

Second Hint for Problem 326

The permutations with four one-cycles and the two-cycle $(1\ 4)$, $(2\ 5)$, or $(3\ 6)$ are in the group of automorphisms. Once you know the cycle structure of D_6 and $(1\ 4)D_6 = \{(1\ 4)\sigma \mid \sigma \in D_6\}$, you know the cycle structure of every element of the group.