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Distinguishing Cartesian Products of Countable Graphs

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Abstract

The distinguishing number $D(G)$ of a graph G is the minimum number of colors needed to color the vertices of G such that the coloring is preserved only by the trivial automorphism. In this note we improve results about the distinguishing number of Cartesian products of finite and infinite graphs by removing restrictions to prime or relatively prime factors.

Keywords: vertex coloring; distinguishing number; automorphisms; infinite graphs; Cartesian and weak Cartesian products

Mathematics Subject Classifications: 05C25, 05C15, 03E10

1 Introduction

This paper is concerned with automorphisms breaking of Cartesian products of graphs by vertex colorings. Our main focus is on breaking the automorphisms of a graph G with a minimum number of colors. This number is called the *distinguishing number* $D(G)$ and is defined as the least natural number d such