A NOTE ON A CLASSICAL CONNECTION BETWEEN PARTITIONS AND DIVISORS[*]

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Dedicated to Dr. Dan Tiba on the occasion of his 70th anniversary

Abstract

In this note, we consider the number of k's in all the partitions of n in order to provide a new proof of a classical identity involving Euler's partition function $p(n)$ and the sum of the positive divisors function $\sigma(n)$. New relations connecting classical functions of multiplicative number theory with the partition function $p(n)$ from additive number theory are introduced in this context. The fascinating feature of these relations is their common nature. A new identity for the number of 1's in all the partitions of n is derived in this context.

MSC: 05A17, 05A19, 11P81.

keywords: divisors, partitions

1 Introduction

Let A be a given set of positive integers, and let $f(n)$ be a given arithmetical function. By Apostol [3, Theorem 14.8], we know that the numbers $p_{A,f}(n)$