MA 426-001/591M-001 Homework

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Assigned January 31, 2003, Due February 7, 2003

1. Sec. 2.7, problem 2.

2. Let x_k be a convergent sequence in $\mathbb{R}^n$. Let $S = \{x_k : k = 1, 2, \ldots\}$. Prove that the set S is bounded.

3. P. 144, problem 11. You may assume that the metric space is $\mathbb{R}^n$.

4. Let x_k be a sequence in $\mathbb{R}^n$. Prove that x_k is Cauchy if and only if for each $\epsilon > 0$ there is a natural number K such that $\|x_k - x_K\| < \epsilon$ for all $k \geq K$. (Suggested by Steven Farrar.)

5. P. 146, problem 27.