
On Sequences Associated to the Invariant Theory of Rank Two Simple Lie Algebras

Speaker

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Abstract

We study two families of sequences, listed in the On-Line Encyclopedia of Integer Sequences, which are associated to invariant theory of Lie algebras. For the first family, we prove combinatorially that the sequences A059710 and A108307 are related by a binomial transform. Based on this, we present two independent proofs of a recurrence equation for A059710, which was conjectured by Mihailovs. Besides, we also give a direct proof of Mihailovs' conjecture by the method of algebraic residues. As a consequence, closed formulae for the generating function of sequence A059710 are obtained in terms of classical Gaussian hypergeometric functions. Moreover, we show that sequences in the second family are also related by binomial transforms. This is joint work with Alin Bostan, Jordan Tirrell, and Bruce Westbury.