Math 101!
October 9, 2001

Announcements:

Because Monday was a holiday, there will be alternate office hours this week on Wednesday from 2:30 until 4:00, or as usual, just make an appointment for any other time that works for you. Come by and let me know how it is going. My e-mail address again is goroff@math.harvard.edu and my office is in Science Center 427.

Reading:

Start reading Chapter Three of the Notes (N3) as posted on the website.
Study Section §W5.3 in Wolf about arbitrary unions, intersections, and the Cantor set.
Read Section §W8.1 in Wolf, especially concerning the axioms for fields.
If interested, read more about infinity in George Gamow, Rudy Rucker, Ian Stewart, etc.

Problem Set:

A. In the special case where A is a finite set, formulate and prove a result that justifies the notation 2^A for the power set of A.
B. In Wolf, §W5.3: #11 and #13 about unions and intersections of sets.
C. Show that the Well Ordering Principle follows from the Principle of Induction. What does it make sense to say about the converse given the role we have assigned to the Principle of Induction?
D. In the Notes, §N2.5: #1, #2, #3, and #4.

Activities: (Talk about these questions in section or on the website's discussion section.)

A. Check out the Hilbert Hotel in Wolf, §7.5: #24.
B. Play with the program Tarski's World on the CD you can borrow. Show your results dealing with some of the sentences and worlds provided in the exercise folder to make sure you understand the meaning and use of quantifiers. We will be making more and more use of such ideas. Briefly, for sentence files, try to make worlds that do and do not satisfy them. For world files, try to make sentences that are or are not satisfied. There is more information about Tarski's World at <www-csli.stanford.edu/hp/Tarski1.html>.
C. The Cantor Middle Thirds set is an example of a fractal, so named because it has a fractional dimension. What do you think this might mean? What dimension would you say it has? What if you tried to construct a Middle Fifths set?
D. There are no errors on this page except this one.