10.7 Alternating Series Test

Calculus   Name: _____   **CA #1**

1. Explain why the Alternating Series Test does not apply to the series $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n \cos(n\pi)}{n^2}$.

2. Determine the convergence or divergence of the series $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n n}{\ln(n+1)}$.

3. Which of the following series converge?

   I. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n}{4^n}$
   II. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n}{\pi^n}$
   III. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n n^2}{1+n^2}$

   A. I only   B. I and II only   C. I and III only   D. I, II, and III

4. Which of the following statements are true about the series $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n n!}{(2n-1)!}$?
   I. The series is alternating.
   II. $|a_{n+1}| \le |a_n|$ for $n \ge 1$.
   III. $\displaystyle\lim_{n\to\infty} a_n = 0$

   A. I only   B. I and II only   C. I and III only   D. I, II, and III

5. Which of the following statements is true?

A. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n(1-n)}{n}$ converges by the Alternating Series Test.

B. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n(n+1)}{2n}$ converges by the Alternating Series Test.

C. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n n^2}{4\sqrt{n}}$ converges by the Alternating Series Test.

D. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n 2\sqrt{n}}{n}$ converges by the Alternating Series Test.

1. The Alternating Series Test does not apply because the series is not alternating.	2. The series diverges by the nth Term Test.	3. B	4. D	5. D