Maths	Autumn 1 (Half term 1)	Autumn 1 continued (Half term 1)	Autumn 2 (Half term 2)	Autumn 2 continued (Half term 2)
Year 11C	**Curriculum (C)** **3 Number Properties 2** • Recap and extend work from Year 10 Calculating using the rules for indices, including negative and fractional indices. • Recap and extend work from Year 10 writing numbers in standard form converting to and from ordinary numbers. • Recap and extend work from Year 10 Calculating using numbers in standard form without a calculator and with a calculator. Calculations should include addition, subtraction, multiplication and division in and out of context. • Understand and state the difference between a rational and irrational number. • Understand that π is an irrational number and that exact answers can be left in terms of π especially in circle, sphere, cone and cylinder based problems. **4 Algebra 1** • Recap and extend work from year 10 as below. • Understand how to substitute positive and negative integers into formulae and expressions including terms with fractions, brackets and indices. • Understand how to substitute fractions and decimals into formulae and expressions including terms with fractions, brackets and indices. • Understand, recall and use various formulae for perimeter and areas of standard shapes including quadrilaterals, cuboids and prisms including cylinders. Be able to use these in context and use them to find missing lenths/areas given area and volumes. • Understand and use the formulae for various compound measures such as speed, density and pressure. • Understand and use formulas related to unit pricing and rates of pay solving worded problems and finding best value. **5 Fractions, decimals, %** • Recap work from Year 10 as detailed below. • Interpret fractions, percentages and decimals as a multipliers when solving problems and use these to solve problems using a calculator and where appropriate without a calculator. • Understand how to solve problems involving percentage increase/decrease and finding percentage increases/decreases following changes in values. • Understand how to solve original value (reverse percentage) problems after a percentage change and solve simple interest problems in financial mathematics. • Understand how to work out the price after VAT, service charge and income after tax in problems in a variety of contexts. • Understand how to solve financial problems by working out the value of savings after a period of compound interest. • Understand how to Identify and calculate a fraction of an amount. • In problems solve calculations where it is necessary to express one quantity as a fraction of another, where the fraction is less than 1 and greater than 1.	**Curriculum (C)** **6 Approximation** • Understand how to estimate answers to calculations and check actual answers using estimation. • Understand that upper and lower bounds exist for rounded values and show these limits using inequality notation. • Understand how to solve problems involving upper and lower bounds including more complex questions as appropriate. **3 Number Properties 2 (continued)** • Understand how to simplify irrational numbers in surd form. • Understand how to write $(3 - \sqrt{3})^2$ in the form $a + b\sqrt{3}$. • Understand how to rationalise a denominator. **7 Algebra 2** • Extend previous work from Year 10 to include:- • Understand how to simplify expressions involving surds including those presented in double brackets and include those in algebraic expressions • Understand how to factorise quadratic expressions of the form ax^2+bx+c. • Understand how to simplify expressions involving algebraic fractions and involving factorising resultant quadratic expressions. • Understand how to expand three binominals. • Understand how to simplify algebraic expressions involving fractional and/or negative powers using index laws. • Understand how to solve linear equations with unknown on both sides, involving those with fractions. • Understand how to solve linear equations graphically **8 Collecting & Interpreting Data** • Understand how to use the symbols for union and intersection and 'not' (compliment) for Venn Diagrams involving 2 and 3 intersecting sets or subsets **Revision**	**Curriculum (C)** **Revision** **Mock I Exams** **9 Sequences and Graphs** • Understand and use subscript notation for position-to-term and term-to-term rules. • Understand how to find a formula for the nth term of a sequence including a quadratic sequence and use a given nth term to generate a sequence. • Understand how to generate and find nth terms of other sequences. For example 1, $\sqrt{2}$, 2, $2\sqrt{2}$ or ½, 2/3, 3/4, …. • Link the algebraic nth term of a quadratic sequence to its corresponding graphical representation. • Understand the nth term and explain where it is has come from in relation to a