

## The projective plane of order 13

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The Desarguesian plane  $PG(2, 13)$  provides some insight into the following questions.

- (1) What is the second smallest length of a maximal 3-dimensional MDS code over  $\mathbf{F}_q$ ?
- (2) What is the maximum number of rational points on a plane algebraic curve of degree  $d$  and genus  $g$  over  $\mathbf{F}_q$ ?
- (3) Is there a plane curve of degree  $d$  over  $\mathbf{F}_q$  such that every line of  $PG(2, q)$  meets the curve in less than  $d$  rational points, when these points are counted by their intersection numbers?