

Name: _____

1. Is the sequence $a_n = \frac{1}{3n+2}$ bounded? Show your work, and state your conclusion in a complete sentence.

12 pts

2. Determine whether the series $\sum_{n=1}^{\infty} \frac{n^2+1}{n^3+1}$ is (circle one)

absolutely convergent,

conditionally convergent,

or divergent.

12 pts

(OVER)

3. The series $\sum_{n=1}^{\infty} \frac{1}{n^2}$ is a convergent p -series.

12 pts

(a) Use the sum of the first four terms to estimate the sum of the series.

(b) Your estimate in (3a) underestimates the sum S of the series by an amount R_4 . Figure out how big R_4 can be, and state your answer in a complete sentence. Remember to explain why your method is valid.

4. Determine whether the series $\sum_{n=2}^{\infty} \frac{(-1)^n}{(\ln n)^n}$ is (circle one)

absolutely convergent,

conditionally convergent,

or divergent.

13 pts

5. Consider the series $\sum_{n=0}^{\infty} \frac{(x+3)^n}{2^n}$.

12 pts

(a) Find the values of x for which the series converges.

(b) What is the sum of the series [for the values of x you identified in (5a)]?

6. Determine whether the series $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{2^n}{n^4}$ is (circle one)

absolutely convergent,

conditionally convergent,

or divergent.

13 pts

(OVER)

7. Determine whether the series $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{1}{\sqrt[4]{n}}$ is (circle one)

absolutely convergent,

conditionally convergent,

or divergent.

13 pts

8. Determine whether the series $\sum_{n=1}^{\infty} (-1)^{n-1} \frac{1 \cdot 3 \cdot 5 \cdots (2n-1)}{(2n-1)!}$ is (circle one)

absolutely convergent,

conditionally convergent,

or divergent.

13 pts