

Liskovets, Valery A.

A reductive technique for enumerating non-isomorphic planar maps. (English) Zbl 0857.05044
Discrete Math. 156, No. 1-3, 197-217 (1996).

In [A census of non-isomorphic planar maps, Colloq. Math. Soc. János Bolyai 25, 479-494 (1981; [Zbl 0519.05040](#))] the author reduced the enumeration of planar maps up to orientation-preserving homeomorphisms of the embedding sphere to the enumeration of rooted planar maps done by *W. T. Tutte* [A census of planar maps, Can. J. Math. 15, 249-271 (1963; [Zbl 0115.17305](#))] and found a closed-form formula for the number of such maps with n edges. *N. C. Wormald* [Counting unrooted planar maps, Discrete Math. 36, 205-225 (1981; [Zbl 0467.05034](#))] and [On the number of planar maps, Can. J. Math. 33, 1-11 (1981; [Zbl 0408.57006](#))] developed an algorithmic method for counting planar maps up to arbitrary homeomorphisms, including orientation-reversing ones. This method yielded no closed-form formula even when restricted to orientation-preserving homeomorphisms.

In the article under review, the reductive method of the author [loc. cit.] is generalized to arbitrary homeomorphisms by classifying them into five types; the enumeration of planar maps up to arbitrary homeomorphisms is thus reduced to counting rooted planar maps, rooted projective maps and rooted circular maps. A recursive formula for counting rooted projective maps was given in [*E. A. Bender, E. R. Canfield* and *R. W. Robinson*, The enumeration of maps on the torus and the projective plane, Can. Math. Bull. 31, No. 3, 251-271 (1988; [Zbl 0617.05036](#))]. In the present paper, rooted circular maps are reduced to certain generalized rooted quadrangular dissections of the disc, and in a final remark a method of enumerating these objects is suggested.

Reviewer: [T.R. Walsh \(Montreal\)](#)

MSC:

[05C30](#) Enumeration in graph theory
[05C10](#) Planar graphs; geometric and topological aspects of graph theory

Cited in **12** Documents

Keywords:

[rotation](#); [reflection](#); [enumeration](#); [planar maps](#); [homeomorphisms](#); [quadrangular dissections](#)

Full Text: [DOI](#)

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