1053-13-109   **Mats Boij** and **Juan C. Migliore*** (`migliore.1@nd.edu`), Dept. of Math, University of Notre Dame, Notre Dame, IN 46556, and **Rosa M. Miro-Roig**, **Uwe Nagel** and **Fabrizio Zanello**. *Enumerating Pure O-sequences.*

A graded algebra A is *level of (socle) type t* if A is Cohen-Macaulay, the last free module in its minimal free resolution has rank t, and all summands of this last free module have the same twist. When A is Artinian and this twist is three more than the number of variables, we say that A has *socle degree* 3. We will fix the type but not the number of variables, and consider level Artinian *monomial* algebras of socle degree 3. The Hilbert function of such an algebra is called a *pure O-sequence* of socle degree 3 and socle type t. For fixed t, the number of pure O-sequences of socle degree 3 is finite. Let $P(t)$ denote this number. Then we show that

$$\lim_{t \to \infty} \frac{P(t)}{t^2} = \frac{9}{2}.$$

This result is contained in a longer joint paper with Mats Boij, Rosa Miro-Roig, Uwe Nagel and Fabrizio Zanello. The proof of this result requires several other results from the same paper, of independent interest, which we will mention. An important tool is that of Macaulay inverse systems. (Received August 26, 2009)