A New Approach to the Formal Differentiation and Polynomial Identities

M. I. Mostafa, *Giza, Egypt*,

June 2017

Abstract

In [1], I presented new classical approach to the formal differentiation and certain multivariate polynomial identities and differential operators. In this talk I will present natural generalizations to formal differentiation and to the polynomial identities and to differential operators. I will show that this generalizations are imperative to compute new multivariate polynomial identities that are intimately related with Diophantine equations involving equal sums of like powers. Moreover, we find new unexpected formulas to well-known sequences in nature including Fibonacci and Lucas sequences.

References

[1] M. I. Mostafa, *A new approach to polynomial identities,* ,*The Ramanujan Journal*, Kluwer Academic Publishers, Springer, 8, pp. 423-457, 2004.