On Szemerédi’s Regularity Lemma

ABSTRACT

Szemerédi’s Regularity Lemma states that for every $\epsilon > 0$ and every integer $m \geq 1$ there exist an integer $M$ such that every graph of order at least $m$ admits an $\epsilon$-regular partition $\{V_0, V_1, \ldots, V_k\}$ with $m \leq k \leq M$. We will give an account of the theory behind Szemerédi’s Regularity Lemma and provide a partial proof of the result. Then we will conclude with several applications of this major result.