

Math 100: Differential Calculus

Section 107, Lecture 1

Lior Silberman¹

¹lior@math.ubc.ca; <https://www.math.ubc.ca/~lior/>
https://www.math.ubc.ca/~lior/teaching/1920/100_F19/

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Calculus ???

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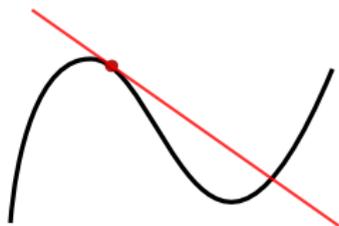
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Calculus???

1 About the
course

2 Learning
methods

3 About me



What is a *Calculus*?

- *Differential calculus*: A collection of methods for studying rates of change.²
- Language to describe nature

²Image due to Jacj from: https://commons.wikimedia.org/wiki/File:Tangent_to_a_curve.svg

Galileo says

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Philosophy is written in that great book (I mean the universe) ... but the book cannot be understood unless one first learns the language and the symbols in which it is written. This book is written in the mathematical language ... without whose help it is impossible to comprehend a single word of it; without which one wanders in vain through a dark labyrinth.

— Galileo Galilei, *The Assayer*, 1623.

HG Wells says

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... the new mathematics is a sort of supplement to language, affording a means of thought about form and quantity and a means of expression, more exact, compact, and ready than ordinary language. The great body of physical science, a great deal of the essential fact of financial science, and endless social and political problems are only accessible and only thinkable to those who have had a sound training in mathematical analysis, and the time may not be very remote when it will be understood that for complete initiation as an efficient citizen ... it is as necessary to be able to compute, to think in averages and maxima and minima, as it is now to be able to read and write.

— HG Wells, *Mankind in the Making*, 1903.

Today's Goals

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- 1 About of the course
- 2 Learning methods
- 3 About me
- 4 Math: Introduction to limits

Course plan

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- Limits and limit laws;
- Differentiation of the derivative;
- Application of the derivative;
- Taylor approximation.

Components of the course

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- Classes (TTh 9:30-11:00, BUCH A103)
- Weekly online homework (due 11pm Fridays) [15%]
 - WebWork 0 (not graded) open now – do it as soon as possible
 - WebWork 1 due September 13
- Offline homework = Practice problems (not for submission) [0%]
- In-class Midterm (October 17th) [25%]
- Final exam [60%]
- Piazza, Office hours

Put in the work

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Learning cycle

- 1 Read before class
- 2 Mindful class
- 3 Practice problems + WebWork

Advice

- Stay caught up
- Put in the hours (2 for 1)
- Online homework: don't take the easy way out.
- Mindful practice.

Mindful class time

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Abducted by an alien circus company, Professor Doyle is forced to write calculus equations in centre ring.

(Gary Larson, "The Far Side", 15/9/1992)

- Learn *ideas* not solutions.
 - Pay attention to *cues*
 - (mostly) Ignore algebra
- *Solve worksheet problems to trigger thinking.*
- **ASK QUESTIONS!!**

Getting help

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- Piazza
- Office hours: Mondays 12:30-14:00, Thursdays after class.
- Math Learning Centre
- AMS Tutoring

About me

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- Dr. Lior Silberman (Li'or Zilberman)
- Email: lior@math.ubc.ca, Office: MATH 1112.
- Work: Number Theory, Random Structures, ...

