REVIEW FOR TEST 2 145 01

1. Logistics

The test in Friday, Nov. 17 during the normal class time. The location is Jackson 006 via the following email:

"Your Math 145 recitation 01-RA will be relocated on 11/17 to Jackson 006"

The test will cover Chapter 8 (Cayley's theorem) through chapter 16 homomorphisms. Monday I will finish homomorphisms and Wednesday will be review.

2. Definitions

General linear group ($GL(n,\mathbb{R}), GL(n,\mathbb{C})$, $O(n)$, $SO(n)$, the direct product of groups. Group generated by a set, partition, equivalence relation, equivalence class, conjugate elements, conjugacy classes, Quaternion group, normal subgroup, quotient group, left cosets, right cosets, index of a subgroup, commutator subgroup, simple group, center of a subgroup, homomorphism, kernel, First isomorphism theorem

3. Theorems and facts you should know and feel comfortable with

- Every group of order n is isomorphic to a subgroup of S_n (and roughly how does this work?)
- When is $Z_m \times Z_n$ cyclic?
- How can you tell if a group is a direct product? (10.2)
- If H is a subgroup of a finite group G, the order of H divides the order of G. (what about the order of elements of G)?
- Consequences of LaGrange's theorem
- Cauchy's theorem: If p is a prime divisor of the order of a finite group G, then G contains an element of order p.
- Computing conjugacy classes.
- How can you tell when a subgroup is normal? (15.2, 15.4)
- First, second and third isomorphism theorems. (Particularly the first!)