

## Math s21 - Day Thirteen (Monday, May 14, 2007)

9:00-10:20

- A. Discuss Exam 3.
- B. In groups of three, begin reading Section 5.5, stopping at “Sequences with Special Properties” near the top of page 121. Complete Exercises 5.5.2, 5.5.4, 5.5.6, and 5.5.7. Describe the problematic notation on page 120. If you finish early, start working through the hint for (and the proof of) Theorem 5.5.9.

10:20-10:35 Break

10:35-11:30

- C. Groups present solutions to exercises at the board.
- D. Groups read pages 121-122, completing Exercises 5.5.11, 5.5.13, 5.5.14, and 5.5.16.

11:30-11:55 Maple

11:55-1:00 Lunch

1:00-3:00

- E. L<sup>A</sup>T<sub>E</sub>X assignment is due at 1:00p.m.
- F. Groups present exercises at the board.
- G. New groups read through the end of Section 5.5. (Can you find the typo on page 123?)
  - i.) Complete Exercises 5.5.19 and 5.5.20. In Exercise 5.5.19 part 6, also find  $s_{k+1}$ .
  - ii.) Read *carefully* through Theorem 5.5.23 and its proof. Respond to the author’s suggestion just before the proof starts: “... try to spot the part of the proof that takes care of this requirement.”
  - iii.) Read the rest of pages 126-127 and prove Theorem 5.5.24.
  - iv.) If you finish, prove the remaining theorems (5.5.25 and 5.5.28) in the section.
- H. Groups present results at the board.

### NEW KEY IDEAS TODAY

sequence  
recursively defined sequence  
iterated map  
sequence of distinct terms; constant sequence  
increasing sequence; decreasing sequence; monotonic sequence  
upper bound; lower bound  
bounded from above; bounded from below; bounded  
subsequence

### SECTIONS TO DISCUSS TUESDAY

5.6, 7.1, 7.2

## HOMEWORK

1. For each sequence  $s$ , determine whether  $s$  is bounded, bounded above, or bounded below:
  - (a)  $s_n = (-1.1)^n$ ;
  - (b)  $s_n = \frac{\cos n}{n}$ ;
  - (c)  $s_n = \log n$ .
2. Let  $s_n = \frac{(-1)^n + 1}{n}$ . Describe the subsequences  $s_{2n}$  and  $s_{2n-1}$ .
3. Try the examples in Problem 23, page 133. (Read the end before you get started, where it says that this problem is meant to be suggestive, not conclusive.) What sorts of results do you get?
4. Prove that in a totally ordered set, if the sequence  $s$  is bounded, then every subsequence of  $s$  is also bounded.