



TOPOLOGICAL VECTOR SPACES II–WS 2019/2020

Interactive Sheet 2

Group 2

Let f be a continuous mapping of a compact space X into a Hausdorff topological space Y . Prove that $f(X)$ is a compact subset of Y .

Proof.

- Let $\{\Omega_i\}_{i \in I}$ be an open cover of $f(X)$, i.e.
 and so by taking the preimages through f of both sides we obtain that

- Then by the compactness of X we have that

Hence, applying f to both sides we get that

Also, $f(X)$ endowed with the is a Hausdorff space. Hence, we can conclude that $f(X)$ is compact.

□