📔 Summary

HL Algebra

Subject	Year	Start date	Duration
Mathematics: analysis and approaches	IB1	Week 2, October	5 weeks

Course Part

Description
Number and algebra allow us to represent patterns, show equivalencies and make generalizations which enable us to model real-world situations.

📔 Inquiry & Purpose

⑦ Inquiry / Higher Order Questions

Type	Inquiry Questions
Skills-based	students can explore the use of logarithmic scales in a variety of contexts
Debatable	Can anyone claim to have invented logarithms? (TOK)

🔎 Curriculum

⊕ Aims

Employ and refine their powers of abstraction and generalization

◇ 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 1: Number and algebra

SL Content

SL 1.1

Operations with numbers in the form $a \times 10^k$ where $1 \leq a < 10$ and k is an integer.

SL 1.2

Arithmetic sequences and series.

Use of the formulae for the nth term and the sum of the first n terms of the sequence.

Use of sigma notation for sums of arithmetic sequences.

Applications.

Analysis, interpretation and prediction where a model is not perfectly arithmetic in real life.

SL 1.3

Geometric sequences and series.

Use of the formulae for the nth term and the sum of the first n terms of the sequence.

Use of sigma notation for the sums of geometric sequences.

Applications.

SL 1.4

Financial applications of geometric sequences and series:

compound interest

annual depreciation.

SL 1.5

Laws of exponents with integer exponents.

Introduction to logarithms with base 10 and e.

Numerical evaluation of logarithms using technology.

SL 1.6

Simple deductive proof, numerical and algebraic; how to lay out a left-hand side to right-hand side (LHS to RHS) proof.

The symbols and notation for equality and identity.

SL 1.7

Laws of exponents with rational exponents.

Laws of logarithms.

$$\log_a xy = \log_a x + \log_a y$$

$$\log_a \frac{x}{y} = \log_a x - \log_a y$$

$$\log_a x^m = m \log_a x$$

for $a, \quad x, \quad y > 0$

Change of base of a logarithm.

$$\log_a x = \frac{\log_b x}{\log_b a}, \text{ for } a, \quad b, \quad x > 0$$

Solving exponential equations, including using logarithms.

SL 1.8

Sum of infinite convergent geometric sequences.

SL 1.9

The binomial theorem: expansion of $(a + b)^n, n \in \mathbb{N}$
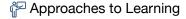
Use of Pascal's triangle and $^n\mathrm{C}_r$

AHL Content

AHL 1.15

Proof by mathematical induction.

📑 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

Deira International School

IB DP Maths HL AA IB1 (IB1)

Developing IB Learners

⭐ Learner Profile

🔍 Inquirers

📚 Knowledgeable

💡 Thinkers

🗿 Reflective