Topology, Munkres
Chapter 4

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Exercise Set 1

Problem 1. *1. A G_δ set in a space X is a set A that equals a countable intersection of open sets of X. Show that in a first-countable T_1 space, every one-point set is a G_δ set.*

2. There is a familiar space in which every one-point set is a G_δ set, which nevertheless does not satisfy the first countability axiom. What is it?

The terminology here comes from the German. The "G" stands for "Gebiet," which means "open set," and the "δ" for "Durchschnitt," which means "intersection.

Solution :