

1060-20-138

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Gerhard Rosenberger. *Something for Nothing: Some Consequences of the Solution to the Tarski Problems*. Preliminary report.

From the positive solution to the Tarski problems by Kharlampovich and Myasnikov and independently by Sela it follows that every first order theorem in a nonabelian free group is true in every elementary free group. An elementary free group is a group that shares the first order theory of the class of nonabelian free groups. The class of elementary free groups extends beyond the class of free groups. In particular orientable surface groups are elementary free. In particular Magnus' theorem concerning the normal closures of elements in free groups is true in surface groups. This was proved directly by J. Howie and independently by O. Bogopolski in a quite difficult manner. This type of result opens up several different types of questions. The first is which additional nontrivial free group results are true in surface groups but difficult to obtain directly. Secondly what first order properties of nonabelian free groups are true beyond the class of elementary free groups. In regard to this second question we consider groups satisfying certain quadratic properties that we call Lyndon properties and show that the class of groups satisfying these are closed under many amalgam constructions. (Received March 28, 2010)