Further Mathematics

A-Level Edexcel - 9FM0

Year 12

Core Pure: Complex numbers, Argand Diagrams and Loci of complex numbers. Series. Roots of polynomials. Matrices and transformations. Proof by induction. Vectors, Geometry in 3D vector equations of lines and planes and their interactions. Volumes of revolution

Decision:

Flow charts, Sorting and Packing algorithms, order of an algorithm. Graphs including Prims & Kruskals algorithms and Dijkstras. Eulerian graphs and the Route inspection problem. Graphical linear programming. Critical Path analysis.

Further Statistics:

Discrete random variable - expecation, variance and linear combinations; Poisson Distribution. Hypothesis testsing [applied to Poisson]. Chi-squared and Goodness of fit tests, including contingency tables.

Year 13

Core Pure: Polar coordinates, First and seconds order differential equations, Coupled first order differential equations. Simple, damped and forced harmonic motion. Hyperbolic functions. Advanced methods in calculus, improper integrals, mean value of a function, Calculus with inverse trig functions. Further Volumes of revolution. Further Complex numbers: De Moivres Theorem and Sums of complex geometric series. Macaluren's series and Method of differences.

Decision:

Further Graph algorithms: Planar Graphs and Floyds; Further Eulerian graphs - more complex cases of Route Inspection. The Traveling Salesman problem. Algebraic Linear Programming. Critical path analysis - resource scheduling and histograms.

Further statistics:

Discrete random variables - the Geometric and Negative Binomial distributions. Further Hypothesis testing - application to the Geometric distribution. The Central Limit theorem. Chi-squared testing with the Geometric distribution. Probability Generating function. Type I and II errors in hypothesis testing.