

Source: [KBhMATH401Limits](#)

1 | Epsilon Delta Proofs

The secrets of the limit

Formal Definition of a Limit

Definition 1 · **Limit Definition** $\lim_{x \rightarrow a} f(x) = L$
for all $\epsilon > 0$, there exists a δ such that *if* $0 < |x - a| < \delta$, *then* $0 < |f(x) - L| < \epsilon$

An Epsilon Delta Proof

Let's prove $\lim_{x \rightarrow 2} x^2 = 4$ together!

The crux of the proof is to come up with a value δ that is a function of ϵ assuming that $0 < \epsilon$ that meets $0 < |x - a| < \delta$.

Oh, here's some symbols

Symbol	Definition
\forall	For all
\exists	There exists
$ $	Such that