

Exercises

E0.1 [2FD] Prerequisites: [2F7]. Consider topological spaces (X_i, τ_i) , each with the discrete topology (and each X_i has at least two elements). Let $I = \mathbb{N}$ or $I = \{0, 1, \dots, N\}$; let $X = \prod_{i \in I} X_i$ be the Cartesian product. We define the *product topology* τ on X , as explained in [2F7]. Describe a simple base for this topology. Moreover, if $I = \mathbb{N}$, show that the topology τ is not the discrete topology.

Solution 1. [2FF]