

Gluing Surfaces with Polygonal Holes

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Abstract

Authors: E. T. Akhmedov, Sh. Shakirov (Submitted on 17 Dec 2007) Abstract: By pairwise gluing of sides of a polygon, one produces two-dimensional surfaces with handles and boundaries. In this paper, we count the number $\mathcal{N}_{g,L}(n_1, n_2, \dots, n_L)$ of different ways to produce a surface of given genus g with L polygonal boundaries with given numbers of sides n_1, n_2, \dots, n_L . Using combinatorial relations between graphs on real two-dimensional surfaces, we derive recursive relations between $\mathcal{N}_{g,L}$. We show that Harer-Zagier numbers appear as a particular case of $\mathcal{N}_{g,L}$ and derive a new explicit expression for them.