

Pappus Configurations in Finite Planes

Lorinda Leshock, University of Delaware

In the classical projective planes both Desargues theorem and Pappus theorem hold. According to a result of Ostrom, the Desargues configuration can also be found in every finite projective plane of order greater than 3, classical or not. The existence of a Pappus configuration in every non-classical finite affine or projective plane is unknown. We study whether the Pappus configuration is present in such planes. In particular, we show that in finite Hall affine or projective planes the Pappus configuration exists. More precisely, we endeavor to prove that in finite Hall affine planes, the following strong versions for the existence of the Pappus configuration holds: For every pair of lines ℓ_1, ℓ_2 , every triple of points on ℓ_1 and every point on ℓ_2 , two more points can be found on line ℓ_2 that define a Pappus configuration. (This is a joint work with Felix Lazebnik.)

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