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J. E. Pascoe*, 9500 Gilman Drive # 0112, La Jolla, CA 92093-0112. *Free functions with symmetry.*

In 1936, Margarete C. Wolf showed that the ring of symmetric free polynomials in two or more variables is isomorphic to the ring of free polynomials in infinitely many variables. In some recent work with David Cushing and Ryan Tully-Doyle, we showed that there is an isomorphism from an arbitrary ring of invariants, of which symmetric functions are a special case, to the ring of free polynomials in some number of variables which extends to the free functional calculus as a norm-preserving isomorphism of function spaces on a domain known as the row ball. Furthermore, to construct this isomorphism, we developed a rudimentary theory of bases for the ring of invariants that are compatible with free analysis on the row ball. In this talk, we will discuss several special cases of the above result in detail: 1. Even functions in two variables (that is, functions which satisfy $f(X, Y) = f(-X, -Y)$), 2. Cyclically symmetric functions in three variables (functions satisfying $f(X, Y, Z) = f(Y, Z, X)$), 3. Symmetric functions in two variables (functions satisfying $f(X, Y) = f(Y, X)$.) (Received September 15, 2014)