

HW 8 (to be tested on April 5)

1. Let $\alpha = (a_1 \dots a_s)$ and $\beta = (b_1 \dots b_s)$ be two cycles. Then prove that
 - (a) There exists a permutation σ such that $\sigma(a_i) = b_i \forall 1 \leq i \leq s$.
 - (b) If σ is any permutation such that $\sigma(a_i) = b_i \forall 1 \leq i \leq s$, then $\beta = \sigma\alpha\sigma^{-1}$.
2. Find a subgroup of S_4 that contains 6 elements. How many such subgroups are there in S_4 ?
3. Show that if $n \geq 4$ every element of S_n can be written as a product of two permutations each of which has order 2.