MA 109 : Calculus I
D4 - T3, Tutorial 0

Krushnakant

IIT Bombay

18th November 2020

Welcome

Hello there!!! Welcome to IITB.
I am Krushnakant Bhattad.
I am from the CSE Department.
Nice to meet you all.
I will be your TA for the course MA 109.
This is an extremely interesting course. You will be introduced to mathematical rigour. Do not fear this, try to appreciate the elegance behind it.
We'll study the things you learnt in JEE with Mathematical Rigour and also, some new interesting things.

This is the first edition of the course.
Earlier we had MA105 - a full semester Calculus course.
You might get to hear a lot of anecdotes about MA105 from seniors, but this course will be quite different and easier.
Do download the Course booklet!
It has also been added to the Files tab in our Team's General channel.

Syllabus- Univariate Calculus

The convergence of sequences and series.
Limits, continuity, differentiability.
The Mean Value Theorem, Taylor's theorem, power series, maxima and minima.
Riemann integrals, The Fundamental Theorem of Calculus, improper integrals; applications to area and volume.

Syllabus- Multivariate Calculus

Partial derivatives
Limits, continuity, differentiability.
The gradient and directional derivatives.
The Chain Rule, Maxima and minima in several variables
Lagrange multipliers

Course Policy

You are expected to attend all lectures and tutorial sessions.
If you miss, see the recordings
Final Exam might constitute high weightage, but this all is tentative now.

Interesting Questions

State whether the following statements are true or false. Justify your answers.

Q-1. If a set $S \subset \mathbb{R}$ is finite, and $c := \sup S$, then $c \in S$.

Q-2. If S is a nonempty subset of $\mathbb{R}$ such that S is bounded above and if $c := \sup S$, then there exists a sequence (x_n) of elements of S such that (x_n) is convergent and $x_n \to c$.

No need to submit.These are just for you to check if you have understood the concepts or not. Solutions will be given 2 weeks later if you need. Happy solving!!!