1064-20-73   **Mark L. Lewis** (`lewis@math.kent.edu`), Department of Mathematical Sciences, Kent State University, Kent, OH 44242, and **James B. Wilson*** (`wilson@math.ohio-state.edu`), Department of Mathematics, The Ohio State University, Columbus, OH 43210. *Distinguishing exponentially many non-isomorphic groups having no known isomorphism invariants.* Preliminary report.

For every integer n there is an integer d such that the Sylow p-subgroup of $\mathrm{GL}(3, p^d)$ has $p^{n^2/8-O(n)}$ pairwise non-isomorphic quotients of order p^n. Yet, two such quotients have in common many powerful isomorphism invariants. For instance, they have isomorphic character tables, all proper centralizers are elementary abelian of the same order, they are centrally indecomposable and of the same type, and the bulk of their automorphisms are identical. Nevertheless, there is a linear-time algorithm that decides when two such groups are isomorphic. (Received August 27, 2010)