

UNEVEN FROBENIUS REPRESENTATIONS OF PARTITIONS USING 3 AND 4 COLORS

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Dedicated to George E. Andrews on the occasion of his 70th birthday

Abstract: In this paper we will look at some Frobenius representations where the top and bottom rows are not the same length. These uneven Frobenius representations are associated with the generating functions for 3- and 4-color generalized Frobenius partitions. Surprisingly, we get representations for some easily described partitions.

Keywords and Phrases: 3- and 4-colors generalized Frobenius partitions, uneven Frobenius representations, generating functions

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1. Introduction

In 1985 Andrews introduced generalized Frobenius partitions [1]. The generating function for generalized Frobenius partitions with k colors is given by the coefficient of z^0 in $(z; q)_\infty^k (z^{-1}q; q)_\infty^k$ and a typical partition has the form $\begin{pmatrix} a_1 & a_2 & a_3 & \cdots & a_r \\ b_1 & b_2 & b_3 & \cdots & b_r \end{pmatrix}$ where the number n represented by this symbol is given by $n = r + \sum_{i=1}^r (a_i + b_i)$ and the entries in each row are distinct and come from k copies of the nonnegative integers distinguished by k colors. The exponent on z keeps track of the difference in the number of entries in the top and bottom rows of the Frobenius symbol.

In this paper we will look at representations of the form $\begin{pmatrix} a_1 & a_2 & a_3 & \cdots & a_r \\ b_1 & b_2 & \cdots & b_s \end{pmatrix}$ where the number of entries in the top row exceeds the number of entries in the bottom row; that is, $r > s$. The number n represented by this symbol will be given by $n = s + \sum_{i=1}^r a_i + \sum_{i=1}^s b_i$. Specifically, we will consider the case where $r = s + 2$ and the entries in each row are distinct and come from 3 copies of the

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