

Curriculum overview for MATH ANALYSIS AND APPROACHES, SL, DP1, 3mn, 2026/2027

Teachers: M.Derek & J.Kos

Unit title / Month	Concept(s)	Content	Objectives / Learning outcomes	Assessment tasks	ATL skills	Sources	Links to other subjects
Unit 1: Sequences and Series (From patterns to generalisation) Ch: 1 September, October 7 weeks	Generalization, representation, modelling, equivalence, patterns, validity, systems	Topics: • Arithmetic sequences and series • Geometric sequences and series • Compound interest • The binomial theorem • Proofs Skills: • to use sigma notation • to model real-life situations using sequences • to find specific term in binomial expansion	• Knowledge and understanding • Problem solving • Communication and interpretation • Technology • Reasoning • Inquiry approach	• Progress test • Unit test • Quizzes	• Communication skills (understand, use and interpret math. notation) • Social skills (negotiate ideas) • Self-management skills (develop new skills, techniques and strategies for effective learning) • Thinking skills (draw reasonable conclusions and generalizations and test them) • Research skills (examine, select and reject sources)	• Textbooks: Oxford IB Diploma Programme Mathematics: Analysis and Approaches SL/HL; Cambridge University Press Math AA Coursebook. • Tech/Calculators: Texas Instruments TI-84 Plus CE / TI-Nspire CX II GDC for sequence simulations. • Apps/Simulations: Wolfram Alpha for binomial expansion checking; PhET Interactive Simulations	Links to other subjects: Loans and repayments (economics) International-mindedness: The properties of “Pascal’s triangle” have been known long before Pascal. Aim 8: Ethics behind borrowing/lending money. TOK: Is mathematical reasoning different from scientific reasoning/reasoning in other Areas of Knowledge?

						(Arithmetic & Geometric Patterns). • Web: IB Oxford MyiMaths digital platform; Revision Village (Sequences and Series topic bank).	
Unit 2: Representing relationships: functions Ch: 2,3 November, December, January, February 13 weeks	Representation, relationships, quantity, equivalence, systems, patterns	<u>Topics:</u> •The equation of a straight line •Domain, range and graph of a function •Composite functions •Inverse function •Identity function •The quadratic function •The reciprocal function •Rational functions •Transformations of graphs •Exponential and logarithmic functions and their graphs <u>Skills:</u> •to graph a function; •to find the point of intersection using technology and without it when possible	•Knowledge and understanding •Problem solving •Communication and interpretation •Technology •Reasoning •Inquiry approach	•Progress test •Unit test •Quizzes •Semester exam	•Communication skills (use graphs to understand relationships) •Social-collaboration (work collaboratively in teams) •Self-management-organisation skills (bring necessary equipment and supplies: GDC) •Thinking-critical thinking skills (use models and simulations to explore complex systems and issue) •Research skills (citation and referencing skills)	• Dynamic Geometry: GeoGebra Graphing Calculator • Textbooks: Haese Mathematics for IB Diploma Programme: Analysis and Approaches SL/HL. • Visual Apps: Desmos Graphing Calculator • Simulations: PhET 'Graphing Quadratics' and 'Function Finder' interactive simulations. • Web: Khan	Links to other subjects: demand and supply curves (economics); graphical analysis (sciences); kinematics, projectile motion, radioactive decay, (physics); reactions and activation energy (chemistry); growth curves (biology). International-mindedness: The development of functions by Descartes (France), Leibnitz (Germany), Euler (Switzerland) Aim 8: Is misleading use of “exponential growth” when used popularly?

		•to solve equations and inequalities both graphically and analytically				Academy (Advanced Functions module)	TOK: What role do “models” play in mathematics?
Unit 3: Measuring change: differentiation Ch: 4 March, April, May 10 weeks	Change, patterns, relationships, approximation, generalization, modelling, systems, quantity	Topics: •Derivative interpreted as gradient function and as rate of change •Tangents and normal •Rules of differentiation: sum, product, quotient, chain •Increasing and decreasing functions •Local maximum and minimum points •The second derivative Skills: •To find equations of tangents and normals •To test for maximum/minimum. •To find stationary points	•Knowledge and understanding •Problem solving •Communication and interpretation •Technology •Reasoning •Inquiry approach	•Progress test •Unit test •Quizzes	•Communication skills (adopt strategies appropriate for different situations) •Social-collaboration (work collaboratively) •Organization skills (managing time and tasks effectively) •Thinking skills (apply skills in unfamiliar situations) •Research skills (present and communicate resulting work)	• Dynamic Geometry: GeoGebra Calculus Suite • Textbooks: Hodder Education Mathematics for the IB Diploma: Analysis and Approaches. • Apps/Software: Desmos Calculus Tools (visualizing local maxima, minima, inflection points, and tangent slopes); Geometers' Sketchpad • Video: 3Blue1Brown 'Essence of Calculus'	Links to other subjects: Marginal cost, revenue, profit, (economics); Instantaneous velocity kinematics (physics); interpreting the gradient of a curve (chemistry) International-mindedness: Indian mathematicians attempted to explain division by zero. TOK: Is infinitesimal behaviour applicable to real life? Is intuition a valid way of knowing in mathematics?
Unit 4: Relationships in space: geometry and trigonometry Ch: 6	Generalization, space, relationships, equivalence, representation, quantity	Topics: •The relationship between trig. ratios •The distance and midpoint in 3D •Volume and surface area	•Knowledge and understanding •Problem solving •Communication and interpretation •Technology	•Progress test •Unit test •Quizzes •Year exam	•Communication skills (formulate arguments in a convincing manner and take full account of other viewpoints)	• Dynamic Geometry: GeoGebra 3D Calculator • Apps/Visual tools: Desmos	Links to other subjects: Design technology; volumes of stars and inverse square law, (physics)

May, June 3 weeks		•The sine and cosine rule Skills: •To solve the ambiguous case for sine rule •To apply trigonometry	•Reasoning •Inquiry approach		•Social-collaboration (work collaboratively in teams during group work) •Organization skills (managing time and tasks effectively) •Research skills (comparing, contrasting and validating information)	Geometry Tool for 2D circle geometry • Textbooks: Pearson Baccalaureate Higher Level/Standard Level Mathematics: Analysis and Approaches. • Simulations: Wolfram Demonstrations Project ('Unit Circle and Trigonometric Functions' simulation). • Web: InThinking IB Maths AA	International-mindedness: Why are there 360 degrees in a complete turn? Links to Babylonian mathematics. TOK: Which is a better measure of angle: radian or degree? What criteria can/do/should mathematicians use to make such decisions?
End of Year 1: Revision and Year Exam June 2 weeks	Representation, Evaluation, Quantity	Syllabus	•Knowledge and understanding •Problem solving •Communication and interpretation •Reasoning •	•Mock (Year) exam	•Self-management-organisation skills •Thinking-critical thinking skills •Communication skills •Social-collaboration (organize learning groups)		

Curriculum overview for MATHEMATICS ANALYSIS AND APPROACHES, SL, DP2, 4mn, 2026/2027

Teachers: D.Dugi Jaguš & J.Kos

Unit title / Month	Concept(s)	Content	Objectives/ Learning outcomes	Assessment tasks	ATL skills	Sources	Links to other subjects
Unit 5: Trigonometry September, October (8 weeks)	Generalization, space, relationships, equivalence, representation, quantity	Topics: - The circle: radians, length of an arc, area of a sector. - The unit circle and trigonometric functions - Trigonometric equations - Trigonometric equations - Double angle identities - Inverse trigonometric functions - Relationships between trigonometric functions and the symmetry properties of their graphs Skills: - To apply trigonometry - To determine amplitude and period of trig.fun - To solve trigonometric equations in a finite interval- graphically and analytically	- Knowledge and understanding - Problem solving - Communication and interpretation - Technology - Reasoning - Inquiry approach	- Progress test - Unit test - Quizz	- Communication skills (formulate arguments in a convincing manner and take full account of other viewpoints) - Social-collaboration (work collaboratively in teams during group work) - Organization skills (managing time and tasks effectively) - Research skills (comparing, contrasting and validating information)	- GeoGebra Trigonometric Functions Suite - Desmos Unit Circle Visualizer - Texas Instruments (TI-84 Plus / TI-Nspire) - Oxford / Haese IB Diploma Mathematics AA SL Textbooks	Links to other subjects: Design technology; volumes of stars and inverse square law, vectors, forces (physics) International-mindedness: Why are there 360 degrees in a complete turn? Links to Babylonian mathematics. TOK: Which is a better measure of angle: radian or degree? What criteria can/do/should mathematicians use to make such decisions?

		• To apply Pythagorean identities on trig.fun • To determine domain and range of trig. Functions and inverse trigonometric functions					
Internal Assessment October (2 weeks)	Representatio n, modelling, patterns, evaluation	Topics: Within syllabus or extensions of syllabus	•Knowledge and understanding •Problem solving •Communication and interpretation •Technology	Internal assesment	•Self-management-organisation skills •Research skills •Information literacy •Communication skills •Mathematical presentation •Personal engagement •Reflection skills Use of mathematics	• IBO Teacher Support Material (TSM) - Sample Math IA explorations with official examiner grading and feedback • GeoGebra & Desmos (For mathematical modeling, curve fitting, and data visualization tools) • WolframAlpha	Applications, technology, moral, social and ethical implications, the international dimension

Unit 6: Statistics and Probability November, December (7 weeks)	Representatio n, relationships, quantity, approximation, generalization	<u>Topics:</u> • Concepts of trial, outcome, equally likely outcomes, sample space, event • The probability of an event • The complementary events • Independent events • Combined events • Conditional probability • Probabilities with and without replacement <u>Skills:</u> • To use Venn diagrams, tree diagrams and tables of outcomes • To use experiments with coins, dice, cards to enhance understanding of the distinction between (experimental) relative frequency and (theoretical) probability	• Knowledge and understanding • Problem solving • Communication and interpretation • Technology • Reasoning • Inquiry approach	• Progress test • Unit test • Quizz	• Communication skills (understand, use and interpret math.notation) • Thinking-critical thinking skills (use models and simulations to explore issues: applying in real-life contexts, recognize and evaluate propositions for general laws, draw reasonable conclusions and generalizations and test them: evaluate evidence and arguments	• Web: https://www.mathwarehouse.com/monty-hall-simulation-online/ • GeoGebra Probability Calculator • Revision Village IB Questionbank for Statistics and Probability	Aim 8 c(moral, social and ethical implications): The gambling issue: use of probability in casinos. Could or should mathematics help increase incomes in gambling? Appl: Use of probability methods in medical studies to assess risk factors for a disease TOK: Mathematics and knowledge claims. Is independence as defined in probabilistic terms the same as that found in normal experience?
Unit 7: Further Calculus January, February	Change, patterns, relationships, approximation, generalization, modelling,	<u>Topics:</u> • Optimization problems • Indefinite integral, anti-differentiation • Integration by substitution • Definite integrals • Area under a curve	• Knowledge and understanding • Problem solving • Communication and interpretation	• Progress tests • Unit test • Quizzes • Semester exam	• Communication skills (use and interpret discipline-specific terms and symbols; • Social-collaboration	• GeoGebra Calculus Suite • GDC Graphing Simulations (Step-by-step TI-84 Plus / TI-	Appl: Economics 1.5 (marginal cost, marginal revenue, marginal profit) International-mindedness: How the Greeks distrust of zero

