1. $| f(x) - l | < \epsilon$ for all x with $0 < | x - a | < \delta$.

(or For every $\epsilon > 0$, there exists a corresponding $\delta > 0$ such that for all x , $0 < | x - a | < \delta$

$\Rightarrow | f(x) - l | < \epsilon.$)

2. Arbitrarily give $\epsilon > 0$. $\lim_{x \to a} f(x) = l$

$\Rightarrow$ there exists $\delta_1 > 0$ such that

$$(0 < | x - a | < \delta_1 \Rightarrow | f(x) - l | < \tfrac{\epsilon}{2}) \qquad \ldots (1)$$

$\lim_{x \to a} g(x) = m$

$\Rightarrow$ there exists $\delta_2 > 0$ such that

$$(0 < | x - a | < \delta_2 \Rightarrow | g(x) - m | < \tfrac{\epsilon}{2}) \qquad \ldots (2)$$

Take $\delta = \min\{\delta_1, \delta_2\}$, then $0 < | x - a | < \delta$

$$\Rightarrow \begin{cases} 0 < | x - a | < \delta_1 \\ 0 < | x - a | < \delta_2 \end{cases}$$

$$\Rightarrow \begin{cases} | f(x) - l | < \frac{\epsilon}{2} & (\because (1)) \\ | g(x) - m | < \frac{\epsilon}{2} & (\because (2)) \end{cases}$$

$\Rightarrow | (f(x) + g(x) - (l + m) |$

$= | (f(x) - l) + (g(x) - m) |$

$\leq | f(x) - l | + | g(x) - m | < \epsilon$

$\therefore$ For an arbitrarily given $\epsilon > 0$, there exist $\delta > 0$ such that $0 < | x - a | < \delta_1$

$\Rightarrow | f(x) + g(x) - (l + m) | < \epsilon.$

Hence $\lim_{x \to a} f(x) + g(x) = l + m.$