood polynomial if $a_j = \pm 1$ for all j. We call $\alpha(z)$ self-reciprocal if $\alpha(z) = z^{n-1}\alpha(1/z)$, and call $\alpha(z)$ skewsymmetric if $n = 2m + 1$ and $a_{m+j} = (-1)^j a_{m-j}$ for all j. It has been observed that Littlewood polynomials with particularly high minimum modulus on the unit circle in $\mathbb{C}$ tend to be skewsymmetric. In this paper, we prove that a skewsymmetric Littlewood polynomial cannot have any zeros on the unit circle, as well as providing a new proof of the known result that a self-reciprocal Littlewood polynomial must have a zero on the unit circle.

Received by the editors June 4, 2004; revised September 25, 2004.
AMS subject classification: 26C10, 30C15, 42A05.