

1067-11-1372

**Andrew G. Earnest\*** (aearnest@math.siu.edu), Department of Mathematics, Southern Illinois University Carbondale, Carbondale, IL 62901. *Multiplicative properties of integral binary quadratic forms and orders of elements in the form class group.*

It follows from the classical Gaussian theory of composition that the set of integers represented by an integral binary quadratic form is closed under three-fold products. The integral binary quadratic forms for which the represented value set is multiplicatively closed were studied by V. Arnold, who referred to them as perfect forms. In this talk we will discuss more generally the integral binary quadratic forms for which the represented value set is closed under  $k$ -fold products, for any even positive integer  $k$ . This property will be seen to distinguish the elements of odd order in the form class group of a fixed discriminant. Moreover, this closure under  $k$ -fold products can always be expressed by a  $k$ -linear mapping. In the case  $k = 2$ , this property is seen to be related to a particular parametrization of the coefficients of the form which arises from a classical correspondence between binary cubic forms and related binary quadratic forms. (Received September 20, 2010)