September 13, hour 1: Course Introduction

September-11-10
12:29 PM

To do: ~~1. Print "About"~~
~~2. Check Munkres.~~

MAT 327 Introduction to Topology

DROR BAR-NATAN [website: search]

Today's reading: Munkres: All introductions, Chapter 1 sections 1-8, Chapter 2 section 12.

Remember blackboard shots!

* Go over the "about" handout.

Definition A function $f:\mathbb{R}\to\mathbb{R}$ is "continuous" if

$\forall x_0\in\mathbb{R}\ \forall\epsilon>0\ \exists\delta>0\ \forall x\in\mathbb{R}\ |x-x_0|<\delta \Rightarrow |f(x)-f(x_0)|<\epsilon$

Theorem $f:\mathbb{R}\to\mathbb{R}$ is continuous iff for every open set $U\subset\mathbb{R}$, $f^{-1}(U)$ is also open.

PM: should have used $f:\mathbb{R}^n\to\mathbb{R}^m$ to separate domains from ranges and to allow use of balls.

* Define open, give some examples.
* A few words on "f^{-1}".
* Proof. (only half was given)

Properties of open sets:

1. $\emptyset$, $\mathbb{R}$ 2. $\bigcup$ 3 Finite $\bigcap$.

done line.

Definition 1. A topological space

2. Continuous function $f: X\to Y$.

Theorem The composition of continuous functions is continuous.

Examples The discrete and trivial topologies, continuous functions $f: X_{\text{discrete, trivial}} \to \mathbb{R}$

$f: \mathbb{R} \to X_{\text{discrete, trivial}}$