MATHEMATICS 300 — SPRING 1997

Introduction to Mathematical Reasoning

Instructor: H. J. Sussmann

HANDOUT NO. 5. February 11, 1997

The **FIRST MIDTERM EXAM** will be on **Thursday, February 27.**

READING ASSIGNMENTS SO FAR

- For the week of January 28 and 30, you have to read *all of Chapter 1.* Plus, of course, the first handout.
- For the week of February 4 and 6, you have to read *Sections 1, 2 and 3 of Chapter 2.*
- For the week of February 11 and 13, you have to read *Sections 2.4, 3.1 and 3.2.*
- For the week of February 18 and 20, you have to read *Sections 3.3 and 3.4.*

HOMEWORK ASSIGNMENTS SO FAR

(1) *Originally due on Tuesday, January 28. The deadline was subsequently extended to February 4.* Page 14, Problem 4; Page 15, Problem 7; Page 26, Problem 10; Page 27, Problem 11; Page 37, Problems 2 and 8.

(2) *Due Tuesday, February 4.* Page 14, Problem 5; Page 47, Problems 1 (parts (a), (j), (q)), 2, and 3; Page 48, Problems 5 (parts (a), (c)) and 7; Page 49, Problems 11 and 12.

(3) *Due Tuesday, February 11.* Page 56, Problem 1, parts (a), (b), (f), (g), (h), (j), (l). Problem 4, parts (a), (b), (c), (e), (h), (i), (j). Page 60-61, Problem 2. Page 61, Problems 3,4. And, in addition, the following:

(A) Let S be the set of all words consisting of exactly three vowels and three consonants, with repetition allowed for the vowels but not for the consonants. (For example: *arabap*, *benito*, *yaaexz* and *xaeiyz* belong to S, but *bavenii*, *baeiou*, *babeic* and *gugugu* do not. Recall that in the English alphabet there are 5 vowels and 21 consonants.)

(i) Determine how many members S has.

(ii) Determine what percentage of the words in S contain the letter "a". Is it higher or lower than 50%?

(4) *Due Tuesday, February 18.* Page 70, problems 4, 6, 8, 9. Page 72, problem 14. Page 73, problem 16. Page 76, problems 6 and 9.

(*) **Optional homework assignment**, *due Tuesday, February 25.* Write a short essay (about one page) discussing the February 7 New York Times article of Handout No. 4. In particular, try to address the following two issues: (a) would the authors of the S.A.T. question have made the mistake they made if they had followed the rules on writing mathematics given in Handout No. 1 of our course? (b) can you find *another mistake* in the question, different from the one found by Mr. Rizzio, which gives a different reason for (D) to be the right answer, even if it had been stipulated that $a > 0$?