

Analysis 1
Quiz 5

Name: _____

You have 10 minutes to complete this quiz. If you have a question raise your hand and remain seated. In order to receive full credit your answer must be **complete**, **legible** and **correct**. Show your work, and give adequate explanations.

1. Write a formal sentence expressing “ $\sum_{k=1}^{\infty} a_k$ is conditionally convergent”.

The sentence I write will express “ $\sum a_k$ is convergent, but not absolutely convergent”. I will use the Cauchy Criterion to express convergence.

$$((\forall \epsilon > 0)(\exists N)(\forall i, j)((j > i > N) \rightarrow (|a_{i+1} + \cdots + a_j| < \epsilon)) \wedge \neg ((\forall \epsilon > 0)(\exists N)(\forall i, j)((j > i > N) \rightarrow (|a_{i+1}| + \cdots + |a_j| < \epsilon)))$$

2. Complete this definition of a topology on X : τ is a **topology** on X if τ is a collection of subsets of X satisfying

(1) \emptyset $\in \tau$.

(2) X $\in \tau$.

(3) τ is closed under arbitrary union.

(4) τ is closed under finite intersection.