Summary

HL Matrices Current

8 of 8 weeks

Subject	Year	Start date	Duration
Mathematics: applications and interpretation	IB1	Week 2, May	8 weeks

Course Part

Description

In this unit you will learn how to manipulate matrices to: solve equations; transform shapes; find and use eigenvalues + vectors.

Inquiry & Purpose

Inquiry / Higher Order Questions

Type	Inquiry Questions
Skills-based	What is an eigervalue and its corresponding eigenvector?
Skills-based	What are the limitations for using matrices in a markov chain in a real life situation?

Curriculum

Aims

Employ and refine their powers of abstraction and generalization

Appreciate how developments in technology and mathematics influence each other

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.

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

Syllabus Content

Topic 1: Number and algebra

AHL Content

AHL 1.14

Definition of a matrix: the terms element, row, column and order for $m \times n$ matrices.

Algebra of matrices: equality; addition; subtraction; multiplication by a scalar for $m \times n$ matrices.

Multiplication of matrices. Properties of matrix multiplication:

associativity, distributivity and non-commutativity.

Identity and zero matrices.

Determinants and inverses of $n \times n$ matrices with technology, and by hand for 2×2 matrices.

Awareness that a system of linear equations can be written in the form $Ax = b$.

Solution of the systems of equations using inverse matrix.

AHL 1.15

Eigenvalues and eigenvectors.

Characteristic polynomial of 2×2 matrices.

Diagonalization of 2×2 matrices (restricted to the

case where there are distinct real eigenvalues).

Applications to powers of 2×2 matrices.

ATL Skills

Approaches to Learning

Thinking

Developing IB Learners

Learner Profile

Inquirers

Knowledgeable

Thinkers