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Involutive Bases of Free Algebras

M. Janet [1] and J. F. Pommaret [2] used involutive approach in solving systems of differential equations. A. Yu. Zharkov, Yu. A. Blinkov [3] and V. P. Gerdt [4] studied involutive bases of ideals of polynomial algebras. We proved a criterion for a subset of an ideal of a free associative algebra to be the involutive basis of this ideal.

References:

[1] Janet M. Sur les Systemes d'Equations aux Dérivées Partielles. *J. Math. Pure et Appl.* **3**, 65–151.

[2] Pommaret J. F. *Systems of Partial Differential Equations and Lie Pseudogroups.* Gordon & Breach, New York.

[3] Zharkov A. Yu, Blinkov Yu. A. Involutive Approach to Investigating Polynomial Systems. In: *Math. Comp. Simul* **42** (1996), 323–332.

[4] Gerdt V. P. Gröbner Bases and Involutive Methods for Algebraic and Differential Equations. In: *Computer Algebra in Science and Engineering*, 117–137.