

**PURE Video links to chapters**

<b>1. Algebraic Expressions</b>	<a href="#">Index laws including negative and fractional indices (1)</a>	Ex1A, Ex1D
(3)	<a href="#">Expanding and factorizing* (1)</a>	Ex1B, Ex1C
	<a href="#">Surds and rationalizing (1)</a>	Ex1E, Ex1F
<b>2. Quadratics &amp; 3. Equations and Inequalities</b>	<a href="#">Solving quadratic equations by factorizing*, formula and completing the square- sketch quadratic graphs. (2)</a>	Ex 2A, 2B
(6)	<a href="#">Linear and quadratic simultaneous equations and solving graphically (1)</a>	Ex 3A – 3C
	<a href="#">Linear (as starter) and quadratic Inequalities (0.5)</a>	Ex 3D and 3E
	<a href="#">Recap use of function notation</a>	Ex 2C
	<a href="#">Discriminants (relate to quadratic graph too) and Modelling with quadratics (1.5)</a>	Ex 2D-2F
	<a href="#">Regions and inequalities on graphs (1)</a>	Ex 3F and 3G Mixed exercise for hwk
<b>October Half term</b>		
<b>7. Algebraic Methods</b>	<a href="#">Algebraic Fractions and dividing Polynomials including factor theorem (1)</a>	Ex 7A – 7C
(2)	<a href="#">Mathematical proof and methods of proof (1)</a>	Ex 7D – 7E
<b>Pure 2</b>	<a href="#">Algebraic Fractions – To do as starter</a>	
<b>1. Algebraic Methods</b>	<a href="#">Partial Fractions – Methods for breaking algebraic fractions into partial fractions. (0.5)</a>	
(2)	<a href="#">Improper Fractions – Writing improper fractions as a number plus partial fraction remainders. (0.5)</a>	
	<a href="#">Proof by contradiction (1)</a>	
<b>4. Graphs and Transformations</b>	<a href="#">Quadratic, cubic, quartic and reciprocal graphs including points of intersection (1)</a>	Ex 4A – 4D
(2.5 lessons)		Ex 4E – 4G
	<a href="#">Transformation of graphs including asymptotes (1.5)</a>	
<b>8. The Binomial Expansion</b>	<ul style="list-style-type: none"> <li><a href="#">Pascal's triangle and introduce Binomial expansion &amp; factorial notation (1)</a></li> <li><a href="#">Solving binomial problems and Binomial estimation(1)</a></li> </ul>	Ex8A-8C
(2 lessons)		Ex 8D-8E
<b>Pure 2!!</b>	<ul style="list-style-type: none"> <li><a href="#">Binomial Expansion – Recap of P1 <math>1 + nx + \dots</math> and application to negative and fractional powers. (1)</a></li> <li><a href="#">Further Expansion – Expanding <math>(a + bx)^n</math> and from partial fractions. Substitution of values for approximation. (1)</a></li> </ul>	Ex 4A-B
<b>4. Binomial Expansion</b>		Ex 4C and Mixed Exercises +exam qu
(2)		
<b>Christmas Holidays</b>		
<b>5. Straight line graphs</b>	<ul style="list-style-type: none"> <li><a href="#">Equation of straight lines, rearrange to find gradient and find missing coordinates (0.5)</a></li> <li><a href="#">Parallel and perpendicular, length of a line and enclosed areas (0.5)</a></li> <li><a href="#">Modelling with straight lines (1)</a></li> </ul>	Ex 5A – 5D
(2 lessons)		Ex 5E – 5G
		Ex 5H Mixed exercise for hwk

6. Circles (2 lessons)	<ul style="list-style-type: none"> <li>Equation of circles, midpoint and perpendicular bisectors (1)</li> <li>Intersection of straight lines and circles, use tangents and chord properties (0.5)</li> <li>Circles and triangles (0.5)</li> </ul>	Ex 6A – 6C  Ex 6D – 6E  Ex 6F  Mixed exercise for hwk
12. Differentiation (3 lessons)	<u>Differentiation – introduction using Gradients of Curves and from first principles (0.5)</u>	Ex12A, 12B
	<u>Basic differentiation, differentiating more complex functions. (0.5)</u>	Ex 12C-12E
	<u>Tangents and normals – use of differentiation to find equations of tangents and normals to curves. (1.5)</u>	Ex 12F
	<u>Increasing and Decreasing functions &amp; Further differentiation - 2nd Order Differentiation (0.5)</u>	Ex12G, 12H
12. Differentiation.... (2 lessons)	<u>Stationary points, Nature of these points (0.5)</u>	Ex12G, 12H
	<u>Sketch gradient function(0.5)</u>	Ex 12I
	<u>Model real-life situations with differentiation, with exam practice (1)</u>	Ex12J,12K
<b>Half term</b>		
13. Integration (3 lessons)	<u>Find y given dy/dx. Integrate polynomials (0.5)</u>	Ex13A, 13B
Fundamentals of Integration**	<u>Find f(x)-given a point on the curve to find the constant 'c' (0.5)</u>	Ex13C
Area Under x-axis*	<u>Evaluate a definite Integral, find area bounded by a curve and the x-axis (0.5)</u>	Ex13D-13F
	<u>Find areas bounded by curves and straight lines (1)</u>	Ex13G
	<u>Mixed ex and exam type questions (0.5)</u>	
11. Vectors & Pure 2- 12. Vectors (4 lessons)	<ul style="list-style-type: none"> <li>Representing Vectors</li> <li>Magnitude and Direction Vector</li> <li>Position Vector</li> <li>3D Coord and Vectors in Pure 2</li> <li>Resultant Force</li> <li>Parallel vectors (proof)</li> <li>Solving geometric problems in Pure 1</li> </ul>	Ex11A – 11D
Pure 2 Vectors	<u>Pure 2 Modelling with Vectors</u>	Ex 11E
<b>Easter Holidays</b>		
9. Trigonometry Ratios (2 lessons)	<u>Sine and cosine rules, area of triangles (with all the proofs), Solve triangle problems (1)</u>	Ex9A-9E
	<u>Graphs of sine, cosine and tangent and Transformations of these graphs (1)</u>	Ex 9G

