On Cauchy–Liouville–Mirimanoff Polynomials

Dedicated to the memory of John Isbell, 1930–2005

Pavlos Tzermias

Abstract. Let \( p \) be a prime greater than or equal to 17 and congruent to 2 modulo 3. We use results of Beukers and Helou on Cauchy–Liouville–Mirimanoff polynomials to show that the intersection of the Fermat curve of degree \( p \) with the line \( X + Y = Z \) in the projective plane contains no algebraic points of degree \( d \) with \( 3 \leq d \leq 11 \). We prove a result on the roots of these polynomials and show that, experimentally, they seem to satisfy the conditions of a mild extension of an irreducibility theorem of Pólya and Szegő. These conditions are conjecturally also necessary for irreducibility.