Quiz 4, Abstract Algebra

Dr. Graham-Squire, Spring 2016

Name: _____

1. (3 points) Suppose G is a group such $|G| = 200$, and K is a subgroup of G with $|K| = 20$. Suppose K is also a proper subgroup of H, and H is a proper subgroup of G. What is/are the possible order(s) of H? Explain your reasoning.

2. (4 points) Let H be a subgroup of G. Using your knowledge of cosets, explain in words what the following equation means and why it is true. You do not have to give a full proof, just an explanation will suffice:

   For any $a, b \in G$, $|aH| = |bH|$.

3. (3 points) What is/are the possible order(s) of the nonidentity elements of $\mathbb{Z}_9 \oplus \mathbb{Z}_9 \oplus \mathbb{Z}_9$? Explain your reasoning.