

EXAM 1  
Some Practice Questions  
Math 3230, Fall 2009  
Not to be turned in.

**Check your understanding**

In addition to the homework and quiz questions, these questions, which should be able to be done very quickly, check whether you understand some very fundamental principles about groups. These are NOT necessarily representative of all the types of questions that might be on the exam.

1. Let  $G$  be a finite group, and  $x \in G$ . Show that  $o(x) \leq |G|$ .
2. Exercise 3.5, 3.9, 3.12
3. Exercise 4.6, 4.7, 4.8, 4.9, 4.16, 4.17, 4.21, 4.22 and 4.23
4. Give a non-cyclic subgroup of  $GL(2, \mathbb{R})$ .
5. All parts of Exercise 5.1.  
(for part (g), using the notation from class,  $H = \{1, i, j\}$ .)
6. Exercise 5.4, 5.10 and 5.22
7. Exercise 6.3, 6.6
8. Exercise 7.6, 7.7 and 7.8