KS5 YEAR 12 FURTHER MATHS CURRICULUM OVERVIEW – AUTUMN TERM

SUBJECT: FURTHER MATHS (Y12)

AUTUMN TERM

	TEACHER 1	TEACHER 2
TERM 1	2. Algebra, Functions & Further Algebra 2a Algebraic manipulation and surds; 2b Quadratic functions including the discriminant; 2c Graphs (cubic, quartic and reciprocal) 3. Coordinate Geometry in the (x.y) plane 3a Straight line: parallel/perpendicular, length/area 3b Circles, equations & geometric problems 5. Trigonometry 5a Trig ratios/graphs; 5b Identities & equations 7. Differentiation 7a Polynomials, second derivatives; 7b Gradients, tangents, maxima/minima	2. Algebra, Functions & Further Algebra Quadratic/linear/simultaneous equations; inequalities (linear/quadratic); transformations of graphs; algebraic division and factor theorem; binomial expansion 1a Vectors (2D) Definitions, magnitude/direction, additional & scalar multiplication; position vectors, distance between two points, geometric problems Mechanics M1 Quantities & units in mechanics; M2 Modelling & assumptions; M7 Kinematics 1 (constant acceleration); M8 Forces and Newton's Laws including connected particles.
TERM 2	8. Integration 8a Opposite of differentiation, indefinite integrals; 8b Definite integrals & area 2. Algebraic and Partial Fractions 2a Simplifying algebraic fractions; 2b Partial fractions The Binomial Theorem 5a Expanding (a+bx)^n; 5b Expansion using partial fractions 4. Series and Sequences 4a Arithmetic/geometric; 4b Sigma notation; 4c Recurrence/iteration 6. Logs and Exponential functions & natural logarithms	M7 Kinematics 2 (variable acceleration) Calcus to determine rates of change 3. Functions and Modelling Modulus, composite/inverse, transformations, modelling with functions Statistics S1 Statistical sampling; S2 Data presentation; S3 Probability; S4 Statistical distributions; S5 Statistical hypothesis testing

VIDEO LINKS

Pure Maths Year 12 link 1 | Pure Maths Year 12 link 2 | Applied Maths Year 12 link 1 | Applied Maths Year 12 link 2

HARROGATE GRAMMAR SCHOOL
EXCELLENCE FOR ALL

KS5 YEAR 12 FURTHER MATHS CURRICULUM OVERVIEW – SPRING & SUMMER TERM

SPRING TERM

TERM 1

TEACHER 1

Trigonometry
Radians, arcs/sectors, small angles, compound/double angle, Rcos$\Theta \pm$a, providing identities, contextual problems.

Further Differentiation
Sin/cos from first principles, exponentials/logarithms, products/quotients/implicit

TEACHER 2

Regression and Correlation
Change of variable; correlation coefficient; statistical hypothesis testing for zero correlation

The Normal Distribution
Understanding and use; normal = binomial; selecting distributions; hypothesis test for the mean of the normal

Numerical methods
Location of roots; iterative methods (staircase/cobweb); Newton – Raphson; problem solving

Proof – by deduction and contradiction

Vectors in 3D (pure)

TERM 2

TEACHER 1

Further Differentiation
Second derivatives, rates of change problems

Further Integration
Integrating 1/x, exponentials & trig; reverse differentiation; using trig identities to manipulate integrals

TEACHER 2

Mechanics (part 2)
Forces at an angle; resolving forces; friction; moments; turning effect (incl 2D problems)

Application of forces
Equilibrium & statics of a particle (incl ladder problems); dynamics of a particle

Further Kinematics
Constant acceleration (2D equations of motion); variable acceleration (using calcus)

SUMMER TERM

TERM 1

TEACHER 1

Parametrics
Definition, Cartesian conversion, sketching/modelling, differentiation & integration of parametric functions

TEACHER 2

Applications of Kinematics - projectiles

VIDEO LINKS

Pure Maths Year 12 link 1 | Pure Maths Year 12 link 2 | Applied Maths Year 12 link 1 | Applied Maths Year 12 link 2

HARROGATE GRAMMAR SCHOOL
EXCELLENCE FOR ALL