Summer Term plan

Year 12 Further Mathematics A Level

Mr Bullock	Mr Ahluwalia
Hypothesis testing and errors Formulate hypotheses and carry out a hypothesis test of a population mean from a Poisson Understand Type I and Type II errors and define in context. Calculate the probability of making a Type I error from tests based on a Poisson, Binomial and normal distributions. **Contingency tables and the Chi squared test** Construction of n × m contingency tables and calculation of the $\chi 2$ statistic with appropriate degrees of freedom. Understand how to reduce errors in this test when expectations are less than 5 and dealing with 2 by 2 contingency tables. **The exponential distribution** Know the conditions for an exponential distribution to be used as a model. Calculate probabilities for an exponential distribution using F(x) or integration of f(x). Know proofs of mean, variance and standard deviation for an exponential distribution. Understand that the lengths of intervals between Poisson events have an exponential distribution.	**Circular motion** Motion of a particle moving in a circle with constant speed (knowledge of radians assumed). Understand the definition of angular speed using both radians and revolutions per unit time. Study the relationships between speed, angular speed, radius and acceleration. Look at conical pendulum, with one or two strings. Study circular motion in a vertical plane Including the conditions to complete vertical circles. Use of conservation of energy in this context.
Half Term
Advanced curve sketching Study of the modulus of functions, associated inequalities and graphs of modulus functions. Investigation of more complicated rational functions including cases when some of these coefficients are zero; asymptotes parallel to coordinate axes and oblique asymptotes. Building on earlier work on transformations, composite transformations are studied including rotations and enlargements. **Series** Find the Maclaurin series of a function including the general term. Recognise and use the Maclaurin series for e^x, $\ln(1 + x)$, $\sin x$, $\cos x$, and $(1 + x)^n$, and be aware of the range of values of x for which they are valid. Evaluation of limits using Maclaurin series or l'Hôpital's rule. **Hyperbolic functions** Understand the definitions of hyperbolic functions including their domains and ranges, and be able to sketch their graphs. Differentiate and integrate hyperbolic functions. Derive and use the logarithmic forms of the inverse hyperbolic functions. Study of problems involving hyperbolic identities.	**Centres of mass and moments** Finding the centre of mass for a system of particles, a composite body or a lamina by integration. Investigation conditions for sliding and toppling. Problems including suspension and on an inclined plane. Determine the forces acting on a rigid body in equilibrium. Use of moments and couples
Revision and UCAS prediction exams During the second half of the Summer term the class will also spend some time revising and practising all of their AS further mathematics skills which will be tested from 28th June – 7th July.