

**Math 128a, problem set 06**  
**Outline due: Wed Mar 11**  
**Due: Mon Mar 16**  
**Last revision due: Wed Apr 22**

**Problems to be done, but not turned in:** (Ch. 6) 7, 15, 17, 21, 25, 31, 33; (Ch. 7) 1, 3, 5, 9, 15.

**Fun:** (Ch. 6) 37, 42.

**Problems to be turned in:**

1. (Ch. 6) 18.
2. (Ch. 6) 22.
3. (a) Find two nonabelian groups of order 12 that are not isomorphic, and prove that they are not isomorphic.  
(b) Find three groups  $G, H, K$  of order 12 such that  $G \not\cong H, H \not\cong K$ , and  $G \not\cong K$ . Prove your result.
4. Consider the group  $D_6$ , using our standard notation.
  - (a) Let  $K = \{e, F_1\} = \langle F_1 \rangle$ . List all of the left cosets of  $K$  and all of the right cosets of  $K$ .
  - (b) Let  $L = \{e, R_{120}, R_{240}\} = \langle R_{120} \rangle$ . List all of the left cosets of  $L$  and all of the right cosets of  $L$ . Do you see any significant qualitative differences between this example and the previous one? Explain.
5. (Ch. 7) 6.
6. (Ch. 7) 14.
7. (Ch. 7) 24.