Math 554- 703 I - Analysis I
Homework Assignment # 8
Due Tuesday - Nov. 13, 2001

1. If \( \{x_{nk}\}_{k=1}^{\infty} \) is a subsequence of \( \{x_n\}_{n=1}^{\infty} \), then prove that \( k \leq n_k \) for all \( k \).

2. Prove that the function \( f(x) = 1/x, \, 0 < x < 1 \) is not uniformly continuous.

3. Let \( f(x) = 1/x, \, 1/2 < x < 2 \).
   
   (a) Show, using the definition (i.e. \( \epsilon-\delta \)) of uniform continuity, that the function is uniformly continuous.
   
   (b) Can you apply the theorems from lecture to prove this more easily?

4. Suppose that a sequence \( \{x_n\}_{n=1}^{\infty} \) converges to a real number \( x_0 \). Prove that each subsequence of this sequence also converges to \( x_0 \).