Elements in a Numerical Semigroup with Factorizations of the Same Length

S. T. Chapman, P. A. García-Sánchez, D. Llena, and J. Marshall

Abstract. Questions concerning the lengths of factorizations into irreducible elements in numerical monoids have gained much attention in the recent literature. In this note, we show that a numerical monoid has an element with two different irreducible factorizations of the same length if and only if its embedding dimension is greater than two. We find formulas in embedding dimension three for the smallest element with two different irreducible factorizations of the same length and the largest element whose different irreducible factorizations all have distinct lengths. We show that these formulas do not naturally extend to higher embedding dimensions.