

Let $\mathfrak{B} = \{(-\infty, a) : a \in \mathbb{R}\} \cup \{\emptyset\} \cup \{\mathbb{R}\}$. By theorem 2.5, this forms the basis for some topology on \mathbb{R} . In this topology, $[0, 1]$ is compact, but its closure is $[0, \infty)$, which is not compact. ■