

1552 Quiz 6: Sample Questions

May 11, 2023

1 Question 1: Alternating Series

Determine whether the following alternating series converges absolutely, converges conditionally, or diverges. Justify your answers using the tests we have discussed in class.

1.
$$\sum_{n=1}^{\infty} (-1)^{n+1} \frac{2n^2}{\sqrt{n^5 + 1}}$$

2.
$$\sum_{n=2}^{\infty} (-1)^n \frac{n^2}{n^3 - 1}$$

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

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

2 Question 2: Power Series

Determine whether the following series converge or diverge using the Ratio Test.

1. $\sum_{k=1}^{\infty} \frac{(x-1)^k}{5^k}$
2. $\sum_{k=2}^{\infty} \binom{k}{k-1} \frac{(x-1)^k}{3^k}$

3 Question 3: Radius of convergence

Find the radius and interval of convergence for the following series.

1. $\sum_{k=1}^{\infty} \frac{(4-3x)^k}{\sqrt{2k+5}}$
2. $\sum_{k=1}^{\infty} \frac{(x-1)^k}{10^k}$