



HUB Maths & Science

Subject : Maths A Level Year 12



Autumn 1	Spring 1	Summer 1
<ul style="list-style-type: none"> • Algebraic expressions – basic algebraic manipulation, indices and surds • Quadratic functions – factorising, solving, graphs and the discriminants • Equations – quadratic/linear simultaneous • Inequalities – linear and quadratic (including graphical solutions) • Introduction to sampling terminology; Advantages and disadvantages of sampling • Understand and use sampling techniques; Compare sampling techniques in context • Calculation and interpretation of measures of location; Calculation and interpretation of • Measures of variation; Understand and use coding • Interpret diagrams for single-variable data; Interpret scatter diagrams and regression lines; • Recognise and interpret outliers; Draw simple conclusions from statistical problems 	<ul style="list-style-type: none"> • Algebraic division, factor theorem and proof • The binomial expansion • Vectors (2D) including scalar multiplication and addition • Kinematics under constant acceleration • Vertical motion under gravity 	<ul style="list-style-type: none"> • Definition, differentiating polynomials, second derivatives • Gradients, tangents, normal, maxima and minima • Definition as opposite of differentiation, indefinite integrals of x^n • Introduction to mathematical modelling and standard S.I. units of length, time and mass • Definitions of force, velocity, speed, acceleration and weight and displacement; Vector and scalar quantities • Newton’s first law, force diagrams, equilibrium, introduction to i, j system • Newton’s second law, ‘$F = ma$’, connected particles (no resolving forces or use of $F = \mu R$); • Newton’s third law: equilibrium, problems involving smooth pulleys

Parents can help by: • Provide a peaceful location for homework and study (without distractions) for at least an hour a day.

Autumn 2	Spring 2	Summer 2
<ul style="list-style-type: none"> • Graphs – cubic, quartic and reciprocal • Transformations – transforming graphs – $f(x)$ notation • Straight-line graphs, parallel/perpendicular, length and area problems • Circles – equation of a circle, geometric problems on a grid • Probability: Mutually exclusive events; Independent events • Statistical distributions: Use discrete distributions to model real-world situations; Identify the discrete uniform distribution; Calculate probabilities using the binomial distribution. • Language of hypothesis testing; Significance levels • Carry out hypothesis tests involving the binomial distribution 	<ul style="list-style-type: none"> • Trigonometric ratios and graphs • Trigonometric identities and equations • Quantities and units in mechanics 	<ul style="list-style-type: none"> • Variable force; Calculus to determine rates of change for kinematics • Use of integration for kinematics problems

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