

Mathematics Colloquium

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**First-Order Logic
on the Free Group**

Abstract: First-order logic over groups concerns itself with those properties of a group which can be expressed by a particularly simple kind of mathematical statements: first-order formulas. We will give a survey of some results about what is known of the first-order theory of free groups. A typical problem is to try and see whether two non-isomorphic groups can be distinguished by first-order logic, namely whether there are some first-order properties satisfied by one and not by the other. This was answered in the negative for finitely generated free groups of distinct ranks by Sela and Kharlampovich-Myasnikov, thus solving the long-standing Tarski problem. Another question is the description of elementary subgroups of a group G , subgroups H whose elements satisfy exactly the same first-order properties in H and in G . In the case where G is a free group, we showed that H has to be a free factor.

Wednesday, November 4

**4:00-5:00 pm
204 Smith Hall**