

Singular functions arising from numerations

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Numerations provide a mean of representing numbers by finite or infinite words. Singular functions (with derivative vanishing almost everywhere) arise naturally by exchanging two different numerations, the most famous such example given by the Cantor-Lebesgue function. Not surprisingly, differentiability at some x and diophantine approximation or normality of x appear to be closely related. We focus on the Minkowski question mark function $?$, strictly increasing however still singular, and present recent results and open questions, with the goal to highlight some aspects in dynamical systems, combinatorics, number theory and fractal harmonic analysis.