

Loop-based identities in the double of a central pique

Jonathan D. H. Smith
Iowa State University, Ames, IA USA

June 28, 2005

A *pique* is a quasigroup with a pointed idempotent. A central pique is a principal isotope of an abelian group, its corresponding loop or *cloop*, the components of the isotopy being automorphisms of the cloop. The characters of a central pique's cloop form a dual pique. The conjugacy classes of the dual correspond to the characters of the primal; indeed the unitary character table of the dual is the inverse of the unitary character table of the primal. Together with its dual, a central pique forms a structure known as the *double*.

In what may well be the first application of one part of quasigroup theory to another, it is shown that the double of a central pique satisfies identities indexed by loops of 2-power order. These identities project onto the unit circle to yield identities involving character values.