1017-14-37 **Benjamin J Howard*** (`bhoward@math.umd.edu`), Mathematics Department, University of Maryland, College Park, MD 20742, and **John J Millson**, **Andrew Snowden** and **Ravi Vakil**.
The projective invariants of ordered points on the line.

We study the Geometric Invariant Theory quotients of n-tuples of points on the projective line, modulo automorphisms of the projective line. It follows from a theorem of A. B. Kempe (1894) that the ring of invariants is generated by the degree one elements. We choose a finite set of generators and study the relations in them.

Our main theorem is that the projective scheme is cut out by very simple linear and quadric relations, unless $n = 6$ and each point has weight one. When $n = 6$ the space is a cubic hypersurface called the Segre cubic threefold. We also show that the ideal of relations is generated by relations of degree four and less, for any number of points with any weighting. (Received February 01, 2006)