Dębski, Wojciech; Mioduszewski, Jerzy

Multiplicities of Peano maps: on a less known theorem by Hurewicz. (English) Zbl 0857.54033

Pr. Nauk. Uniw. Śląsk. Katowicach 1523, Ann. Math. Silesianae 9, 11-15 (1995).

A continuous function $f : I = [0, 1] \to \mathbb{R}^2$ is called a Peano map if $f(I)$ has non-empty interior in $\mathbb{R}^2$. The multiplicity of a value $f(x)$ is the cardinality of $f^{-1}(f(x))$. The authors state that in 1933, Hurewicz proved that if f is finite-to-one and has only two multiplicities for its values then it cannot be a Peano map. They consider the following concept. A value of y of a map $f : X \to Y$ between topological spaces is called a value of openness if for each $x \in f^{-1}(y)$ and neighborhood U of x in X, $y \in \text{int } f(U)$. The theorem in this paper can now be stated: the values with the highest multiplicities cannot be values of openness of a Peano map if they lie in the interior of the image.

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