Abstract

We give explicit formulas for the weighted sum of squares \( \sum_{j=0}^{m-1} z^j (a_j + b)^2 \), where \( a, b \in \mathbb{C} \) are given, and \( z \in \mathbb{C} \), \( z \neq 0, 1 \) is the weight. In the case \( a, b \in \mathbb{Z} \) and \( z \in \mathbb{Q} \), we show that there is a one-to-one correspondence between our weighted sums and Primitive Pythagorean Triples. The main tools we use are the \( Z \)-transform of sequences and a generalization of Eulerian polynomials.