Thirdly it follows easily from these observations and the residual nilpotence of free groups that G is parafree of rank r.

Finally we observe that G is not finitely generated, but that $G/\gamma_2 G$ is free abelian of rank two. Hence G is not free.

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SOLVABLE AND NILPOTENT SUBALGEBRAS OF LIE ALGEBRAS

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1. **Introduction.** We describe here some results on the structure of a Lie algebra in terms of its nilpotent and solvable subalgebras. Proofs will appear elsewhere.

In the following discussions, F is an arbitrary field, $\mathfrak{L}$ is a (finite dimensional) Lie algebra over F and V is a (finite dimensional) vector space over F.

2. **Arbitrary Lie algebras.** Let $\mathfrak{N}$ be a set of linear transformations in V such that the Lie algebra generated by $\mathfrak{N}$ over F is nilpotent. Then, as is well known, V has a unique vector space decomposition $V=V_0(\mathfrak{N})+V_*(\mathfrak{N})$ (direct) where $V_*(\mathfrak{N})$ is $\mathfrak{N}$-stable, $V_0(\mathfrak{N})$ is $\mathfrak{N}$-stable and $\mathfrak{N}|_{V_0(\mathfrak{N})}$ consists of nilpotent transformations, and where $V_0(\mathfrak{N})$ is maximal with respect to the latter two properties.

One has the following theorem, in spite of the fact that a nilpotent linear Lie algebra cannot always be triangulized over the algebraic closure of its base field.

THEOREM 1.[2] *If F is infinite and $\mathfrak{N}$ is a subspace of* $\mathrm{Hom}_F(V, V)$ *such that the Lie algebra generated by $\mathfrak{N}$ is nilpotent, then there exists N in $\mathfrak{N}$ such that $V_0(N)=V_0(\mathfrak{N})$.*

[1] This research was done while the author was a National Science Foundation Postdoctoral Research Fellow at the University of Bonn.

[2] This is essentially Lemma 3.5 of [4, pp. 87–88]. The author has heard that an independent forthcoming paper of R. Block contains material close to this theorem.