IB DP Maths HL AA IB1 (IB1)

📒 Summary

HL Calculus Integration `Current`

6 of 6
weeks

Subject	Year	Start date	Duration
Mathematics: analysis and approaches	IB1	Week 4, May	6 weeks

Course Part

Description

In this chapter we consider integral calculus. This involves antidifferentiation, which is the reverse process of differentiation.

📚 Inquiry & Purpose

? Inquiry / Higher Order Questions

Type	Inquiry Questions
Skills-based	Exploring numerical integration techniques such as Simpson's rule or the trapezoidal rule
Skills-based	Prove the Fundamental theorem of calculus.

🔍 Curriculum

⊕ Aims

Develop an understanding of the concepts, principles and nature of mathematics

◇ Objectives

Problem solving: Recall, select and use their knowledge of mathematical skills, results and models in both abstract and real-world contexts to solve problems.

📘 Syllabus Content

Topic 5: Calculus

SL Content

SL 5.5

Introduction to integration as anti-differentiation of functions of the form $f(x) = ax^n + bx^{n-1} + \dots$, where $n \in \mathbb{Z}, \quad n \neq -1$

Anti-differentiation with a boundary condition to determine the constant term.

Definite integrals using technology.

Area of a region enclosed by a curve $y = f(x)$ and the x-axis, where $f(x) > 0$.

SL 5.9

Kinematic problems involving displacement s, velocity v, acceleration a and total distance travelled.

SL 5.10

Indefinite integral of x^n $(n \in \mathbb{Q})$, $\sin x$, $\cos x$, $\dfrac{1}{x}$ and e^x

The composites of any of these with the linear function $ax + b$.

Integration by inspection (reverse chain rule) or by substitution for expressions of the form: $\displaystyle \int kg'(x)f(g(x))\mathrm{d}x$

SL 5.11

Definite integrals, including analytical approach.

Areas of a region enclosed by a curve $y = f(x)$ and the x-axis, where $f(x)$ can be positive or negative, without the use of technology.

Areas between curves.

AHL Content

AHL 5.15

Indefinite integrals of the derivatives of any of the above functions.

The composites of any of these with a linear function.

Use of partial fractions to rearrange the integrand.

AHL 5.16

Integration by substitution.

Integration by parts.

Repeated integration by parts.

AHL 5.17

Area of the region enclosed by a curve and the y-axis in a given interval.

Volumes of revolution about the x-axis or y-axis.

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📑 ATL Skills

🧑‍🏫 Approaches to Learning

⚙️ Thinking

- In this unit, we will

  ask students to formulate a reasoned argument to support their opinion or conclusion

  give students time to think through their answers before asking them for a response

  reward a new personal understanding, solution or approach to an issue

  ask open questions

  set students a task which required higher-order thinking skills (such as analysis or evaluation)

  build on a specific prior task

  help students to make their thinking more visible (for example, by using a strategy such as a thinking routine)

  require students to take an unfamiliar viewpoint into account when formulating arguments

  ask questions that required the use of knowledge from a different subject from the one you are teaching

  include a reflection activity

  make a link to TOK

👨‍🏫 Developing IB Learners

⭐ Learner Profile

🔍 Inquirers

📚 Knowledgeable

💡 Thinkers

💬 Communicators

🖼️ Open-minded

⛰️ Risk-takers (Courageous)

🗿 Reflective