Math 220, Section 201
Review for Midterm on February 15, 2002

The midterm will be in the normal lecture room and time. No notes, books, calculators, or other aids are allowed. You must bring your student ID to the midterm. There will be no make-up midterm; only documented medical emergencies are allowable excuses for missing the midterm.

SECTIONS COVERED ON THE MIDTERM:

§1 Logical connectives
§2 Quantifiers
§3 Techniques of Proof: I
§4 Techniques of Proof: II
§5 Basic Set Operations
§10 Natural Numbers and Induction
§11 Ordered Fields (only pages 100–101)
§12 The Completeness Axiom
§13 Topology of the Reals
§14 Compact Sets

Remember that you are not responsible for topics mentioned neither in lectures nor on the homework. You also do not have to memorize theorem numbers, as long as you clearly state whatever facts you invoke in your solutions.

For Sections 1–12, I suggest that you make sure you can solve the warm-up questions on Homeworks 1–4; check your homework answers against the solutions and understand whatever mistakes you might have made; and try to work the practice problems in the sections before looking at the solutions. The same strategy is a good one for Sections 13–14; I suggest the following problems as a surrogate homework set (do not hand in answers to these problems):

- Suppose that U_1, U_2, U_3, ... are open sets. Prove that $\bigcup_{n=1}^{\infty} U_n$ is also open.
- Lay, p. 120, #13.1
- Lay, p. 121, #13.3 and #13.4
- Lay, p. 121, #13.7, #13.9, and #13.13
- Suppose that a subset S of $\mathbb{R}$ is compact. Prove that S is bounded.
- Suppose that a subset S of $\mathbb{R}$ is compact. Prove that S is closed.
- Lay, p. 127, #14.1 and #14.2
- Lay, p. 127, #14.3
- Lay, p. 127, #14.4 and #14.5
- Lay, p. 127, #14.6