Problem 1. (5 points) Consider the permutation $\sigma = (13654)(1524637) \in S_7$.

(a) Write $\sigma$ as a product of disjoint cycles.
(b) Find $|\sigma|$.
(c) Is $\sigma \in A_7$? Explain why or why not.

Problem 2. (5 points) Let $G$ be a group of permutations on a set $X$ and let $a \in X$. Prove that $\text{stab}_G(a) = \{\alpha \in G \mid \alpha(a) = a\}$ is a subgroup of $G$. 