

1141-05-72

Allison Ganger, Shannon Golden, Brian Kronenthal* (kronenthal@kutztown.edu), **Felix Lazebnik** and **Carter Lyons**. *The girth of two-dimensional algebraically defined graphs*. Preliminary report.

The objects of interest in this talk are algebraically defined bipartite graphs, which are constructed as follows. Let \mathbb{F} denote a field, and consider the bipartite graph whose partite sets P and L are copies of \mathbb{F}^2 such that $(p_1, p_2) \in P$ and $(\ell_1, \ell_2) \in L$ are adjacent if and only if $p_2 + \ell_2 = p_1 \ell_1$. This graph has girth six, and of particular interest is identifying any polynomials $f \in \mathbb{F}[x, y]$ such that replacing $p_1 \ell_1$ with $f(p_1, \ell_1)$ in the adjacency condition produces a girth six graph that is not isomorphic to the original. In addition to discussing some results related to this question, we will also explain the connection between algebraically defined graphs and incidence geometry, which partially motivates this line of inquiry. (Received July 16, 2018)