Name ________________________________

Give the $\epsilon$-$\delta$ definition of a limit. That is define precisely what is meant by the sentence,

\[ \lim_{x \to c} f(x) = L. \]

**Solution:** We say that $\lim_{x \to c} f(x) = L$ if and only if for every $\epsilon > 0$ there is a $\delta > 0$ such that

\[ |f(x) - L| < \epsilon \]

provided

\[ |x - c| < \delta. \]

**In more symbols,** $\lim_{x \to c} f(x) = L$ if and only if $\forall \epsilon > 0$, $\exists \delta > 0$ such that

\[ |f(x) - L| < \epsilon \]

provided

\[ |x - c| < \delta. \]