Homework #5, due Tuesday, May 28, 2002

- Ch.4, sec.3: 2; 4 (Hint. Review first from topology the notions of connected and arcwise connected space. For (a) try paths that are line segments. Compare (b) with problem 5.); 7 (Hint. You may want to characterize first the open and convex subsets of \( \mathbb{R} \)).

- Ch.5, sec.1: 1*; 7; 8 (Hint. Interpret \( \|h_n\| \to \|h\| \) as \( \langle h_n, h_n \to \langle h, h \rangle \); 10*.

- Ch.7, sec.1: 2, 3*, 5.

Note. The problems marked with an asterisk are not required.

Student presentations: each of you should chose one topic from the following list and present it on May 28, during our regular class.

- The invertibles in a unital Banach algebra form an open set (Theorem 2.2, p.192).
- Beurling formula for the spectral radius (Theorem 3.8, p.197).
- Define the approximate point spectrum (Definition 6.3) and prove Proposition 6.4, p.208, which characterizes the complement of the approximate point spectrum.