

In the following, R is a ring with identity and the notation is that used on the second page (p. 281) of the paper.

27. Let $n \geq 4$. Determine the number of permutations in Σ_n which are the product of two disjoint transpositions.
28. Determine all subgroups of
 - (a) Σ_2
 - (b) Σ_3
29. Prove that Σ_n is not cyclic for $n \geq 3$.
30. For $n \geq 2$, prove $n = 2 \iff C_n = \Sigma_n$.
31. Prove $P_n(R)$ is a subgroup of Σ_n .
32. Show that if $(1, 2) \in P_3(R)$, then $P_3(R) = \Sigma_3$.
33. Show that $P_3(R) \in \{I_3, \Sigma_3, C_3\}$.
34. Show that $P_n(R) \in \{I_n, \Sigma_n, C_n\} \forall n \geq 2$.
35. Show that
 - (a) $P_3(R) = I_3 \Rightarrow P_n(R) = I_n \forall n \geq 2$
 - (b) $P_3(R) = C_3 \Rightarrow P_n(R) = C_n \forall n \geq 2$
 - (c) $P_3(R) = \Sigma_3 \Rightarrow P_n(R) = \Sigma_n \forall n \geq 2$