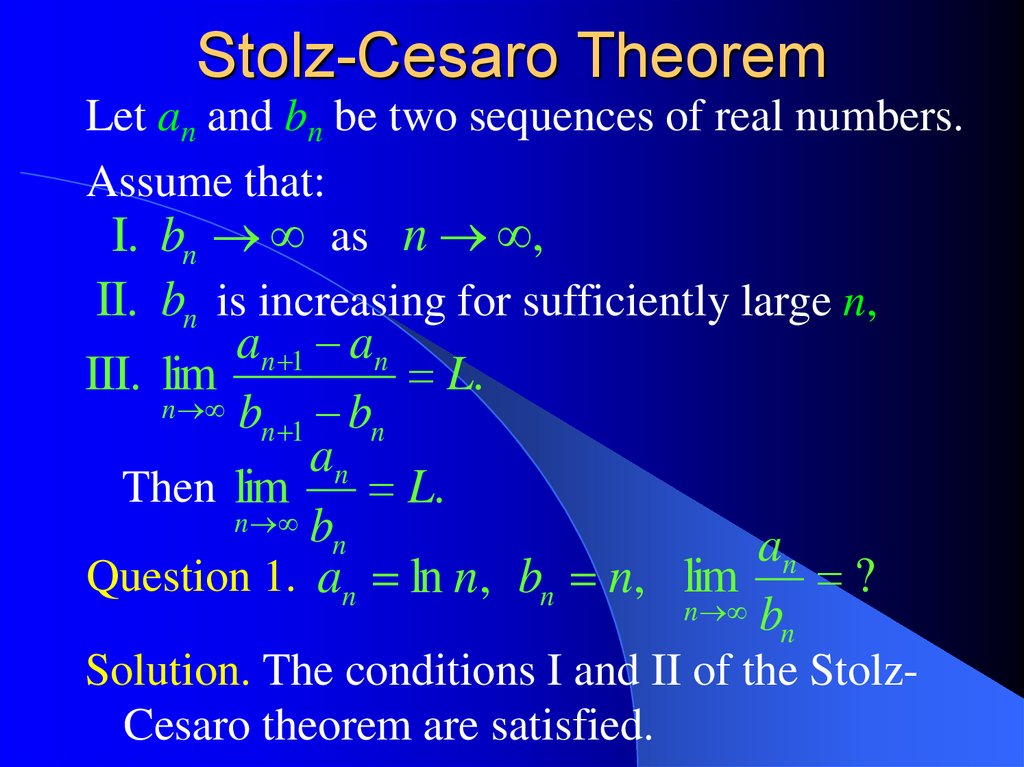
Title: An Introduction To Stolz-Cesaro Theorem



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Topic: Mathematics

Description: In mathematics, the Stolz–Cesaro theorem is a criterion for proving the convergence of a sequence. The theorem is named after mathematicians Otto Stolz and Ernesto Cesaro, who stated and proved it for the first time.
The Stolz–Cesaro theorem can be viewed as a generalization of the Cesaro mean, but also as a L'Hopital rule for sequences.

Content: Let {\displaystyle (a\_{n})\_{n\geq 1}}(a\_{n})\_{n\geq 1} and {\displaystyle (b\_{n})\_{n\geq 1}}(b\_{n})\_{n\geq 1} be two sequences of real numbers. Assume that {\displaystyle (b\_{n})\_{n\geq 1}}(b\_{n})\_{n\geq 1} is a strictly monotone and divergent sequence (i.e. strictly increasing and approaching {\displaystyle +\infty }+\infty , or strictly decreasing and approaching {\displaystyle -\infty }-\infty ) and the following limit exists:
{\displaystyle \lim \_{n\to \infty }{\frac {a\_{n+1}-a\_{n}}{b\_{n+1}-b\_{n}}}=l.\ }{\displaystyle \lim \_{n\to \infty }{\frac {a\_{n+1}-a\_{n}}{b\_{n+1}-b\_{n}}}=l.\ }
Then, the limit
{\displaystyle \lim \_{n\to \infty }{\frac {a\_{n}}{b\_{n}}}=l.\ }{\displaystyle \lim \_{n\to \infty }{\frac {a\_{n}}{b\_{n}}}=l.\ }
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