

MA 425-003 Homework

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Assigned February 24, 2003, due March 3, 2003

1. Sec. 3.4, problem 14.
2. Show directly from the definition of Cauchy sequence that if (x_n) and (y_n) are both Cauchy sequences, then $(x_n + y_n)$ is a Cauchy sequence.
3. Assume (1) $x_n > 0$ for all n and (2) $\lim(x_n) = \infty$. Show that $\lim(\frac{1}{x_n}) = 0$.
4. Let (x_n) be a sequence that is not bounded above. Show that there is a subsequence (x_{n_k}) such that $\lim(x_{n_k}) = \infty$.
5. Assume (1) $\lim(x_n) = \infty$ and (2) the sequence (y_n) is bounded. Show that $\lim(x_n + y_n) = \infty$.