Relation between sum of 2mth powers and polynomials of triangular numbers

ABSTRACT

Let ʌ (m, k)(n) denote the number of representations of an integer n as a sum of k 2mth powers and Ɋ (m, k)(n) denote the number of representations of an integer n as a sum of k polynomial Pm(ɔ), where ɔ is a triangular number. We show that ʌ (2, k)(8n + k) = 2k Ɋ(2,k)(n) for 1 Ò k Ò 7. A general relation between the number of representations (formula presented) and the sum of its associated polynomial of triangular numbers for any degree m Ó 2 is given as ʌ (m, k) (8n + k) = 2k Ɋ (m, k) (n).

Keyword: Number of representations; Polynomial; Triangular numbers