Let $D_4$ be the symmetry group of the square, and let $r$ and $s$ be the rotation and reflection that you studied last time. The group has eight elements:

1. See where the various elements of $D_4$ send $(1, 2)$. This gives you a subset of $X$ with eight elements, called the orbit of $(1, 2)$.
2. The orbit of $(1, 3)$ only has four elements. What are they?
3. The stabilizer of $(1, 3)$ is a subgroup of $D_4$. What are its elements? Hint: There are two.
4. Same with the orbit and stabilizer of $(1, 1)$.
5. Are there any other orbits, or have you found them all?