(7 weeks)	systems, quantity	• Kinematics Skills: • To find primitive functions • To find the area between curves, algebraically/ GDC • To solve kinematics problems	• Technology • Reasoning • Inquiry approach		(work collaboratively) • Self-management-organisation skills (bring necessary equipment to class; GDC) • Reflection (identify strengths and weaknesses of personal learning strategies) • Research • Information literacy (use memory techniques to develop long term memory - rules for differentiation and integration) • Thinking-critical thinking skills (Identify obstacles and challenges) • Thinking-research (make connections)	Nspire • 3Blue1Brown 'Essence of Calculus' YouTube series (Visualizing integration and optimization for advanced concept intuition)	meant that Archimedes' work did not lead to calculus. TOK: What does the dispute between Newton and Leibnitz tell us about human emotion and mathematical discovery? TOK: What value does the knowledge of limits have? Is infinitesimal behaviour applicable to real life? Appl: Physics (kinematics) Appl: profit
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					between subject groups and disciplines)		
Internal Assessment February (2 weeks)	Representatio n, modelling, patterns, evaluation	Topics: Within syllabus or extensions of syllabus	•Knowledge and understanding •Problem solving •Communicatio n and interpretation •Technology	Internal assesment	•Self-management-organisation skills •Research skills •Information literacy •Communication skills •Mathematical presentation •Personal engagement •Reflection skills •Use of mathematics	• InThinking Mathematics IB Guide (Criteria checklists, structural layout strategies, and self-assessment rubrics for students) • Desmos Regression Tools	Applications, technology, moral, social and ethical implications, the international dimension
Unit 8: Probability Distributions March 4 weeks	Generalization, representation , modelling, equivalence, patterns, quantity validity	Topics: •Concept of discrete and continuous random variables and their probability distributions •Expectation, mode, median and standard deviation •Binomial distribution, its mean and variance •Normal distribution •Properties of the normal distribution	•Knowledge and understanding •Problem solving •Communicatio n and interpretation •Technology •Reasoning •Inquiry approach	•Progress test •Unit test •Quizz	•Thinking-critical thinking skills (use models and simulations to explore complex issues •Social-collaboration •Thinking-research (make connections between disciplines,	• GeoGebra Probability Calculator • Texas Instruments GDC Probability Distribution Apps (binompdf, binomcdf, normalpdf, normalcdf,	Appl: Psychology, Biology (statistical analysis). Aim 8(moral, social and ethical implications): Why might the misuse of the normal distribution lead to dangerous inferences and conclusions? TOK: Mathematics and the real world. Is the

		•Standardization of normal variables <u>Skills:</u> •To recognise and use appropriate probability density functions in real-life situations •To apply normal distribution on different problems			psychology, economy) •Communication- the ability to formulate one's arguments, in speaking or writing, in a convincing manner	and invNorm programming routines) • Haese Mathematics Core Exam Prep Smart Quizzes	binomial distribution ever a useful model for an actual real-world situation Appl: Expected gain to insurance companies.
Course review April (2 weeks)	Representatio n, Evaluation, Quantity	Syllabus	•Knowledge and understanding •Problem solving •Communication and interpretation •Reasoning	Mock exam	•Self-management- organisation skills •Thinking-critical thinking skills •Communication skills •Social-collaboration (organize learning groups)	• Revision Village (Full-length IB Mathematics AA SL Mock Examination Papers and video markschemes) • InThinking IB Mathematics Assessment Banks (Paper 1 and Paper 2 conditional question sets) • Official IBO Mathematics Analysis and Approaches Formula Booklet	

Curriculum overview for MATHEMATICS ANALYSIS AND APPROACHES, HL, DP1, 3mn, 2026/2027

Teacher: D.Dugi Jagušt

Unit title / Month	Key concept(s)	Content	Objectives / Learning outcomes	Assessment tasks	ATL skills	Sources	Links to other subjects
First semester: 7.9.2026.- 23.12.2026. Course introduction, initial assessment, use of GDC 1 week Unit 1: From patterns to generalization Ch: 1 September, October 8 weeks	Generalization, representation, modelling, equivalence, patterns, validity, systems	<u>Topics:</u> - Arithmetic sequences and series - Geometric sequences and series - Compound interest - The binomial theorem - Counting principles - Permutations and combinations - Partial fractions - Complex numbers in Cartesian form - Principle of mathematical induction <u>Skills:</u>	- Knowledge and understanding - Problem solving - Communication and interpretation - Technology - Reasoning - Inquiry approach	- Progress test - Unit test - Quizzes	- Communication skills (understand, use and interpret math. notation) - Social skills (negotiate ideas) - Self-management skills (develop new skills, techniques and strategies for effective learning) - Thinking skills (draw reasonable conclusions and generalizations and test them)	- Oxford IB diploma programme: Mathematics High Level: Analysis and approaches- - Formula Booklet- - Graphic Calculator: TI 84-CE Plus - past papers - The IB Question bank	Links to other subjects: Loans and repayments (economics) International-mindedness: The properties of “Pascal’s triangle” have been known in a number of different cultures long before Pascal. Aim 8: Ethics behind borrowing/lending money. TOK: Is mathematical reasoning different from scientific reasoning/reasoning in other Areas of Knowledge? Is it possible to know about things of which we can have

		• to use sigma notation • to model real-life situations using sequences • to find specific term in binomial expansion • to perform operations with complex numbers			• Research skills (examine, select and reject sources)		no experience (infinity)?
Unit 2: Representing relationships: functions Ch: 2,3 November, December, 9 weeks Semester exam 1 week	Representation, relationships, quantity, equivalence, systems, patterns	Topics: • The equation of a straight line • Domain, range and graph of a function • Composite functions • Inverse function • Identity function • The quadratic function • The reciprocal function • Rational functions	• Knowledge and understanding • Problem solving • Communication and interpretation • Technology • Reasoning • Inquiry approach	• Progress test • Unit test • Quizzes • Semester exam	• Communication skills (use graphs to understand relationships) • Social-collaboration (work collaboratively in teams) • Self-management-organisation skills (bring necessary equipment and supplies: GDC)	• Oxford IB diploma programme: Mathematics High Level: Analysis and approaches- • Formula Booklet- • Graphic Calculator: TI 84-CE Plus • past papers • Desmos • The IB Question bank • IA guide for students	Links to other subjects: demand and supply curves (economics); graphical analysis (sciences); kinematics, projectile motion, radioactive decay, (physics); reactions and activation energy (chemistry); growth curves (biology). International-mindedness: The development of functions by

		• Absolute value functions • Polynomial functions • The factor and remainder theorems. • Sum and product of the roots of polynomial equations • Odd and even functions • Exponential and logarithmic functions and their graphs • Transformations of graphs. <u>Skills:</u> • to graph a function; • to find the point of intersection using technology. • to solve equations and inequalities both			• Thinking-critical thinking skills (use models and simulations to explore complex systems and issue) • Research skills (citation and referencing skills)		Descartes (France), Leibnitz (Germany), Euler (Switzerland) Aim 8: Is misleading use of “exponential growth” when used popularly? TOK: What role do “models” play in mathematics?
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		graphically and analytically					
Second semester 7.1.2027.- 15.6.2027. Unit 3: Measuring change: differentiation Ch: 4 January, February, March 7 weeks	Change, patterns, relationships, approximation, generalization, modelling, systems, quantity	Topics: • Concepts of a limit, continuity and differentiability of a function at a point • Derivative interpreted as gradient function and as rate of change • Tangents and normal • Rules of differentiation: sum, product, quotient, chain • Increasing and decreasing functions • Local maximum and minimum points • The second derivative Skills:	• Knowledge and understanding • Problem solving • Communication and interpretation • Technology • Reasoning • Inquiry approach	• Progress test • Unit test • Quizzes	• Communication skills (adopt strategies appropriate for different situations) • Social-collaboration (work collaboratively) • Organization skills (managing time and tasks effectively) • Thinking skills (apply skills in unfamiliar situations) • Research skills (present and communicate resulting work)	• Oxford IB diploma programme: Mathematics High Level: Analysis and approaches- • Formula Booklet- • Graphic Calculator: TI 84-CE Plus • past papers • Desmos • Geogebra applets • The IB Question bank	Links to other subjects: Marginal cost, revenue, profit, (economics); Instantaneous velocity kinematics (physics); interpreting the gradient of a curve (chemistry) International-mindedness: Indian mathematicians attempted to explain division by zero. TOK: Is infinitesimal behaviour applicable to real life? Is intuition a valid way of knowing in mathematics?

		• To find derivative from the first principles • To find equations of tangents and normals • To test for maximum and minimum. • To optimize • To find stationary points					
Unit 4: Relationships in space: geometry and trigonometry Ch: 6 April, May, June 8 weeks End of the year Mock exam 1 week	Generalization, space, relationships, equivalence, representation, quantity	Topics: • The distance and midpoint in 3D • Volume and surface area • The angle between lines/planes • The sine and cosine rule • The circle: radians, length of an arc, area of a sector. • The unit circle and	• Knowledge and understanding • Problem solving • Communication and interpretation • Technology • Reasoning • Inquiry approach	• Progress test • Unit test • Quizzes • Year exam	• Communication skills (formulate arguments in a convincing manner and take full account of other viewpoints) • Social-collaboration (work collaboratively in teams during group work)	• Oxford IB diploma programme: Mathematics High Level: Analysis and approaches- • Formula Booklet- • Graphic Calculator: TI 84-CE Plus • past papers • Desmos • Geogebra applets • The IB Question bank - Past mocks	Links to other subjects: Design technology; volumes of stars and inverse square law, vectors, forces (physics) International-mindedness: Why are there 360 degrees in a complete turn? Links to Babylonian mathematics. TOK: Which is a better measure of

		trigonometric functions • Trigonometric equations • Reciprocal trigonometric ratios; the inverse trigonometric functions • Compound angle identities • Relationships between trigonometric functions and the symmetry properties of their graphs <u>Skills:</u> • To solve the ambiguous case for sine rule • To apply trigonometry • To determine amplitude and period of trigonometric functions			• Organization skills (managing time and tasks effectively) • Research skills (comparing, contrasting and validating information)		angle: radian or degree? What criteria can/do/should mathematicians use to make such decisions?
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		• To solve trigonometric equations in a finite interval-graphically and analytically • To apply Pythagorean identities on trig.fun • To determine domain and range of inverse and reciprocal trigonometric functions					
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Curriculum overview for MATHEMATICS ANALYSIS AND APPROACHES, HL, DP2, 4mn, 2026/2027

Teacher: M.Derek

Unit title / Month	Key concept(s)	Content	Objectives / Learning outcomes	Assessment tasks	ATL skills	Sources	Links to other subjects
First semester: 7.9.2026.-23.12.2026. Unit 1: Relationships in space: geometry and trigonometry CH 4: Ch: 6 September October 5 weeks	Generalization, space, relationships, equivalence, representation, quantity	Topics: - Trigonometric equations - Reciprocal trigonometric ratios; the inverse trigonometric functions - Compound angle identities - Relationships between trigonometric functions and the symmetry properties of their graphs - Derivatives of trigonometric functions Skills: - To apply trigonometry - To solve trigonometric equations in a finite	- Knowledge and understanding - Problem solving - Communication and interpretation - Technology - Reasoning - Inquiry approach	- Progress test - Unit test - Quizzes	- Communication skills (understand, use and interpret math. notation) - Social skills (negotiate ideas) - Self-management skills (develop new skills, techniques and strategies for effective learning) - Thinking skills (draw reasonable conclusions and generalizations and test them) - Research skills (examine,	- Oxford IB diploma programme: Mathematics High Level: Analysis and approaches- - Formula Booklet- - Graphic Calculator: TI 84-CE Plus - past papers - Desmos - The IB Question bank	Links to other subjects: Vectors, forces, kinematics, optimization problems (physics) International-mindedness: Why are there 360 degrees in a complete turn? Links to Babylonian mathematics. TOK: Which is a better measure of angle: radian or degree? What criteria can/do/should mathematicians use to make such decisions?

		interval- graphically and analytically To apply trig.fun. derivatives in modelling problems			select and reject sources)		
IA Introduction 1 week October	Representation, modelling, patterns, evaluation	Topics: Within syllabus or extensions of syllabus	- Knowledge and understanding - Problem solving - Communication and interpretation - Technology	Internal assessment	- Self-management-organization skills - Research skills - Information literacy - Communication skills - Mathematical presentation - Personal engagement - Reflection skills - Use of mathematics	- IBO Teacher Support Material (TSM) - Sample Math IA explorations with official examiner grading and feedback - GeoGebra & Desmos (For mathematical modeling, curve fitting, and data visualization tools) - WolframAlpha	Applications, technology, moral, social and ethical implications, the international dimension
Unit 2: Number and algebra, Functions Ch: 10 October, November	Generalization, representation, modelling, equivalence, patterns, quantity, validity relationships, space, quantity, systems	Topics: Extension of the number system; Cartesian and geometric representations; conjugate, modulus and argument; Argand diagram.	- Knowledge and understanding - Problem solving - Communication and interpretation - Technology - Reasoning	- Progress test - Unit test - Quizzes - Semester exam	- Communication skills (use graphs to understand relationships) - Social collaboration (work collaboratively in teams)	- Oxford IB diploma programme: Matheamtics High Level: Analysis and approaches- - Formula Booklet-	Appl: Physics, Computer graphics, Mathematics TOK: How does changing the representation of a mathematical object

