Math 5616H, Spring 2004 **Assignments** are due at the start of class on the given day

Note: Special Problems are like Term Papers. They must be well and neatly written, or typed, on standard size paper. Paper torn from spiral notebooks will not be accepted! Margins of one inch at least on all four edges and legibility are required. Special Problems will to some extent be scored competitively. The use of lined paper and writing on both sides of a page are quite acceptable.

Assignment 12, Book Problems: Due May 3

Chapter 8, # 5, 14(*apply* (8.14)), 22 (first part); Chapter 9, # 6.

Special Problem 5: Due April 28

Chapter 7, # 13.

Assignment 11, Book Problems: Due April 26

Chapter 7, # 12, 18; Chapter 8, # 1, 2.

Special Problem 4: Due April 21

Chapter 7, # 25def.

Assignment 10, Book Problems: Due April 19

Chapter 7, # 10, 11, 13a (counts as two problems), and, in addition:
Prove that *if* $0 < x < 1$ *and* $x^2 + y^2 < 1$ *and* $A > 1$ *and*

$$(*) \qquad |y| \le \sqrt{1 - A^{-2}}\,\sqrt{x}\,(1-x)$$

$$(**) \qquad \textit{then, with } z = x + iy, \qquad |1 - z| \le A(1 - |z|).$$

Sketch the set of those z when $A = 2/\sqrt{3}$.

Special Problem 3: Due April 14

Chapter 7, # 25bc.

Special Problem 2: Due April 5

Chapter 7, # 25a, including the verification of the steps in the hint that precede (a). This is the first of several Special Problems based on Chapter 7, # 25. Suggestion: use $\varphi(x, y) := xy$ as an example, to give you ideas.

Assignment 9, Book Problems: Due March 31

Chapter 7, # 15, 16, 23(counts as two problems).

Assignment 8, Book Problems: Due March 26

Chapter 7, # 4, 5, 6, 8, 24(the rest of the problem; the "it follows" is a *definition* for you to learn).

Assignment 7, Book Problems: Due March 10

Chapter 6, # 19; Chapter 7, # 1, 3, 24(the first "Prove that").

Assignment 6, Book Problems: Due March 1

Chapter 6, # 12, 15, 16a, 16b.

Assignment 5, Book Problems: Due February 23

Chapter 6, # 10b, 10c (with $\alpha(x) = x$), Problem 1, Problem 3 in the note *Riemann sums compared. More criteria for Riemann integrability, v4*.

Assignment 4, Book Problems: Due February 16

Chapter 6, # 5, 6, 8, 10a, 11(with $\alpha(x) = x$).

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Special Problem 1: Due February 18

Suppose that $f(x)$ is bounded on $[a, b]$, where $-\infty < a < b < +\infty$ and suppose that for every $\epsilon > 0$ there exists a partition π of $[a, b]$ such that

$$\sum_{i=1}^{n_\pi} \omega_i \Delta x_i < \epsilon \text{ (here, } \omega_i \text{ is the oscillation of } f \text{ on } I_i := [x_{i-1}, x_i] \text{ and } \Delta x_i = x_i - x_{i-1}).$$

Prove that f is Riemann integrable over $[a, b]$. Get busy on this one soon!

Assignment 3, Book Problems: Due February 9

Chapter 5, # 15, 22a, 22b, Chapter 6, # 7.

Assignment 2, Book Problems: Due February 2

Chapter 5, # 9, 10, 12, Chapter 6, # 2.

Assignment 1, Book Problems: Due January 26

Chapter 5, # 1, 2, 5, 7.