

1. Use the formal definition of limit of a sequence to prove the following.

(a) $\lim_{n \rightarrow \infty} \frac{n^2}{n^2 - 1} = 1$

(b) $\lim_{n \rightarrow \infty} \frac{2n}{3n^2 - 1} = 0$

(c) $\lim_{n \rightarrow \infty} \frac{(1 + \frac{1}{n})^2 - 1}{\frac{1}{n}} = 2.$

2. Prove the following proposition.

If the sequence (a_n) converges, then its limit is unique.