

We are interested in the question of whether or not the terms in the sequence get arbitrarily close to a real number L (which is called the limit of the sequence $\{a_n\}$ or not.

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

If a sequence has a limit we say it converges to the value L .

If a sequence has no limit or has ∞ as a limit, we say that it diverges.

Examples: $a_n = \frac{1}{n} \quad \lim_{n \rightarrow \infty} a_n = 0$

$$b_n = \frac{(-1)^n}{n} \quad \lim_{n \rightarrow \infty} b_n = 0$$

$$c_n = \frac{(n^2 - n + 2)}{3n^2 + 4} = \frac{1 - \left(\frac{1}{n} + \frac{2}{n^2}\right)}{3 + \left(\frac{4}{n^2}\right)} \rightarrow \frac{1}{3}$$