Code	**Name** and Key Concepts
MMu1t1	**Functions and graphs**: Lines, Quadratics, Inverse Proportions, Polynomials, Relations, Translations and Dilations
MMu1t2	**Trigonometric functions**: Unit Circle, Radians, SOH CAH TOA, Sine Rule, Exact Values, Amplitude/ Period/ Phase, Sum of Angles Identities
MMu1t3	**Counting and probability**: Binomial Coefficients, Set Complement Intersection and Union, Probability, $P(A \cup B) = P(A) + P(B) - P(A \cap B)$, Conditional Probability, Independance
MMu2t1	**Exponential functions**: Index Laws, Fractional Indices, Functions, Asymptotes, Graphs
MMu2t2	**Arithmetic and geometric sequences and series**: Arithmetic and Geometric Sequences as Recurrence Relations, Limiting Behaviour, and Partial Sum Formulae, Growth and Decay
MMu2t3	**Introduction to differential calculus** Average Rate of Change, First Principles, Leibniz Notation, Instantaneous Rate of Change, Slope of Tangent, Derivitive of Polynomials, Linearity of Differentiation, Optimisation, Anti-Derivitives, Interpret Position-Time Graphs
MMu3t1	**Further differentiation and applications**: Define e as a s.t. $\lim_{h\to 0} \frac{a^h - 1}{h} = 1$, Derivitives of e^x $\sin(x)$ and $\cos(x)$, Chain Product and Quotient Rules, Second Derivitives
MMu3t2	**Integrals**: Integrate Polynomial Exponential and Trigonometric Functions, Linearity of Integration, Determine Displacement given Velocity, Definite Integrals, Fundamental Theorem of Calculus, (signed) Area Under a Curve
MMu3t3	**Discrete random variables**: Frequencies, General Properties, Expected Value, Variance, Standard Deviation, Bernoulli and Binomial Distribtions
MMu4t1	**The logarithmic function**: Logs as Inverse of Exponentials, Log-Scales, Log Function Graphs, Natural Log, $\frac{d}{dx}\ln(x) = \frac{1}{x}$, $\int \frac{1}{x} dx = \ln(x) + c$ for $x > 0$
MMu4t2	**Continuous random variables and the normal distribution**: Probability Density Function, Cumulative Distribution Function, Probabilites Expected Value, Variance and Standard Deviation as Integrals, Linear Transformation of Random Variables, Normal Distribution using Technology
MMu4t3	**Interval estimates for proportions** Simple Random Sampling, Bias, Sample Proportion, Normal Approximation to the Binomial Proportion, Wald Confidence Interval, Trade-Off Between Width and Level of Confidence
SMu1t1	**Combinatorics** Multiplication of Possibilities, Factorial Notation, Permutations with and without Repeated Objects, Union of Three Sets, Pigeon-Hole Principle, Combinations, Pascals Triangle
SMu1t2	**Vectors in the plane**: Magnetude and Direction, Scalar Multiplication, Addition and Substraction as a Triangle, Vector Notation, $a\mathbf{i} + b\mathbf{j}$ Notation, Scalar Dot Product, Projection, Parallel and Perpendicular Vectors
SMu1t3	**Geometry**: Notation for Implication ($\Rightarrow$) and Equivalence ($\Leftrightarrow$), Converse ($B \Rightarrow A$) Negation ($\neg A \Rightarrow \neg B$) and Contrapositive ($\neg B \Rightarrow \neg A$), Proof by Contradiction, $\forall$ and $\exists$ Notation, Counter-Examples, Circle Theorems, Quadrilateral Proofs in $\mathbb{R}^2$
SMu2t1	**Trigonometry**: Graph and Solve Trig Functions, Prove Various Trig Indentities, Reciprocal Trig Functions
SMu2t2	**Matrices**: Notation, Addition and Scalar Multiplication of Matrices, Multiplicative Identity and Inverse, Determinant, Matrices as Transformations
SMu2t3	**Real and complex numbers**: Rationality and Irrationality, Induction, $i = \sqrt{-1}$, Complex Numbers $a + bi$ and Arithmetic ($+$, $-$, $\times$, $\div$), Complex Conjugates, Complex Plane, Complex Conjugate Roots of Polynomials
SMu3t1	**Complex numbers**: Modulus and Argument, Arithmetic ($\times$, $\div$, and z^n) in Polar Form, Convert between Polar and Cartesian Form, De Moivre's Theorem, Roots of Complex Numbers, Factorising Polynomials
SMu3t2	**Functions and sketching graphs**: Composition of Functions, One-to-One, Inverse Functions, Absolute Value Function, Rational Functions
SMu3t3	**Vectors in three dimensions**: $a\mathbf{i} + b\mathbf{j} + c\mathbf{k}$ Notation, Equation for Spheres, Parameterised Vector Equations, Equations of Lines, the Cross Product, Equation for a Plane, Systems of Linear Equation (Elimination Method) and Geometric Interpretation of Solutions, Kinematics via Differentiation of Vector Equations, Projectile and Circular Motion
SMu4t1	**Integration and applications of integration** Substitution, $\int \frac{1}{x} dx = \ln\lvert x\rvert + c$ for $x \neq 0$, Inverse Trig Functions and their Derivitives, Integrate $\frac{\pm 1}{\sqrt{a^2 - x^2}}$ and $\frac{a}{a^2 + x^2}$, Partial Fractions, Integration by Parts, Volume of Solids of Revolution, Numerical Integration using Technology
SMu4t2	**Rates of change and differential equations**: Implicit Differentiation, First-Order Seperable Differential Equations, The Logistic Equation, Kinematics (Rates of Change)
SMu4t3	**Statistical inference**: Central Limit Theorem and the Resulting Confidence Interval for a Mean
S1M1	**Functions and graphs**: Equations for a Line, Slope, y-intercept, Intersection of Lines, Reciprocal Function, Asymptotes, Functions vs Relations, Domain, Range, Function Notation
S1M2	**Polynomials**: Quadratic Equations in Vertex and Factorised Forms, Quadratic Formula, Completing the Square, The Leading Coefficient and Degree of a Polynomials, Cubics, Quartics
S1M3	**Trigonometry**: Pythagoras, SOH CAH TOA, Cosine Rule, Sine Rule, Unit Circle, Sine and Cosine Functions, Radians, Length of Arc, Area of Sector, Amplitude, Period, Phase, $\tan(x) = \frac{\sin(x)}{\cos(x)}$
S1M4	**Counting and statistics**: Factorial, Permutations, Multiplication Principle, Combinations, Discrete vs Continuous Random Variables, Mean, Median, Mode, Range, Interquartile Range, Standard Deviation, Normal Distribution,
S1M5	**Growth and decay**: Index and Logarithm Laws, Exponential Functions and their Graphs
S1M6	**Introduction to differential calculus**: Average Rate of Change, First Principles, Notation $f'(x) = \frac{df}{dx}$, $\frac{d}{dx} x^n = nx^{n-1}$, Linearity of Differentiation, Slope of Tangent, Increasing vs Decreasing, Local and Global Maxima and Minima, Stationary Points, Sign Diagram
S1M7	**Arithmetic and geometric sequences and series**: Arithmetic and Geometric Series as Recurrance Relations and Explicit Expressions, Partial Sums, Limiting Behaviour
S1M8	**Geometry**: Circle Properties, Proofs (Direct, Contradiction, and Contrapositive)
S1M9	**Vectors in the plane**: Component (column) vs $ai + bj$ Notation, Length and Direction, Linear Combinations of Vectors, Scalar Dot Product, Projection, Angle Between Two Vectors and Parallel/ Perpendicular, Geometric Proof
