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A Fractal Example of a Continuous Monotone Function with Vanishing Derivatives on a Dense Set and Infinite Derivatives on Another Dense Set

Bünyamin DEMİR, Vakıf DZHAFAROV,
Şahin KOÇAK, Mehmet ÜREYEN
Department of Mathematics,
Anadolu University,
26470 Eskişehir-TURKEY

Abstract: Inspired by the theory of analysis on fractals, we construct an example of a continuous, monotone function on an interval, which has vanishing derivatives on a dense set and infinite derivatives on another dense set. Although such examples could be constructed by classical means of probability and measure theory, this one is more elementary and emerges naturally as a byproduct of some new fractal constructions.

Key Words: Sierpinki Gasket, harmonic function

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