

Calculus(II)

Homework 2, Apr, 16, 2020

Deadline: Apr, 29, 2020

1. Determine whether the sequence converges or diverges. If it converges, find the limit.

(a) $a_n = \frac{\cos^2 n}{2^n}$.

(b) $\{0, 1, 0, 0, 1, 0, 0, 0, 1, \dots\}$.

2. Determine whether the series is convergent or divergent. If it is convergent, find its sum.

(a) $\sum_{n=1}^{\infty} \sqrt[n]{2}$.

(b) $\sum_{n=1}^{\infty} \arctan n$.

3. Given $\sum_{n=1}^{\infty} \frac{1}{\sqrt{n+4}}$, use the Integral Test to determine whether the series is convergent or divergent.

4. Given $\sum_{n=1}^{\infty} \frac{n}{2n^3+1}$, use the Comparison Test to determine whether the series is convergent or divergent.

5. Determine whether the series is absolutely convergent, conditionally convergent, or divergent.

(a) $\sum_{n=1}^{\infty} \frac{n}{5^n}$.

(b) $\sum_{n=1}^{\infty} \frac{10^n}{(n+1)4^{2n+1}}$.

6. Given $\sum_{n=1}^{\infty} (-1)^n n x^n$, find the radius of convergence and interval of convergence of the series.

7. Given $f(x) = \frac{2}{3-x}$, find a power series representation for the function and determine the interval of convergence.