📔 Summary

HL Algebra (Proofs, partial fractions, extension to binomial theorem)

Subject	Year	Start date	Duration
Mathematics: analysis and approaches	IB2	Week 2, September	4 weeks

Course Part

Description

Science relies on experimental evidence, Mathematics relies on logic and reasoning. A mathematical proof can include logic, calculation, or a combination of the two. We will discuss both of these during this chapter.

📚 Inquiry & Purpose

❓ Inquiry / Higher Order Questions

Type	Inquiry Questions
Debatable	Mathematics, Sense, Perception and Reason: If we can find solutions in higher dimensions can we reason that these spaces exist beyond our sense perception?
Debatable	What is the role of the mathematical community in determining the validity of a mathematical proof? Do proofs provide us with completely certain knowledge? What is the difference between the inductive method in science and proof by induction in mathema

🔎 Curriculum

⊕ Aims

Develop a curiosity and enjoyment of mathematics, and appreciate its elegance and power

◇ Objectives

Knowledge and understanding: Recall, select and use their knowledge of mathematical facts, concepts and techniques in a variety of familiar and unfamiliar contexts.

📖 Syllabus Content

Topic 1: Number and algebra

AHL Content

AHL 1.10

Extension of the binomial theorem to fractional and negative indices, ie $(a+b)^n, \quad n \in \mathbb{Q}$

AHL 1.11

Partial fractions.

AHL 1.15

Proof by contradiction.

Use of a counterexample to show that a statement is not always true.

AHL 1.16

Solutions of systems of linear equations (a maximum of three equations in three unknowns), including cases where there is a unique solution, an infinite number of solutions or no solution.

📝 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

Risk-takers (Courageous)

Reflective