

1077-05-8

Larry Guth* (lguth@cims.nyu.edu), Courant Institute, 251 Mercer St., New York, NY 10012.
The polynomial method in combinatorial geometry.

In the last five years, several difficult combinatorial problems have been solved by an unexpected argument using polynomials. The combinatorial problems involved have to do with the way that lines intersect in a vector space. We will discuss the example of the joints problem - a problem about the intersections of lines in \mathbb{R}^3 . This problem was posed in the early 90's and was open for close to twenty years. We now have a one page proof, which I will explain in all details.

Why are polynomials useful in these questions? I'm not sure that I understand, but I'll discuss this question from one or two perspectives.

After that, I'll discuss some of the other applications of the polynomial method, including the Erdős distinct distance problem for points in the plane. (Received September 21, 2011)