

# DIVISION RINGS SATISFYING A GENERALIZED POLYNOMIAL IDENTITY WITH AN ANTI-AUTOMORPHISM

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ABSTRACT. Let  $D$  be a division ring with center  $F$  and  $\star$  be an  $F$ -anti-automorphism of  $D$ . In [7], the authors proved that if  $D$  satisfies a non-trivial generalized polynomial identity, then  $D$  is a finite dimensional vector space over  $F$ . In this paper, we shall extend this result for a division ring satisfying a  $\sigma^m$ -generalized rational identity, where  $m$  is a positive integer.

## REFERENCES

- [1] S. A. Amitsur, Generalized polynomial identities and pivotal monomials, *Trans. Amer. Math. Soc.* (1965), 210–226.
- [2] S. A. Amitsur, Rational identities and applications to algebra and geometry, *J. Algebra* **3**(1966), 304–359.
- [3] K. I. Beider, W. S. Martindale 3 rd. *Rings with generalized indentities*, Marcel Dekker, Inc., New York-Basel-Hong Kong, 1996.
- [4] K. Chiba, Skew fields with a non-trivial generalized power central rational identity, *Bull. Austral. Math. Soc.* **49** (1994), 85–90.
- [5] P. M. Cohn, *Free rings and their relations*, Academic Press, New York and London, 1971.
- [6] P.K. Draxl, *Skew field*, London Mathematical Society Lecture Note Series 81, Cambridge University Press 1983.
- [7] I. Kaplansky, Ring with a polynomial identity, *Bull. Amer. Math. Soc.* **54** (1948), 575–580.
- [8] W. S. Martindale 3rd, Prime rings with involution and generalized polynomial identities, *J. Algebra.* **22** (1972), 502–516.
- [9] W. S. Martindale 3 rd, On semiprime PI rings, *Proc. Amer. Math. Soc.* **40** (1973), 365–369.
- [10] L. H. Rowen, Generalized polynomial identities, *J. Algebra.* **34** (1975), 458–480.
- [11] J. D. Rosen, Generalized rational identities and rings with involution, *J. Algebra.* **88** (1984), 416–436.

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