

Math 151
Quiz
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Ali Nesin

We say that a sequence $(r_n)_n$ of real numbers converges to r if for all $\varepsilon > 0$ there is an N such that for all $n > N$, $|r_n - r| < \varepsilon$.

1. Let $r_n = 1/n$ if $n \neq 0$ and $r_0 = 1$. Show that the sequence $(r_n)_n$ converges to 0.
2. Let $r_n = (-1)^n$. Show that the sequence $(r_n)_n$ does not converge to any real number.
3. Let $r_n = n$. Show that the sequence $(r_n)_n$ does not converge to any real number.
4. Show that a sequence of real numbers cannot converge to two distinct real numbers.
Thus we are allowed to write $\lim_{n \rightarrow \infty} r_n = r$ when r is the limit of the sequence r_n .
5. Show that any convergent sequence is a bounded sequence.