

Quiz 1, Abstract Algebra

Dr. Graham-Squire, Spring 2016

Name: _____

1. Consider the following 3 sets. For each set, determine if it is a group or not. If the set is a group, prove that it satisfies the conditions to be a group. If the set is *not* a group, explain what part of the definition of *group* that it fails.
 - (a) The odd integers, under addition
 - (b) \mathbb{Z}_{10} , under addition mod 10
 - (c) The irrational numbers, under multiplication

2. Let G be an Abelian group (that means that $ab = ba$ for all $a, b \in G$). Let H be the subset of G given by

$$H = \{g^2 \mid g \in G\}$$

In other words, H is the subset of “squares” of elements of G . Use either the one-step or the two-step subgroup test to prove that H is a subgroup of G .