Existence of periodic points and Sharkovsky’s theorem
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If \( f(x) \) is a polynomial with coefficients in a field \( K \), for which \( n \) does \( f(x) \) have a periodic point \( p \) in \( K \) with primitive period \( n \)? The answer depends, in a dramatic way, on the field \( K \). We will discuss what is known and conjectured about this problem, focusing on the case when \( K \) is the field of real numbers.