**Math 544 Exam 3 Summer 2000**

Use the paper provided. Put your name on the front of the first page and the back of the last page. Problem 7 is worth 8 points each. The other problems are worth 7 points each.

1. Define “limit point”.

2. State the Nested Intervals Property.

3. Prove that every bounded monotone decreasing sequence of real numbers converges.

4. Prove that every bounded infinite set of real numbers has a limit point.

5. Give an example of a bounded non-empty set of real numbers with exactly 3 limit points.

6. Give an example of a bounded non-empty set of real numbers, $E$, such that $\sup E$ is not a limit point of $E$.

7. Let $\{a_n\}$ and $\{b_n\}$ be sequences of real numbers. Suppose that the sequence $\{a_n\}$ diverges to $\infty$, and that the sequence $\{b_n\}$ converges to $\frac{1}{10^6}$. What is the limit of the sequence $\{a_n b_n\}$? Prove your answer.