Constructing a four-colorable map

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Abstract

In this paper, we solve the four-color problem by a new algorithm.

1 Introduction and results

In 1977, Appel *et al.* [AHK77] solved the four color problem. In this paper, we compute the four-colorability of a map. These below are the basic definitions of map theory.

Definition 1. Country is a region in a map.

Definition 2. Map is a collection of countries or regions separated by boundary lines.

Definition 3. Neighboring countries are two countries with a boundary line in common.

Definition 4. Region is a general term for a country, county or state in a map.

This below, we introduce an algorithm for constructing a four-colorable map.

1. Fix the colors. The colors: A,B,C,D.

2. Locate the colors at random. We may use more than one same colors provided that there are no the conflicting colors.

3. Continue 2, we locate the colors as much as required.

4. If it has been sufficient, then we draw the boundary lines which surround that colors until a complete map is constructed.

Because we can continue this process of algorithm indefinitely and can make various four-colorable maps as we wishes, then this algorithm holds for any map.

References

[AHK77] K. Appel, W. Haken, and J. Koch. Every planar map is four colorable, part ii: Reducibility. *Illinois J. Math*, 21:491–567, 1977.