QUIZ 7: ABSTRACT ALGEBRA

- A **permutation** of a set is a rearrangement of its elements.
- **Cycle notation** expresses permutations by denoting the elements cyclically moved by the permutation.
- The **order** of a permutation is the number of times the permutation must be applied to return to the original arrangement.

Problem 1: List all elements of S_3 in cycle notation and determine their order.

Problem 2: Let $\sigma = (123)$ and $\tau = (12)$. Compute τ^{-1} and $\tau\sigma\tau^{-1}$. Write your answer in cycle notation

Problem 3: Consider the element of S_9 below. Write the permutation below as a composition of cycles.

$$\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 4 & 3 & 2 & 7 & 6 & 5 & 9 & 1 & 8 \end{pmatrix}$$