

10.10 Alternating Series Error Bound

Calculus

Name: _____

CA #1

1. If the series $\sum_{n=1}^{\infty} (-1)^n \frac{1}{2n+1}$ is approximated by the partial sum with 50 terms, what is the alternating series error bound?
2. Approximate an interval for the sum of the convergent alternating series $\sum_{n=1}^{\infty} \frac{(-1)^n 2}{n^2}$ using the Alternating Series Error Bound the first 6 terms.
3. The series $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{\sqrt{n}}$ converges to S . Based on the alternating series error bound, what is the least number of terms to guarantee a partial sum that is within 0.02 of S ?

4. If the series $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{5}{n}$ is approximated by $S_k = \sum_{n=1}^k (-1)^{n+1} \frac{5}{n}$, what is the least value of k for which the alternating series error bound guarantees that $|S - S_k| < 0.001$?

(A) 999

(B) 1000

(C) 4999

(D) 5000

5. Determine the least number of terms necessary to approximate the sum of the series $\sum_{n=1}^{\infty} \frac{(-1)^n 3}{4^n}$ with an error less than 10^{-3} .

Answers to 10.10 CA #1

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|--------------------|---------------------------------|---------|------|------|
| 1. $\frac{1}{103}$ | 2. $-1.662 \leq S \leq -1.5808$ | 3. 2500 | 4. D | 5. 5 |
|--------------------|---------------------------------|---------|------|------|