Instructions. Write all answers clearly on one piece of paper, and put all group members' names on the top of the paper. If you talk, you must do so **very quietly**!

1. (True/False) Let $n \in \mathbb{Z}$, let G be a group, and let $a \in G$. If $|G|$ divides n, then $a^n = e$.

2. Suppose that $p \geq 3$ is a prime number. How many different groups are there of order $2p$ up to isomorphism?

3. How many permutations in S_4 stabilize 1? This is the same as asking for the size of the set $\{\phi \in S_4 \,|\, \phi(1) = 1\}$.

4. The orbit of an element s in a group G is defined as $\text{orb}_G(s) = \{\phi(s) \,|\, \phi \in G\}$. What is $\text{orb}_G(4)$ when $G = \langle (135)(246) \rangle$?