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# THE THEOREM OF KERÉKJÁRTÓ ON PERIODIC HOMEOMORPHISMS OF THE DISC AND THE SPHERE

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ABSTRACT. We give a modern exposition and an elementary proof of the topological equivalence between periodic homeomorphisms of the disc and the sphere and euclidean isometries.

## 1. INTRODUCTION

In 1919, Kerékjártó published the first proof of the topological equivalence between periodic homeomorphisms of the disc and the sphere and euclidean isometries [3]. In the same journal just following Kerékjártó's article, Brouwer [1] gave his own argument for these theorems, explaining that these results had been known to him for a long time and that they were consequences of some earlier and slightly different theorems of his on periodic homeomorphisms of compact surfaces. However, Brouwer's proof is not easy to follow and the proof of Kerékjártó was just sketched and contained a gap.

It was only in 1934 that a complete proof of this important theorem was presented by Eilenberg [6]. More recently Epstein [7] has reconsidered the question for pointwise periodic homeomorphisms (each point is periodic under $f$ but the period $n(x)$ depends on $x$ and may not be bounded). Because of the importance of these results and since no modern exposition of them seems to be found in the litterature, the authors have thought that it would be useful to present a modern and elementary proof. The essential arguments, however, remain those of [1, 3, 6].