PRINT Your Name:_____

**Quiz – March 28, 2006**

Does the series $\sum_{k=3}^{\infty} \frac{\ln k}{k}$ converge? **Explain very thoroughly.**

**Answer:** We notice that $\frac{\ln k}{k} > \frac{1}{k}$. The series $\sum_{k=3}^{\infty} \frac{1}{k}$ is the harmonic series (or if you prefer is the $p$-series with $p = 1$). We know that the harmonic series diverges to $+\infty$. The series

$$\boxed{\sum_{k=3}^{\infty} \frac{\ln k}{k} \text{ diverges to } +\infty}$$

even more rapidly than $\sum_{k=3}^{\infty} \frac{1}{k}$ does.