Reading Questions 13

page 75: Definition 3.1

1. A cycle in S_n of length m is a $m-$ cycle.

2. The cycles (123) and (231) are disjoint cycles.

3. What is the length of $(123)(24)$.

Section 3.1 Permutations, Cycles, and Transpositions (Part 1)

Cycles and Transpositions

P 1. List all 3 cycles in S_4.

P 2. Give an example of 2 disjoint transpositions in S_6.

P 3. If σ is a transposition, what is σ^{-1}?

P 4. Prove the following statement. Let n be a positive integer. If σ and τ are disjoint cycles in S_n then $\sigma\tau = \tau\sigma$.

Properties

P 5. Write $(123)(24)(321)$ as a product of disjoint cycles.

P 6. Write $(1234)(231)$ as a product of transpositions.

P 7. A simple transposition is a transposition of the form $(i\, i+1)$. Write (1245) as a product of simple transpositions.

P 8. What is the order of $(123)(25)(46)$ in S_7?