Final, Math 113, Winter 06

Due 02/08/06 (?)

1. Let X be the vector space of finitely nonzero sequences. Show that X is a dense subspace of c_0 and of l_p when $1 \leq p < \infty$, but not of l_∞.
2. A normed space X is finite-dimensional if and only if it has the Heine-Borel property, which happens if and only if $ballX = \{x \in X \ : \ \|x\| \leq 1\}$ is compact. Recall the Heine-Borel property: All closed bounded subsets of the space are compact.
3. Probem 4 on page 77.
4. Problem 4 on page 81.
5. Problem 5 on page 93.
   The last homework becomes part of the final:
6. Problem 13 on page 67.
7. Problem 7 on page 69.
8. Problems 12 and 16 on page 73.