PRINT Your Name:_____

Quiz – November 9, 2006

Does the series $\sum_{k=1}^{\infty} \left(1+\frac{1}{k}\right)^{-k}$ converge? Explain **very thoroughly.**

Answer: Recall that $\lim_{k\to\infty} \left(1+\frac{1}{k}\right)^{k} = e$. It follows that

$$\lim_{k\to\infty} \left(1+\frac{1}{k}\right)^{-k} = \lim_{k\to\infty} \frac{1}{\left(1+\frac{1}{k}\right)^{k}} = \frac{1}{e}.$$

In other words, the individual terms of this series go to something other than zero. The series DIVERGES by the Individual Term Test for Divergence.