pictorial sequence given (this can include quadratic sequences). **10 Proportion 1 & 11 Ratio & Scale** • Understand how to convert between families of fractions and decimals including recurring decimals to exact fractions. • Recap the application of ratio by solving problems leading to being able to:- • Understand ratio, simplify ratio, determine equivalent ratio and divide in a given ratio both with and without a calculator. • Understand how to compare proportions when given a ratio of two quantities and use ratio/proportion in recipes. • Use the ratio 1 : n for use with map scales and scale drawing/plans. • Understand and use the ratio n : 1. • Understand how to solve problems that could include direct and inverse proportion questions. • Understand the relationship between fractions and ratio/proportion.	**Curriculum (C)** **11 Ratio and Scale** • Understand how to use ratio to solve problems involving similar shapes; for length, areas and volumes. • Understand and use the effect of enlargement for perimeter, area and volume of shapes and solids. • Recognise that similar triangles maintain the same ratios between their sides. • Understand that the scale factor of an enlargement of a shape is the ratio of the lengths of two corresponding sides. • Know the relationships between linear, area and volume scale factors of mathematically similar shapes and solids. • Understand that trigonometric functions are commonly defined as ratios of two sides of a right triangle containing the angle **12 Shape Properties** • Understand how to find missing lengths in similar shapes. • Understand how to show angles are equal in similar shapes. • Understand how to prove properties of a triangle using an understanding of Pythagoras' theorem. • Understand how to show that a triangle must contain a right angle given its side lengths. • Understand how to show why the base angles of an isosceles triangle are equal using SAS as introduction to congruency of triangles covered later. **16 Triangles and Construction** • Use Pythagoras and trigonometry (SOHCAHTOA) in a wide variety of contexts, including their application on a coordinate grid and in bearings (find angles and sides in all contexts). Questions will include angles of elevation and depression. • Understand how to apply the sine and cosine rule to find missing lengths and angles in any triangle or shape based problem. • Understand how to apply Area = 1/2abSinC to calculate the area, sides or angles of any triangle.

Maths	Spring 1 (Half term 3)	Spring 1 continued (Half term 3)	Spring 2 (Half term 4)	Spring 2 continued (Half term 4)	Summer 2 (Half term 5)	Summer 2 (Half term 6)
Year 11C	**Curriculum (C)** **13 Algebra 3** • Understand how to change the subject of a formula involving algebraic fractions. • Understand how to use function notation and evaluate functions. • Understand and be able to use composite functions. • Understand that f(x) followed by g(x) gives the composite function gf(x). • Recognise that fg(x) and gf(x) will not be the same **14 Transformations** • Review of all 4 types of transformations including the following. • Transform and describe combinations of transformations, understanding what is the same and what is different. • Understand the term invariant. • Understand Vector addition using diagrams and column vectors. • Understand how to multiply vectors by a scalar quantity. • Understand how to solve simple geometric vector problems and extend where applicable to solve geometrical problems in 2D using vector methods for example those containing a trapezium, a parallelogram and understand how to prove vectors are parallel or that points are collinear (are on a straight line). **15 Probability** • Understand how to construct an accurate tree diagram given information for independent and dependent events. • Understand how to fill in missing probabilities from a tree diagram and use a tree diagram to calculate the probability of events occurring. • Extend as applicable to the following:- • Understand what the term 'conditional probability means and the implications of with or without replacement when calculating probabilities. • Be able to recognise when a problem involves conditional probability. • Understand how to select the necessary information from two-way tables, Venn diagrams, tree diagrams to calculate conditional probabilities.	