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Wali Muhammad Shah* (wmsah@yahoo.co.in), Jammu and Kashmir Institute of Mathematical, Sciences, Amar Singh College Campus, Srinagar, Kashmir, India, India. *Frontiers of Bernstien type Inequalities for Polynomials and Rational Functions.*

Let $P(z)$ be a polynomial of degree n , then

$$\max_{|z|=1} |P'(z)| \leq n \max_{|z|=1} |P(z)|.$$

This is a well-known result due to S. Bernstein [Q. I. Rahman and G. Schmeisser, Analytic Theory of Polynomials, Oxford Science Publications, (2002), P.508]. In the proof of this inequality Bernstein applied the Gauss-Lucas theorem and the central idea is that if a polynomial $P(z)$ has all its zeros in the unit disk, then so does the derivative $P'(z)$. There are operators other than the differentiation for which this is true and Polar derivative with respect to a point outside the unit disk is one such operator. There are many others and just as interesting. In this talk besides the characterization of some operators, we shall discuss Bernstein type inequalities for rational functions and find their connections with the polynomial inequalities preserved by these operators. (Received August 30, 2014)