

1. Complete the definition: Two elements x and y of a group G are called *conjugate* if ...

Solution: ... there exists a $g \in G$ such that $gxg^{-1} = y$.

2. Let G be a group of permutations of a set S . Suppose $a \in S$. Define the *stabilizer of a in G* .

Solution: The stabilizer of a in G is the set $\{g \in G : g(a) = a\}$.

3. The group S_3 is a group of permutations of the set $\{1, 2, 3\}$. Find $\text{stab}_{S_3}(1)$.

Solution: The only elements in S_3 that do not move 1 are the identity and the transposition (23) . So

$$\text{stab}_{S_3}(1) = \{e, (23)\}.$$