Homework 6

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Problem 1 Pg 106 Problem 1

Show that compact sets are closed under arbitrary intersections and finite unions. (Hint: You need to show the intersection of finite or infinte compact sets is compact and the union of finitely many compact sets is a compact set.

Problem 2 Pg 107 Problem 4

If $A \subseteq B_1 \cup B_2$ where B_1 and B_2 are disjoint open sets and A is compact, show that $A \cap B_1$ is compact.

Is the same true if B_1 and B_2 not disjoint?

Problem 3 Pg 107 Problem 8

If A is compact, show that $\sup A$ and $\inf A$ belong to A.

Give an example of a non-compact set A such that both $\sup A$ and $\inf A$ belong to A.