

MATH 440: Chapter 5 Write-Up Problems

Name:

1. Let $\sigma = (a \ b \ c) \in S_4$. Prove or disprove: For all $K \subseteq S_4$, $\sigma K = K\sigma$.
2. Let σ be the m -cycle $(1 \ 2 \ 3 \ \dots \ m)$. Show that if σ^i is also a m -cycle, then $\gcd(m, i) = 1$.
3. Let G be the group of permutations on a set X . Let $a \in X$ and define the stabilizer of a as

$$\text{stab}(a) = \{g \in G \mid g(a) = a\}.$$

Prove or disprove: $\text{stab}(a)$ is a subgroup of G .