Counterexamples to the Isomorphism Problem in Finite Group Algebras
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Techniques by Perlis-Walker [3] and more recently by Broche and Del Rio [1] are used to find the Wedderburn decomposition of group algebras. These methods are used and adapted to give new results for semisimple finite abelian group algebras. In doing so, we get a further insight into the isomorphism problem for group algebras, which asks, given two groups \( G \) and \( H \) and a field \( F \), is it true that if \( FG \) and \( FH \) are isomorphic, then \( G \) and \( H \) are isomorphic? The answer to this question is no. For example, the minimum counterexample to this problem is given in [2]. Here we show that this is a specific case of a general class of counterexamples. We construct another class of isomorphic group algebras and give examples.

Joint with Leo Creedon.

References: