

IB Analysis and Approaches HL Yr 1 Subject Group Overview - Semester 1

| Unit Name | Unit 1: Number and Algebra | Unit 2: Functions | Unit 3: Geometry & Trigonometry |
|-------------------------------------|--|--|--|
| Time Frame | 6 weeks | 6 weeks | 10 weeks (cont. 2nd semester) |
| Standards/ IB Topics | Topic 1: Number and Algebra SL 1.1 - 1.9; HL 1.10 - 1.16 | Topic 2: Functions SL 2.1 – 2.10; HL 2.12 – 2.16 | Topic 3: Geometry & Trigonometry SL 3.1 – 3. 8; HL 3.9 – 3.18 |
| Content Specific Information | Operations with numbers in scientific notation form Arithmetic Sequences Geometric Sequences Financial Applications of Geometric Sequences Laws of Exponents Algebraic Proofs Properties of Logs Sum of Geometric Sequences Binomial Theorem Complex Numbers – Definition, format Complex Plane Polar Form Euler Form Operations on Complex Conjugates/Roots DeMoivre’s Theorem Powers and Roots Proofs – Induction Contradiction Counterexample Systems – Solving Unique, infinite, and no solution | Linear Equations, Parallel, Perpendicular Lines Domain, Range, Inverses Graphs of Functions Key features of Graphs Composite functions Quadratic Functions Quadratic Equations & Inequalities, discriminant Rational Functions & Equations Exponential & Log Functions Solving all equations Polynomial Functions Rational Functions, Partial Fractions Odd/Even Functions Function Inverses, Domain Restrictions Solutions to $g(x) \geq f(x)$ Graphs of $y = f(x) $, $y = f(x), y = \frac{1}{f(x)},$ $y = f(ax + b), y = [f(x)]^2$ | Distance, midpoint, volume Sine, Cosine, Tangent Ratios, Sine Rule, Cosine Rule & Area of a Triangle SOH CAH TOA applications Unit Circle Sine, Cosine, Tangent in terms of unit circle, radians Trig Identities Circular Functions Solving Trig Equations Vectors – Basics, Vocabulary & Notation Operations Magnitude, Direction Scalar Product Angle b/t Vectors, Lines, Planes Vector Equations Applications Parallel, Intersecting, Coincident, Skew Lines Vector Products Trig Identities - Reciprocal Pythagorean Compound Angle Double Angle Inverse Trig Functions Relationships between functions & their graphs |

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|--|--|--|--|
| Common Assessments / Major Projects | Formative Assessments Summative Assessment – Unit 1 Test Pt. 1, Unit 1 Test Pt. 2 | Formative Assessment – Polynomial Functions Other Functions Summative Assessment – Uni 2 | Formative Assessments Summative Assessment – Unit 3 Test - Part 1 Unit 3 Test - Part 2 |
| Resources | Textbook - Mathematics: Analysis and Approaches HL (Oxford, 2019) Pearson Application and Analysis IB QuestionBank | Textbook - Mathematics: Analysis and Approaches HL (Oxford, 2019) Pearson Application and Analysis IB QuestionBank | Textbook - Mathematics: Analysis and Approaches HL (Oxford, 2019) Pearson Application and Analysis IB QuestionBank |

IB Analysis and Approaches HL Yr 1 Subject Group Overview - Semester 2

| Unit Name | Unit 4: Calculus | Unit 5: Stats and Probability | Internal Assessment |
|--|--|--|---|
| Time Frame | 8 weeks | 5 weeks | 2 weeks |
| Standards/ IB Topics | Topic 5: Calculus AA SL 5.1 - 5.9 | Topic 4: Stats and Probability SL 4.1 - 4.12 | Students will begin work to complete their Math Exploration Paper |
| Content Specific Information | Intro to the concept of a limit. Derivative as a rate of change Increasing and decreasing functions. Graphical representation of positive, negative, and zero derivatives. Power rule Equations of tangents and normals Basic derivative rules: $\sin x$, $\cos x$, e^x , $\ln x$, sum, product, quotient, chain Second derivative, graphical behavior of graphs with first and second derivatives Max/min, optimizations, points of inflection. Kinematics, PVA | Population, samples, outliers Presentation of data, box-whisker plots, histograms Measures of central tendency & dispersion, Linear Regression Probability of Events Conditional, independent, dependent probability Expected Value Binomial distribution Normal distribution | All topics. |
| Common Assessments / Major Projects | Formative Assessments Summative Assessment - Unit 4 Part 1 and Part 2 | Formative Assessments Summative Assessment Unit 5 | Internal Assessment Goal |
| Resources | Textbook – Mathematics: Analysis and Approaches HL (Oxford, 2019) Pearson Application and Analysis IB QuestionBank | Textbook – Mathematics: Analysis and Approaches HL (Oxford, 2019) Pearson Application and Analysis IB QuestionBank | |