Problema săptămânii 190

Fie $n \geq 3$ un număr natural şi $a_1, a_2, \ldots, a_n$ numere reale cu proprietatea că

$$a_k + a_{k+2} \geq 2a_{k+1}, \text{ oricare ar fi } k \in \{1, 2, \ldots, n-2\}.$$

Pentru orice $k \in \{1, 2, \ldots, n\}$ notăm cu $m_k = \dfrac{a_1 + a_2 + \ldots + a_k}{k}$.

Demonstraţi că $m_k + m_{k+2} \geq 2m_{k+1}$ oricare ar fi $k \in \{1, 2, \ldots, n-2\}$.

Problem of the week no. 190

Let $n \geq 3$ be an integer and let $a_1, a_2, \ldots, a_n$ be real numbers such that

$$a_k + a_{k+2} \geq 2a_{k+1}, \text{ for all } k \in \{1, 2, \ldots, n-2\}.$$

For all $k \in \{1, 2, \ldots, n\}$ we denote $m_k = \dfrac{a_1 + a_2 + \ldots + a_k}{k}$.

Prove that $m_k + m_{k+2} \geq 2m_{k+1}$ for all $k \in \{1, 2, \ldots, n-2\}$.