

Curriculum Plan: Level 2 Certificate in Further Maths

	Autumn Term		Spring Term		Summer Term	
	Autumn 1 7 weeks	Autumn 2 7 weeks	Spring 1 5.5 weeks	Spring 2 6 weeks	Summer 1 6 weeks	Summer 2 7 weeks
Year 11	<p>Number</p> <ul style="list-style-type: none"> –The product rule for counting –Manipulation of surds, including rationalising the denominator <p>Algebra</p> <ul style="list-style-type: none"> –Definition of a function –Domain and range of a function –Composite functions –Inverse functions –Expand $(a + b)^n$ for positive integer n –Manipulation of rational expressions: Use of $+$ $-$ \times \div for algebraic fractions with denominators being numeric, linear or quadratic –Use of the factor theorem for rational values of the variable for polynomials –Completing the square –Drawing and sketching of functions –Interpretation of graphs –Solution of linear and quadratic equations –Algebraic and graphical solution of simultaneous equations in two 	<p>Coordinate Geometry</p> <ul style="list-style-type: none"> –Know the relationship between the gradients of parallel and perpendicular lines –Use Pythagoras’ theorem to calculate the distance between two points –Use ratio to find the coordinates of a point on a line given the coordinates of two other points –The equation of a straight line in the forms $y = mx + c$ and $y - y_1 = m(x - x_1)$ and other forms –Understand that $x^2 + y^2 = r^2$ is the equation of a circle, centre (0, 0) and radius r –Understand that $(x - a)^2 + (y - b)^2 = r^2$ is the equation of a circle with centre (a, b) and radius r –The equation of a tangent at a point on a circle 	<p>Calculus</p> <ul style="list-style-type: none"> –Know that the gradient function $\frac{dy}{dx}$ gives the gradient of the curve and measures the rate of change of y with respect to x –Know that the gradient of a function is the gradient of the tangent at that point –Differentiation of kx^n where n is an integer and the sum of such functions –The equation of a tangent and normal at any point on a curve –Increasing and decreasing functions –Understand and use the notation $\frac{d^2y}{dx^2}$ –Use of differentiation to find maxima and minima points on a curve –Using calculus to find maxima and minima in simple problems –Sketch/interpret a curve with known maximum and minimum points 	<p>Matrix transformations</p> <ul style="list-style-type: none"> –Multiplication of matrices –The identity matrix –Transformations of the unit square in the $x - y$ plane –Combination of transformations <p>Geometry</p> <ul style="list-style-type: none"> –Understand and construct geometrical proofs using formal arguments –Sine and cosine rules in scalene triangles; area of a triangle = $\frac{1}{2}absinC$ –Use of Pythagoras’ theorem in 2D and 3D –Be able to apply trigonometry and Pythagoras’ theorem to 2 and 3 dimensional problems –Sketch and use graphs of $y = \sin x$, $y = \cos x$ and $y = \tan x$ for angles of any size –Be able to use the definitions of $\sin \theta$, $\cos \theta$ and $\tan \theta$ for any positive angle up to 360° (measured in degrees only) –Knowledge and use of 30°, 60°, 90° triangles and 45°, 45°, 90° triangles –Use of $\tan \theta = \frac{\sin \theta}{\cos \theta}$ and $\sin^2 \theta + \cos^2 \theta = 1$ –Solution of simple trigonometric 	<p>Revision for GCSE exams</p>	

	<p>unknowns</p> <ul style="list-style-type: none">– Algebraic solution of linear equations in three unknowns– Solution of linear and quadratic inequalities– Index laws, including fractional and negative indices and the solution of equations– Algebraic proof– Using nth terms of sequences. Limiting value of a sequence as $n \rightarrow \infty$– n^{th} terms of linear sequences.– n^{th} terms of quadratic sequences.			equations in given interval		
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