

# Fixed points of projectivities of prime order

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## Abstract

The talk presents the material featured in [1]. It is shown that, in a finite projective plane of order  $q$ , there exists a projectivity  $\tilde{g}$  of prime order  $p > 3$  if and only if  $p$  divides exactly one of the integers  $q - 1$ ,  $q$ ,  $q + 1$ ,  $q^2 + q + 1$ . A correspondence is established between the possible structures of points fixed by  $\tilde{g}$  and the integer that is divisible by  $p$ . For the special case of  $p = 2$ , it is shown that every involution is a harmonic homology for  $q$  odd and an elation for  $q$  even. The special case of  $p = 3$  is also considered.

An application is determining the sizes of  $(n, r)$ -arcs that are stabilized by projectivities of prime order  $p$  in the finite projective plane of order  $q$ .

## References

- [1] G. Cook, Fixed points of projectivities of prime order, J. Geom. **103-2** (2012), 191-205.