Wstęp do topologii algebraicznej

Ćwiczenia 5

(1) Show that $Q \times I \cong Q$.

(2) Let X, Y be compact spaces with Y being a metric space. Show that $\mathcal{S}(X, Y)$ is closed in $C(X, Y)$.

(3) Let X, Y be compact metric spaces. Show that $\bigcap_{n=1}^{\infty} \mathcal{S}_{1/n}(X, Y) = \mathcal{H}(X, Y)$.

(4) Show that a compact metric space is complete.

(5) For $i \in A$ let $h_i \colon X_i \to Y_i$ be a homeomorphism. Show that the product map $\prod_{i \in A} h_i \colon \prod_{i \in A} X_i \to \prod_{i \in A} Y_i$ is a homeomorphism.