Terms mentioned in this binder's notes PhL 1.31.05

A. Metric Spaces Section

metric, Taxi Cab metric, Discrete metric, sup metric
norm
Cauchy-Schwarz Inequality [~1830], Minkowski Inequality [1896]
lub = sup and glb = inf
subspace A of a metric space X
diameter
bounded
distance between a point x and a subspace A
product metric
continuity , "Cauchy-Weierstrass continuity"
open ball $B(x_1; r)$
N is a neighborhood of x_1
open set, closed set
family of all open sets is the topology for X generated by metric d
$A^c = X \setminus A$ = the complement of set A
neighborhood definition of continuity
limit of a sequence
"true for almost all of S"
"sequence definition of continuity"
Properties of the open sets, Properties of the closed sets
accumulation or limit point
interior intA, boundary ∂A, closure of S called S-bar

B. Topological Spaces Section

family, topology for X
(X,F) is called a topological space
metric space appeared late, in 1906 (Maurice Frechet)
In 1914 if was Hausdorff who coined the "topo space"
discrete metric , singleton sets
power set, usually written 2^X = the discrete topology, the trivial topology
finite complement topology = cofinite topology
set A is closed if its complement X\A is open
limit point
A' is the derived set of all limit points
dense , nowhere dense , separable
basis of a topology. basic open sets, second countable
local basis , first countable
Every metric space is first countable
homeomorphism
topological property
metrizable
relative topology (aka subspace topology), relatively open sets, subspace
hereditary property

Hausdorff Space

C. Compactness Section
compact is a *generalization* of a set of the reals being both closed and bounded
open cover , subcover
Cantor's Nesting theorem
locally compact at point a, locally compact
Bolzano-Weierstrass Theorem
Heine-Borel Theorem
sequentially compact
support, compact support