

Ex. 1

- i) By considering the types of the cycle decompositions in the permutation group S_5 find directly the number D_5 of derangements of M_5 . (Hint: show that the cycle types for derangements are $(abcde)$ and $(abc)(de)$. How many are there of each type?)
- ii) By considering the types of the cycle decompositions in the permutation group S_6 find directly the number D_6 of derangements of M_6 .
- iii) Use a calculator to find the difference between $\frac{D_5}{5!}$ and $\frac{1}{e}$. and the difference between $\frac{D_6}{6!}$ and $\frac{1}{e}$.