Analysis of Fractal Properties of the Iteration of Vieta's Theorem

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We examined the iteration of the mapping that is given by Vieta's Theorem. Under its application different behaviours like convergence and divergence emerge. We could prove that the convergent set in R^2 has a triangular shape. This proof can be extended to describe the convergent set general R^n as the volume enclosed by other convergent sets in R^(n-1). Further, the set of all points directly mapped onto one of the axes can be viewed as algebraic varieties. We proved the count of their irreducible components grows (postulated: like their degree with the nth Fibonacci numbers, which is already proven) while the components converge. Their convergence led us to numerically approximate the box-counting dimension of the union of all said algebraic varieties using General Purpose Computation on Graphics Processing Unit (GPGPU) processing. Although we still need to prove the applicability of our measurements, we postulate that they form a fractal, i.e. their dimension is non-integer.

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