Notes about Exam 1, Math 547, Spring 2005

1. Exam 1 is Friday January 28.

2. There is a Problem Session in room 316 on Thursday January 27 starting at 5:15 PM.

3. The exam covers rings, ring homomorphisms, kernels, ideals, factor rings, and the First Isomorphism Theorem. (Most of this material may be found in sections 5.1–5.3.)

4. Know everything we did in class and all of the Homework assigned on Jan. 10, Jan. 12, and Jan. 19. Be able to see how properties of the ideal I translate into properties of the ring $\frac{R}{I}$.
   (a) Example 1. The ideal I in the ring R is called *prime* if whenever a and b are in R with $ab \in I$, then $a \in I$ or $b \in I$. Fill in the blank and prove the result: The ideal I in the ring R is a prime ideal if and only if $\frac{R}{I}$ is a _____ .
   (b) Example 2. The ideal I in the ring R is called *radical* if whenever r is in R with $r^n \in I$ for some positive integer n , then $r \in I$. Fill in the blank and prove the result: The ideal I in the ring R is a radical ideal if and only if $\frac{R}{I}$ satisfies _____ .