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limit superior of sets

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Defines	limit inferior of sets
Defines	infinitely often
Defines	i.o.

Let A_1, A_2, \dots be a sequence of sets. The limit superior of sets is defined by

$$\limsup A_n = \bigcap_{n=1}^{\infty} \bigcup_{k=n}^{\infty} A_k.$$

It is easy to see that $x \in \limsup A_n$ if and only if $x \in A_n$ for infinitely many values of n . Because of this, in probability theory the notation $[A_n \text{ i. o.}]$ is often used to refer to $\limsup A_n$, where i.o. stands for *infinitely often*.

The limit inferior of sets is defined by

$$\liminf A_n = \bigcup_{n=1}^{\infty} \bigcap_{k=n}^{\infty} A_k,$$

and it can be shown that $x \in \liminf A_n$ if and only if x belongs to A_n for all but finitely many values of n .