Unary polynomial functions on a class of finite groups

Peeter Puusemp
University of Tartu
Tartu, Estonia

We describe unary polynomial functions on noncommutative groups G that are semidirect products $A \rtimes_\alpha B$, where $A \cong \mathbb{Z}_p^n$, $B \cong \mathbb{Z}_q$, with p and q different prime numbers, and $\alpha : B \to \operatorname{Aut} A$ a group homomorphism.

Let $M = \alpha(1)$ be the matrix that determines the homomorphism α. If S is the ring generated by M in $\operatorname{Mat}_n(\mathbb{Z}_p)$, then A forms an S-module. Our results depend on the submodule structure of that S-module. Complete description is obtained for cases $n = 2, 3$. For some special cases the results in E. Aichinger's paper [1] can be used.

References

[1] E. Aichinger, The polynomial functions on certain semidirect products of groups, *Acta Sci. Math.* (Szeged), **68** (2002), 63-81.