

**Math 128A, problem set 02**  
**Outline due: Wed Sep 08**  
**Due: Mon Sep 13**  
**Last revision due: Mon Oct 18**

**Problems to be done, but not turned in:** (Ch. 2) 7, 15, 17, 19, 23, 27, 31, 35, 39;  
(Ch. 3) 1, 5, 7, 9, 13, 17.

**Fun:** (Ch. 2) 33, 38.

**Problems to be turned in:**

1. (Ch. 2) 14.
2. (Ch. 2) 16.
3. Construct a Cayley table for  $U(20)$ .
4. (Ch. 2) 34(b,c).
5. Let

$$G = \left\{ \begin{bmatrix} a & b \\ -b & a \end{bmatrix} \mid a^2 + b^2 \neq 0 \right\}.$$

It can be shown that  $G$  is a group under matrix multiplication (i.e., you do not have to prove this).

Is  $G$  an abelian group? Prove or disprove.

6. (Ch. 3) 6.
7. Suppose  $H$  is a subgroup of  $Z$  under addition, and  $H$  contains 9 and 15. What are the possibilities for  $H$ ?