

# 44 Lecture - MTH101

## Important Subjective

**What is an alternating series in calculus?**

**Answer:** An alternating series in calculus is a series where the terms alternate between positive and negative values.

**What is the Alternating Series Test?**

**Answer:** The Alternating Series Test is a test used to determine the convergence or divergence of an alternating series. It states that if the absolute value of the terms in an alternating series decrease and approach zero, then the series converges.

**What is conditional convergence?**

**Answer:** Conditional convergence is a property of some series in which the series converges, but if the signs of the terms are changed, the series will diverge.

**What is the Ratio Test?**

**Answer:** The Ratio Test is a test used to determine the convergence or divergence of a series. It involves taking the limit of the ratio of consecutive terms and comparing it to a threshold value.

**What is the Root Test?**

**Answer:** The Root Test is a test used to determine the convergence or divergence of a series. It involves taking the limit of the  $n$ th root of the absolute value of the  $n$ th term and comparing it to a threshold value.

**What is the difference between absolute convergence and conditional convergence?**

**Answer:** Absolute convergence is a property of a series in which the series converges regardless of the order of the terms, while conditional convergence is a property of a series in which the series converges only when the terms are arranged in a specific order.

**What is the alternating harmonic series?**

**Answer:** The alternating harmonic series is an alternating series of the form  $1 - 1/2 + 1/3 - 1/4 + 1/5 - 1/6 + \dots$ , which converges to  $\ln(2)$ .

**What is the limit comparison test?**

**Answer:** The limit comparison test is a test used to determine the convergence or divergence of a series. It involves taking the limit of the ratio of two series and comparing it to a threshold value.

**What is the absolute convergence test?**

**Answer:** The absolute convergence test is a test used to determine the convergence or divergence of a series. It involves taking the absolute value of the terms in the series and determining whether the resulting series converges.

**What is the significance of conditional convergence?**

**Answer:** Conditional convergence is significant because it shows that the order in which the terms of a series are arranged can affect whether the series converges or diverges. This is important in certain applications of series, such as in Fourier series.