(b) $\lim_{n \to \infty} (K a_n) = K a$.

proof:- let $\epsilon > 0$ be given

since $\lim_{n \to \infty} a_n = a \Rightarrow \exists$ positive integer N

$\ni |a_n - a| < \frac{\epsilon}{|K|} \quad \forall n \geq N, \; K \neq 0.$

$\therefore |K a_n - K a| = |K(a_n - a)| = |K| \cdot |a_n - a|$
$< |K| \cdot \frac{\epsilon}{|K|} = \epsilon.$

$\therefore |K a_n - K a| < \epsilon.$

proof $\lim_{n \to \infty} (K + a_n) = K + a$.

let $\epsilon > 0$ be given

since $\lim_{n \to \infty} a_n = a \Longrightarrow \exists$ positive integer N

$\ni |a_n - a| < \epsilon \quad \forall n \geq N.$

$\Rightarrow |(a_n + K) - (a + K)| = |a_n + \cancel{K} - a - \cancel{K}| = |a_n - a| < \epsilon$
$\forall n \geq N.$

$\therefore |(a_n + K) - (a + K)| < \epsilon$

$\therefore \lim_{n \to \infty} (K + a_n) = K + a.$