

Analysis 1
Quiz 4

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. Assume that $a_n \leq b_n \leq c_n$ for all n , and that the limits

$$\lim_{n \rightarrow \infty} a_n, \quad \lim_{n \rightarrow \infty} b_n, \quad \lim_{n \rightarrow \infty} c_n$$

exist. Show that if $\lim_{n \rightarrow \infty} a_n = L = \lim_{n \rightarrow \infty} c_n$, then $\lim_{n \rightarrow \infty} b_n = L$.

By the Order Limit Theorem,

$$L = \lim_{n \rightarrow \infty} a_n \leq \lim_{n \rightarrow \infty} b_n \leq \lim_{n \rightarrow \infty} c_n = L,$$

so $\lim_{n \rightarrow \infty} b_n = L$.

2. State the Cauchy Criterion.

A sequence converges if and only if it is a Cauchy Sequence.