Abstract

Jacobian conjecture was first posed by Keller in 1939, and was listed by Smale in 1998 as his 16th problems of 18 problems. This conjecture states that if $F:\ \mathbb C^n~(\mathbb R^n) \rightarrow \mathbb C^n~(\mathbb R^n)$ is a polynomial map such that the Jacobian of F is a nonzero constant, then F is injective. This conjecture is still open for all $n\ge 2$, and for both $\mathbb C^n$ and $\mathbb R^n$. Here we provide a positive answer to the Jacobian conjecture in $\mathbb R^2$ via the tools from the theory of dynamical systems.