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. In a finite group, what is the criterion for when $a^i = a^j$, where the element $a \in G$ has order n?
- 2. (True/False) If you know the order of an element $a \in G$, then you know the order of the subgroup $\langle a \rangle$ generated by a.
- 3. For how many distinct elements $a \in \mathbb{Z}_{10}$ (integers mod 10 under addition) does a generate \mathbb{Z}_{10} ?
- 4. Generally speaking, what does the Fundamental Theorem of Cyclic Groups say about the subgroups of $\langle a \rangle$, when the order of a is a positive integer?