Math 99r, Algebraic Combinatorics: Symmetric Functions
Problem Set 1

February 4, 2010

- Due: Thursday, February 18.
- Do any 2(two) of the following problems from the list of Stanley's Supplementary Exercises for Chapter 7 (also available at http://math.mit.edu/ rstan/ec/ch7supp.pdf): 2,4,5,6,8,15,17, 18,19,29,22 or any other from 1 to 22 rated [2+] or higher.
- Note for problem 2: the rank of a partition, rank(λ), is the length of the main diagonal of the Young diagram of λ, equivalently the largest i for which $\lambda_i \geq i$.
- Note for problem 22: The $\frac{\partial}{\partial p_i} f$ is defined as the partial derivative of f, when expressed as a polynomial in p_js and the p_js are treated as independent variables. E.g.

$$\frac{\partial}{\partial p_2}(p_{(3,2,2,1)} + p_{(3,1)}) = \frac{\partial}{\partial p_2}(p_3 p_2^2 p_1 + p_3 p_1) = 2p_3 p_2 p_1 = 2p_{(3,2,1)}$$