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Curtis Greene* (cgreene@haverford.edu), Dept of Mathematics, Haverford College, 370 Lancaster Avenue, Haverford, PA 18940. *Inequalities for symmetric polynomials*. Preliminary report.

If f and g are symmetric polynomials with real coefficients, we say that f is less than or equal to g if $f(X)$ is less than or equal to $g(X)$ for all nonnegative substitutions of the variables X . This defines a partial order on the set of all symmetric polynomials. In joint work with A. Cuttler and M. Skandera (to appear in the *Europ. Journal of Combinatorics*) we studied the restriction of this partial order classical families such as the elementary, power sum, complete homogeneous, monomial, and Schur polynomials. Many of the results obtained can be viewed as generalizations of Muirhead's Inequalities. We will report progress on some conjectures that remained unproved in that work, and, in addition, give a complete characterization of all homogeneous symmetric function inequalities of degree three. The latter is joint work with M. Skandera, J. Kroll, J. Lima, and R. Xu. (Received August 31, 2009)