**Curriculum (C)** **16 Triangles & Construction** • Be able to recall, the the exact values of sinθ and cosθ for θ = 0, 30, 45, 60 and 90 degrees; know the exact value of tanθ for θ = 0, 30, 45 and 60 degrees, by understanding their derivation using trigonometry in equilateral triangles of side 2, and isosceles triangles of side 1 respectively). • Understand how to sketch the trigonometric graphs of Sin, Cos and Tan, using known facts to identify where the key intercepts on the x and y-axes are. • Understand and apply the relationship between Linear and Area & Volume scale factors between shapes that are mathematically similar. **17 Interpreting Data** • Review the drawing and interpretation of pie charts, frequency diagrams (include frequency polygons) and scatter diagrams. • Review the drawing and interpretation of cumulative frequency diagrams and box plots. • Review Calculating the average from grouped data. • Review how to calculate the interquartile range from a list of data or a cumulative frequency curve. • Review the elements of the data handling cycle and how it is used to prove an hypothesis. • Understand how to draw, use and interpret histograms for grouped data with equal and unequal class widths. **Revision** **Mock I Paper 3**	**Curriculum (C)** **18 Circles** • Understand how to calculate the area of a sector. • Understand how to find the length of an arc. • Recap problem solving involving using the Circle theorems covered in Year 10: including angle subtended by an arc at the centre is equal to twice the angle subtended at any point on the circumference, angle subtended at the circumference by a semicircle is 90°, angles in the same segment are equal, opposite angles in a cyclic quadrilateral sum to 180°, tangent at any point on a circle is perpendicular to the radius at that point, tangents from an external point are equal in length, the perpendicular from the centre to a chord bisects the chord and the alternate segment theorem. **19 Proportion 2** • Understand how to use the gradient of a straight line graph as the rate of change. • Recognise graphs that represent direct and inverse proportion. • Understand how to match graphs of direct or inverse proportion with the algebraic formula and the real-life context it is representing. • Understand how to solve direct and inverse proportion problems numerically, algebraically and graphically **20 Solving equations and inequalities** • Understand how to sketch a quadratic graph by finding the x and y axis crossings (intercepts) and roots/turning points found by completing the square. • Understand how to find/estimate solutions to equations by interpreting the graph **Mock II**	**Curriculum (C)** **20 Solving equations and inequalities (continued)** • Understand how to solve quadratic equations algebraically by completing the square and by using the formula. Solutions to be given as exact solutions or those involving surds. • Understand how to relate graphical solutions to quadratic equations to the graphical representation. • Understand how to solve equations numerically using iteration. • For the most able core students in year 11 cover the following (cover as part of the main revision if applicable):- • Understand how to draw graphs of straight lines and curves in different contexts and interpret the gradient of a straight line or chord, gradient of a tangent at a point on a curve and recognise that the first is 'average' but the second is instantaneous rate of change. • Understand how to solve two simultaneous equations (one linear and one quadratic) algebraically or graphically. • Understand how to solve quadratic inequalities by algebraic or graphical methods. **21 Plotting and sketching graphs** • Understand how to plot and draw graphs of y = cosx, y = sinx and y = tanx for angles (in degrees) of any magnitude. • Understand how to plot real life graphs including speed, distance graphs. • For the most able core students in year 11 cover the following (cover as part of main revision if applicable):- • Understand how to sketch graphs of lines, quadratics, exponentials, reciprocals and trig functions. • Understand how to sketch translations and reflections of functions. • Understand how to sketch y = f(x-1), y = f(x) + 2, y = f(x - 1) + 2 given the sketch of y = f(x) and know that given a diagram of a sketch and its transformation how to find the equation. • Understand how to sketch y = f(-x) and y = -f(x) given the sketch of y = f(x) and be able to find the equation of the graph given the graph and its transformation. • Understand how to find the gradient of a curve at a given point by drawing a tangent and calculating its value. • Understand how to calculate the area between a curve and the x axis by using the trapezium rule or other method and understand how to interpret this area in context (Kinematics graphs). • Understand how to read and interpret real life graphs and be able to explain what the gradient of the graph represents. • Understand and use function notation. • Understand how to calculate or estimate gradients and areas under graphs and be able to interpret the results when appropriate. **Revision**	**Curriculum (C)** **Revision** **Final Exam 1**	**Curriculum (C)** **Revision** **Final Exam 2** **Final Exam 3**

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