SYMMETRIC SKEW 3-REVERSE DERIVATIONS WITH SEMIPRIME RINGS

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ABSTRACT

Suppose α be an anti automorphism in R , $D: R \times R \times R \rightarrow R$ is a symmetric skew 3-reverse derivation with anti automorphism α . f trace in D then $D(f(l), l, l) = 0$, every $l \in I$, implies $D = 0$.

KEYWORDS: Reverse Derivation and Anti automorphism.

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INTRODUCTION

Faiza Shujat and Abuzaid Ansari [4] has studied symmetric skew 3-derivations on prime and semiprime rings. This paper proved that in semi prime ring with a non zero symmetric skew 3-reverse derivation is commutative.

Preliminaries

In this paper, If 2, 3- torsion free semiprime ring R with center Z , α is anti automorphism in R . The notation $[x, y]$ is commutator $xy - yx$. Semi prime if $xRx = 0$, then $x = 0$.

Before starting our main theorem, using some results.

Let D be a symmetric then

$$D(-l, m, n) = -D(l, m, n), \text{ all in } R. \quad (1)$$

Theorem 1

$D: R^3 \rightarrow R$ is symmetric skew 3-reverse derivation in R on f is $D(f(l), l, l) = 0$, all in R . Implies $D = 0$.

Proof

Assume $D(f(l), l, l) = 0$, l in R . (2)

Linearization of (2) and replace m by $-m$, substitute $m + n$ for m , replacing n by wn and using symmetric in D , we have

$$6\alpha(D(m, m, n))D(w, l, l) + 6\alpha(D(m, m, w))D(\alpha(n), l, l) + 24\alpha(D(m, n, l))D(w, l, m) + \\ 24\alpha(D(m, w, l))D(\alpha(n), l, m) + 6\alpha(D(l, l, n))D(w, n, n) + 6\alpha(D(l, l, w))D(\alpha(n), m, m) = 0, \quad \text{for all } l, m, n, w \in R. \quad (3)$$

$$D(l, l, n)D(w, l, l) = 0, \text{ any in } R. \quad (4)$$

Substitute w by uw equation (4) and using equation (4) obtain

$$D(l, l, n)uD(w, l, l) = 0$$

Semi prime ness, $D(w, l, l) = 0$, for all $w, l \in R$.

By linearization implies $D(w, l, m) = 0$, any $w, l, m \in R$.

Implies $D = 0$.

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