

1011-14-196

David L Wright* (wright@math.wustl.edu), Department of Mathematics, Washington University, Campus Box 1146, St. Louis, MO 63130-4899. *The Jacobian Conjecture as a Problem in Combinatorics*. Preliminary report.

The famous Jacobian Conjecture has been addressed as a problem not only in Affine Algebraic Geometry, but also in Commutative Algebra, Analysis, Differential Equations, Topology, and Complex Variables. Recently work from a variety of sources has linked it with Combinatorics. We discuss a recent combinatoric connection which involves the formal inverse approach advanced by Bass, Connell, and Wright in 1982 and the recent (2003) “gradient reduction” of de Bondt and van den Essen. This involves free (non-rooted) trees and the Grossman-Larson Hopf algebra. It yields a marvelously simple proof of the case $F = X + H$, H a homogeneous gradient with $(JH)^3 = 0$, giving a bound on the degree of F^{-1} which depends only on the degree of H , independent of dimension. (Received August 26, 2005)