

Meeting: 1004, Bowling Green, Kentucky, SS 11A, Special Session on Commutative Ring Theory

1004-13-142 **Shane P Redmond*** (Shane.Redmond@eku.edu), 313 Wallace, Eastern Kentucky University, 521 Lancaster Ave., Richmond, KY 40475. *Central Sets of the Zero-Divisor Graph of a Commutative Ring.*

For a commutative ring R with identity, the zero-divisor graph, $\Gamma(R)$, is the graph with vertices the nonzero zero-divisors of R and edges between distinct vertices x and y whenever $xy = 0$. It is shown that the radius of $\Gamma(R)$ is 0, 1, or 2 if R is Noetherian. Three different notions of centrality in a graph are examined: the center, the median, and minimal dominating sets. These notions all have practical applications other settings. The center of $\Gamma(R)$ is shown to be a union of annihilator ideals if R is Artinian. If R is finite, then the median is shown to be a subset of the center. A dominating set of $\Gamma(R)$ is constructed using elements of the center when R is Artinian. It is shown that for a finite ring $R \not\cong \mathbb{Z}_2 \times F$ for some finite field F , the domination number of $\Gamma(R)$ is equal to the number of distinct maximal ideals of R . (Received January 22, 2005)