

Autumn Term plan

Year 13 Further Mathematics A Level

<p>Mr Bullock</p> <p>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</p> <p>Further calculus Evaluate improper integrals where either the integrand is undefined at a value in the range of integration or the range of integration extends to infinity. Integrate using partial fractions Differentiate inverse trigonometric functions.</p>	<p>Mr Ahluwalia</p> <p>Centres of mass and moments Centre of mass for a system of particles Centre of mass for a composite body Centre of mass of a lamina by integration. Centres of mass of bodies formed by rotating a region about the x-axis. 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.</p> <p>Complex numbers Understand de Moivre's theorem and use it to find multiple angle formulae and sums of series Know and use the definition $e^{i\theta} = \cos\theta + i\sin\theta$ and the form $z = re^{i\theta}$ Find the n distinct nth roots of $re^{i\theta}$ for $r \neq 0$ and know that they form the vertices of a regular n-gon in the Argand diagram. Use complex roots of unity to solve geometric problems.</p>
Half Term	
<p>Further calculus Integrate functions using standard integrals and be able to choose trigonometric substitutions to integrate associated functions. Arc length and area of surface of revolution for curves expressed in Cartesian or parametric coordinates. Derivation and use of reduction formulae for integration. Find the area enclosed by a polar curve. Differentiate inverse trigonometric functions.</p>	<p>Matrices Calculate determinants of 3×3 matrices and interpret as scale factors, including the effect on orientation. Calculate and use the inverse of non-singular 2×2 matrices and 3×3 matrices. Solve three linear simultaneous equations in three variables by use of the inverse matrix. Interpret geometrically the solution and failure of solution of three simultaneous linear equations. Factorisation of determinants using row and column operations. Find eigenvalues and eigenvectors of 2×2 and 3×3 matrices. Find and use the characteristic equation. Understand the geometrical significance of eigenvalues and eigenvectors. Diagonalisation of matrices; when eigenvalues are real.</p>