

### **Deira International School**

Shah Ali, Kirsty Fairman

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



# **Summary**

# SL Chapter 5 - Differentiation

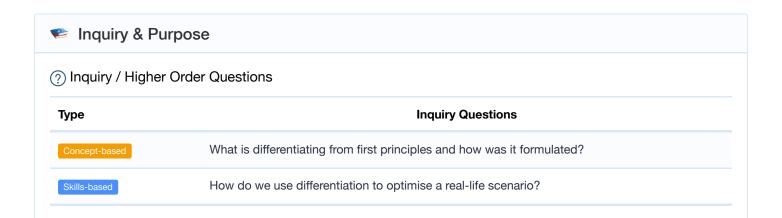
Start date Duration Subject Year Mathematics: analysis and IB1 Week 2, January 5 weeks

approaches

Course Part

#### Description

In this unit you will explore the graphical interpretation of first and second derivatives and the application of differential calculus in optimisation and kinematics.



# Curriculum

( Aims

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

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 5: Calculus**

SL Content

SL 5.1

Introduction to the concept of a limit.

Derivative interpreted as gradient function and as rate of change.



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### SL 5.2

Increasing and decreasing functions.

Graphical interpretation of f'(x) > 0, f'(x) = 0, f'(x) < 0

#### SL 5.3

Derivative of 
$$f(x)=ax^n$$
 is  $f'(x)=anx^{n-1}, n\in\mathbb{Z}$ 

The derivative of functions of the form  $f(x) = ax^n + bx^{n-1}$  ... where all exponents are integers.

### SL 5.4

Tangents and normals at a given point, and their equations.

#### SL 5.6

The chain rule for composite functions.

The product and quotient rules.

#### SL 5.7

The second derivative.

Graphical behaviour of functions, including the relationship between the graphs of f, f' and f''

#### SL 5.8

Local maximum and minimum points.

Testing for maximum and minimum.

Optimization.

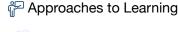
Points of inflexion with zero and non-zero gradients.

### SL 5.9

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



## ATL Skills



## 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

include a reflection activity



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