

Math 6980 Homework # 10, Assigned 2/9/06, Due 2/14/06

1. Write down the 10 different λ -tabloids for $\lambda = (3, 2)$.
2. For each tabloid t above, determine κ_t and then calculate e_t .
3. Find a subset of the 10 e_t above which is a basis for the space they span. (Hint: it should be five-dimensional).
4. Now in your basis, write down the matrices for the permutations $(1, 2)$ and $(1, 2, 3, 4, 5)$ in their action on $S^{(3,2)}$.
5. Repeat the above to determine in general the Specht module $S^{(n-1,1)}$. It should be $n - 1$ dimensional. Prove that the natural (n -dimensional) module for Σ_n is a direct sum of $S^{(n)}$ and $S^{(n-1,1)}$.