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IDEMPOTENTS IN THE NUCLEUS OF AN ASSOSYMMETRIC RING

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Abstract

In this paper we show that in an assosymmetric ring R, an idempotent e 6= 0 is in the nucleus N. The assosymmetric ring was introduced by E. Kleinfeld in [3] is a nonassociative ring in which the associator (x; y; z) = (xy)z - x(yz) has the property (x; y; z) = (P(x); P(y); P(z)) for each permutation P of x; y; z in R. These rings are neither exible nor power associative, not commutative and not semiprime [1]. E. Kleinfeld in [3] has shown that the associator and the commutator are in the nucleus of an assosymmetric ring. By using these properties, first we show that in an assosymmetric ring R, an idempotent e 6= 0 is in the nucleus N. We also prove that if R is prime, then e is the identity element of R. We give an example of an assosymmetric ring which does not have Pierce decomposition with respect to the idempotent e. A ring is said to be prime if for any ideals A and B of R, AB = (0) implies either A = (0) or B = (0). A ring is simple if for any ideal A of R either A = (0) or A = R. A ring R is said to have Pierce decomposition relative to the idempotent e 2 R, if R can be decomposed into the direct sum of Z-modules R_{ij} (i; j = 0; 1) where R_{ij} = fx 2 R : ex = ix and xe = jxg. The commutator [x; y] is defined by xy - yx.

Key Words and Phrases : Assosymmetric ring, Prime ring, Nucleus, Idempotent.

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