

Generalized Markov constant and continued fractions

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Given a number $\alpha \in \mathbb{R}$, its Markov constant is the number $\liminf_{m \rightarrow +\infty} m \|m\alpha\|$, where $\|m\alpha\|$ is the distance from $m\alpha$ to the nearest integer. We shall introduce a generalization of this concept, denoted $S(\alpha)$ which comprises of all accumulation points of the set $\{m^2 \left(\frac{k}{m} - \alpha\right) : k, m \in \mathbb{Z}\}$. We will show some results concerning $S(\alpha)$ and focus on the relations to the continued fraction expansions of α and to its combinatorial properties. Finally, we will show how one can approximate elements of $S(\alpha)$ using automata.

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