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## STRUCTURES OF ARCHIMEDEAN SEMIGROUPS

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## Abstract

Additive structures play an important role in determining the structure of semirings. In this paper we shall study the structures of archimedean semigroups. In a semiring (S, +, .) if (S, +) is archimedean and commutative it is proved that (S, +) is weakly cancellative (cancellative) with or without considering weakly separative condition. Later we define a relation  $\eta$  on S by  $a\eta b \Leftrightarrow ka = b + c, lb = a + d$  for all a, b, c, d in S and some positive integer k, l, and it is proved that  $\eta$  is a separative congruence on S, also if (S, +) is left weakly balanced semigroup then this congruence relation form a chain, so that (S, +) is a  $\Delta$  - semigroup.

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Key Words : Archimedean, Separative, Cancellative, Weakly cancellative,  $\Delta$  - semigroup.