

Name: _____

Reading Questions

1. Make sure you know the definitions of a group action, a G -set, conjugation, orbit, fixed point set, and stabilizer/isotropy subgroup.
2. The group $G = D_4$ acts on the set $X = \{1, 2, 3, 4\}$ of vertices of the square. For uniformity of notation, let $G = D_4 = \{\text{id}, r, r^2, r^3, s, sr, sr^2, sr^3\}$, where r is be a 90° counter-clockwise rotation and s is the reflection fixing vertices 1 and 3.
 - (a) For each $g \in G$, find the fixed point set X_g of g in X .

(b) For each $x \in X$, find the stabilizer/isotropy subgroup G_x of x in G .

(c) For each $x \in X$, find the orbit $\mathcal{O}_x$ of x under G .

(d) For each $x \in X$, verify that the “orbit-stabilizer theorem” (Theorem 14.11) holds.

3. What struck you in this reading? What is still unclear? What remaining questions do you have?