Problem Set 3 Real Analysis 1 Due 9/30/2002

For each proposition, either prove or give a counterexample. Each problem is worth 3 points. Adequate demonstration is required for full credit.

1. Proposition: If the sequence $\{a_n\}$ converges to 0, then the sequence $\{|a_n|\}$ converges to 0.

2. Proposition: If the sequence $\{|a_n|\}$ converges to 0, then the sequence $\{a_n\}$ converges to 0.

3. Proposition: If the sequence $\{a_n\}$ converges to A, then the sequence $\{|a_n|\}$ converges to $|A|$.

4. Proposition: If the sequence $\{|a_n|\}$ converges to $|A|$, then the sequence $\{a_n\}$ converges to A.

5. Proposition: If the sequence $\{a_n\}$ converges to 0, and the sequence b_n is bounded, then the sequence $\{a_n b_n\}$ converges to 0.

6. Proposition: If the sequence $\{a_n\}$ converges to 0, and $\{b_n\}$ is another sequence, then the sequence $\{a_n b_n\}$ converges to 0.