1 Show that wk is the smallest topology on $\mathscr{X}$ such that each x^* in $\mathscr{X}^*$

Must show that an arbitrary open set in wk can be generated by some collection of sets of the form $x^{*-1}(V)$.

Start with an arbitrary open set U.

$\bigcap_{i=1}^{n}\{x \epsilon \mathscr{X} : p_j(x - x_0) < \varepsilon_j\}$

Since U is generated by the subbase of preimages of the collection of x^* and U is arbitrary, all open sets of wk are generated in this way, thus is the smallest possible topology.