**AS Level Core 1**

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|  | **What You Need To Know** | pe03020_[1] | pe03018_[1] | pe03019_[1] |
| 1. Language | * Understand and use correct mathematical language and grammar. |  |  |  |
| 1. Surds | * Be able to simplify surds * Be able to do operations involving surds * Be able to rationalise the denominator. |  |  |  |
| 1. Quadratic Functions | * Quadratic functions and their graphs. * The discriminant of a quadratic function. * Factorisation of quadratic Polynomials * Completing the square. * Solution of quadratic equations. * Simultaneous equations, e.g. one linear and one quadratic, analytical solution by substitution. Solution of linear and quadratic inequalities. |  |  |  |
| 1. Algebra | * Algebraic manipulation of polynomials, including expanding brackets and collecting like terms. * Simple algebraic division. * Use of the Remainder Theorem. * Use of the Factor Theorem |  |  |  |
| 1. Graphs of Functions | * Sketch Linear, Quadratic and cubic graphs and graphs of circles. * Using graphs to find solutions to functions and simultaneous functions * Know and understand the transformation of function including the transformation of quadratic graphs and graphs of circles. |  |  |  |
| 1. Co-ordinate geometry | * Understand the equation of a straight line * Find the gradient of parallel and perpendicular lines * Find the equation of a straight line given two point (A and B) * To understand the equation of a circle. * To use completing the square to find the centre and radius of a circle from its function. * The equation of the tangent and normal at a given point to a circle. * The intersection of a straight line and a curve. |  |  |  |
| 1. Differentiation | * The derivative of f(*x*) as the gradient of the tangent to the graph of *y* = f(*x*) at a point; the gradient of the tangent as a limit; interpretation as a rate of change. * Differentiation of polynomials. * Applications of differentiation to gradients, tangents and normals, maxima and minima and stationary points, increasing and decreasing functions. * Using second order derivatives to find the maxima and minima. |  |  |  |
| 1. Integration | * Indefinite integration as the reverse of differentiation * Integration of polynomials. * Evaluation of definite integrals. Interpretation of the definite integral as the area under a curve. |  |  |  |