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Combinatorial aspects of the double Hurwitz numbers and Faber's intersection numbers

Faber's intersection numbers, double Hurwitz numbers and Hurwitz numbers contain a surprising amount of combinatorial structure. Goulden, Vakil and I hope to gain further understanding of the Faber intersection numbers by examining their relationship to the double Hurwitz numbers. I shall give an account of the high points of this work by starting with the classical case of genus zero covers of the sphere, for it is in this case that there is a glimpse of an instance of a basic algebraic-combinatorial structure that appears to pervade our approach. Vakil's earlier talk has given an introduction to the moduli space of curves and an impression of how such geometric questions may be translated into combinatorics. I shall describe how an approach through algebraic combinatorics may be used to determine further properties of these numbers.