

MATH 251: Topology II

[website]

\mathbb{R} real line

[syllabus]

analytic

[exam dates]

discrete

[participation]

indiscrete

[plagiarism]

finite complement (aka cofinite)

[generated by $\mathbb{R} - S$ for finite S]

[Jan 30 add/drop deadline]

lower limit (aka Sorgenfrey)

[generated by $[a, b)$ for $a < b$]

[course objectives]

Q

which are most similar to analytic?

e.g., connected
 Hausdorff
 locally compact

Df

a top space X is connected iff

there is no pair of disjoint nonempty open U, V
sub X s.t. $X = U \cup V$ [draw]

e.g., analytic
 indiscrete
 cofinite

Df

X is Hausdorff ["séparé"] iff

for any $x \neq y$ in X, have disjoint open U, V sub X
s.t. $x \in U$ and $y \in V$ [draw]

e.g., analytic
 discrete
 lower limit

Df

X is locally compact iff

for any x in X, have open U and compact K sub X
s.t. $x \in U$ sub K [draw]

[which is stronger, compact or locally compact?]

locally compact but not compact:

analytic [x in $(x - 1, x + 1)$ sub $[x - 1, x + 1]$]
discrete [$\{x\}$ is both open and compact]

compact:

indiscrete
cofinite [if $\{U_i\}_i$ is an open cover of \mathbb{R} , then
some U_i is nonempty]

Thm the lower limit top is not locally compact

[will do proof later]

focus of this course:

locally compact Hausdorff spaces
[usually but not always connected]

next two weeks:

more on Hausdorffness,
connectedness,
compactness