

1052-20-269

Francesco Matucci* (fm6w@virginia.edu), Department of Mathematics, 325 Kerchof Hall, Charlottesville, VA 22904, and **Martin Kassabov** (kassabov@math.cornell.edu), Department of Mathematics, 590 Malott Hall, Ithaca, NY 14853. *Bounding the residual finiteness of free groups*. Preliminary report.

We analyze the question of the minimal index of a normal subgroup in a free group which does not contain a given element. Recent work by BouRabee-McReynolds and Rivin give estimates for the index. By using results on the length of shortest identities in finite simple groups we recover and improve polynomial upper and lower bounds for the order of the quotient. The bounds can be improved further if we assume that the element lies in the lower central series. (Received August 30, 2009)