

We show the NP-hardness by reduction from PARTITION.

Given any instance of PARTITION, $S = \{a_1, a_2, \dots, a_n\}$, we construct an instance of SQUAREFINDING as follows. For each a_i , we construct a rectangle r_i with height a_i and width $\frac{\sum_i a_i}{4}$. Moreover, we set $k = \frac{\sum_i a_i}{2}$. The construction takes polynomial time.