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Calculus quiz 11 (§8.5∼8.6)

1. Determine the convergence or divergence of the series:

   (a) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^{n+1}(n+1)}{\ln(n+1)}$

   (b) $\displaystyle\sum_{n=1}^{\infty} \frac{\cos n}{2^n}$

2. Determine the number of terms required to approximate the sum of the convergent series with an error of less than 0.001 :
   $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n}{n!} = \frac{1}{e}$.

3. The following argument, that 0=1, is incorrect. Describe the error.

$$\begin{aligned} 0 &= 0+0+0+\cdots \\ &= (1-1)+(1-1)+(1-1)+\cdots \\ &= 1+(-1+1)+(-1+1)+\cdots \\ &= 1+0+0+\cdots \\ &= 1 \end{aligned}$$

4. Use the Ratio Test to test for convergence or divergence of the series.
   $\displaystyle\sum_{n=0}^{\infty} \frac{(-1)^{n+1} n!}{1\cdot 3\cdot 5\cdot \cdots \cdot (2n+1)}$