THE IRREDUCIBILITY OF ALL BUT FINITELY MANY BESSEL POLYNOMIALS

Michael Filaseta

Abstract: Emil Grosswald has conjectured that the Bessel Polynomials

$$y_n(x) = \sum_{j=0}^{n} \frac{(n+j)!}{2^j (n-j)! j!} x^j$$

are irreducible for all $n \geq 1$. The main result of this paper can be phrased as follows:

Theorem. *There is an effectively computable constant N such that if $n \geq N$ and $a_0, a_1, \dots, a_n$ are arbitrary integers with $|a_n| = |a_0| = 1$. Then*

$$\sum_{j=0}^{n} a_j \frac{(n+j)!}{2^j (n-j)! j!} x^j$$

is irreducible.

By considering the special case that $a_j = 1$ for all j, it follows that all but finitely many Bessel polynomials are irreducible.

Typeset by $\mathcal{A}\mathcal{M}\mathcal{S}$-TEX