1. Assume \( \lim_{n \to \infty} a_n = a \) and \( \lim_{n \to \infty} b_n = b \). Show that
\[
\lim_{n \to \infty} (a_n + b_n) = a + b.
\]

2. (a) Let \( a, b \in \mathbb{R} \). Show that \( a = b \) if and only if \( |a - b| < \epsilon \) for every \( \epsilon > 0 \).

(b) Show that the limit of a convergent sequence is unique. That is, show that if \( \lim_{n \to \infty} a_n = a \) and \( \lim_{n \to \infty} a_n = b \) then \( a = b \). *Hint: Use the definition of limit together with part (a).*