Math 128b, problem set 01
Due: Fri Feb 03

Problems to be done, but not turned in: (Ch. 14) 5, 9, 13, 17, 23, 25, 27, 33, 35, 39, 47, 49.

Fun: (Ch. 14) 56.

Problems to be turned in:

1. (Ch. 14) 4.
2. (Ch. 14) 10.
3. (Ch. 14) 12.
4. (Ch. 14) 18.
5. Let R_1 and R_2 be rings with unity, and let I be an ideal of $R_1 \oplus R_2$.
   (a) Prove that if $(x, y) \in I$, then $(x, 0) \in I$ and $(0, y) \in I$.
   (b) Prove that there exist ideals I_1 of R_1 and I_2 of R_2 such that
   $$I = \{(x, y) \mid x \in I_1, y \in I_2\},$$
   i.e., such that $I = I_1 \oplus I_2$ in the most natural way. (We say that ideals must "split" over direct sums of rings.)
6. (Ch. 14) 30.
7. (Ch. 14) 52.