3 weeks		Trigonometric form of complex numbers: • Polar and Euler representations; modulus and argument; conversion between representations; geometric interpretation of operations; De Moivre's theorem; powers and roots. • Polynomials • Remainder theorem Skills: • To find cartesian/polar form of a complex number • To apply De'Moivre theorem and its consequences	• Inquiry approach		• Self-management-organization skills (bring necessary equipment and supplies: GDC) • Thinking-critical thinking skills (use models and simulations to explore complex systems and issue) • Research skills (citation and referencing skills)	• Graphic Calculator: TI 84-CE Plus • past papers • Desmos • The IB Question bank • IA guide for students	(Cartesian, polar or exponential form) affect our understanding of it? How has extending the concept of number enabled mathematicians to solve equations that were previously considered unsolvable?
Unit 3: Calculus Ch: 8 Ch: 6 November, December, January	Change, patterns, relationships, approximation, generalization, modelling, systems, quantity	Topics: • Areas and volumes • Kinematics • L'Hôpital's rule • Optimization problems • Indefinite integral, anti-differentiation Integr	• Knowledge and understanding • Problem solving • Communication and interpretation	• Progress test • Unit test • Quizzes	• Communication skills (use graphs to understand relationships) • Social collaboration (work	• Oxford IB diploma programme: Mathematics High Level: Analysis and approaches- • Formula Booklet-	Appl: Economics (theory of the firm); Chemistry (graphical techniques), Physics (kinematics) TOK: The nature of mathematics.

8 weeks		ation by substitution and by parts • Definite integrals • Area under a curve • Kinematics • Volumes of solids • ODE • Separation of variables • Substitution • Integrating factor • Euler's numerical solution • L'Hôpital's rule • Maclaurin series Skills: • To apply derivatives to solve modelling problems • To find antiderivative using separations of variables, integration by substitution and integration by parts. • To find volumes of revolution • To solve kinematics problems • To find area between two curves • To recognize and solve ODEs	• Technology • Reasoning • Inquiry approach •		collaboratively in teams) • Self-management-organization skills (bring necessary equipment and supplies: GDC) • Thinking-critical thinking skills (use models and simulations to explore complex systems and issue) • Research skills (citation and referencing skills)	• Graphic Calculator: TI 84-CE Plus • past papers • Desmos • The IB Question bank • IA guide for students • Old Paper 3 examples.	Does the fact that Leibniz and Newton came across the calculus at similar times support the argument that mathematics exists prior to its discovery? International-mindedness: How the Greeks distrust of zero meant that Archimedes' work did not lead to calculus. TOK: Mathematics and the knower. What does the dispute between Newton and Leibnitz tell us about human emotion and mathematical discovery?
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		- To find numerical solutions of ODE using Euler's method - Apply L'Hôpital's rule - Find Maclaurin series					
Second semester 7.1.2027.- 15.6.2027. Unit 4: Statistics and Probability Ch: 5 January, February 5 weeks	Representation, relationships, quantity, approximation, generalization, comparisons	Topics: - Independent events; - Combined events - Conditional probability - Bayes' Formula - Concept of discrete and continuous random variables and their probability distributions - Expectation, mode, median and standard deviation - Binomial distribution, its mean and variance - Poisson distribution, its mean and variance - Normal distribution - Properties of the normal distribution - Standardization of normal variables Skills:	- Knowledge and understanding - Problem solving - Communication and interpretation - Technology - Reasoning - Inquiry approach	- Progress test - Unit test - Quizzes	- Communication skills (adopt strategies appropriate for different situations) - Social collaboration (work collaboratively) - Organization skills (managing time and tasks effectively) - Thinking skills (apply skills in unfamiliar situations) - Research skills (present and communicate resulting work)	- Oxford IB diploma programme: Mathematics High Level: Analysis and approaches- - Formula Booklet- - Graphic Calculator: TI 84-CE Plus - Past papers - Desmos - The IB Question bank - IA guide for students	Appl: Use of probability methods in medical studies to assess risk factors for certain diseases. TOK: Mathematics and knowledge claims. Is independence as defined in probabilistic terms the same as that found in normal experience? Appl: Psychology, Biology (statistical analysis). Aim 8(moral, social and ethical implications):

