2016 Spring Math 430 Assignment 4. Due: Feb 22, 2016

Student No.

Name:

All problems, unless otherwise specified, are from A First Course in Abstract Algebra 7ed by Fraleigh. You do NOT need to hand in solutions to the problems in parentheses, but you need to hand in solution to the extra problems if there is any.

Extra problems.

1. **Definition.** Let G be a group. A minimal generating set of G is a generating set S of G such that if S' is another generating set of G, then $|S| \leq |S'|$.

Is it possible that H is a proper subgroup of a finite group G, but a minimal generating set of H contains more elements than a minimal generating set of G? If yes, give an explicit example; if not, give a proof.

§10 (5), (6), (7), (9), (10), 16, (19), 30, 31, 32, 35, 39, 44a, (45), (46)

Note: For 10.35, the wording is slight ambiguous. The correct wording should be as follows:

Show that the the collection of left cosets of a subgroup H of G and the collection of right cosets of H are of the same cardinality.

Also for 10.35, here is a hint: check your result of 10.32.

§11 (24), (32), (34), 50, 51, (52), 53