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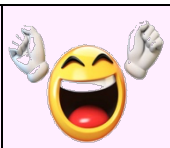
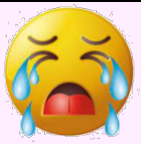
A Level Pure Maths Topic Checklist

Year 1
Year 2

Pure Topics				
Algebra				
Expanding brackets and simplifying expressions				
Factorising (5 types)				
Simultaneous Equations				
Completing The Square				
Quadratics – Factorising, Solving And Completing The Square				
Surds				
Linear and Quadratic Modelling				
Solving Inequalities (linear, quadratic and rational)				
Indices				
Algebraic Fractions				
Discriminant (including hidden discriminant)				
Binomial Expansion (integers powers)				
Binomial Expansion (fractional and negative powers)				
Polynomial Division, factor and remainder theorem				
Partial Fractions (2 types)				
Geometry				
Straight Line Graphs				
Circles				
Trigonometry				
Bearings				
Radians				
Arc Lengths And Areas Of Sectors				
Given The Value Of One Trig Function, Find Another				
Sine/Cosine Rule				
Trig graphs (sin, cos and tan)				
Identities and solving with $sin^2x + \cos^2 x = 1$ and $\tan x = \frac{\sin x}{\cos x}$				
Identities and solving with $1 + \tan^2 x = \sec^2 x$ and $1 + \cot^2 x = cosec^2 x$				
Identities and solving with reciprocal functions: $\sec x = \frac{1}{\cos x}, \operatorname{cosec} x = \frac{1}{\sec x}, \cot x = \frac{1}{\tan x}$				
Identities and solving with double angle formulae				
Identities and solving with addition angle formulae				
Identities and solving with $asinx \pm bcos\ x$ or $a\cos x \pm bsin\ x$ forms				
Small Angle Approximations				
Inverse Trig – finding values				
Trig graphs – reciprocal and inverse trig				
Trigonometric Models				
Exponentials and Logs				
Simplifying Expressions				
Solving Logarithmic Equations				
Solving Natural Logarithmic Equations				
Solving exponential equations				
Linear transformations				
Exponential Models				
Proofs				
Counter Example				
Deduction				
Exhaustion				
Contradiction				
Differentiation Note: for parametric differentiation see parametric equations section				
$y = x^n$ differentiation technique				
Differentiation by 1st principles – x^n types				
Differentiation by 1st principles – trig functions				
Finding gradients				
Stationary points (max/min) and point of Inflection				
Increasing/Decreasing and Convex/Concave				
Tangents and Normals (finding equations + other applications)				
$f \leftrightarrow f' \leftrightarrow f''$ graphs				
Optimisation				
Differentiating x in terms of y and getting answer in terms of x				
Composite functions differentiation techniques – chain rule ($(f(x))^n, lnf(x), e^{f(x)}, a^{f(x)}, sinf(x)$ etc)				
Product and Quotient Rule				

Implicit Differentiation				
Rates of Change/Related Rates				
Integration **Note: for parametric integration see parametric equations section**				
$\int x^n$ Integration Technique				
Finding area under a curve				
Composite functions integration techniques ($(f(x))^n, lnf(x), e^{f(x)}, sinf(x)$ etc)				
Integration by Parts				
Integration by Substitution				
Trapezium Rule				
Riemann Sums				
Differential Equations				
Sequences and Series				
Arithmetic Series				
Geometric Series				
Sigma Notation				
Recursive Sequences				
Functions				
Types of functions (one to one, many to one)				
Basics (notation, composite etc)				
Finding inverses and knowing when they exist				
Modulus (solving equalities and inequalities)				
Graphing				
Basic graphs (linear, quadratic, cubic, quartic, reciprocal, root, rational, exponential, log, trig + reciprocal trig)				
Basic graphs (modulus and inverse trig)				
Graphing a modulus graph without being given the equation				
Transformations				
Finding points of intersection and intercepts				
Finding a polynomial equation when given a graph				
Solving graphically				
Domain and Range				
Numerical Methods				
Iteration				
Newton Raphson				
Parametric Equations				
Sketching				
Domain & range				
Finding Points of intersection				
Differentiation				
Integration				
Finding Areas				
Modelling				
Vectors				
2D				
3D				
Geometric Types				