§10 Dimension [0YH]

Let (X, d) be a metric space. Let in the following K a compact non-empty subset of X, and $N(\rho)$ the minimum number of balls of radius ρ that are needed to cover K. [†84]

Definition 10.1. *[0YJ]*

If the limit does not exist, we can still use the limsup and the liminf to define the *upper and lower dimension*.

Note that this definition depends *a priori* on the choice of the distance, i.e. $N = N(\rho, K, d)$ and $\dim = \dim(K, d)$. See in particular [0YZ].

Exercises

E10.2 [0YK]

E10.3 [0YN]

E10.4 [0YQ]

E10.5 [0YS]

E10.6 [0YV]

E10.7 [0YX]

E10.8 [0YZ]

E10.9 [0Z1]

E10.10 [0Z3]

E10.11 [0Z7]

E10.12 [0ZB]

E10.13 [0ZD]

E10.14 [0ZG]

E10.15 [0ZJ]

E10.16 [0ZM]

E10.17 [0ZP]

E10.18 [0ZR]

QuasiEsercizio 1. *[0ZS]*

[†84] By the Heine–Borel theorem [0V3] we know that $N(\rho) < \infty$