Appendix - Definition of Limit

Informal:
$L$ is the limit of $f(x)$ as $x$ approaches $c$
if and only if
you can make $f(x)$ stay as close as you like to $L$
just by keeping $x$ close enough to $c$,
(but not equal to $c$).

More formal, verbal:
$L$ is the limit of $f(x)$ as $x$ approaches $c$
if and only if
- for any positive number epsilon, no matter how small,
- there is a positive number delta, such that
- if $x$ is kept within delta units of $c$,
  but not equal to $c$,
- then $f(x)$ stays within epsilon units of $L$.

Formal, more symbols:
$L = \lim_{{x \to c}} f(x)$
if and only if
- for any number $\varepsilon > 0$, no matter how small,
- there is a number $\delta > 0$ such that
- if $x$ is kept within $\delta$ units of $c$, but $x \neq c$,
- then $f(x)$ stays within $\varepsilon$ units of $L$. 