limits of a sequence

converges

diverges

limits of a sequence

A sequence $\{a_n\}$ has limit L if we can make the terms an as close as we like to L by taking n sufficiently large. We denote this by

$$\lim_{n\to\infty} a_n = L$$

or

$$a_n \to L \text{ as } n \to \infty$$

- If $\lim_{n\to\infty} a_n$ exists (is finite), then the series converges, otherwise it diverges
- Graphically:
  If $\lim_{n\to\infty} a_n = L$ the graph of the sequence $\{a_n\}_{n=1}^{\infty}$ has a unique horizontal asymptote $y = L$

limits of a sequence