Exercises

E12.2 [13J] Let I be a family of indices. Supposte that, for $n \in I$, $f_n : X \to \mathbb{R}$ are l.s.c. functions. We define $f \overset{\text{def}}{=} \sup_{n \in I} f_n$, then f is l.s.c. (defined as $f : X \to \mathbb{R} \cup \{+\infty\}$). [a].

Solution 1. [13K]

[a] Note that this is also true when $n \in I$ is an uncountable family of indices; and it is also true when f_n are continuous