		• To use Venn diagrams, tree diagrams and tables of outcomes • To apply Bayes formula on real life situations • To recognize and use appropriate probability density functions in real-life situations • To apply normal distribution on different problems					Why might the misuse of the normal distribution lead to dangerous inferences and conclusions? TOK: Mathematics and the real world. Is the binomial distribution ever a useful model for an actual real-world situation. Mathematics and knowledge claims. To what extent can we trust mathematical models such as normal distribution? Appl: Expected gain to insurance companies.
IA feedback and submission	Representation, modelling, patterns,	Topics:	• Knowledge and understanding	• Internal assesment	• Self-management-organisation skills • Research skills	• InThinking Mathematics IB Guide (Criteria checklists,	Applications, technology,

1 week	evaluation	Within syllabus or extensions of syllabus	• Problem solving • Communication and interpretation • Technology		• Information literacy • Communication skills • Mathematical presentation • Personal engagement • Reflection skills • Use of mathematics	structural layout strategies, and self-assessment rubrics for students) • Desmos Regression Tools	moral, social and ethical implications, the international dimension
Unit 5: Vectors Ch: 9 March 3 weeks	Generalization, space, relationships, equivalence, representation, quantity	Topics: • Concept of a vector • Operations with vectors • Scalar and vector product of two vectors • Vector equation of a line and a plane • Coincident, parallel, intersecting and skew lines • Points of intersection of lines and planes • Angle between a line and a plane, two planes Skills: • To find unit vectors, magnitude and position vectors	• Knowledge and understanding • Problem solving • Communication and interpretation • Technology • Reasoning • Inquiry approach	• Progress test • Unit test • Quizzes • Year exam	• Communication skills (formulate arguments in a convincing manner and take full account of other viewpoints) • Social collaboration (work collaboratively in teams during group work) • Organization skills (managing time and tasks effectively)	• Oxford IB diploma programme: Mathematics High Level: Analysis and approaches- • Formula Booklet- • Graphic Calculator: TI 84-CE Plus • past papers • Desmos • The IB Question bank • Geogebra	Appl: Physics TOK: The nature of mathematics. Why this definition of scalar product? Appl: Modelling linear motion in three dimensions; Navigational devices (GPS) TOK: The nature of mathematics. Why might it be argued that vector representation of lines is superior to Cartesian?

Revision and End of the year Mock exam 2 weeks		graphically and in coordinate form - To find the angle between two vectors, perpendicular and parallel vectors - To transform from parametric to Cartesian form of line - To find the angle between two lines - To apply vectors on finding areas of triangles and parallelograms - To geometrically interpret the solutions			Research skills (comparing, contrasting and validating information)		TOK: Why are symbolic representations of three-dimensional objects easier to deal with than visual representations?
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Mathematics AA, ATL Skills, TOK, CAS and International-mindedness

Through the study of mathematics, students develop critical thinking, problem-solving, communication, research and self-management skills. The course promotes international-mindedness through exploration of the historical and cultural development of mathematical ideas across civilizations and through consideration of global applications of mathematics. Connections with TOK encourage reflection on the nature of mathematical knowledge, proof, modelling and certainty. Opportunities for CAS may arise through the application of mathematics to authentic community issues, statistical investigations and interdisciplinary projects. Academic integrity underpins all learning through responsible use of technology, ethical conduct in mathematical investigations, and appropriate acknowledgement of sources. The course also supports the development of IB Learner Profile attributes, particularly Thinkers, Inquirers, Reflective, Principled and Open-minded learners.