

MATH 30A: QUIZZES

3. QUIZ 3A

Open book and notes. You may also use a calculator and/or laptop computer. But no internet or IM with friends. No cellphone use.

Here is the question: Take the group $G = S_3 \oplus \mathbb{Z}_4$ where S_3 is the symmetric group on 3 letters.

- (1) What are the possible orders of the elements of G ? Find an element of each order if you can.
- (2) Let H be the cyclic subgroup generated by the element $((12), 1)$ (The first coordinate is the transposition $(12) \in S_3$ and the second is the generator $1 \in \mathbb{Z}_4$.) What is the index of H in G ? Find the left cosets of H .
- (3) Show that $((13), 3)$ and $((123), 1)$ do not lie in the same left coset of H in G .