S1M10	**Further Trigonometry**: Sketch Trigonometric Functions with Translations and Dilations, Solve for Angles, Trigonometric Identities, Reciprocal Trigonometric Functions
S1M11	**Matrices**: Linear Combinations of Matrices, Matrix Multiplication, The Identity, Inverse Matrices, The 2×2 Inverse, The 2×2 Determinant, Linear Transformations (including rotations, reflections and composition)
S1M12	**Real and complex numbers**: Rationals, Irrationals, Interval Notation, Induction, $i = \sqrt{-1}$, Real and Imaginary Components, Complex Conjugates and Arithmetic, Argand Diagram, Modulus, Complex Roots of Polynomals
S2MM1	**Further differentiation and applications**: S1M6, Chain Product and Quotient Rules, $e = 2.718...$, $\frac{d}{dx} e^x = e^x$, $\frac{d}{dx} \sin(x) = \cos(x)$, $\frac{d}{dx} \cos(x) = -\sin(x)$, Second Derivatives, Concavity and Points of Inflection
S2MM2	**Discrete random variables**: Random Variables, Discrete vs Continuous, Probability Functions and Distributions, Properties of Probabilities, Frequency, Expected Value $E[X] = \sum xp(x) = \mu_X$, Standard Deviation $\sigma_X = \sqrt{\sum (x - \mu_X)^2 p(x)}$, Uniform Bernoulli and Binomial Distributions
S2MM3	**Integral calculus**: Anti-differentiation, If $F'(x) = f(x)$ then $\int f(x)dx = F(x) + c$, Reversing Chain Rule for $\int f(ax + b)dx$, Linearity of Integration, Finding the Constant of Integration, Area Under the Curve as Upper and Lower Sum Approximations, Definite Integral, Area Between Two Functions and Between a Negative Function and the x-axis, Fundamental Theorem of Calculus,
S2MM4	**Logarithmic functions**: Sketching $y = a\ln(b(x - c))$, $\frac{d}{dx}\ln(x) = \frac{1}{x}$, For $x > 0$ $\int \frac{1}{x} dx = \ln(x) + c$
S2MM5	**Continuous random variables and the normal distribution**: $P(X = x) = 0$, Probability Density Function, $\mu_X = \int_{-\infty}^{\infty} xf(x)dx$, $\sigma_X = \int_{-\infty}^{\infty} (x - \mu_X)^2 f(x)dx$, $f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}$, Standard Normal $Z = \frac{X - \mu}{\sigma}$, Simple Random Sampling, For $X \sim (\mu, \sigma)$ and $X_i \sim iidX$ Sampling Distributions of $S_n = \Sigma_{i=1}^n X_i$ $(n\mu, \sigma\sqrt{n})$ and $\bar{X}_n = \frac{S_n}{n}$ $(\mu, \frac{\sigma}{\sqrt{n}})$, If X is Normally Distributed, then so are S_n and $\bar{X}_n$, Central Limit Theorem (CLT)
S2MM6	**Sampling and confidence intervals**: Confidence Interval for a Mean using CLT $\left(\bar{x} - z^* \frac{s}{\sqrt{n}}\right) \leq \mu \leq \left(\bar{x} + z^* \frac{s}{\sqrt{n}}\right)$, Wald Interval for a Proportion
S2SM1	**Mathematical induction**:
S2SM2	**Complex numbers**:
S2SM3	**Functions and sketching graphs**:
S2SM4	**Vectors in three dimensions**:
S2SM5	**Integration techniques and applications**:
S2SM6	**Rates of change and differential equations**:
MS1	**Numbers & Functions**:
MS2	**Linear Functions**:
MS3	**Quadratic Functions**:
MS4	**Rational Functions**:
MS5	**Trigonometry I**:
MS6	**Trigonometry II**:
MS7	**Exponential Functions**:
MS8	**Logarithms**:
MT1	**Polynomials**:
MT2	**Matrices**:
MT3	**Vectors and Applications**:
MT4	**Systems of Linear Equations**:
MT6	**Differentiation**:
MT7	**Applications of Differentiation**:
MT8	**Exponential and Logarithm Functions**:
MT9	**Integration**: