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 $R/I$.

   (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 $R/I$ 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 $R/I$ satisfies ____________.