Unitals with many automorphisms

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Abstract

Classical examples of unitals arise from suitable polarities of desarguesian projective planes, and can be described by hermitian forms over coordinatizing (skew) fields. The point set is the set of absolute points, the blocks are (induced by) the secant lines.

In the finite case, the fundamental combinatorial properties (each point is on q^2 blocks, each block has $q+1$ points, and any two points are on a unique block) are used as axioms for a class of incidence structures called unitals. We consider a given (possibly non classical) unital as an abstract incidence geometry (without referring to any embedding into an ambient projective plane).

Many examples (and systematic constructions) are known of unitals. For some (but not all) examples, the full group of automorphisms has been determined.

Classical unitals can be characterized by various conditions. The talk focuses on characterizations by suitable transitivity properties. In particular, we obtain a variant of the Lenz classification.