



Math for the people, by the people.

nonwandering set

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Defines	nonwandering point

Let X be a metric space, and $f : X \rightarrow X$ a continuous surjection. An element x of X is a *wandering point* if there is a neighborhood U of x and an integer N such that, for all $n \geq N$, $f^n(U) \cap U = \emptyset$. If x is not wandering, we call it a *nonwandering point*. Equivalently, x is a nonwandering point if for every neighborhood U of x there is $n \geq 1$ such that $f^n(U) \cap U$ is nonempty. The set of all nonwandering points is called the *nonwandering set* of f , and is denoted by $\Omega(f)$.

If X is compact, then $\Omega(f)$ is compact, nonempty, and forward invariant; if, additionally, f is an homeomorphism, then $\Omega(f)$ is invariant.