**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.
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| 1. Surds
 | * Be able to simplify surds
* Be able to do operations involving surds
* Be able to rationalise the denominator.
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| 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.
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| 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
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| 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.
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| 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.
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| 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.
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| 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.
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