DP Mathematics (Level 1)

Dr. CHENG, Kam Hang Henry

The Center for the Development of the Gifted and Talented,
The Hong Kong University of Science and Technology

香港科技大學
THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

Course introduction
September 9, 2023

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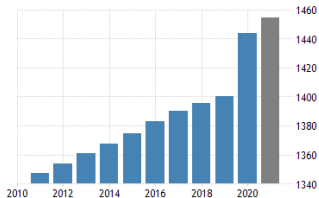- **Speed** and **distance** traveled by a moving particle

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We will study behaviors of different functions in various aspects.

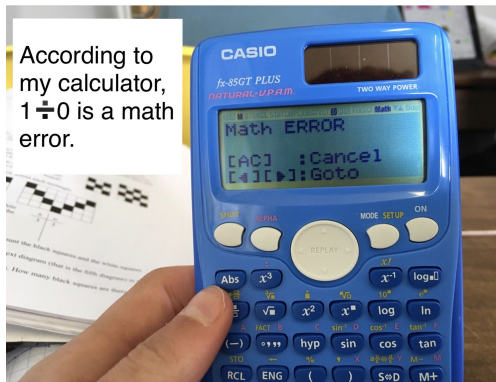## Limits and continuity of functions

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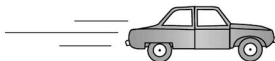
What is actually happening here?

Derivatives of functions and their applications

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We can solve the following problems after we know how to compute and how to apply **derivatives** of functions:
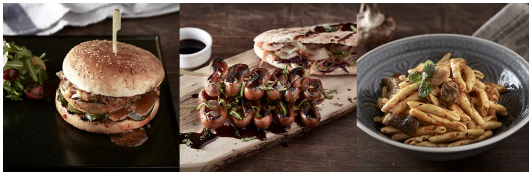
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- Without using a calculator, how do you find a solution to a **complicated equation** such as

$$x = \cos x?$$

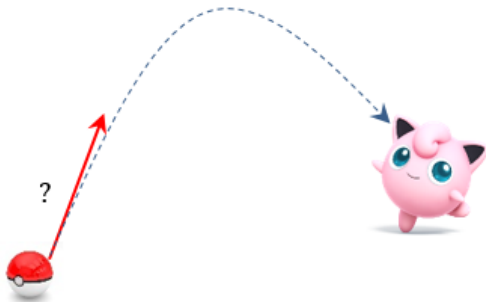　　　　　　　　　　Dr. Henry Cheng (HKUST)　　**DP Mathematics (Level 1)**

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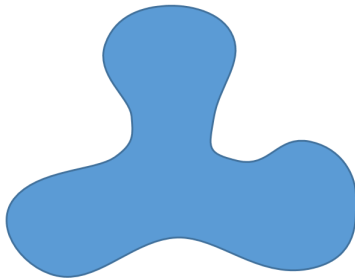
- If we know the derivative of a function, how can we **recover** the original function?
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- Why is the **area** of a circular disk of radius r given by

$$A = \pi r^2?$$

Why is the **volume** of a spherical ball of radius r given by

$$V = \frac{4\pi}{3} r^3?$$

How do we compute the **volume**, **surface area**, **length**, etc. of other geometric shapes?
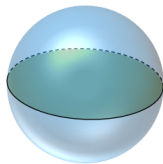
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The following are some characteristics of Mathematics (Level 1) which may distinguish it from Physics (Pre-stage):

- We focus more on **conceptual understanding** of the mathematical **theory**.

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- Some **proof-based problems** will be included.

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The main purpose of this test to better allocate students to a Mathematics course (Level 1 vs. Pre-stage) (English vs. Cantonese) that is **more suitable** for them.

- You do not need to study or prepare particularly for this test.
- Usage of calculators will not be allowed (and will not be necessary).