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).*