Summary

SL Chapter 3 - Linear and quadratic functions

Subject	Year	Start date	Duration
Mathematics: analysis and approaches	IB1	Week 1, October	4 weeks

Course Part

Chapter 3

Description

In this unit you will explore the concepts of linear and quadratics functions and their applications to real-life situations.

Inquiry & Purpose

Inquiry / Higher Order Questions

Type	Inquiry Questions
Skills-based	Why can completing the square be used to find a maximum or minimum?
Skills-based	Why does a quadratic have no roots when the discriminant is less than zero?

Curriculum

Aims

Communicate mathematics clearly, concisely and confidently in a variety of contexts

Objectives

Technology: Use technology accurately, appropriately and efficiently both to explore new ideas and to solve problems.

Syllabus Content

Topic 2: Functions

SL Content

SL 2.1

Different forms of the equation of a straight line. Gradient; intercepts.

Lines with gradients m_1 and m_2 Parallel lines $m_1 = m_2$. Perpendicular lines $m_1 \times m_2 = -1$.

SL 2.4

Determine key features of graphs.

Finding the point of intersection of two curves or lines using technology.

SL 2.6

The quadratic function $f(x) = ax^2 + bx + c$ its graph, y -intercept $(0, c)$. Axis of symmetry.

The form $f(x) = a(x - p)(x - q)$, x-intercepts $(p, 0)$ and $(q, 0)$.

The form $f(x) = a(x - h)^2 + k$, vertex (h, k).

SL 2.7

Solution of quadratic equations and inequalities. The quadratic formula.

The discriminant $\Delta = b^2 - 4ac$ and the nature of the roots, that is, two distinct real roots, two equal real roots, no real roots.

SL 2.10

Solving equations, both graphically and analytically.

Use of technology to solve a variety of equations, including those where there is no appropriate analytic approach.

Applications of graphing skills and solving equations that relate to real-life situations.

SL 2.11

Transformations of graphs. Translations: $y = f(x) + b; y = f(x - a)$

Reflections (in both axes): $y = -f(x); \quad y = f(-x)$

Vertical stretch with scale factor p: $y = pf(x)$

Horizontal stretch with scale factor $\frac{1}{q}$: $y = f(qx)$

Composite transformations.

ATL Skills

Approaches to Learning

Thinking

- In this unit, we will

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

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

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

IB DP IB Mathematics Analysis and approaches SL 2022 (IB1)

Developing IB Learners

Learner Profile


Inquirers


Knowledgeable


Thinkers


Reflective