MATH 554- 703 I - ANALYSIS I
HOMEWORK ASSIGNMENT # 8
DUE TUESDAY - NOV. 13, 2001

1. If $\{x_{n_k}\}_{k=1}^{\infty}$ 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 $f(x) = 1/x$, $\frac{1}{2} < x < 2$.
   (a) Show, using the definition (i.e. ϵ-δ) 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.