

1122-05-100

**Brian G. Kronenthal\*** (kronenthal@kutztown.edu), **Felix Lazebnik** and **Jason Williford**.

*On the uniqueness of some girth eight algebraically defined graphs.*

In this talk, we will discuss algebraically defined bipartite graphs. Indeed, let  $\mathbb{F}$  denote a field, and consider the bipartite graph with partite sets  $P = \mathbb{F}^3 = L$  such that  $(p_1, p_2, p_3) \in P$  and  $[\ell_1, \ell_2, \ell_3] \in L$  are adjacent if and only if  $p_2 + \ell_2 = p_1\ell_1$  and  $p_3 + \ell_3 = p_1\ell_1^2$ . This graph has girth eight, and of particular interest is whether it is possible to alter these equations by replacing  $p_1\ell_1$  and  $p_1\ell_1^2$  with other bivariate polynomials to create a nonisomorphic girth eight graph. In addition to discussing some results related to this question, we will also explain the connection between algebraically defined graphs and the point-line incidence graphs of generalized quadrangles, which partially motivates the study of the objects in this talk. (Received August 10, 2016)