Higher Pupil Record Sheet- Unit 1

Expressions 1.1 Logs and Exponentials	**NS**	**OT**	**VG**
Evaluating exponential functions			
Converting between logarithmic and exponential form			
Simplifying expressions using laws of logs			
Simplifying expressions using natural logs and e			
Solving log equations using the laws of logs			
Exponential growth or decay - solving exponential equations using $\log_e$			
Use logs to find the equations of functions in the form $y = kx^n$ or $y = ab^x$			
L&L Higher Ch 1 P 2 - 22			

Expressions 1.2 Trigonometric Expressions	**NS**	**OT**	**VG**
The exact value ratios for 30°, 45°, 60°and 90°			
Convert between degrees and radians			
The exact value trigonometric ratios in radians			
Addition formulae for the sum and difference of two angles			
Double angle formulae			
Trigonometric identities			
Wave Function			
L&L Higher Ch 2 P 23 – 52			

Expressions 1.3 Related Functions	**NS**	**OT**	**VG**
Identifying and sketching related functions			
Transformations of functions – $af(x)$, $f(bx)$ f(x) + c and f(x + d)			
Completing the square to find min/max values and sketch functions			
Sketching graphs of exponential and logarithmic functions			
Sketching graphs of trigonometric functions and identifying min/max values			
Sketch the graph of the derived function y = f'(x)			
Composite and inverse functions			
Identify the range and the domain of a function			
Identify any restrictions on the domain and state largest possible domain			
Find a formula for a composite function $f(g(x))$			
Find a formula for the inverse of a linear function			
L&L Higher Ch 3 P 53 – 82, Ch 4 P 83 – 91			

Expressions 1.4 Vectors	**NS**	**OT**	**VG**
Vector connections			
Vector properties, unit vectors **i,j** and **k** and position vectors			
Calculate the coordinates of an internal division point of a line			
Find vector pathways			
Work with parallel vectors and collinearity			
Working with vectors			
Calculate the scalar product of two vectors			
Calculate the angle between two vectors using the scalar product			
Work with perpendicular vectors			
The distributive law and the scalar product			
L&L Higher Ch 5 P 92 - 113 , Ch 6 P114 - 131			

Higher Pupil Record Sheet- Unit 2

Relationships 1.1 Solving Algebraic Equations	NS	OT	VG
Using the factor theorem to identify factors of a polynomial			
Using synthetic division to fully factorise a polynomial			
Using the factor theorem to calculate unknown coefficients			
Using the remainder theorem to find the quotient and remainder			
Determine the x and y-intercepts for a graph of a polynomial			
Determine the function of a polynomial from its graph			
Solving Polynomial equations			
Determine points of intersection between straight lines and curves, or two curves			
Using the discriminant to determine unknown coefficients in quadratic equations			
Solving quadratic inequalities			
L&L Higher Ch 7 P 136-169			

Relationships 1.2. Solving Trig Equations	NS	OT	VG
Solving linear trig equations in degrees			
Solving linear trig equations with compound angles in degrees			
Solving quadratic trig equations in degrees			
Solving linear, compound and quadratic trig equations in radians			
Solve equations in degrees and radians using $\sin^2 x + \cos^2 x = 1$			
Solve equations in degrees and radians using double angle formulae			
Solving trig equations using the wave function			
Solving further trig equations in degrees or radians			
L&L Higher Ch 8 P 170 – 201			

Relationships 1.3 Differentiation	NS	OT	VG
Differentiating functions			
Differentiate simple expressions in the form ax^n			
Express a function in differentiable form, then differentiate			
Evaluate derivatives to find rate of change or the gradient of a curve			
Differentiate trigonometric functions			
Differentiate composite functions using the chain rule			
Using differentiation to find the nature and properties of functions			
Find the equation of a tangent to a curve			
Evaluate where a function is increasing or decreasing			
Determine the stationary points of a function and their nature			
Sketch the graph of a function, showing all key points			
L&L Higher Ch 9 P 202 – 237, Ch 10 P 238 – 264			

Relationships 1.4 Integration	NS	OT	VG
Integrating functions			
Integrating simple expressions in the form ax^n			
Integrating more complex functions in the form $(px + q)^n$			
Integrating trigonometric functions			
Solving differential equations			
Definite Integrals			
Evaluating definite integrals for functions in the form ax^n and $(px + q)^n$			
Evaluating definite integrals for trigonometric functions			
L&L Higher Ch 11 P 265 - 282 , Ch 12 P283 - 290			

Applications 1.1 Equations of Lines	NS	OT	VG
Find the equation of a line parallel to a given line			
Find the equation of a line perpendicular to a given line			
Use $m = \tan\theta$ to calculate gradient or angle			
Use gradients to show that points are collinear			
Find equations of medians, altitudes and perpendicular bisectors			
Solve problems involving medians, altitudes and perpendicular bisectors			
L&L Higher Ch 13 P293- 305			

Applications 1.2 Circles	NS	OT	VG
Determine and use the equation of a circle $(x – a)^2 + (y – b)^2 = r^2$			
Determine and use the general equation of a circle $x^2 + y^2 +2gx + 2fx + c = 0$			
Use properties of tangency when solving problems			
Determine the intersection of circles or a line and a circle			
L&L Higher Ch 14 P306 – 317			

Applications 1.3 Sequences	NS	OT	VG
Use the terminology and notation associated with sequences			
Use and determine nth term formulae			
Determine a recurrence relation from given information			
Use a recurrence relation to calculate a required term			
Find and interpret a limit of a sequence, where it exists			
L&L Higher Ch 15 P318- 327			

Applications 1.4 Application of Calculus	NS	OT	VG
Find the greatest/ least values of an algebraic function on a closed interval			
Find the optimal solution to a problem			
Solve problems using rates of change			
L&L Higher Ch 16 P328- 345			
Calculate the scalar product of two vectors			
Calculate the angle between two vectors using the scalar product			
Work with perpendicular vectors			
The distributive law and the scalar product			
L&L Higher Ch 17 P346 - 369			