Freudenthal-Hopf

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Introduction

The goal of this project is to formalise the Freudenthal-Hopf theorem from Geometric Group Theory, which states that the Cayley graph of a finitely-generated group has zero, one, two, or infinitely many ends.

Chapter 1

Ends

This chapter outlines an approach to defining ends of a graph. For concreteness, we restrict the definition of ends to just graphs, although it the concept of ends can also be formulated for arbitrary topological spaces.

Chapter 2

Functoriality

Sufficiently nice maps between graphs can induce maps between their corresponding sets of ends. This chapter describes an approach to formalising this functoriality in terms of a notion of *reachability* of points in a graph.

Chapter 3

The Freudenthal-Hopf theorem

This chapter outlines the final proof of the *Freudenthal-Hopf theorem*.