

# A Level Maths Year 1/AS Checklist

## Pure

## Statistics

## Mechanics

<ul style="list-style-type: none"> <li><input type="checkbox"/> Surds and indices</li> <li><input type="checkbox"/> Algebraic expressions</li> <li><input type="checkbox"/> Equations and inequalities</li> <li><input type="checkbox"/> The discriminant</li> <li><input type="checkbox"/> Sketching graphs</li> <li><input type="checkbox"/> Transformations of functions</li> <li><input type="checkbox"/> Coordinate geometry</li> <li><input type="checkbox"/> The equation of a circle and use of circle theorems</li> <li><input type="checkbox"/> The factor theorem and dividing polynomials</li> <li><input type="checkbox"/> Year 1 methods of proof &amp; disproof</li> <li><input type="checkbox"/> Binomial expansion with positive integer powers</li> <li><input type="checkbox"/> Trigonometry with triangles</li> <li><input type="checkbox"/> Year 1 trigonometric equations &amp; identities</li> <li><input type="checkbox"/> Year 1 vectors</li> <li><input type="checkbox"/> Differentiation from first principles</li> <li><input type="checkbox"/> Year 1 differentiation of functions</li> <li><input type="checkbox"/> Finding tangents and normals</li> <li><input type="checkbox"/> Stationary points</li> <li><input type="checkbox"/> Year 1 integration of functions</li> <li><input type="checkbox"/> Area under curves</li> <li><input type="checkbox"/> Exponential functions and <math>e^x</math></li> <li><input type="checkbox"/> Logarithms</li> <li><input type="checkbox"/> Natural logarithms</li> <li><input type="checkbox"/> Logarithms and non-linear data</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Populations and sampling</li> <li><input type="checkbox"/> Median, quartiles and percentiles</li> <li><input type="checkbox"/> Box plots</li> <li><input type="checkbox"/> Histograms</li> <li><input type="checkbox"/> Variance and standard deviation</li> <li><input type="checkbox"/> Interpolation</li> <li><input type="checkbox"/> Coding</li> <li><input type="checkbox"/> Outliers</li> <li><input type="checkbox"/> Histograms</li> <li><input type="checkbox"/> Correlation, regression and outliers</li> <li><input type="checkbox"/> Year 1 probability</li> <li><input type="checkbox"/> Discrete random variables</li> <li><input type="checkbox"/> The binomial distribution</li> <li><input type="checkbox"/> Hypothesis testing with discrete data</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Modelling in mechanics</li> <li><input type="checkbox"/> Displacement-time &amp; velocity-time graphs</li> <li><input type="checkbox"/> Constant acceleration (SUVAT) equations</li> <li><input type="checkbox"/> Vertical motion under gravity</li> <li><input type="checkbox"/> Forces and Newton's laws</li> <li><input type="checkbox"/> Use of vectors</li> <li><input type="checkbox"/> Connected particles</li> <li><input type="checkbox"/> Pulleys</li> <li><input type="checkbox"/> Variable acceleration in 1D</li> </ul>
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# A Level Maths Year 2 Checklist

## Pure

## Statistics

## Mechanics

- Proof by contradiction
- Standard proofs
- Partial Fractions
- Algebraic division
- The modulus function
- Modulus transformations
- Functions and mappings
- Arithmetic sequences/series
- Geometric sequences/series
- Sigma notation
- Recurrence relations
- Year 2 binomial expansion
- Radians and applications
- Small angle approximations
- Reciprocal trig functions
- Pythagorean identities
- Inverse trig functions
- Addition formulae
- Double angle formulae
- Year 2 trig equations
- Harmonic identities
- Parametric equations
- Derivatives of  $\sin(x)$  &  $\cos(x)$  from first principles
- Derivatives of standard functions
- The chain rule
- The product rule
- The quotient rule
- Parametric differentiation
- Implicit differentiation
- Concave/convex functions and points of inflection
- Rates of change
- Locating roots
- Iteration
- The Newton-Raphson method
- Integrating standard functions
- Integrating  $f(ax+b)$
- Integration using trig identities
- Integration by substitution
- Integration by parts
- Integration using partial fractions
- Integration by inspection
- Parametric integration
- The trapezium rule
- Solving differential equations
- 3D coordinates and vectors
- Geometric vector problems

- Non-linear regression
- Measuring correlation
- Hypothesis testing for correlation
- Year 2 probability
- The normal distribution
- Approximating a binomial distribution
- Hypothesis testing with the normal distribution

- Moments
- Resolving forces (inclined planes)
- Friction
- Projectiles
- Statics
- Rigid bodies/moments
- Dynamics
- Vectors in kinematics
- Variable acceleration in 2D