

CONTINUOUS MAPS OF THE CIRCLE WITH FINITELY MANY PERIODIC POINTS

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Abstract. Let  $f$  be a continuous map of the circle into itself. The main purpose of this paper is to study the properties of the unstable manifold associated to a periodic point of  $f$ . Let  $\Omega(f)$  denote the nonwandering set of  $f$ . Suppose  $f$  has finitely many periodic points. Then, using the unstable manifolds associated to periodic points of  $f$ , three theorems are proved providing complete answers to the following three questions:

- (1) Which are the possible periods of the periodic points of  $f$ ?
- (2) Which is the value of the topological entropy of  $f$ ?
- (3) If  $\Omega(f)$  is finite, which are the points of  $\Omega(f)$ ?