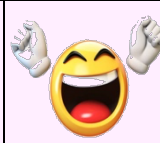


A Level Pure Maths Topic Checklist

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 $\sin^2 x + \cos^2 x = 1$ and $\tan x = \frac{\sin x}{\cos x}$				
Identities and solving with $1 + \tan^2 x = \sec^2 x$ and $1 + \cot^2 x = \operatorname{cosec}^2 x$				
Identities and solving with reciprocal functions: $\sec x = \frac{1}{\cos x}$, $\operatorname{cosec} x = \frac{1}{\sin x}$, $\cot x = \frac{1}{\tan x}$				
Identities and solving with double angle formulae				
Identities and solving with addition angle formulae				
Identities and solving with $a \sin x \pm b \cos x$ or $a \cos x \pm b \sin x$ 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				
<small>Note: for parametric differentiation see parametric equations section</small>				
$y = x^n$ differentiation technique				
Differentiation by 1 st principles – x^n types				
Differentiation by 1 st 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 ($(f(x))^n$, $\ln f(x)$, $e^{f(x)}$, $a^{f(x)}$, $\sin f(x)$ etc)				
Product and Quotient Rule				

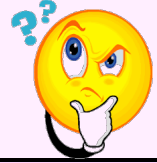
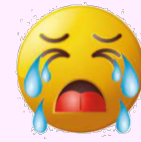
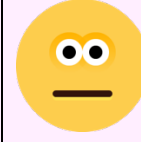
Implicit Differentiation				
Rates of Change/Related Rates				
Integration				
<small>Note: for parametric integration see parametric equations section</small>				
$\int x^n$ Integration Technique				
Finding area under a curve				
Composite functions integration techniques ($(f(x))^n, \ln f(x), e^{f(x)}, \sin f(x)$ 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				

Year 1

Year 2

Year 1 and Year 2

Statistics Topics



Data

Sampling				
Large data set (memorised set of facts – doesn't involve maths knowledge)				
Mean and standard deviation calculations				
Quartile Calculations - Interpolation				
Outliers				
Coding				
Box Plots				
Cumulative Frequency				
Histograms				
Comparing Data				

Regression and Correlation

Calculating the correlation coefficient r and interpreting it				
Calculating the line of best fit/least squares regression line and interpreting the slope and intercept				
Using the line of best fit to make predictions				
Exponential Models				

Probability

Set Notation				
Mutually exclusive and Independent Events				
Conditional Events				
Venn Diagrams				
Tree Diagrams				
Tables				

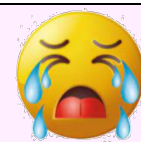
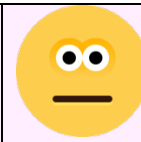
Distributions

Dealing with Discrete Random Variables				
Binomial Distribution				
Normal Distribution				
Normal Approximation to Binomial (including Continuity Correction)				

Hypothesis Testing

Binomial Distribution – performing the test, finding critical values and p values				
Normal Distribution – performing the test, finding critical values and p values				
Correlation – performing the test, finding critical values and p values				

Mechanics Topics



Kinematics

Displacement, velocity and time graphs				
SUVAT – constant acceleration				
Differentiating and Integrating to get displacement, velocity, acceleration – non constant accel				
Projectiles				

Basic Forces

Basic horizontal and vertical forces - finding the resultant and magnitude				
Basic diagonal forces resolving - finding the resultant, magnitude and angles				
Using $f = ma$ to solve basic problems such as boxes on tables etc				
Finding missing angles and forces in force diagrams				

Connected Particles

Lifts				
Cars and Trailers				
Pulleys - Vertical				
Pulleys – Inclined planes				

Moments

Flat plane – vertical forces				
Flat plane – diagonal forces				
Inclined plane – ladders				

Vectors

Basic resolving on forces given in vector form - resultant and magnitude and finding angles				
SUVAT				
Differentiating and Integrating to get displacement, velocity, acceleration – non constant accel				