Cortés, Teresa (E-ZRGZ)

Bernstein algebras: lattice isomorphisms and isomorphisms. (English summary)

Bernstein algebras are nonassociative algebras satisfying the identity \((xx)(xx) = w(xx)(xx)\), where \(w\) is a homomorphism of the algebra into its base field. Given an idempotent \(e\) and characteristic not 2 the algebra decomposes into \(Fe \oplus Ue \oplus Ve\). This decomposition depends on the idempotent \(e\). The algebra is called type \((r, s)\), where the dimension of the whole algebra is \(r + s + 1\), \(r = \dim Ue\) and \(s = \dim Ve\). The integers \(r\) and \(s\) are invariants. The author starts with the low-dimensional algebras, proving that two Bernstein algebras of dimension less than or equal to 3 over an infinite field of characteristic different from 2 are lattice-isomorphic if and only if they are isomorphic. The proof is by a case by case study of all Bernstein algebras of dimension 3 or less. The author then jumps to the other extreme, showing that if two Bernstein algebras are lattice-isomorphic and one of them is an \((n + 1)\)-dimensional Bernstein algebra of type \((n + 1, 0)\), then they are isomorphic. She also shows that if two Bernstein algebras are lattice-isomorphic and one of them is a trivial Bernstein algebra which is \((n + 1)\)-dimensional of type \((r + 1, s)\), then they are isomorphic.

The author studies normal Bernstein algebras which are Bernstein algebras satisfying \(UeVe + VeVe = 0\) for any idempotent \(e\); she shows that if two Bernstein algebras are lattice-isomorphic and one of them is a normal Bernstein algebra \((n + 1)\)-dimensional of type \((2, n − 1)\), then they are isomorphic.

{For the entire collection see MR1189607 (93f:17002)}

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