

	Applications and Interpretation	Analysis and Approaches
Topic 1: Number and Algebra	<ul style="list-style-type: none"> - Scientific notation. - Arithmetic sequences and series – nth term, sum of, sigma notation, applications, analysis, interpretation and prediction. - Geometric sequences and series – nth term, sum of sigma notation, applications. - Financial applications of geometric – compound interest, annual depreciation. - Exponent laws (integer exponents). - Logarithms base 10 and e, numerical evaluations of logarithms. 	
	<ul style="list-style-type: none"> - Sig Fig, decimal places, bounds, percentage errors, estimation. - Amortization and annuities using tech. - Tech for 3 variables, polynomial equations. 	<ul style="list-style-type: none"> - Simple deductive proof, numerical and algebraic. - Equality and identity. - Laws of logarithms, change of base law, solving exponential equations. - Sum of infinitive convergent sequences. - Binomial theorem and Pascal.
Topic 2: Functions	<ul style="list-style-type: none"> - Equation of straight line, gradients intercepts, gradients, parallel and perpendicular lines. - Functions, domain, range, notation, inverse functions, reflection in $y=x$, mathematical models. - Graph of function, sketch from info given, tech to graph functions, key features of graphs, intersection of 2 graphs using tech. 	
	<ul style="list-style-type: none"> - Modelling with – - Linear models - Quadratic models – intercepts, roots, vertex, axis of symmetry - Exponential growth and decay, asymptotes - Direct/inverse variation, asymptotes - Cubic models - Sinusoidal models. - Modelling skills – create, fit and use models and graphs. Develop models, context, domain for model, parameter of model, test and reflect, use model to 	<ul style="list-style-type: none"> - Composite functions, identity functions, reversing inverse. - Quadratic function – all forms and properties. - Solving quadratics and inequalities. - Quad formula and discriminant. - Reciprocal function, rational functions, asymptotes. - Exponential functions, logarithmic functions and graphs. - Solving equations – graphically, analytically, using tech. - Applications. - Transformations of graphs and composite transf.

	interpret and read then make predictions.	
Topic 3: Geometry and Trigonometry	<ul style="list-style-type: none"> - Distance between two points in 3D space, and midpoint. - Volume and surface area of 3D solids. - Circle, length of arc, area of a sector. - Angle between two intersecting lines. Angles of elevation and depression, construction of labelled diags. - Pythagoras, SOH CAH TOA, Sine and Cosine rule, area of a triangle, non-right-angled trig. 	
	<ul style="list-style-type: none"> - Perpendicular bisectors. - Voronoi diagrams: vertices, edges, cells. - Applications of 'toxic waste dump' problem. 	<ul style="list-style-type: none"> - Radian measure. - Definition of cos, sin on unit circle. - Tan as sin/cos - Exact values of trig ratios (pi/6 etc) - Extension of sine rule to ambiguous case. - Double angle identities, relationship between trig ratios. - Circular functions sin, cos, tan – period, amplitude, graphs etc. - Transformations of trig graphs. - Real life contexts. - Solving trig equations in finite interval. - Equations leading to quad equations in sin, cos, tan.
Topic 4: Stats and Probability	<ul style="list-style-type: none"> - Population, sample, random, discrete, continuous, bias, reliability, outliers, sampling techniques and effectiveness. - Presentation of data, frequency distributions, histograms, cumulative frequency graphs, median, quartiles, percentiles, range, IQR. - Box and whisker diagrams and understanding. - Measures of central tendency, estimation of mean, modal class, dispersion (standard deviation, variance, IQR). - Effects of constant changes on data, quartiles of discrete data. - Linear correlation, Pearson's correlation. - Scatter diagrams, lines of best fit, passing through mean point. 	

	<ul style="list-style-type: none"> - Equation of regression line, using to predict, interpret meaning of a and b in regression equation. - Concepts of trial, outcome, equally likely outcomes, relative frequency, sample space, event. - Probability of an event, complementary events, expected number of events. - Use of Venn diagrams, tree diagrams, sample space diagrams, tables of outcomes. - Combined events, mutually exclusive events, conditional probability, independent events. - Discrete random variables, probability distributions, expected value (mean) discrete data. Applications. - Binomial Distribution, mean and variance. - Normal distribution and curve, properties of distribution, normal probability, inverse normal. 	
	<ul style="list-style-type: none"> - Spearman's Rank correlation. - Appropriateness and limitations of Pearson's and Spearman's and effect of outliers on each. - Null and alternative hypotheses, significance levels, p-value, expected and observed, chi-squared independence test. - Chi-squared goodness of fit. - T-test, p-value to compare populations. One-tailed and two-tailed tests. 	<ul style="list-style-type: none"> - Regression line x on y. Equation for prediction. - Formula for probabilities. - Standardization of normal variables (z-values), inverse where mean and s.d. are unknown.
Topic 5: Calculus	<ul style="list-style-type: none"> - Introducing limits, derivative interpreted as gradient function and as rate of change. - Increasing and decreasing functions, graphical representation of gradient >0, $=0$, <0. - Derivative where all exponents integers. - Tangents and normal at given point, and their equations. - Integration introduction as anti-differentiation. - Integration to find constant term (c). - Definite integrals using technology. Area of a region enclosed by curve and x axis. 	
	<ul style="list-style-type: none"> - Values of x where gradient is 0. Finding solution where $f'(x)=0$. Local max and min points. - Optimisation in context. 	<ul style="list-style-type: none"> - Derivative of trig and logs (sum and multiples of these). - Chain, product and quotient rules. - Second derivative, graphical functions, relationship between function, der and sec der.

	<ul style="list-style-type: none">- Approximating areas using trapezoidal rule.	<ul style="list-style-type: none">- Local max and min point, testing for these.- Optimisation.- Points of inflexion with zero and non-zero gradients.- Kinematic problems involving s, v, a and total distance travelled.- Indefinite integrals (including trig).- Integration by inspection.- Integration by substitution.- Definite integrals, including analytical approach.- Areas of region enclosed by curve, x-axis and between curves. Can be positive or negative.
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green is IB1, yellow and blue are the two different courses for IB2.