Name : _____

1. The Maclaurin series for e^x is $\sum_{n=0}^{\infty} \frac{x^n}{n!}$ for $-\infty < x < \infty$.

   Evaluate $\lim_{x \to 0} \frac{e^x - 1}{x}$ using the Maclaurin series. Verify your answer with L'hopital rule and the computer.

2. The Maclaurin series for $\sin x$ is $\sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+1}}{(2n+1)!}$ for $-\infty < x < \infty$.

   Assume the conditions for the **Integral Test** have been verified. Determine the convergence or divergence of the series $\sum_{k=1}^{\infty} \sin\left(\frac{1}{k}\right)$.