Quasideterminants Reader

October-31-12
7:51 PM

There is a theory of determinants of matrices over non-commutative (in particular, free) rings. It was mainly developed by Gelfand and Retah. I think the first paper is this: Gelfand, I. M., Retakh, V. S. Theory of noncommutative determinants, and characteristic functions of graphs. Funktsional. Anal. i Prilozhen. 26 (1992), no. 4, 1--20, 96; translation in Funct. Anal. Appl. 26 (1992), no. 4, 231–246 (1993) . In particular, they discuss a connection between inverses of matrices ovr non-commutative rings and these "quasi-determinants".

Pasted from <http://mathoverflow.net/questions/81948/inverse-of-a-mive-ring>

Quasi-det is NOT direct analogue of the determinant in the commutative case. It is very simple thing. There are by definition not one, but n^2 quasi-determinants. Quasi-determinant with index (i,j) is by definition the (i,j) element of the inverse matrix. More precisely you should invert this element. So you may ask why such a simple thing should be called by loud name "quasi-determinant". The logic of authors (imho) - that for many matrix theorems you do not need determinant, but key thing is inverse matrix and you can reformulate in terms of its elements (i.e. quasi-dets) some theorems – Alexander Chervov Nov 26 at 18:27

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Quasideterminants

I. Gelfand, S. Gelfand, V. Retakh, R. Wilson

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The determinant is a main organizing tool in commutative linear algebra. In this review we present a theory of the quasideterminants defined for matrices over a division algebra. We believe that the notion of quasideterminants should be one of main organizing tools in noncommutative algebra giving them the same role determinants play in commutative algebra.

Pasted from <http://arxiv.org/abs/math/0208146>

Quasideterminants, I

I.Gelfand, V.Retakh

(Submitted on 28 May 1997)

Our experience shows that dealing with noncommutative objects one should not imitate the classical commutative mathematics, but follow "the way it is" starting with basics. In this paper we consider mainly two such problems: noncommutative Pl\"ucker coordinates (as a background of a noncommutative geometry) and noncommutative Bezout and Vieta theorems (as a background of noncommutative algebra). We apply these results to the theory of noncommutative symmetric functions started by Gelfand, Krob, Lascoux, Leclerc, Retakh, Thibon. We also continue our investigation of noncommutative continued fractions and almost triangular matrices. It turns out that this problem is related with a computation of quantum cohomology.

Pasted from <http://arxiv.org/abs/q-alg/9705026>