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. Complete the theorem. Let G be a cyclic group and let $Z(G)$ be the center of G. If $G/Z(G)$ is cyclic, then G _____.

2. Based on where the group operation is taking place, explain the difference between an internal direct product and an external direct product of two groups.

3. (True/False) G is an Abelian group of order 100, and so G has an elements of order 2 and 5, since 2 and 5 are prime and divide $|G|$.

4. Suppose that $G = H_1 \times H_2 \times \cdots \times H_n$; that is, G is the internal direct product of $H_1, H_2, \ldots, H_n$. How is $|G|$ related to $|H_1|, |H_2|, \ldots, |H_n|$?

5. (True/False) A_4 has no subgroup of order 6.