

Quiz #3

Problems:

1. (20 pt) Let G be a group acting on a set X .
 - (a) If $|G| = 11$ and $|X| = 12$ prove that the action has at least one fixed point.
 - (b) If $|G| = 11$ and $|X| = 10$ prove that $G(x) = x$ for all $x \in X$.
2. (30 pt)
 - (a) Prove that $\{(124), (142), (1)\}$ is a subgroup of S_4 .
 - (b) Prove that $\{(124), (142), (1)\}$ is not a normal subgroup of S_4 .
 - (c) Describe all elements of order 4 in S_4 .