Geometry Seminar
Tuesday, January 20, 2009
Room 317 WWH at 6:00 P.M.

A simple proof of a theorem by Larman.

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What is the maximal integer $m(d)$ such that any set of $m(d)$ points in general position in R^d can be mapped, by a permissible projective transformation, onto the vertices of a convex polytope?

This question was raised by P. McMullen around 1970, and shortly after D. Larman showed that $2d+1 \leq m(d) \leq (d+1)2, d \geq 2$, and $m(d) = 2d+1$ for $d = 2, 3$. The quadratic upper bound is a simple construction, while the linear lower bound follows from an interesting connection to a Radon-type theorem on partitions of point sets in R^d. Larman's original proof of this Radon-type theorem is technically quite difficult, and in this talk I will present a new simple proof of his Theorem which relies on basic properties of the Gale-transform, well-known from the theory of convex polytopes.

For more information please visit the seminar website at:
`http://www.math.nyu.edu/seminars/geometry_seminar.html`.