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 \(\lim\left(\frac{1}{x_n}\right) = 0\).
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 \(\lim(x_n + y_n) = \infty\).