10. Trigonometry Identities and equations (3 lessons)	<a href="#">Exact Values – Exact values for standard angles (30, 60, 90 etc) and finding one trig ratio given another in exact form (degrees). (0.5)</a>	Ex 10A, 10B
	<a href="#">Identities – Use of identities <math>\tan A = \frac{\sin A}{\cos A}</math> and <math>\sin^2 A + \cos^2 A = 1</math> to prove further identities and to solve equations including those that result in quadratic equations. (1.5)</a>	Ex 10C, 10D
	<a href="#">Solving Harder Equations – Solving more complex equations involving. (1)</a>	Ex 10E and Mixed exercise
<b>Half Term May</b>		
	<b>Pure 1 End of Year Mock</b>	
14. Exponentials and Logarithms (5.5 lessons)	<a href="#">Sketch graphs <math>y=ax</math> and <math>y= e^x</math> and transformations of these graphs (1)</a>	Ex 14A, 14B
	<a href="#">Modelling, differentiate <math>e^{kx}</math> and understand why this result is important, recognise the relationship between exponents and logarithms. USE exam questions as well. (1)</a>	Ex 14C
	<a href="#">Logarithms – Introduce and solve equations of the form <math>ax = b</math> (0.5)</a>	Ex14D & Ex 14F Q1
	<a href="#">Laws of logarithms and solve equations (1)</a>	
	<a href="#">Working with natural logarithm function(1)</a>	Ex 14G
	<a href="#">Use Logarithms to estimate the values of the constants in non-linear models (1)</a>	Ex 14H
**Pure 2- 5. Radian Measure PURE 2 (2) (if time allows)  To be taught by Pure 1 teacher	<a href="#">Definition – Radian measure and converting between degrees and radians, standard angles (30, 45, 60, 90 and 180) in terms of <math>\pi</math>. (0.5)</a>	Ex 5A-5B  Ex 5C-5D  Ex 5E-F
	<a href="#">Arc Length</a>	
	<a href="#">Area of Sectors</a>	
	<a href="#">Small angles and Solving Trigonometric equations using Radians (1)</a>	
<b>Applied Maths YEAR 12 Video Links</b>		
	<b>Year 12 Scheme of Work – M1/S1 (NEW TOPICS TO THE COURSE)</b>	
<b>Chapter</b>	<b>Breakdown</b>	
<b>AUTUMN</b>		
1 Statistical Sampling (1.5 lessons)	<ul style="list-style-type: none"> <li>• <a href="#">Understanding ‘population’, ‘sample’ and ‘census’ and comment on the advantages and disadvantages of each (0.25)</a></li> <li>• <a href="#">Understand the advantages and disadvantages of simple random sampling, systematic sampling, stratified sampling, quota sampling and opportunity sampling (0.5)</a></li> <li>• <a href="#">Define qualitative, quantitative, discrete and continuous data, and understand grouped data (0.5)</a></li> <li>• <a href="#">Understand the large data set and how to collect data from it, identify types of data and calculate simple statistics (0.5)</a></li> </ul>	

