10.13 Radius and Interval of Convergence

CA #1

Calculus Name: _____

Find the interval of convergence for each power series.

1. $\sum_{n=1}^{\infty} \frac{(-1)^n (x+4)^n}{n}$

2. $\sum_{n=0}^{\infty} \frac{(-1)^n \, n! \, (x-4)^n}{3^n}$

3. What is the radius of convergence of the power series $\sum_{n=0}^{\infty} \frac{(x+2)^n}{2^n}$?

4. What is the interval of convergence for the power series $\sum_{n=1}^{\infty} \frac{n}{n+1}(-kx)^{n-1}$, where k is a positive integer?

5. If the power series $\sum_{n=0}^{\infty} a_n (x-4)^n$ converges at $x = 7$ and diverges at $x = 8$, which of the following must be true?

   I. The series converges at $x = 1$.

   II. The series converges at $x = 2$.

   III. The series diverges at $x = 0$.

(A) I only (B) II only (C) I and II only (D) II and III only

Answers to 10.13 CA #1

1. $-5 < x \leq -3$	2. $x = 4$	3. 2	4. $-\frac{1}{k} < x < \frac{1}{k}$	5. B