

HOMEWORK 4, DUE THURSDAY OCTOBER 26TH

1. Chapter 2, Section 4: 13, 14, 24.
2. For Chapter 3, Section 1: 1, 5.
3. For Chapter 3, Section 2: 1, 2, 3 (c), (d), 8 (c), (d).
4. Find the conjugate of $\sigma = (1, 4, 7, 2)(3, 6, 5) \in S_7$ by $\tau = (1, 2, 3)(4, 7, 5)$.
What is the order of σ and τ ?
5. Find an element $\tau \in S_7$ that carries $\sigma = (1, 2, 5)(3, 6, 7, 4)$ into $\sigma' = (3, 1, 4)(2, 7, 6, 5)$, that is find $\tau \in S_7$ such that

$$\sigma' = \tau\sigma\tau^{-1}.$$

Challenge Problems (Just for fun)

6. Chapter 2, Section 4: 36-38.
7. Show that the transposition $(1, 2)$ and the n -cycle $(1, 2, 3, 4, \dots, n)$ generate S_n .
8. "Every countable group is finitely generated". True or False? If true then give a proof and if false then give a counterexample. (Finitely generated means that the group is generated by a finite subset).