

MA30041: Metric Spaces

SELF-ASSESSMENT SHEET 9: COMPACTNESS

- 1.) Let A be a compact subset of a metric space (X, d) . Show that the derived set A' of A is compact.

For a solution, click on the the following space:

- 2.) Let (x_n) be a convergent sequence in a metric space (X, d) . Let $x = \lim_n x_n$. Prove that the set $K = \{x\} \cup \{x_n \mid n \in \mathbb{N}\}$ is a compact subset of X .

For a solution, click on the the following space:

- 3.) Show that the sequence $(x_n) \subset \mathbb{R}$ (with the usual metric) given by $x_n = \sin(n)$ $\forall n \in \mathbb{N}$ has a convergent subsequence.

For a solution, click on the the following space:

- 4.) Show: the X -prickly hedgehog (see Exercise sheet 1 Question 3) is totally bounded iff X is finite.

For a solution, click on the the following space:
