Announcements.

Talk Tuesday 5/23, 3:30, "How to Become a Liberated Mathematician in 13 Painful Years," by Professor Piper Harron (U Hawaii), Savery 260. My email to the class on 5/15 had an announcement of this talk, but with a different room.)

Thursday study session (9:30-11:30) this week only (5/25) in a different room: the "Red C" seminar room in Allen Library.

This homework assignment will be the last one collected and graded. There will be homework for the last week of classes, but practice problems only.

Friday (5/26) I will be out of town. There will be a substitute lecturer. Homework can still be turned in either in class or to my mailbox in the Math Department.

HOMEWORK 9, due Friday, May 26.

Reading: Finish Chapter 6. Suggestions below about what you might skip and should be sure not to skip. If you find you need to see more simple concrete examples, read some of the skippable material.

§6.4: OK to skip Preview Activities pp. 323-324 and skip "Decomposing Functions" p. 327.

§6.5: OK to start by reading the top half of p. 338 then skip to Theorem 6.25 at the bottom of p. 339. From there on, read everything carefully!

§6.6: Most important parts are p. 351 and the theorems and proofs on pp. 355-357. If you want just one concrete example to think about, try Example 6.33, pp. 354-355.

Practice Problems

§6.4, p. 332: 7abf.

§6.6, pp. 358-359: 5, 9. All of the problems 5 through 14 will be good practice problems for the final exam.

Brainteaser that previews Chapter 9. We'll discuss this on Wednesday (5/24).

The HOTEL INFINITY has an infinite number of rooms, and they are all full when you show up at the desk. "Don't worry," says the clerk, "I can move the guests around so that everyone already here still has a room, and there will be one for you, too." How can the clerk do this?

The mathematical version of this is a question about an injective function. Suppose the rooms are identified by their room numbers, which are natural numbers, a different number for every room, and a room for every natural number. The set of room numbers, that is, the set $\mathbb{N}$, is the codomain for the function. The domain is $\mathbb{N} \cup \{0\}$: identify the guest currently in room n as the element n in the domain, and you, the new guest, are element 0 in the domain. The clerk's job is figure out an injective function $f : \mathbb{N} \cup \{0\} \to \mathbb{N}$, so that guest n can stay in the room with number $f(n)$. He needs the function to be injective, because two guests don't want to share a single room.

If you figure this brainteaser out, think about what the clerk's plan should be if the hotel is full and an infinite number of new guests show up!

Hand-In Problems

§6.4, pp. 332-333: 6, 7cdeg*h, 10b.
**Corrected !* CORRECTION to 7g: It should say, "The function g is not a surjection, the function $g \circ f$ is a surjection."

§6.5, p. 346: 9.

§6.6, pp. 358-359: 7, 8, 10