Math 8801, Fall 2000 **Assignments** are due at the start of class on the Due date

Further Problem 1: Due Sept 20

Find a simple necessary and sufficient condition, on sets in a VS, that $A + A = 2A$, and deduce that a convex set C satisfies $C + C = 2C$. *Must* a set A such that $A + A = 2A$ be convex? What if we add the condition that the intersection $A \cap L$ of any line $L = L(p, q)$ in X be closed in $\mathbb{R}$? Note: by "a line L in X" we mean a set L, determined by distinct vectors p and q, and given by $L(p, q) := \{(1-t)p + tq : t \in \mathbb{R}\}$. Then $A \cap L(p, q)$ determines the set in $\mathbb{R}$ given by $\{t \in \mathbb{R} : (1-t)p + tq \in A\}$, and this is the set that we will always require to be closed in the added condition.

Assignment 1, Book Problems: Due Sept. 25

Chapter 1, # 1((e) thru (i)), 2, 4, 5, and 12.

Assignment 2, Book Problems: Due Oct. 2

Chapter 1, # 7, 8, 10.

Further Problem 2: Due Oct. 6

Chapter 1, # 13.

Assignment 3, Book Problems: Due Oct. 9

Chapter 1, # 9, 11, 19.

Assignment 4, Book Problems: Due Oct. 16

Chapter 1, # 14, 15, 20.

Assignment 5, Book Problems: Due Oct. 23

Chapter 1, # 21, 22; Chapter 2, # 1, 4.

Assignment 6, Book Problems: Due Oct. 30

Chapter 1, # 3; Chapter 2, # 5, 8; Chapter 3, # 4.

Assignment 7, Book Problems: Due Nov. 6

Chapter 2, # 13, 15, 16; Chapter 3, # 15.

Further Problem 3: Due Nov. 17

Chapter 3, # 23–25.

Assignment 8, Book Problems: Due Nov. 13

Chapter 3, # 1, 5abc, 20 (use ℓ^2).

Assignment 9, Book Problems: Due Nov. 20

Chapter 3, # 2, 5de, 6, 8, 10a.

Assignment 10, Book Problems: Due Dec. 4

Chapter 3, # 7, 9, 10c, 11, 12.

Further Problem 4: Due Dec. ?

Determine whether or not $L^1(\mathbb{R})$ and $C([0, 1])$ are the dual spaces of any normed spaces. Their usual topologies must agree with their norm topologies given by the norms that arise as linear functionals. If not, prove that.