

Problems in Topology (Math436)

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Read Chapter 7

- (1) An infinite set with the cofinite topology is compact.
- (2) Let X be a compact space and $f : X \rightarrow \mathbb{R}$ be continuous. Show that f assumes its supremum, i.e. $s = \sup_{x \in X}(f(x)) < \infty$ and there is an $x_0 \in X$ so that $f(x_0) = s$.
- (3) 3/page 95.
- (4) 10/ page 95
- (5) (*) Show that if X and Y are compact spaces that $X \times Y$ (with the product topology) is also compact.
- (6) (*) Let \mathbb{M} be the Michael line.
 - (a) Show that if a set $A \subset \mathbb{M}$ is \mathbb{M} -closed. Then $A \cap \mathbb{Q}$ is closed in \mathbb{Q} with respect to the restriction topology of the usual topology on \mathbb{R} .
 - (b) Show that \mathbb{M} is normal.