18.100**C**
Fall 2012

Problem Set 6

1. Given nonzero real numbers $x_1, x_2, \ldots$ define a notion of convergence for the infinite product $\prod_{k=1}^{\infty} x_k$. Prove that if the product converges (in your sense) and the limit is nonzero, then necessarily $\lim_k x_k = 1$. On the other hand, prove that $\prod_{k=1}^{\infty}(1+1/k)$ does not converge. (1+2+2 = 5 points)
2. Prove that $\sum_{k=1}^{\infty} \frac{1}{k^2} < 7/4$. (3 points)
3. Problem 2 on page 98 (3 points). **Please write this problem up carefully in LaTeX.**
4. Problem 3 on page 98 (2 points).

Total: 5 + 3 + 3 + 2 = 13 points.

18.100C Real Analysis

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