Exam #3, Math 315, Dr. Bohner. May 8, 2001.

1. Define the outer measure of a set $A \subset \mathbb{R}^N$.
2. The outer measure is monotone and subadditive. What does that mean?
3. When is a subset of $\mathbb{R}^N$ called Lebesgue measurable?
4. Give five examples of classes of sets that are Lebesgue measurable.
5. If a set A is Lebesgue measurable, how can A^C be written?
6. Define in detail what a σ-algebra is.
7. Define in detail what a measure space is.
8. When is a measure space complete?
9. Give two examples of a measure space.
10. When is a function called measurable?
11. How did we define f^+ and f^-? What are their relations to $|f|$?
12. When are two functions f and g said to be equal almost everywhere?
13. When is a function called summable?
14. Define the sets $A_\infty(f)$, $A_0(f)$, $A_{nk}(f)$ and the sums $s_n(f)$.
15. State the three main results on the sums s_n.
16. How is the integral of a summable function over X defined? How about over A?
17. What are the three consequences of #15 for integrals?
18. State the converse of the Radon-Nikodym theorem.
19. State the theorem of Beppo Levi (Monotone Convergence).
20. State Fatou's lemma.