Exercises

E8.37 [OHW] Topics:direct ordering. Prerequisites:[O6M], [O6N], [O6V].

Let $(I, \leq)$ be a set with direct ordering and with a maximum that we call ∞. We call $J = I \setminus \{\infty\}$ and assume that J is filtering (with induced sorting) and non-empty. In this case we propose a finer topology. The topology τ for I contains:

- $\emptyset, I$;
- sets A that contain a "half-line" $\{k \in I : k \geq j\}$, for a $j < \infty$, (these are called "neighborhoods of ∞");
- subsets of I that do not contain ∞.

Show that τ is a topology. Is this topology Hausdorff? Show that ∞ is the only accumulation point.

Solution 1. *[OHX]*