

PHILADELPHIA UNIVERSITY
DEPARTMENT OF BASIC SCIENCES

Exam 2

Abstract Algebra 1

11-12-2012

1. Is the group U_{18} cyclic or not cyclic? If cyclic, find all the generators.
2. The group \mathbb{Z}_{18} is cyclic. Draw the subgroup lattice.
3. Draw the Cayley table for the factor group $U_{20}/\langle 9 \rangle$.
4. Let G be a cyclic group. Prove that every subgroup of G is cyclic.
5. Prove that the subgroup $SL(n, \mathbb{Q})$ is normal in $GL(n, \mathbb{Q})$.
6. Let G be an infinite cyclic group. Prove that G is isomorphic to \mathbb{Z} .
7. Prove that the group U_5 is not isomorphic to U_8 .

-Amin Witno