Square roots and their applications on pseudo MV-algebras

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A square root as a unary operation on MV-algebras was introduced in [3]. This presentation provides a study of pseudo MV-algebras with square roots on pseudo MV-algebras. We introduce different notions of a square root on a pseudo MV-algebra which coincide on MV-algebras, and present their main properties. We show that the class of pseudo-MV-algebras with square roots is a proper subvariety of the variety of pseudo MV-algebras. We define a strict square root to classify the class of pseudo MV-algebras with square roots. We found a relationship between strongly atomless pseudo MV-algebras and strict pseudo MV-algebras and we investigate square roots on representable symmetric pseudo MV-algebras, and we present a complete characterization of a square root and a weak square root on a representable symmetric pseudo MV-algebra using addition in a unital ℓ-group. In addition, some interesting examples are provided.

References

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[3] U. Höhle, *Commutative, residuated 1—monoids.* In: U. Höhle., E.P. Klement (eds), Non-Classical Logics and their Applications to Fuzzy Subsets: A Handbook of the Mathematical Foundations of Fuzzy Set Theory, Vol **32**, pp. 53--106. Springer, Dordrecht, 1995.