2. Data Presentation and Interpretation (2.5 lessons)	<ul style="list-style-type: none"> <li>● <a href="#">Averages from tables including Interpolation (0.5)</a></li> <li>● <a href="#">Quartiles and Percentiles including IQR and IPR (0.5)</a></li> <li>● <a href="#">Variance and Standard Deviation (1)</a></li> <li>● <a href="#">Coding (0.5)</a></li> </ul>	
3. Representation of Data (3.5 lessons)	<ul style="list-style-type: none"> <li>● <a href="#">Outlier testing and Box Plots (draw and Interpret) (0.5)</a></li> <li>● <a href="#">Draw and Interpret Cumulative Frequency Graphs (0.5)</a></li> <li>● <a href="#">Draw and Interpret Histograms (1)</a></li> <li>● <a href="#">Compare 2 data sets (0.5)</a></li> <li>● <a href="#">Mixed exercises and Exam questions (1)</a></li> </ul>	
4. Correlation (2 lessons)	<ul style="list-style-type: none"> <li>● <a href="#">Draw and Interpret Scatter Diagrams for Bivariate Data (0.5)</a></li> <li>● <a href="#">Interpret Correlation and understand it does not imply causation (0.5)</a></li> <li>● <a href="#">Interpret the coefficients of the regression line equation for bivariate data (0.5)</a></li> <li>● <a href="#">Understand when you can use a regression line to make predictions (0.5)</a></li> </ul>	
5. Probability (2.5 lessons)	<ul style="list-style-type: none"> <li>● <a href="#">Calculate probabilities for single events (0.5)</a></li> <li>● <a href="#">Draw and interpret Venn Diagrams (1)</a></li> <li>● <a href="#">Understand Mutually Exclusive and Independent Events and determine independent events (0.5)</a></li> <li>● <a href="#">Use and Understand Tree Diagrams (0.5)</a></li> </ul>	
<b>CHRISTMAS</b>		
6. Statistical Distributions (2.5 lessons)	<ul style="list-style-type: none"> <li>● <a href="#">Understand and use simple discrete probability distributions including Discrete Uniform Distributions (1)</a></li> <li>● <a href="#">Understand the Binomial distribution as a model and comment on appropriateness (0.5)</a></li> <li>● <a href="#">Calculate individual probabilities for the Binomial distribution (0.5)</a></li> <li>● <a href="#">Calculate Cumulative Probabilities for Binomial distribution (0.5)</a></li> </ul>	
7. Statistical Hypothesis testing (4 lessons)	<ul style="list-style-type: none"> <li>● <a href="#">Understand the language and concept of Hypothesis Testing</a></li> <li>● <a href="#">Understand that a sample is used to make an inference about a population (1)</a></li> <li>● <a href="#">Critical values of a Binomial distribution using tables (1)</a></li> <li>● <a href="#">Carry out a one-tailed test and interpret the results (1)</a></li> <li>● <a href="#">Carry out a two-tailed test and interpret the results (1)</a></li> </ul>	
<b>HALF TERM</b>		
8. Modelling in Mechanics (2 lessons)	<ul style="list-style-type: none"> <li>● <a href="#">Understand the concept of a Mathematical Model and its application (0.5)</a></li> <li>● <a href="#">Understand and be able to apply some of the common assumptions used in Mechanical Models (0.5)</a></li> <li>● <a href="#">Know SI units for quantities and derived quantities used in Mechanics (0.5)</a></li> <li>● <a href="#">Know the difference between scalar and vector quantities (0.5)</a></li> </ul>	
9. Kinematics1 (Constant Acceleration) (4 lessons)	<ul style="list-style-type: none"> <li>● <a href="#">Understand and Interpret displacement-time graph (0.5)</a></li> <li>● <a href="#">Understand and interpret velocity-time graph (0.5)</a></li> <li>● <a href="#">Derive the constant acceleration formulae and use them to solve problems (1.5)</a></li> <li>● <a href="#">Use the constant acceleration formulae to solve problems involving vertical motion under gravity (1.5)</a></li> </ul>	
<b>Easter Holidays</b>		
10. Forces and Newton's Law (5 lessons)	<ul style="list-style-type: none"> <li>● <a href="#">Draw Force diagrams and calculate resultant forces (0.5)</a></li> <li>● <a href="#">Understand and use Newton's First Law (0.5)</a></li> <li>● <a href="#">Calculate resultant forces by adding vectors (0.5)</a></li> <li>● <a href="#">Understand and use Newton's second law, <math>F=ma</math> (0.5)</a></li> <li>● <a href="#">Apply Newton's second law to vector forces and acceleration (1)</a></li> <li>● <a href="#">Understand and use Newton's third law (1)</a></li> <li>● <a href="#">Solve problems involving connected particles (1.5)</a></li> </ul>	

<b>HALF TERM</b>		
<b>11. Kinematics 2 (Variable Acceleration)</b>  (3 lessons)	<ul style="list-style-type: none"> <li>• <a href="#">Understand that displacement, velocity and acceleration maybe given as functions of time (1)</a></li> <li>• <a href="#">Use differentiation to solve problems (0.5)</a></li> <li>• <a href="#">Use calculus to solve problems including maxima and minima (0.5)</a></li> <li>• <a href="#">Use integration to solve kinematics problems (0.5)</a></li> <li>• <a href="#">Use calculus to derive constant acceleration formula (0.5)</a></li> </ul>	
Revise Exam booklet End of Year MOCK CAP		