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On the Girth of the Regular Digraph of Ideals of a Commutative Ring

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Abstract : Let R be a commutative ring. The regular digraph of ideals of R, which is denoted by Γ(R), is a digraph whose vertex-set is the set of all non-trivial ideals of R and, for every two distinct vertices I and J, there is an arc from I to J, whenever I contains a non-zero-divisor on J. In this article, we show that an indecomposable Noetherian ring R is Artinian local if and only if Z(I)=Z(R) for every non-nilpotent ideal I. Then we conclude that the girth of Γ(R) is not equal to four.

Keywords : commutative ring, girth, regular digraph, zero-divisor
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